2020 IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR 2020)

Seattle, Washington, USA
14-19 June 2020

Pages 1-705

IEEE Catalog Number: CFP20003-POD
ISBN: 978-1-7281-7169-2

Copyright © 2020 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP20003-POD
ISBN (Print-On-Demand):	978-1-7281-7169-2
ISBN (Online):	978-1-7281-7168-5
ISSN:	1063-6919

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

2020 IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)

CVPR 2020

Table of Contents

Organizers ..... **ccix**
Area Chairs ..... **ccxi**
Reviewers ..... **ccxvi**

Oral 1-1A: 3D From a Single Image and Shape-From-X (1)

Unsupervised Learning of Probably Symmetric Deformable 3D Objects From Images in the Wild 1
Shangzhe Wu (Visual Geometry Group, University of Oxford), Christian Rupprecht (Visual Geometry Group, University of Oxford), and Andrea Vedaldi (Visual Geometry Group, University of Oxford)

Footprints and Free Space From a Single Color Image 11
Jamie Watson (Niantic), Michael Firman (Niantic), Aron Monszpart (Niantic), and Gabriel J. Brostow (Niantic)

Dynamic Fluid Surface Reconstruction Using Deep Neural Network 21
Simron Thapa (Louisiana State University, Baton Rouge, LA, USA), Nianyi Li (Louisiana State University, Baton Rouge, LA, USA), and Jinwei Ye (Louisiana State University, Baton Rouge, LA, USA)

CvxNet: Learnable Convex Decomposition 31
Boyang Deng (Google Research), Kyle Genova (Google Research), Soroosh Yazdani (Google Hardware), Sofien Bouaziz (Google Hardware), Geoffrey Hinton (Google Research), and Andrea Tagliasacchi (Google Research)

BSP-Net: Generating Compact Meshes via Binary Space Partitioning 42
Zhiqin Chen (Simon Fraser University), Andrea Tagliasacchi (Google Research), and Hao Zhang (Simon Fraser University)

Total3DUnderstanding: Joint Layout, Object Pose and Mesh Reconstruction for Indoor Scenes From a Single Image 52
Yinyu Nie (Bournemouth University; The Chinese University of Hong Kong, Shenzhen; Shenzhen Research Institute of Big Data), Xiaoguang Han (The Chinese University of Hong Kong, Shenzhen; Shenzhen Research Institute of Big Data), Shihui Guo (Xiamen University), Yujian Zheng (The Chinese University of Hong Kong, Shenzhen; Shenzhen Research Institute of Big Data), Jian Chang (Bournemouth University), and Jian Jun Zhang (Bournemouth University)

Generating and Exploiting Probabilistic Monocular Depth Estimates ..62
Zhihao Xia (Washington University in St. Louis), Patrick Sullivan (The Boeing Company), and Ayan Chakrabarti (Washington University in St. Louis)

Neural Cages for Detail-Preserving 3D Deformations ..72
Wang Yifan (ETH Zurich), Noam Aigerman (Adobe Research), Vladimir G. Kim (Adobe Research), Siddhartha Chaudhuri (Adobe Research; IIT Bombay), and Olga Sorkine-Hornung (ETH Zurich)

PIFuHD: Multi-Level Pixel-Aligned Implicit Function for High-Resolution 3D Human Digitization ..81
Shunsuke Saito (University of Southern California; Facebook AI Research), Tomas Simon (Facebook Reality Labs), Jason Saragih (Facebook Reality Labs), and Hanbyul Joo (Facebook AI Research)

A Lighting-Invariant Point Processor for Shading ..91
Kathryn Heal (Harvard University), Jialiang Wang (Harvard University), Steven J. Gortler (Harvard University), and Todd Zickler (Harvard University)

ActiveMoCap: Optimized Viewpoint Selection for Active Human Motion Capture ..100
Sena Kiciroglu (CVLAB, EPFL), Helge Rhodin (CVLAB, EPFL; Imager Lab, UBC), Sudipta N. Sinha (Microsoft), Mathieu Salzmann (CVLAB, EPFL), and Pascal Fua (CVLAB, EPFL)

Peek-a-Boo: Occlusion Reasoning in Indoor Scenes With Plane Representations ..110
Ziyu Jiang (NEC Laboratories America; Texas A&M Universaity), Buyu Liu (NEC Laboratories America), Samuel Schulter (NEC Laboratories America), Zhangyang Wang (Texas A&M Universaity), and Manmohan Chandraker (NEC Laboratories America; UC San Diego)

Oral 1-1B: Action and Behavior

Multi-Modal Domain Adaptation for Fine-Grained Action Recognition ..119
Jonathan Munro (University of Bristol) and Dima Damen (University of Bristol)

Evolving Losses for Unsupervised Video Representation Learning ..130
AJ Piergiovanni (Research at Google), Anelia Angelova (Research at Google), and Michael S. Ryoo (Research at Google)

Disentangling and Unifying Graph Convolutions for Skeleton-Based Action Recognition ..140
Ziyu Liu (The University of Sydney; The University of Sydney, SenseTime Computer Vision Research Group, Australia), Hongwen Zhang (University of Chinese Academy of Sciences & CASIA), Zhenghao Chen (The University of Sydney), Zhiyong Wang (The University of Sydney), and Wanli Ouyang (The University of Sydney; The University of Sydney, SenseTime Computer Vision Research Group, Australia)

A Multigrid Method for Efficiently Training Video Models ..150
Chao-Yuan Wu (The University of Texas at Austin; Facebook AI Research (FAIR)), Ross Girshick (Facebook AI Research (FAIR)), Kaiming He (Facebook AI Research (FAIR)), Christoph Feichtenhofer (Facebook AI Research (FAIR)), and Philipp Krähenbühl (The University of Texas at Austin)

Ego-Topo: Environment Affordances From Egocentric Video .160
Tushar Nagarajan (UT Austin), Yanghao Li (Facebook AI Research), Christoph Feichtenhofer (Facebook AI Research), and Kristen Grauman (UT Austin; Facebook AI Research)

Generative Hybrid Representations for Activity Forecasting With No-Regret Learning .170
Jiaqi Guan (Carnegie Mellon University; University of Illinois Urbana Champaign), Ye Yuan (Carnegie Mellon University), Kris M. Kitani (Carnegie Mellon University), and Nicholas Rhinehart (Carnegie Mellon University; UC Berkeley)

Skeleton-Based Action Recognition With Shift Graph Convolutional Network .180
Ke Cheng (NLPR & AIRIA, Institute of Automation, Chinese Academy of Sciences; School of Artificial Intelligence, University of Chinese Academy of Sciences), Yifan Zhang (NLPR & AIRIA, Institute of Automation, Chinese Academy of Sciences; School of Artificial Intelligence, University of Chinese Academy of Sciences), Xiangyu He (NLPR & AIRIA, Institute of Automation, Chinese Academy of Sciences; School of Artificial Intelligence, University of Chinese Academy of Sciences), Weihan Chen (NLPR & AIRIA, Institute of Automation, Chinese Academy of Sciences; School of Artificial Intelligence, University of Chinese Academy of Sciences), Jian Cheng (NLPR & AIRIA, Institute of Automation, Chinese Academy of Sciences; School of Artificial Intelligence, University of Chinese Academy of Sciences; CAS Center for Excellence in Brain Science and Intelligence Technology), and Hanqing Lu (NLPR & AIRIA, Institute of Automation, Chinese Academy of Sciences; School of Artificial Intelligence, University of Chinese Academy of Sciences)

Predicting Goal-Directed Human Attention Using Inverse Reinforcement Learning .190
Zhibo Yang (Stony Brook University), Lihan Huang (Stony Brook University), Yupei Chen (Stony Brook University), Zijun Wei (Adobe Inc.), Seoyoung Ahn (Stony Brook University), Gregory Zelinsky (Stony Brook University), Dimitris Samaras (Stony Brook University), and Minh Hoai (Stony Brook University)

X3D: Expanding Architectures for Efficient Video Recognition .200
Christoph Feichtenhofer (Facebook AI Research (FAIR))

Dynamic Multiscale Graph Neural Networks for 3D Skeleton Based Human Motion Prediction 211
Maosen Li (Cooperative Medianet Innovation Center, Shanghai Jiao Tong University), Siheng Chen (Mitsubishi Electric Research Laboratories), Yangheng Zhao (Cooperative Medianet Innovation Center, Shanghai Jiao Tong University), Ya Zhang (Cooperative Medianet Innovation Center, Shanghai Jiao Tong University), Yanfeng Wang (Cooperative Medianet Innovation Center, Shanghai Jiao Tong University), and Qi Tian (Cooperative Medianet Innovation Center, Shanghai Jiao Tong University)

Use the Force, Luke! Learning to Predict Physical Forces by Simulating Effects .221
Kiana Ehsani (University of Washington), Shubham Tulsiani (FAIR), Saurabh Gupta (UIUC), Ali Farhadi (University of Washington), and Abhinav Gupta (FAIR; Carnegie Mellon University)

Oral 1-1C: Adversarial Learning

DaST: Data-Free Substitute Training for Adversarial Attacks .231.....
Mingyi Zhou (University of Electronic Science and Technology of China; Megvii Technology), Jing Wu (University of Electronic Science and Technology of China; Megvii Technology), Yipeng Liu (University of Electronic Science and Technology of China), Shuaicheng Liu (University of Electronic Science and Technology of China; Megvii Technology), and Ce Zhu (University of Electronic Science and Technology of China)

Towards Verifying Robustness of Neural Networks Against A Family of Semantic Perturbations..... 241
Jeet Mohapatra (MIT EECS), Tsui-Wei Weng (MIT EECS), Pin-Yu Chen (MIT-IBM Watson AI Lab, IBM Research), Sijia Liu (MIT-IBM Watson AI Lab, IBM Research), and Luca Daniel (MIT EECS)

The Secret Revealer: Generative Model-Inversion Attacks Against Deep Neural Networks .250.
Yuheng Zhang (Fudan University), Ruoxi Jia (University of California at Berkeley), Hengzhi Pei (Fudan University), Wenxiao Wang (Tsinghua University), Bo Li (University of Illinois at Urbana-Champaign), and Dawn Song (University of California at Berkeley)

A Self-supervised Approach for Adversarial Robustness .259.....
Muzammal Naseer (Australian National University, Australia; Inception Institute of Artificial Intelligence, UAE; Data61-CSIRO, Australia), Salman Khan (Inception Institute of Artificial Intelligence, UAE), Munawar Hayat (Inception Institute of Artificial Intelligence, UAE), Fahad Shahbaz Khan (Inception Institute of Artificial Intelligence, UAE; CVL, Link¨oping University, Sweden), and Fatih Porikli (Australian National University, Australia)

Adversarial Vertex Mixup: Toward Better Adversarially Robust Generalization .269.....
Saehyung Lee (Electrical and Computer Engineering, ASRI, INMC, and Institute of Engineering Research Seoul National University, South Korea), Hyungyu Lee (Electrical and Computer Engineering, ASRI, INMC, and Institute of Engineering Research Seoul National University, South Korea), and Sungroh Yoon (Electrical and Computer Engineering, ASRI, INMC, and Institute of Engineering Research Seoul National University, South Korea)

How Does Noise Help Robustness? Explanation and Exploration under the Neural SDE Framework.279.....
Xuanqing Liu (UCLA), Tesi Xiao (UC Davis), Si Si (Google), Qin Cao (Google), Sanjiv Kumar (Google), and Cho-Jui Hsieh (UCLA, Google)

Unpaired Image Super-Resolution Using Pseudo-Supervision .288.....
Shunta Maeda (Navier Inc.)

Universal Litmus Patterns: Revealing Backdoor Attacks in CNNs .298.....
Soheil Kolouri (HRL Laboratories, LLC., Malibu, CA, USA), Aniruddha Saha (University of Maryland, Baltimore County, MD), Hamed Pirsiavash (University of Maryland, Baltimore County, MD), and Heiko Hoffmann (HRL Laboratories, LLC., Malibu, CA, USA)

Robustness Guarantees for Deep Neural Networks on Videos 308
Min Wu (Department of Computer Science, University of Oxford, UK) and Marta Kwiatkowska (Department of Computer Science, University of Oxford, UK)

Benchmarking Adversarial Robustness on Image Classification 318
Yinpeng Dong (Dept. of Comp. Sci. and Tech., BNRist Center, Institute for AI, THBI Lab\, Tsinghua University, Beijing, China), Qi-An Fu (Dept. of Comp. Sci. and Tech., BNRist Center, Institute for AI, THBI Lab\, Tsinghua University, Beijing, China), Xiao Yang (Dept. of Comp. Sci. and Tech., BNRist Center, Institute for AI, THBI Lab\, Tsinghua University, Beijing, China), Tianyu Pang (Dept. of Comp. Sci. and Tech., BNRist Center, Institute for AI, THBI Lab\, Tsinghua University, Beijing, China), Hang Su (Dept. of Comp. Sci. and Tech., BNRist Center, Institute for AI, THBI Lab\, Tsinghua University, Beijing, China), Zihao Xiao (RealAI), and Jun Zhu (Dept. of Comp. Sci. and Tech., BNRist Center, Institute for AI, THBI Lab\, Tsinghua University, Beijing, China)

What It Thinks Is Important Is Important: Robustness Transfers Through Input Gradients 329
*Alvin Chan (Nanyang Technological University), Yi Tay (Nanyang Technological University), and Yew-Soon Ong (Nanyang Technological University; AI3, A*STAR, Singapore)*

Transferable, Controllable, and Inconspicuous Adversarial Attacks on Person Re-identification With Deep Mis-Ranking 339
Hongjun Wang (Sun Yat-sen University), Guangrun Wang (Sun Yat-sen University), Ya Li (Guangzhou University), Dongyu Zhang (Guangzhou University), and Liang Lin (Sun Yat-sen University; DarkMatter AI)

Poster 1-1P

Video Modeling With Correlation Networks 349
Heng Wang (Facebook AI), Du Tran (Facebook AI), Lorenzo Torresani (Facebook AI), and Matt Feiszli (Facebook AI)

Projection & Probability-Driven Black-Box Attack 359
Jie Li (Department of Artificial Intelligence, School of Informatics, Xiamen University), Rongrong Ji (Department of Artificial Intelligence, School of Informatics, Xiamen University), Hong Liu (Department of Artificial Intelligence, School of Informatics, Xiamen University), Jianzhuang Liu (Noah's Ark Lab, Huawei Technologies), Bineng Zhong (Huaqiao University), Cheng Deng (Xidian University), and Qi Tian (Noah's Ark Lab, Huawei Technologies)

Auxiliary Training: Towards Accurate and Robust Models 369
Linfeng Zhang (Tsinghua University; Institute for Interdisciplinary Information Core Technology), Muzhou Yu (Institute for Interdisciplinary Information Core Technology; Xi'an Jiaotong University), Tong Chen (Tsinghua University), Zuoqiang Shi (Tsinghua University), Chenglong Bao (Tsinghua University), and Kaisheng Ma (Tsinghua University)

PaStaNet: Toward Human Activity Knowledge Engine ..379
Yong-Lu Li (Shanghai Jiao Tong University), Liang Xu (Shanghai Jiao Tong University), Xinpeng Liu (Shanghai Jiao Tong University), Xijie Huang (Shanghai Jiao Tong University), Yue Xu (Shanghai Jiao Tong University), Shiyi Wang (Shanghai Jiao Tong University), Hao-Shu Fang (Shanghai Jiao Tong University), Ze Ma (Shanghai Jiao Tong University), Mingyang Chen (Shanghai Jiao Tong University), and Cewu Lu (Shanghai Jiao Tong University)

A Hierarchical Graph Network for 3D Object Detection on Point Clouds ..389
Jintai Chen (Zhejiang University, Hangzhou, China), Biwen Lei (Zhejiang University, Hangzhou, China), Qingyu Song (Zhejiang University, Hangzhou, China), Haochao Ying (Zhejiang University, Hangzhou, China), Danny Z. Chen (Department of Computer Science and Engineering, University of Notre Dame, Notre Dame, IN, USA), and Jian Wu (Zhejiang University, Hangzhou, China)

Learning Generative Models of Shape Handles ..399
Matheus Gadelha (Umass Amherst), Giorgio Gori (Adobe Research), Duygu Ceylan (Adobe Research), Radomír Měch (Adobe Research), Nathan Carr (Adobe Research), Tamy Boubekeur (Adobe Research), Rui Wang (Umass Amherst), and Subhransu Maji (Umass Amherst)

One Man's Trash Is Another Man's Treasure: Resisting Adversarial Examples by Adversarial Examples ..409
Chang Xiao (Columbia University, New York) and Changxi Zheng (Columbia University, New York)

Toward a Universal Model for Shape From Texture ..419
Dor Verbin (Harvard University) and Todd Zickler (Harvard University)

HybridPose: 6D Object Pose Estimation Under Hybrid Representations ..428
Chen Song (The University of Texas at Austin), Jiaru Song (The University of Texas at Austin), and Qixing Huang (The University of Texas at Austin)

Boundary-Aware 3D Building Reconstruction From a Single Overhead Image ..438
Jisan Mahmud (University of North Carolina at Chapel Hill), TRUE Price (University of North Carolina at Chapel Hill), Akash Bapat (University of North Carolina at Chapel Hill), and Jan-Michael Frahm (University of North Carolina at Chapel Hill)

Articulation-Aware Canonical Surface Mapping ..449
Nilesh Kulkarni (University of Michigan), Abhinav Gupta (Carnegie Mellon University; Facebook AI Research), David F. Fouhey (University of Michigan), and Shubham Tulsiani (Facebook AI Research)

BiFuse: Monocular 360 Depth Estimation via Bi-Projection Fusion ..459
Fu-En Wang (National Tsing Hua University; ASUS AICS Department), Yu-Hsuan Yeh (National Chiao Tung University), Min Sun (National Tsing Hua University; MOST Joint Research Center for AI Technology and All Vista Healthcare), Wei-Chen Chiu (National Chiao Tung University), and Yi-Hsuan Tsai (NEC Labs America)

Transformation GAN for Unsupervised Image Synthesis and Representation Learning ..469.....
Jiayu Wang (CAS Key Laboratory of GIPAS, Department of EEIS, University of Science and Technology of China), Wengang Zhou (CAS Key Laboratory of GIPAS, Department of EEIS, University of Science and Technology of China), Guo-Jun Qi (Laboratory for MAchine Perception and LEarning (MAPLE); Futurewei Technologies), Zhongqian Fu (Department of EST, University of Science and Technology of China), Qi Tian (CAS Key Laboratory of GIPAS, Department of EEIS, University of Science and Technology of China), and Houqiang Li (CAS Key Laboratory of GIPAS, Department of EEIS, University of Science and Technology of China)

PPDM: Parallel Point Detection and Matching for Real-Time Human-Object Interaction Detection ..479.....
Yue Liao (School of Computer Science and Engineering, Beihang University; SenseTime Research), Si Liu (School of Computer Science and Engineering, Beihang University), Fei Wang (SenseTime Research), Yanjie Chen (SenseTime Research), Chen Qian (SenseTime Research), and Jiashi Feng (National University of Singapore)

Height and Uprightness Invariance for 3D Prediction From a Single View ..488.....
Manel Baradad (Massachusetts Institute of Technology) and Antonio Torralba (Massachusetts Institute of Technology)

SCT: Set Constrained Temporal Transformer for Set Supervised Action Segmentation ..498.....
Mohsen Fayyaz (University of Bonn, Bonn, Germany) and Jürgen Gall (University of Bonn, Bonn, Germany)

3DV: 3D Dynamic Voxel for Action Recognition in Depth Video ..508.....
*Yancheng Wang (National Key Laboratory of Science and Technology on Multispectral Information Processing, School of Artificial Intelligence and Automation, Huazhong University of Science and Technology, China), Yang Xiao (National Key Laboratory of Science and Technology on Multispectral Information Processing, School of Artificial Intelligence and Automation, Huazhong University of Science and Technology, China), Fu Xiong (Megvii Research Nanjing, Megvii Technology, China), Wenxiang Jiang (National Key Laboratory of Science and Technology on Multispectral Information Processing, School of Artificial Intelligence and Automation, Huazhong University of Science and Technology, China), Zhiguo Cao (National Key Laboratory of Science and Technology on Multispectral Information Processing, School of Artificial Intelligence and Automation, Huazhong University of Science and Technology, China), Joey Tianyi Zhou (IHPC, A*STAR, Singapore), and Junsong Yuan (CSE Department, State University of New York at Buffalo)*

Adaptive Interaction Modeling via Graph Operations Search 518
Haoxin Li (School of Electronics and Information Technology, Sun Yat-sen University, China), Wei-Shi Zheng (School of Data and Computer Science, Sun Yat-sen University, China; Peng Cheng Laboratory, China; 5 Key Laboratory of Machine Intelligence and Advanced Computing, Ministry of Education, China), Yu Tao (School of Data and Computer Science, Sun Yat-sen University, China; Accuvision Technology Co. Ltd.), Haifeng Hu (School of Electronics and Information Technology, Sun Yat-sen University, China), and Jian-Huang Lai (School of Data and Computer Science, Sun Yat-sen University, China)

Front2Back: Single View 3D Shape Reconstruction via Front to Back Prediction 528
Yuan Yao (University of British Columbia), Nico Schertler (University of British Columbia), Enrique Rosales (University of British Columbia; Universidad Panamericana), Helge Rhodin (University of British Columbia), Leonid Sigal (University of British Columbia; Canada CIFAR AI Chair, Vector Institute), and Alla Sheffer (University of British Columbia)

SDC-Depth: Semantic Divide-and-Conquer Network for Monocular Depth Estimation 538
Lijun Wang (Dalian University of Technology), Jianming Zhang (Adobe Research), Oliver Wang (Adobe Research), Zhe Lin (Adobe Research), and Huchuan Lu (Dalian University of Technology; Peng Cheng Lab)

Single-View View Synthesis With Multiplane Images 548
Richard Tucker (Google Research) and Noah Snavely (Google Research)

Deep Parametric Shape Predictions Using Distance Fields 558
Dmitriy Smirnov (Massachusetts Institute of Technology), Matthew Fisher (Adobe Research), Vladimir G. Kim (Adobe Research), Richard Zhang (Adobe Research), and Justin Solomon (Massachusetts Institute of Technology)

Leveraging Photometric Consistency Over Time for Sparsely Supervised Hand-Object Reconstruction 568
Yana Hasson (Inria; Département d'informatique de l'ENS, CNRS, PSL Research University), Bugra Tekin (Microsoft), Federica Bogo (Microsoft), Ivan Laptev (Inria; Département d'informatique de l'ENS, CNRS, PSL Research University), Marc Pollefeys (ETH Zürich; Microsoft), and Cordelia Schmid (Inria; Univ. Grenoble Alpes, CNRS, Grenoble INP, LJK)

Ensemble Generative Cleaning With Feedback Loops for Defending Adversarial Attacks 578
Jianhe Yuan (University of Missouri, Columbia, MO) and Zhihai He (University of Missouri, Columbia, MO)

Temporal Pyramid Network for Action Recognition 588
Ceyuan Yang (The Chinese University of Hong Kong), Yinghao Xu (The Chinese University of Hong Kong), Jianping Shi (SenseTime Group Limited), Bo Dai (The Chinese University of Hong Kong), and Bolei Zhou (The Chinese University of Hong Kong)

FaceScape: A Large-Scale High Quality 3D Face Dataset and Detailed Riggable 3D Face Prediction .598
Haotian Yang (Nanjing University), Hao Zhu (Nanjing University; Baidu Research; National Engineering Laboratory for Deep Learning Technology and Applications, China), Yanru Wang (Nanjing University), Mingkai Huang (Nanjing University), Qiu Shen (Nanjing University), Ruigang Yang (Baidu Research; University of Kentucky; Inceptio Inc.; National Engineering Laboratory for Deep Learning Technology and Applications, China), and Xun Cao (Nanjing University)

Structure-Guided Ranking Loss for Single Image Depth Prediction .608
Ke Xian (National Key Laboratory of Science and Technology on MultiSpectral Information Processing, School of Artificial Intelligence and Automation, Huazhong University of Science and Technology, China), Jianming Zhang (Adobe Research), Oliver Wang (Adobe Research), Long Mai (Adobe Research), Zhe Lin (Adobe Research), and Zhiguo Cao (National Key Laboratory of Science and Technology on MultiSpectral Information Processing, School of Artificial Intelligence and Automation, Huazhong University of Science and Technology, China)

In Perfect Shape: Certifiably Optimal 3D Shape Reconstruction From 2D Landmarks .618
Heng Yang (Laboratory for Information & Decision Systems (LIDS), Massachusetts Institute of Technology) and Luca Carlone (Laboratory for Information & Decision Systems (LIDS), Massachusetts Institute of Technology)

When NAS Meets Robustness: In Search of Robust Architectures Against Adversarial Attacks .628
Minghao Guo (The Chinese University of Hong Kong), Yuzhe Yang (MIT CSAIL), Rui Xu (The Chinese University of Hong Kong), Ziwei Liu (The Chinese University of Hong Kong), and Dahua Lin (The Chinese University of Hong Kong)

Towards Transferable Targeted Attack .638
Maosen Li (School of Electronic Engineering, Xidian University, Xi'an, China), Cheng Deng (School of Electronic Engineering, Xidian University, Xi'an, China), Tengjiao Li (School of Electronic Engineering, Xidian University, Xi'an, China), Junchi Yan (Department of CSE, and MoE Key Lab of Artificial Intelligence, Shanghai Jiao Tong University, China), Xinbo Gao (School of Electronic Engineering, Xidian University, Xi'an, China), and Heng Huang (Department of Electrical and Computer Engineering, University of Pittsburgh, PA , USA; JD Finance America Corporation, CA , USA)

Self-Supervised Human Depth Estimation From Monocular Videos .647
Feitong Tan (Simon Fraser University), Hao Zhu (Nanjing University), Zhaopeng Cui (ETH Zürich), Siyu Zhu (Alibaba AI Labs), Marc Pollefeys (ETH Zürich), and Ping Tan (Simon Fraser University)

Recursive Social Behavior Graph for Trajectory Prediction .657
Jianhua Sun (Shanghai Jiao Tong University, China), Qinhong Jiang (SenseTime Group Limited, China), and Cewu Lu (Shanghai Jiao Tong University, China)

Context-Aware and Scale-Insensitive Temporal Repetition Counting .667
Huaidong Zhang (South China University of Technology), Xuemiao Xu (South China University of Technology; State Key Laboratory of Subtropical Building Science; Guangdong Provincial Key Lab of Computational Intelligence and Cyberspace Information), Guoqiang Han (South China University of Technology), and Shengfeng He (South China University of Technology)

OASIS: A Large-Scale Dataset for Single Image 3D in the Wild .676
Weifeng Chen (University of Michigan, Ann Arbor; Princeton University), Shengyi Qian (University of Michigan, Ann Arbor), David Fan (Princeton University), Noriyuki Kojima (University of Michigan, Ann Arbor), Max Hamilton (University of Michigan, Ann Arbor), and Jia Deng (Princeton University)

VPLNet: Deep Single View Normal Estimation With Vanishing Points and Lines .686
Rui Wang (University of North Carolina at Chapel Hill), David Geraghty (Facebook, Inc.), Kevin Matzen (Facebook, Inc.), Richard Szeliski (Facebook, Inc.), and Jan-Michael Frahm (University of North Carolina at Chapel Hill; Facebook, Inc.)

Adversarial Robustness: From Self-Supervised Pre-Training to Fine-Tuning .696
Tianlong Chen (Texas A&M University), Sijia Liu (MIT-IBM Watson AI Lab, IBM Research), Shiyu Chang (MIT-IBM Watson AI Lab, IBM Research), Yu Cheng (Microsoft Dynamics 365 AI Research), Lisa Amini (MIT-IBM Watson AI Lab, IBM Research), and Zhangyang Wang (Texas A&M University)

Defending Against Universal Attacks Through Selective Feature Regeneration .706
Tejas Borkar (Arizona State University), Felix Heide (Princeton University; Algolux), and Lina Karam (Arizona State University; Lebanese American University)

Universal Physical Camouflage Attacks on Object Detectors .717
Lifeng Huang (School of Data and Computer Science, Sun Yat-sen University; Guangdong Key Laboratory of Information Security Technology), Chengying Gao (School of Data and Computer Science, Sun Yat-sen University), Yuyin Zhou (Department of Computer Science, The Johns Hopkins University), Cihang Xie (Department of Computer Science, The Johns Hopkins University), Alan L. Yuille (Department of Computer Science, The Johns Hopkins University), Changqing Zou (Max Planck Institute for Informatics; University of Maryland, College Park), and Ning Liu (School of Data and Computer Science, Sun Yat-sen University; Guangdong Key Laboratory of Information Security Technology)

Intra- and Inter-Action Understanding via Temporal Action Parsing .727
Dian Shao (CUHK-SenseTime Joint Lab, The Chinese University of Hong Kong), Yue Zhao (CUHK-SenseTime Joint Lab, The Chinese University of Hong Kong), Bo Dai (CUHK-SenseTime Joint Lab, The Chinese University of Hong Kong), and Dahua Lin (CUHK-SenseTime Joint Lab, The Chinese University of Hong Kong)

Lightweight Photometric Stereo for Facial Details Recovery ..737
Xueying Wang (University of Science and Technology of China), Yudong Guo (University of Science and Technology of China), Bailin Deng (Cardiff University), and Juyong Zhang (University of Science and Technology of China)

Bundle Pooling for Polygonal Architecture Segmentation Problem ..747
Huayi Zeng (Washington University in St. Louis), Kevin Joseph (Simon Fraser University), Adam Vest (Nike), and Yasutaka Furukawa (Simon Fraser University)

AvatarMe: Realistically Renderable 3D Facial Reconstruction "In-the-Wild" ..757
Alexandros Lattas (Imperial College London, UK; FaceSoft.io), Stylianos Moschoglou (Imperial College London, UK; FaceSoft.io), Baris Gecer (Imperial College London, UK; FaceSoft.io), Stylianos Ploumpis (Imperial College London, UK; FaceSoft.io), Vasileios Triantafyllou (FaceSoft.io), Abhijeet Ghosh (Imperial College London, UK), and Stefanos Zafeiriou (Imperial College London, UK; FaceSoft.io)

Defending Against Model Stealing Attacks With Adaptive Misinformation ..767
Sanjay Kariyappa (Georgia Institute of Technology, Atlanta, GA, USA) and Moinuddin K. Qureshi (Georgia Institute of Technology, Atlanta, GA, USA)

Learning to Generate 3D Training Data Through Hybrid Gradient ..776
Dawei Yang (University of Michigan; Princeton University) and Jia Deng (Princeton University)

Cascaded Refinement Network for Point Cloud Completion ..787
Xiaogang Wang (National University of Singapore), Marcelo H. Ang (National University of Singapore), and Gim Hee Lee (National University of Singapore)

Enhancing Intrinsic Adversarial Robustness via Feature Pyramid Decoder ..797
Guanlin Li (Shandong Provincial Key Laboratory of Computer Networks, Shandong Computer Science Center (National Supercomputer Center in Jinan)), Shuya Ding (School of Computer Science and Engineering, Nanyang Technological University), Jun Luo (School of Computer Science and Engineering, Nanyang Technological University), and Chang Liu (School of Computer Science and Engineering, Nanyang Technological University)

Learning to Discriminate Information for Online Action Detection ..806
Hyunjun Eun (Korea Advanced Institute of Science and Technology (KAIST); SK Telecom), Jinyoung Moon (Electronics and Telecommunications Research Institute (ETRI)), Jongyoul Park (Electronics and Telecommunications Research Institute (ETRI)), Chanho Jung (Hanbat National University), and Changick Kim (Korea Advanced Institute of Science and Technology (KAIST))

Adversarial Examples Improve Image Recognition ..816
Cihang Xie (Google; Johns Hopkins University), Mingxing Tan (Google), Boqing Gong (Google), Jiang Wang (Google), Alan L. Yuille (Johns Hopkins University), and Quoc V. Le (Google)

PQ-NET: A Generative Part Seq2Seq Network for 3D Shapes ..826
Rundi Wu (Center on Frontiers of Computing Studies, Peking University), Yixin Zhuang (Center on Frontiers of Computing Studies, Peking University), Kai Xu (National University of Defense Technology), Hao Zhang (Simon Fraser University), and Baoquan Chen (Center on Frontiers of Computing Studies, Peking University)

Actor-Transformers for Group Activity Recognition ..836
Kirill Gavrilyuk (University of Amsterdam), Ryan Sanford (Sportlogiq), Mehrsan Javan (Sportlogiq), and Cees G. M. Snoek (University of Amsterdam)

SG-NN: Sparse Generative Neural Networks for Self-Supervised Scene Completion of RGB-D Scans ..846
Angela Dai (Technical University of Munich), Christian Diller (Technical University of Munich), and Matthias Nießner (Technical University of Munich)

Geometry-Aware Satellite-to-Ground Image Synthesis for Urban Areas ..856
Xiaohu Lu (The Ohio State University), Zuoyue Li (ETH Zürich), Zhaopeng Cui (ETH Zürich), Martin R. Oswald (ETH Zürich), Marc Pollefeys (ETH Zürich; Microsoft), and Rongjun Qin (The Ohio State University)

Action Modifiers: Learning From Adverbs in Instructional Videos ..865
Hazel Doughty (University of Bristol), Ivan Laptev (Inria, École Normale Supérieure), Walterio Mayol-Cuevas (University of Bristol; Amazon), and Dima Damen (University of Bristol)

ZSTAD: Zero-Shot Temporal Activity Detection ..876
Lingling Zhang (School of Computer Science and Technology, Xi'an Jiaotong University, Xian, China; Ministry of Education Key Lab For Intelligent Networks and Network Security, Xian, China), Xiaojun Chang (Faculty of Information Technology, Monash University, Australia), Jun Liu (School of Computer Science and Technology, Xi'an Jiaotong University, Xian, China; National Engineering Lab for Big Data Analytics, Xi'an Jiaotong University, Xian, China), Minnan Luo (School of Computer Science and Technology, Xi'an Jiaotong University, Xian, China; National Engineering Lab for Big Data Analytics, Xi'an Jiaotong University, Xian, China), Sen Wang (School of Information Technology and Electrical Engineering, The University of Queensland, Australia), Zongyuan Ge (Faculty of Information Technology, Monash University, Australia), and Alexander Hauptmann (School of Computer Science, Carnegie Mellon University, USA)

Geometric Structure Based and Regularized Depth Estimation From 360 Indoor Imagery ..886
Lei Jin (ShanghaiTech University), Yanyu Xu (ShanghaiTech University), Jia Zheng (ShanghaiTech University), Junfei Zhang (KooLab, Kujiale.com), Rui Tang (KooLab, Kujiale.com), Shugong Xu (Shanghai University), Jingyi Yu (ShanghaiTech University), and Shenghua Gao (ShanghaiTech University)

Deep Kinematics Analysis for Monocular 3D Human Pose Estimation .896
Jingwei Xu (Shanghai Jiao Tong University, Shanghai, China; MoE Key Lab of Artificial Intelligence, AI Institute, Shanghai Jiao Tong University), Zhenbo Yu (Shanghai Jiao Tong University, Shanghai, China; MoE Key Lab of Artificial Intelligence, AI Institute, Shanghai Jiao Tong University), Bingbing Ni (Shanghai Jiao Tong University, Shanghai, China; MoE Key Lab of Artificial Intelligence, AI Institute, Shanghai Jiao Tong University; Huawei Hisilicon), Jiancheng Yang (Shanghai Jiao Tong University, Shanghai, China; MoE Key Lab of Artificial Intelligence, AI Institute, Shanghai Jiao Tong University), Xiaokang Yang (Shanghai Jiao Tong University, Shanghai, China; MoE Key Lab of Artificial Intelligence, AI Institute, Shanghai Jiao Tong University), and Wenjun Zhang (Shanghai Jiao Tong University, Shanghai, China; MoE Key Lab of Artificial Intelligence, AI Institute, Shanghai Jiao Tong University)

TEA: Temporal Excitation and Aggregation for Action Recognition .906
Yan Li (Platform and Content Group (PCG), Tencent), Bin Ji (State Key Laboratory for Novel Software Technology, Nanjing University, China), Xintian Shi (Platform and Content Group (PCG), Tencent), Jianguo Zhang (Department of Computer Science and Engineering, Southern University of Science and Technology, China), Bin Kang (Platform and Content Group (PCG), Tencent), and Limin Wang (State Key Laboratory for Novel Software Technology, Nanjing University, China)

Oops! Predicting Unintentional Action in Video .916
Dave Epstein (Columbia University), Boyuan Chen (Columbia University), and Carl Vondrick (Columbia University)

Scene Recomposition by Learning-Based ICP .927
Hamid Izadinia (University of Washington) and Steven M. Seitz (University of Washington)

Enhancing Cross-Task Black-Box Transferability of Adversarial Examples With Dispersion Reduction .937
Yantao Lu (Syracuse University), Yunhan Jia (Bytedance AI Lab), Jianyu Wang (Baidu USA), Bai Li (Duke University), Weiheng Chai (Syracuse University), Lawrence Carin (Duke University), and Senem Velipasalar (Syracuse University)

Single-Step Adversarial Training With Dropout Scheduling .947
Vivek B.S. (Video Analytics Lab, Department of Computational and Data Sciences Indian Institute of Science, Bangalore, India) and R. Venkatesh Babu (Video Analytics Lab, Department of Computational and Data Sciences Indian Institute of Science, Bangalore, India)

Deep Non-Line-of-Sight Reconstruction .957
Javier Grau Chopite (University of Bonn), Matthias B. Hullin (University of Bonn), Michael Wand (University of Mainz), and Julian Iseringhausen (University of Bonn)

SSRNet: Scalable 3D Surface Reconstruction Network ..967.....
Zhenxing Mi (National Key Laboratory of Science and Technology on Multi-spectral Information Processing School of Artifical Intelligence and Automation, Huazhong University of Science and Technology, China), Yiming Luo (National Key Laboratory of Science and Technology on Multi-spectral Information Processing School of Artifical Intelligence and Automation, Huazhong University of Science and Technology, China), and Wenbing Tao (National Key Laboratory of Science and Technology on Multi-spectral Information Processing School of Artifical Intelligence and Automation, Huazhong University of Science and Technology, China)

Progressive Relation Learning for Group Activity Recognition ..977.....
Guyue Hu (Brainnetome Center, National Laboratory of Pattern Recognition, Institute of Automation, Chinese Academy of Sciences (CASIA); University of Chinese Academy of Sciences), Bo Cui (Brainnetome Center, National Laboratory of Pattern Recognition, Institute of Automation, Chinese Academy of Sciences (CASIA); University of Chinese Academy of Sciences), Yuan He (Brainnetome Center, National Laboratory of Pattern Recognition, Institute of Automation, Chinese Academy of Sciences (CASIA); University of Chinese Academy of Sciences), and Shan Yu (Brainnetome Center, National Laboratory of Pattern Recognition, Institute of Automation, Chinese Academy of Sciences (CASIA); CAS Center for Excellence in Brain Science and Intelligence Technology; University of Chinese Academy of Sciences)

Cooling-Shrinking Attack: Blinding the Tracker With Imperceptible Noises ..987.....
Bin Yan (School of Information and Communication Engineering, Dalian University of Technology, China), Dong Wang (School of Information and Communication Engineering, Dalian University of Technology, China), Huchuan Lu (School of Information and Communication Engineering, Dalian University of Technology, China; Peng Cheng Laboratory), and Xiaoyun Yang (China Science IntelliCloud Technology Co., Ltd)

Adversarial Camouflage: Hiding Physical-World Attacks With Natural Styles ..997.....
Ranjie Duan (Swinburne University of Technology), Xingjun Ma (The University of Melbourne), Yisen Wang (Shanghai Jiao Tong University), James Bailey (The University of Melbourne), A. K. Qin (Swinburne University of Technology), and Yun Yang (Swinburne University of Technology)

Weakly-Supervised Action Localization by Generative Attention Modeling ..1006.....
Baifeng Shi (Peking University), Qi Dai (Microsoft Research Asia), Yadong Mu (Peking University), and Jingdong Wang (Microsoft Research Asia)

Towards Achieving Adversarial Robustness by Enforcing Feature Consistency Across Bit Planes .1017
Sravanti Addepalli (Video Analytics Lab, Department of Computational and Data Sciences Indian Institute of Science, Bangalore, India), Vivek B.S. (Video Analytics Lab, Department of Computational and Data Sciences Indian Institute of Science, Bangalore, India), Arya Baburaj (Video Analytics Lab, Department of Computational and Data Sciences Indian Institute of Science, Bangalore, India), Gaurang Sriramanan (Video Analytics Lab, Department of Computational and Data Sciences Indian Institute of Science, Bangalore, India), and R. Venkatesh Babu (Video Analytics Lab, Department of Computational and Data Sciences Indian Institute of Science, Bangalore, India)

Polishing Decision-Based Adversarial Noise With a Customized Sampling .1027
Yucheng Shi (College of Intelligence and Computing, Tianjin University, China; Tianjin Key Lab of Machine Learning, Tianjin University, China), Yahong Han (College of Intelligence and Computing, Tianjin University, China; Tianjin Key Lab of Machine Learning, Tianjin University, China), and Qi Tian (Noah's Ark Lab, Huawei Technologies)

Towards Large Yet Imperceptible Adversarial Image Perturbations With Perceptual Color Distance .1036
Zhengyu Zhao (Radboud University, Nijmegen, Netherlands), Zhuoran Liu (Radboud University, Nijmegen, Netherlands), and Martha Larson (Radboud University, Nijmegen, Netherlands)

Something-Else: Compositional Action Recognition With Spatial-Temporal Interaction Networks .1046
Joanna Materzynska (University of Oxford, TwentyBN), Tete Xiao (UC Berkeley), Roei Herzig (Tel Aviv University), Huijuan Xu (UC Berkeley), Xiaolong Wang (UC Berkeley), and Trevor Darrell (UC Berkeley)

Learning Unsupervised Hierarchical Part Decomposition of 3D Objects From a Single RGB Image .1057
Despoina Paschalidou (Max Planck Institute for Intelligent Systems Tübingen; Computer Vision Lab, ETH Zürich; Max Planck ETH Center for Learning Systems), Luc Van Gool (Computer Vision Lab, ETH Zürich; KU Leuven; Max Planck ETH Center for Learning Systems), and Andreas Geiger (Max Planck Institute for Intelligent Systems Tübingen; University of Tübingen; Max Planck ETH Center for Learning Systems)

Focus on Defocus: Bridging the Synthetic to Real Domain Gap for Depth Estimation .1068
Maxim Maximov (Technical University Munich), Kevin Galim (Technical University Munich), and Laura Leal-Taixé (Technical University Munich)

Active Vision for Early Recognition of Human Actions .1078
Boyu Wang (Stony Brook University), Lihan Huang (Stony Brook University), and Minh Hoai (Stony Brook University; VinAI Research)

SmallBigNet: Integrating Core and Contextual Views for Video Classification 1089
Xianhang Li (ShenZhen Key Lab of Computer Vision and Pattern Recognition, SIAT-SenseTime Joint Lab, Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences; SIAT Branch, Shenzhen Institute of Artificial Intelligence and Robotics for Society), Yali Wang (ShenZhen Key Lab of Computer Vision and Pattern Recognition, SIAT-SenseTime Joint Lab, Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences), Zhipeng Zhou (ShenZhen Key Lab of Computer Vision and Pattern Recognition, SIAT-SenseTime Joint Lab, Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences), and Yu Qiao (ShenZhen Key Lab of Computer Vision and Pattern Recognition, SIAT-SenseTime Joint Lab, Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences; SIAT Branch, Shenzhen Institute of Artificial Intelligence and Robotics for Society)

Gate-Shift Networks for Video Action Recognition 1099
Swathikiran Sudhakaran (Fondazione Bruno Kessler, Trento, Italy), Sergio Escalera (Computer Vision Center, Barcelona, Spain; Universitat de Barcelona, Barcelona, Spain), and Oswald Lanz (Fondazione Bruno Kessler, Trento, Italy)

Semantics-Guided Neural Networks for Efficient Skeleton-Based Human Action Recognition 1109
Pengfei Zhang (Xi'an Jiaotong University, Shaanxi, China), Cuiling Lan (Microsoft Research Asia, Beijing, China), Wenjun Zeng (Microsoft Research Asia, Beijing, China), Junliang Xing (National Laboratory of Pattern Recognition, Institute of Automation, Chinese Academy of Sciences, Beijing, China), Jianru Xue (Xi'an Jiaotong University, Shaanxi, China), and Nanning Zheng (Xi'an Jiaotong University, Shaanxi, China)

Exploiting Joint Robustness to Adversarial Perturbations 1119
Ali Dabouei (West Virginia University), Sobhan Soleymani (West Virginia University), Fariborz Taherkhani (West Virginia University), Jeremy Dawson (West Virginia University), and Nasser M. Nasrabadi (West Virginia University)

From Image Collections to Point Clouds With Self-Supervised Shape and Pose Networks 1129
K L Navaneet (Indian Institute of Science), Ansu Mathew (Indian Institute of Science), Shashank Kashyap (Indian Institute of Science), Wei-Chih Hung (University of California, Merced), Varun Jampani (Google Research), and R. Venkatesh Babu (Indian Institute of Science)

Searching for Actions on the Hyperbole 1138
Teng Long (University of Electronic Science and Technology of China), Pascal Mettes (University of Amsterdam), Heng Tao Shen (University of Electronic Science and Technology of China), and Cees G. M. Snoek (University of Amsterdam)

ColorFool: Semantic Adversarial Colorization 1148
Ali Shahin Shamsabadi (Centre for Intelligent Sensing, Queen Mary University of London, UK), Ricardo Sánchez-Matilla (Centre for Intelligent Sensing, Queen Mary University of London, UK), and Andrea Cavallaro (Centre for Intelligent Sensing, Queen Mary University of London, UK)

Boosting the Transferability of Adversarial Samples via Attention .1158
Weibin Wu (Department of Computer Science and Engineering, The Chinese University of Hong Kong), Yuxin Su (Department of Computer Science and Engineering, The Chinese University of Hong Kong), Xixian Chen (Tencent), Shenglin Zhao (Tencent), Irwin King (Department of Computer Science and Engineering, The Chinese University of Hong Kong), Michael R. Lyu (Department of Computer Science and Engineering, The Chinese University of Hong Kong), and Yu-Wing Tai (Tencent)

ActionBytes: Learning From Trimmed Videos to Localize Actions .1168
Mihir Jain (Qualcomm AI Research, Qualcomm Technologies Netherlands B.V.), Amir Ghodrati (Qualcomm AI Research, Qualcomm Technologies Netherlands B.V.), and Cees G. M. Snoek (QUVA Lab, University of Amsterdam)

Efficient Adversarial Training With Transferable Adversarial Examples .1178
Haizhong Zheng (University of Michigan, Ann Arbor), Ziqi Zhang (University of Michigan, Ann Arbor), Juncheng Gu (University of Michigan, Ann Arbor), Honglak Lee (University of Michigan, Ann Arbor), and Atul Prakash (University of Michigan, Ann Arbor)

Alleviation of Gradient Exploding in GANs: Fake Can Be Real .1188
Song Tao (Department of Electronic Engineering, Shanghai Jiao Tong University) and Jia Wang (Department of Electronic Engineering, Shanghai Jiao Tong University)

On Isometry Robustness of Deep 3D Point Cloud Models Under Adversarial Attacks .1198
Yue Zhao (Department of Industrial Systems Engineering and Management, National University of Singapore), Yuwei Wu (Department of Industrial Systems Engineering and Management, National University of Singapore), Caihua Chen (School of Management and Engineering, Nanjing University), and Andrew Lim (Department of Industrial Systems Engineering and Management, National University of Singapore)

Achieving Robustness in the Wild via Adversarial Mixing With Disentangled Representations 1208
Sven Gowal (DeepMind), Chongli Qin (DeepMind), Po-Sen Huang (DeepMind), Taylan Cemgil (DeepMind), Krishnamurthy Dvijotham (DeepMind), Timothy Mann (DeepMind), and Pushmeet Kohli (DeepMind)

QEBA: Query-Efficient Boundary-Based Blackbox Attack .1218
Huichen Li (University of Illinois at Urbana-Champaign), Xiaojun Xu (University of Illinois at Urbana-Champaign), Xiaolu Zhang (Ant Financial), Shuang Yang (Ant Financial), and Bo Li (University of Illinois at Urbana-Champaign)

Learning to Simulate Dynamic Environments With GameGAN .1228
Seung Wook Kim (NVIDIA; University of Toronto; Vector Institute), Yuhao Zhou (University of Toronto), Jonah Philion (NVIDIA; University of Toronto; Vector Institute), Antonio Torralba (MIT), and Sanja Fidler (NVIDIA; University of Toronto; Vector Institute)

Learn2Perturb: An End-to-End Feature Perturbation Learning to Improve Adversarial Robustness .1238
Ahmadreza Jeddi (Waterloo AI Institute, University of Waterloo, Waterloo, Ontario, Canada), Mohammad Javad Shafiee (Waterloo AI Institute, University of Waterloo, Waterloo, Ontario, Canada), Michelle Karg (ADC Automotive Distance Control Systems GmbH, Continental, Germany), Christian Scharfenberger (ADC Automotive Distance Control Systems GmbH, Continental, Germany), and Alexander Wong (Waterloo AI Institute, University of Waterloo, Waterloo, Ontario, Canada)

Oral 1-2A: 3D From Multiview and Sensors (1)

SDFDiff: Differentiable Rendering of Signed Distance Fields for 3D Shape Optimization .1248
Yue Jiang (University of Maryland, College Park), Dantong Ji (University of Maryland, College Park), Zhizhong Han (University of Maryland, College Park), and Matthias Zwicker (University of Maryland, College Park)

Through the Looking Glass: Neural 3D Reconstruction of Transparent Shapes .1259
Zhengqin Li (University of California, San Diego), Yu-Ying Yeh (University of California, San Diego), and Manmohan Chandraker (University of California, San Diego)

TextureFusion: High-Quality Texture Acquisition for Real-Time RGB-D Scanning .1269
Joo Ho Lee (KAIST), Hyunho Ha (KAIST), Yue Dong (Microsoft Research Asia), Xin Tong (Microsoft Research Asia), and Min H. Kim (KAIST)

D3VO: Deep Depth, Deep Pose and Deep Uncertainty for Monocular Visual Odometry .1278
Nan Yang (Technical University of Munich; Artisense), Lukas von Stumberg (Technical University of Munich; Artisense), Rui Wang (Technical University of Munich; Artisense), and Daniel Cremers (Technical University of Munich; Artisense)

Deep Implicit Volume Compression .1290
Danhang Tang (Google), Saurabh Singh (Google), Philip A. Chou (Google), Christian Häne (Google), Mingsong Dou (Google), Sean Fanello (Google), Jonathan Taylor (Google), Philip Davidson (Google), Onur G. Guleryuz (Google), Yinda Zhang (Google), Shahram Izadi (Google), Andrea Tagliasacchi (Google), Sofien Bouaziz (Google), and Cem Keskin (Google)

MAGSAC++, a Fast, Reliable and Accurate Robust Estimator .1301
Dániel Baráth (Visual Recognition Group, Department of Cybernetics, Czech Technical University, Prague; Machine Perception Research Laboratory, MTA SZTAKI, Budapest), Jana Noskova (Visual Recognition Group, Department of Cybernetics, Czech Technical University, Prague), Maksym Ivashechkin (Visual Recognition Group, Department of Cybernetics, Czech Technical University, Prague), and Jiří Matas (Visual Recognition Group, Department of Cybernetics, Czech Technical University, Prague)

OctSqueeze: Octree-Structured Entropy Model for LiDAR Compression .1310
Lila Huang (Uber Advanced Technologies Group; University of Waterloo), Shenlong Wang (Uber Advanced Technologies Group; University of Toronto), Kelvin Wong (Uber Advanced Technologies Group; University of Toronto), Jerry Liu (Uber Advanced Technologies Group), and Raquel Urtasun (Uber Advanced Technologies Group; University of Toronto)

4D Association Graph for Realtime Multi-Person Motion Capture Using Multiple Video Cameras.... 1321
Yuxiang Zhang (Department of Automation, Tsinghua University), Liang An (Department of Automation, Tsinghua University), Tao Yu (Department of Automation, Tsinghua University), Xiu Li (Department of Automation, Tsinghua University), Kun Li (Tianjin University), and Yebin Liu (Department of Automation, Tsinghua University; Institute for Brain and Cognitive Sciences, Tsinghua University)

Upgrading Optical Flow to 3D Scene Flow Through Optical Expansion .1331
Gengshan Yang (Carnegie Mellon University) and Deva Ramanan (Carnegie Mellon University; Argo AI)

Robust 3D Self-Portraits in Seconds .1341
Zhe Li (Department of Automation, Tsinghua University, China), Tao Yu (Department of Automation, Tsinghua University, China), Chuanyu Pan (Department of Automation, Tsinghua University, China), Zerong Zheng (Department of Automation, Tsinghua University, China), and Yebin Liu (Department of Automation, Tsinghua University, China; Institute for Brain and Cognitive Sciences, Tsinghua University, China)

Oral 1-2B: Computational Photography

FastDVDnet: Towards Real-Time Deep Video Denoising Without Flow Estimation .1351
Matias Tassano (GoPro France), Julie Delon (MAP5, Université de Paris & IUF), and Thomas Veit (GoPro France)

Learning to Have an Ear for Face Super-Resolution .1361
Givi Meishvili (University of Bern, Switzerland), Simon Jenni (University of Bern, Switzerland), and Paolo Favaro (University of Bern, Switzerland)

Deep Optics for Single-Shot High-Dynamic-Range Imaging .1372
Christopher A. Metzler (Stanford University), Hayato Ikoma (Stanford University), Yifan Peng (Stanford University), and Gordon Wetzstein (Stanford University)

Learning Rank-1 Diffractive Optics for Single-Shot High Dynamic Range Imaging .1383
Qilin Sun (KAUST), Ethan Tseng (Princeton University), Qiang Fu (KAUST), Wolfgang Heidrich (KAUST), and Felix Heide (Princeton University)

Deep White-Balance Editing .1394
Mahmoud Afifi (Samsung AI Center (SAIC) – Toronto; York University) and Michael S. Brown (Samsung AI Center (SAIC) – Toronto)

Non-Line-of-Sight Surface Reconstruction Using the Directional Light-Cone Transform .1404
Sean I. Young (Stanford University), David B. Lindell (Stanford University), Bernd Girod (Stanford University), David Taubman (UNSW Sydney), and Gordon Wetzstein (Stanford University)

Seeing the World in a Bag of Chips .1414
Jeong Joon Park (University of Washington), Aleksander Holynski (University of Washington), and Steven M. Seitz (University of Washington)

Correction Filter for Single Image Super-Resolution: Robustifying Off-the-Shelf Deep Super-Resolvers .1425
Shady Abu Hussein (Tel Aviv University, Israel), Tom Tirer (Tel Aviv University, Israel), and Raja Giryes (Tel Aviv University, Israel)

Retina-Like Visual Image Reconstruction via Spiking Neural Model .1435
Lin Zhu (Peking University; Pengcheng Laboratory), Siwei Dong (Peking University), Jianing Li (Peking University; Pengcheng Laboratory), Tiejun Huang (Peking University), and Yonghong Tian (Peking University; Pengcheng Laboratory)

Plug-and-Play Algorithms for Large-Scale Snapshot Compressive Imaging .1444
Xin Yuan (Bell Labs, NJ, USA), Yang Liu (MIT, MA, USA), Jinli Suo (Dept. of Automation & Institute for Brain and Cognitive Sciences, Tsinghua Univ., Beijing, China), and Qionghai Dai (Dept. of Automation & Institute for Brain and Cognitive Sciences, Tsinghua Univ., Beijing, China)

Oral 1-2C: Efficient Training and Inference

Neural Network Pruning With Residual-Connections and Limited-Data .1455
Jian-Hao Luo (National Key Laboratory for Novel Software Technology, Nanjing University, Nanjing, China) and Jianxin Wu (National Key Laboratory for Novel Software Technology, Nanjing University, Nanjing, China)

AdderNet: Do We Really Need Multiplications in Deep Learning? .1465
Hanting Chen (Key Lab of Machine Perception (MOE), Dept. of Machine Intelligence, Peking University; Noah's Ark Lab, Huawei Technologies), Yunhe Wang (Noah's Ark Lab, Huawei Technologies), Chunjing Xu (Noah's Ark Lab, Huawei Technologies), Boxin Shi (NELVT, Dept. of CS, Peking University; Peng Cheng Laboratory), Chao Xu (Key Lab of Machine Perception (MOE), Dept. of Machine Intelligence, Peking University), Qi Tian (Noah's Ark Lab, Huawei Technologies), and Chang Xu (School of Computer Science, Faculty of Engineering, The University of Sydney)

NeuralScale: Efficient Scaling of Neurons for Resource-Constrained Deep Neural Networks .1475
Eugene Lee (Institute of Electronics, National Chiao Tung University) and Chen-Yi Lee (Institute of Electronics, National Chiao Tung University)

Training Quantized Neural Networks With a Full-Precision Auxiliary Module .1485
Bohan Zhuang (The University of Adelaide), Lingqiao Liu (The University of Adelaide), Mingkui Tan (South China University of Technology), Chunhua Shen (The University of Adelaide), and Ian Reid (The University of Adelaide)

Neural Networks Are More Productive Teachers Than Human Raters: Active Mixup for Data-Efficient Knowledge Distillation From a Blackbox Model .1495
Dongdong Wang (University of Central Florida), Yandong Li (University of Central Florida), Liqiang Wang (University of Central Florida), and Boqing Gong (Google)

Multi-Dimensional Pruning: A Unified Framework for Model Compression .1505
Jinyang Guo (School of Electrical and Information Engineering, The University of Sydney), Wanli Ouyang (School of Electrical and Information Engineering, The University of Sydney), and Dong Xu (School of Electrical and Information Engineering, The University of Sydney)

Towards Efficient Model Compression via Learned Global Ranking .1515
Ting-Wu Chin (Carnegie Mellon University), Ruizhou Ding (Carnegie Mellon University), Cha Zhang (Microsoft Cloud and AI), and Diana Marculescu (Carnegie Mellon University; The University of Texas at Austin)

HRank: Filter Pruning Using High-Rank Feature Map .1526
Mingbao Lin (Media Analytics and Computing Laboratory, Department of Artificial Intelligence, School of Informatics, Xiamen University, China), Rongrong Ji (Media Analytics and Computing Laboratory, Department of Artificial Intelligence, School of Informatics, Xiamen University, China; Peng Cheng Laboratory, Shenzhen, China), Yan Wang (Pinterest, USA), Yichen Zhang (Media Analytics and Computing Laboratory, Department of Artificial Intelligence, School of Informatics, Xiamen University, China), Baochang Zhang (Beihang University, China), Yonghong Tian (Peking University, Beijing, China; Peng Cheng Laboratory, Shenzhen, China), and Ling Shao (Inception Institute of Artificial Intelligence, Abu Dhabi, UAE)

DMCP: Differentiable Markov Channel Pruning for Neural Networks .1536
Shaopeng Guo (SenseTime Research), Yujie Wang (SenseTime Research), Quanquan Li (SenseTime Research), and Junjie Yan (SenseTime Research)

ReSprop: Reuse Sparsified Backpropagation .1545
Negar Goli (University of British Columbia, Vancouver, Canada) and Tor M. Aamodt (University of British Columbia, Vancouver, Canada)

Poster 1-2P

Adversarial Texture Optimization From RGB-D Scans .1556
Jingwei Huang (Stanford University; Google Research), Justus Thies (Technical University of Munich), Angela Dai (Technical University of Munich), Abhijit Kundu (Google Research), Chiyu Jiang (Google Research; UC Berkeley), Leonidas J. Guibas (Stanford University), Matthias Nießner (Technical University of Munich), and Thomas Funkhouser (Google Research)

Synchronizing Probability Measures on Rotations via Optimal Transport 1566
Tolga Birdal (Department of Computer Science, Stanford University, USA), Michael Arbel (Gatsby Computational Neuroscience Unit, University College London, UK), Umut Şimşekli (LTCI, Télécom Paris, Institut Polytechnique de Paris, Paris, France; Department of Statistics, University of Oxford, Oxford, UK), and Leonidas J. Guibas (Department of Computer Science, Stanford University, USA)

GhostNet: More Features From Cheap Operations 1577
Kai Han (Noah's Ark Lab, Huawei Technologies), Yunhe Wang (Noah's Ark Lab, Huawei Technologies), Qi Tian (Noah's Ark Lab, Huawei Technologies), Jianyuan Guo (Peking University), Chunjing Xu (Noah's Ark Lab, Huawei Technologies), and Chang Xu (School of Computer Science, Faculty of Engineering, University of Sydney)

Attention-Aware Multi-View Stereo 1587
Keyang Luo (School of Computer Science & Technology, Huazhong University of Science & Technology, China), Tao Guan (School of Computer Science & Technology, Huazhong University of Science & Technology, China; Farsee2 Technology Ltd, China), Lili Ju (University of South Carolina, USA), Yuesong Wang (School of Computer Science & Technology, Huazhong University of Science & Technology, China), Zhuo Chen (School of Computer Science & Technology, Huazhong University of Science & Technology, China), and Yawei Luo (School of Computer Science & Technology, Huazhong University of Science & Technology, China)

Bi3D: Stereo Depth Estimation via Binary Classifications 1597
Abhishek Badki (NVIDIA; University of California, Santa Barbara), Alejandro Troccoli (NVIDIA), Kihwan Kim (NVIDIA), Jan Kautz (NVIDIA), Pradeep Sen (University of California, Santa Barbara), and Orazio Gallo (NVIDIA)

Joint Filtering of Intensity Images and Neuromorphic Events for High-Resolution Noise-Robust Imaging 1606
Zihao W. Wang (Northwestern University), Peiqi Duan (Peking University), Oliver Cossairt (Northwestern University), Aggelos Katsaggelos (Northwestern University), Tiejun Huang (Peking University), and Boxin Shi (Peking University)

SGAS: Sequential Greedy Architecture Search 1617
Guohao Li (King Abdullah University of Science and Technology (KAUST), Saudi Arabia), Guocheng Qian (King Abdullah University of Science and Technology (KAUST), Saudi Arabia), Itzel C. Delgadillo (King Abdullah University of Science and Technology (KAUST), Saudi Arabia), Matthias Müller (Intelligent Systems Lab, Intel Labs, Germany), Ali Thabet (King Abdullah University of Science and Technology (KAUST), Saudi Arabia), and Bernard Ghanem (King Abdullah University of Science and Technology (KAUST), Saudi Arabia)

HVNet: Hybrid Voxel Network for LiDAR Based 3D Object Detection 1628
Maosheng Ye (DEEPROUTE.AI), Shuangjie Xu (DEEPROUTE.AI), and Tongyi Cao (DEEPROUTE.AI)

Frequency Domain Compact 3D Convolutional Neural Networks .1638.....
Hanting Chen (Key Lab of Machine Perception (MOE), Dept. of Machine Intelligence, Peking University; Noah's Ark Lab, Huawei Technologies), Yunhe Wang (Noah's Ark Lab, Huawei Technologies), Han Shu (Noah's Ark Lab, Huawei Technologies), Yehui Tang (Key Lab of Machine Perception (MOE), Dept. of Machine Intelligence, Peking University; Noah's Ark Lab, Huawei Technologies), Chunjing Xu (Noah's Ark Lab, Huawei Technologies), Boxin Shi (NELVT, Dept. of CS, Peking University; Peng Cheng Laboratory), Chao Xu (Key Lab of Machine Perception (MOE), Dept. of Machine Intelligence, Peking University), Qi Tian (Noah's Ark Lab, Huawei Technologies), and Chang Xu (School of Computer Science, Faculty of Engineering, The University of Sydney)

Single-Image HDR Reconstruction by Learning to Reverse the Camera Pipeline .1648.....
Yu-Lun Liu (National Taiwan University; MediaTek Inc.), Wei-Sheng Lai (Google), Yu-Sheng Chen (National Taiwan University), Yi-Lung Kao (National Taiwan University), Ming-Hsuan Yang (Google; UC Merced), Yung-Yu Chuang (National Taiwan University), and Jia-Bin Huang (Virginia Tech)

DNU: Deep Non-Local Unrolling for Computational Spectral Imaging .1658.....
Lizhi Wang (Beijing Institute of Technology), Chen Sun (Beijing Institute of Technology), Maoqing Zhang (Beijing Institute of Technology), Ying Fu (Beijing Institute of Technology), and Hua Huang (Beijing Institute of Technology)

Single Image Optical Flow Estimation With an Event Camera .1669.....
Liyuan Pan (Australian National University, Canberra, Australia; Australian Centre for Robotic Vision), Miaomiao Liu (Australian National University, Canberra, Australia; Australian Centre for Robotic Vision), and Richard Hartley (Australian National University, Canberra, Australia; Australian Centre for Robotic Vision)

Multi-View Neural Human Rendering .1679.....
Minye Wu (ShanghaiTech University; University of Chinese Academy of Sciences; Shanghai Institute of Microsystem and Information Technology), Yuehao Wang (ShanghaiTech University), Qiang Hu (ShanghaiTech University), and Jingyi Yu (ShanghaiTech University; DGene Inc.)

Depth Sensing Beyond LiDAR Range .1689.....
Kai Zhang (Cornell Tech, Cornell University), Jiaxin Xie (HKUST), Noah Snavely (Cornell Tech, Cornell University), and Qifeng Chen (HKUST)

Event Probability Mask (EPM) and Event Denoising Convolutional Neural Network (EDnCNN) for Neuromorphic Cameras .1698.....
R. Wes Baldwin (Department of Electrical Engineering, University of Dayton), Mohammed Almatrafi (Department of Electrical Engineering, Umm Al-Qura University), Vijayan Asari (Department of Electrical Engineering, University of Dayton), and Keigo Hirakawa (Department of Electrical Engineering, University of Dayton)

Point-GNN: Graph Neural Network for 3D Object Detection in a Point Cloud .1708.....
Weijing Shi (Carnegie Mellon University,) and Raj Rajkumar (Carnegie Mellon University,)

Self-Learning Video Rain Streak Removal: When Cyclic Consistency Meets Temporal Correspondence .1717
Wenhan Yang (City University of Hong Kong), Robby T. Tan (National University of Singapore; Yale-NUS College), Shiqi Wang (City University of Hong Kong), and Jiaying Liu (Peking University)

Neuromorphic Camera Guided High Dynamic Range Imaging .1727
Jin Han (Key Laboratory of Machine Perception (MOE), Dept. of Machine Intelligence, Peking University), Chu Zhou (Key Laboratory of Machine Perception (MOE), Dept. of Machine Intelligence, Peking University), Peiqi Duan (National Engineering Laboratory for Video Technology, Dept. of Computer Science, Peking University), Yehui Tang (Key Laboratory of Machine Perception (MOE), Dept. of Machine Intelligence, Peking University), Chang Xu (School of Computer Science, Faculty of Engineering, University of Sydney), Chao Xu (Key Laboratory of Machine Perception (MOE), Dept. of Machine Intelligence, Peking University), Tiejun Huang (National Engineering Laboratory for Video Technology, Dept. of Computer Science, Peking University), and Boxin Shi (National Engineering Laboratory for Video Technology, Dept. of Computer Science, Peking University)

Learning in the Frequency Domain .1737
Kai Xu (DAMO Academy, Alibaba Group; Arizona State University), Minghai Qin (DAMO Academy, Alibaba Group), Fei Sun (DAMO Academy, Alibaba Group), Yuhao Wang (DAMO Academy, Alibaba Group), Yen-Kuang Chen (DAMO Academy, Alibaba Group), and Fengbo Ren (Arizona State University)

Polarized Reflection Removal With Perfect Alignment in the Wild .1747
Chenyang Lei (HKUST), Xuhua Huang (HKUST), Mengdi Zhang (HKUST), Qiong Yan (Sensetime), Wenxiu Sun (Sensetime), and Qifeng Chen (HKUST)

Learning Multiview 3D Point Cloud Registration .1756
Zan Gojcic (ETH Zurich), Caifa Zhou (ETH Zurich), Jan D. Wegner (ETH Zurich), Leonidas J. Guibas (Stanford University), and Tolga Birdal (Stanford University)

A Sparse Resultant Based Method for Efficient Minimal Solvers .1767
Snehal Bhayani (Center for Machine Vision and Signal Analysis, University of Oulu, Finland), Zuzana Kukelova (Visual Recognition Group, Faculty of Electrical Engineering, Czech Technical University in Prague), and Janne Heikkilä (Center for Machine Vision and Signal Analysis, University of Oulu, Finland)

Zero-Reference Deep Curve Estimation for Low-Light Image Enhancement .1777
Chunle Guo (BIIT Lab, Tianjin University; City University of Hong Kong), Chongyi Li (BIIT Lab, Tianjin University; City University of Hong Kong), Jichang Guo (BIIT Lab, Tianjin University), Chen Change Loy (Nanyang Technological University), Junhui Hou (City University of Hong Kong), Sam Kwong (City University of Hong Kong), and Runmin Cong (Beijing Jiaotong University)

BlendedMVS: A Large-Scale Dataset for Generalized Multi-View Stereo Networks 1787
Yao Yao (The Hong Kong University of Science and Technology), Zixin Luo (The Hong Kong University of Science and Technology), Shiwei Li (Everest Innovation Technology), Jingyang Zhang (The Hong Kong University of Science and Technology), Yufan Ren (Zhejiang University), Lei Zhou (The Hong Kong University of Science and Technology), Tian Fang (Everest Innovation Technology), and Long Quan (The Hong Kong University of Science and Technology)

Convolution in the Cloud: Learning Deformable Kernels in 3D Graph Convolution Networks for Point Cloud Analysis 1797
Zhi-Hao Lin (Graduate Institute of Communication Engineering, National Taiwan University, Taiwan), Sheng-Yu Huang (Graduate Institute of Communication Engineering, National Taiwan University, Taiwan), and Yu-Chiang Frank Wang (Graduate Institute of Communication Engineering, National Taiwan University, Taiwan; ASUS Intelligent Cloud Services, Taiwan)

A Semi-Supervised Assessor of Neural Architectures 1807
Yehui Tang (Key Lab of Machine Perception (MOE), Dept. of Machine Intelligence, Peking University; Noah's Ark Lab, Huawei Technologies), Yunhe Wang (Noah's Ark Lab, Huawei Technologies), Yixing Xu (Noah's Ark Lab, Huawei Technologies), Hanting Chen (Key Lab of Machine Perception (MOE), Dept. of Machine Intelligence, Peking University; Noah's Ark Lab, Huawei Technologies), Boxin Shi (NELVT, Dept. of CS, Peking University; Peng Cheng Laboratory), Chao Xu (Key Lab of Machine Perception (MOE), Dept. of Machine Intelligence, Peking University), Chunjing Xu (Noah's Ark Lab, Huawei Technologies), Qi Tian (Noah's Ark Lab, Huawei Technologies), and Chang Xu (School of Computer Science, Faculty of Engineering, University of Sydney)

Learning a Reinforced Agent for Flexible Exposure Bracketing Selection 1817
Zhouxia Wang (SenseTime Research; The University of Hong Kong), Jiawei Zhang (SenseTime Research), Mude Lin (SenseTime Research), Jiong Wang (SenseTime Research), Ping Luo (The University of Hong Kong), and Jimmy Ren (SenseTime Research)

CARS: Continuous Evolution for Efficient Neural Architecture Search 1826
Zhaohui Yang (Key Lab of Machine Perception (MOE), Dept. of Machine Intelligence, Peking University; Noah's Ark Lab, Huawei Technologies), Yunhe Wang (Noah's Ark Lab, Huawei Technologies), Xinghao Chen (Noah's Ark Lab, Huawei Technologies), Boxin Shi (NELVT, Dept. of CS, Peking University; Peng Cheng Laboratory), Chao Xu (Key Lab of Machine Perception (MOE), Dept. of Machine Intelligence, Peking University), Chunjing Xu (Noah's Ark Lab, Huawei Technologies), Qi Tian (Noah's Ark Lab, Huawei Technologies), and Chang Xu (School of Computer Science, Faculty of Engineering, University of Sydney)

Joint 3D Instance Segmentation and Object Detection for Autonomous Driving ..1836
Dingfu Zhou (Baidu Research; National Engineering Laboratory of Deep Learning Technology and Application, Beijing, China), Jin Fang (Baidu Research; National Engineering Laboratory of Deep Learning Technology and Application, Beijing, China), Xibin Song (Baidu Research; National Engineering Laboratory of Deep Learning Technology and Application, Beijing, China), Liu Liu (Australian National University, Canberra, Australia; Australian Centre for Robotic Vision, Australia), Junbo Yin (Beijing Institute of Technology, Beijing, China; Baidu Research; National Engineering Laboratory of Deep Learning Technology and Application, Beijing, China), Yuchao Dai (Northwestern Polytechnical University, Xi'an, China), Hongdong Li (Australian National University, Canberra, Australia; Australian Centre for Robotic Vision, Australia), and Ruigang Yang (Baidu Research; National Engineering Laboratory of Deep Learning Technology and Application, Beijing, China; University of Kentucky, Kentucky, USA)

View-GCN: View-Based Graph Convolutional Network for 3D Shape Analysis ..1847
Xin Wei (Xi'an Jiaotong University, Xi'an, China), Ruixuan Yu (Xi'an Jiaotong University, Xi'an, China), and Jian Sun (Xi'an Jiaotong University, Xi'an, China)

Collaborative Distillation for Ultra-Resolution Universal Style Transfer ..1857
Huan Wang (Zhejiang University; Notheastern University), Yijun Li (Adobe Research), Yuehai Wang (Zhejiang University), Haoji Hu (Zhejiang University), and Ming-Hsuan Yang (UC Merced; Google Research)

TomoFluid: Reconstructing Dynamic Fluid From Sparse View Videos ..1867
Guangming Zang (KAUST), Ramzi Idoughi (KAUST), Congli Wang (KAUST), Anthony Bennett (KAUST), Jianguo Du (KAUST), Scott Skeen (Sandia National Laboratories), William L. Roberts (KAUST), Peter Wonka (KAUST), and Wolfgang Heidrich (KAUST)

Instance Shadow Detection ..1877
Tianyu Wang (Department of Computer Science and Engineering, The Chinese University of Hong Kong; Shenzhen Key Laboratory of Virtual Reality and Human Interaction Technology, Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, China), Xiaowei Hu (Department of Computer Science and Engineering, The Chinese University of Hong Kong), Qiong Wang (Shenzhen Key Laboratory of Virtual Reality and Human Interaction Technology, Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, China), Pheng-Ann Heng (Department of Computer Science and Engineering, The Chinese University of Hong Kong; Shenzhen Key Laboratory of Virtual Reality and Human Interaction Technology, Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, China), and Chi-Wing Fu (Department of Computer Science and Engineering, The Chinese University of Hong Kong; Shenzhen Key Laboratory of Virtual Reality and Human Interaction Technology, Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, China)

Self2Self With Dropout: Learning Self-Supervised Denoising From Single Image .1887.....
Yuhui Quan (School of Computer Science and Engineering, South China University of Technology, Guangzhou , China), Mingqin Chen (School of Computer Science and Engineering, South China University of Technology, Guangzhou , China), Tongyao Pang (Department of Mathematics, National University of Singapore, Singapore), and Hui Ji (Department of Mathematics, National University of Singapore, Singapore)

Discrete Model Compression With Resource Constraint for Deep Neural Networks .1896.....
Shangqian Gao (Electrical and Computer Engineering Department, University of Pittsburgh, PA, USA; JD Finance America Corporation, CA, USA), Feihu Huang (Electrical and Computer Engineering Department, University of Pittsburgh, PA, USA), Jian Pei (School of Computing Science, Simon Fraser University, BC, Canada), and Heng Huang (Electrical and Computer Engineering Department, University of Pittsburgh, PA, USA; JD Finance America Corporation, CA, USA)

Structured Compression by Weight Encryption for Unstructured Pruning and Quantization .1906
Se Jung Kwon (Samsung Research, Republic of Korea), Dongsoo Lee (Samsung Research, Republic of Korea), Byeongwook Kim (Samsung Research, Republic of Korea), Parichay Kapoor (Samsung Research, Republic of Korea), Baeseong Park (Samsung Research, Republic of Korea), and Gu-Yeon Wei (Samsung Research, Republic of Korea; Harvard University, MA)

End-to-End Learning Local Multi-View Descriptors for 3D Point Clouds .1916.....
Lei Li (HKUST), Siyu Zhu (Alibaba A.I. Labs), Hongbo Fu (City University of Hong Kong), Ping Tan (Alibaba A.I. Labs; Simon Fraser University), and Chiew-Lan Tai (HKUST)

Minimal Solutions for Relative Pose With a Single Affine Correspondence .1926.....
Banglei Guan (College of Aerospace Science and Engineering, National University of Defense Technology, China), Ji Zhao (College of Aerospace Science and Engineering, National University of Defense Technology, China), Zhang Li (College of Aerospace Science and Engineering, National University of Defense Technology, China), Fang Sun (College of Aerospace Science and Engineering, National University of Defense Technology, China), and Friedrich Fraundorfer (Institute for Computer Graphics and Vision, Graz University of Technology, Austria; Remote Sensing Technology Institute, German Aerospace Center, Germany)

Point Cloud Completion by Skip-Attention Network With Hierarchical Folding .1936.....
Xin Wen (School of Software, BNRist, Tsinghua University, Beijing, China), Tianyang Li (School of Software, BNRist, Tsinghua University, Beijing, China), Zhizhong Han (Department of Computer Science, University of Maryland, USA), and Yu-Shen Liu (School of Software, BNRist, Tsinghua University, Beijing, China)

Fast-MVSNet: Sparse-to-Dense Multi-View Stereo With Learned Propagation and Gauss-Newton Refinement .1946.....
Zehao Yu (ShanghaiTech University) and Shenghua Gao (ShanghaiTech University)

AANet: Adaptive Aggregation Network for Efficient Stereo Matching ..1956
Haofei Xu (University of Science and Technology of China) and Juyong Zhang (University of Science and Technology of China)

Towards Unified INT8 Training for Convolutional Neural Network ..1966
Feng Zhu (SenseTime Group Limited), Ruihao Gong (SenseTime Group Limited; State Key Laboratory of Software Development Environment, Beihang University), Fengwei Yu (SenseTime Group Limited), Xianglong Liu (State Key Laboratory of Software Development Environment, Beihang University), Yanfei Wang (SenseTime Group Limited), Zhelong Li (SenseTime Group Limited), Xiuqi Yang (SenseTime Group Limited), and Junjie Yan (SenseTime Group Limited)

Active 3D Motion Visualization Based on Spatiotemporal Light-Ray Integration ..1977
Fumihiko Sakaue (Nagoya Institute of Technology, Gokiso Showa Nagoya, 466-8555, Japan) and Jun Sato (Nagoya Institute of Technology, Gokiso Showa Nagoya, 466-8555, Japan)

Block-Wisely Supervised Neural Architecture Search With Knowledge Distillation ..1986
Changlin Li (Monash University), Jiefeng Peng (DarkMatter AI Research), Liuchun Yuan (DarkMatter AI Research; Sun Yat-sen University), Guangrun Wang (DarkMatter AI Research; Sun Yat-sen University), Xiaodan Liang (DarkMatter AI Research; Sun Yat-sen University), Liang Lin (DarkMatter AI Research; Sun Yat-sen University), and Xiaojun Chang (Monash University)

GreedyNAS: Towards Fast One-Shot NAS With Greedy Supernet ..1996
Shan You (SenseTime; Department of Automation, Tsinghua University), Tao Huang (SenseTime; Dian Group, School of CST, Huazhong University of Science and Technology), Mingmin Yang (SenseTime), Fei Wang (SenseTime), Chen Qian (SenseTime), and Changshui Zhang (Department of Automation, Tsinghua University)

Learning Filter Pruning Criteria for Deep Convolutional Neural Networks Acceleration ..2006
Yang He (ReLER, University of Technology Sydney), Yuhang Ding (Baidu Research), Ping Liu (ReLER, University of Technology Sydney), Linchao Zhu (ReLER, University of Technology Sydney), Hanwang Zhang (Nanyang Technological University), and Yi Yang (ReLER, University of Technology Sydney)

DIST: Rendering Deep Implicit Signed Distance Function With Differentiable Sphere Tracing ..2016
Shaohui Liu (ETH Zurich; Tsinghua University), Yinda Zhang (Google), Songyou Peng (ETH Zurich; Max Planck ETH Center for Learing Systems), Boxin Shi (Peking University; Peng Cheng Laboratory), Marc Pollefeys (ETH Zurich; Microsoft; Max Planck ETH Center for Learing Systems), and Zhaopeng Cui (ETH Zurich)

Visually Imbalanced Stereo Matching ..2026
Yicun Liu (SenseTime Research; Columbia University), Jimmy Ren (SenseTime Research), Jiawei Zhang (SenseTime Research), Jianbo Liu (SenseTime Research; The Chinese University of Hong Kong), and Mude Lin (SenseTime Research)

Mesh-Guided Multi-View Stereo With Pyramid Architecture .2036.....
Yuesong Wang (School of Computer Science & Technology, Huazhong University of Science & Technology, China), Tao Guan (School of Computer Science & Technology, Huazhong University of Science & Technology, China; Farsee2 Technology Ltd, China), Zhuo Chen (School of Computer Science & Technology, Huazhong University of Science & Technology, China), Yawei Luo (School of Computer Science & Technology, Huazhong University of Science & Technology, China), Keyang Luo (School of Computer Science & Technology, Huazhong University of Science & Technology, China), and Lili Ju (University of South Carolina, USA)

BiDet: An Efficient Binarized Object Detector .2046.....
Ziwei Wang (Department of Automation, Tsinghua University, China; State Key Lab of Intelligent Technologies and Systems, China; Beijing National Research Center for Information Science and Technology, China), Ziyi Wu (Department of Automation, Tsinghua University, China), Jiwen Lu (Department of Automation, Tsinghua University, China; State Key Lab of Intelligent Technologies and Systems, China; Beijing National Research Center for Information Science and Technology, China), and Jie Zhou (Department of Automation, Tsinghua University, China; State Key Lab of Intelligent Technologies and Systems, China; Beijing National Research Center for Information Science and Technology, China; Tsinghua Shenzhen International Graduate School, Tsinghua University, China)

Local Non-Rigid Structure-From-Motion From Diffeomorphic Mappings .2056.....
Shaifali Parashar (CVLAB, EPFL, Switzerland), Mathieu Salzmann (CVLAB, EPFL, Switzerland), and Pascal Fua (CVLAB, EPFL, Switzerland)

Seeing Around Street Corners: Non-Line-of-Sight Detection and Tracking In-the-Wild Using Doppler Radar .2065.....
Nicolas Scheiner (Mercedes-Benz AG), Florian Kraus (Mercedes-Benz AG), Fangyin Wei (Princeton University), Buu Phan (Algolux), Fahim Mannan (Algolux), Nils Appenrodt (Mercedes-Benz AG), Werner Ritter (Mercedes-Benz AG), Jürgen Dickmann (Mercedes-Benz AG), Klaus Dietmayer (Ulm University), Bernhard Sick (University of Kassel), and Felix Heide (Princeton University; Algolux)

APQ: Joint Search for Network Architecture, Pruning and Quantization Policy .2075.....
Tianzhe Wang (Massachusetts Institute of Technology; Shanghai Jiao Tong University), Kuan Wang (Massachusetts Institute of Technology), Han Cai (Massachusetts Institute of Technology), Ji Lin (Massachusetts Institute of Technology), Zhijian Liu (Massachusetts Institute of Technology), Hanrui Wang (Massachusetts Institute of Technology), Yujun Lin (Massachusetts Institute of Technology), and Song Han (Massachusetts Institute of Technology)

On the Acceleration of Deep Learning Model Parallelism With Staleness .2085.....
An Xu (Electrical and Computer Engineering Department, University of Pittsburgh, PA, USA), Zhouyuan Huo (Electrical and Computer Engineering Department, University of Pittsburgh, PA, USA), and Heng Huang (Electrical and Computer Engineering Department, University of Pittsburgh, PA, USA; JD Finance America Corporation, CA, USA)

RevealNet: Seeing Behind Objects in RGB-D Scans 2095
Ji Hou (Technical University of Munich), Angela Dai (Technical University of Munich), and Matthias Nießner (Technical University of Munich)

MemNAS: Memory-Efficient Neural Architecture Search With Grow-Trim Learning 2105
Peiye Liu (Beijing Key Lab of Intelligent Telecommunication Software and Multimedia, Beijing University of Posts and Telecommunications, Beijing, China; Department of Electrical Engineering, Columbia University, NY, USA), Bo Wu (Department of Electrical Engineering, Columbia University, NY, USA), Huadong Ma (Beijing Key Lab of Intelligent Telecommunication Software and Multimedia, Beijing University of Posts and Telecommunications, Beijing, China), and Mingoo Seok (Department of Electrical Engineering, Columbia University, NY, USA)

StegaStamp: Invisible Hyperlinks in Physical Photographs 2114
Matthew Tancik (University of California, Berkeley), Ben Mildenhall (University of California, Berkeley), and Ren Ng (University of California, Berkeley)

L2-GCN: Layer-Wise and Learned Efficient Training of Graph Convolutional Networks 2124
Yuning You (Texas A&M University), Tianlong Chen (Texas A&M University), Zhangyang Wang (Texas A&M University), and Yang Shen (Texas A&M University)

Polarized Non-Line-of-Sight Imaging 2133
Kenichiro Tanaka (Nara Institute of Science and Technology (NAIST), Japan; University of California, Los Angeles (UCLA), USA), Yasuhiro Mukaigawa (Nara Institute of Science and Technology (NAIST), Japan), and Achuta Kadambi (University of California, Los Angeles (UCLA), USA)

AdaBits: Neural Network Quantization With Adaptive Bit-Widths 2143
Qing Jin (ByteDance Inc.), Linjie Yang (ByteDance Inc.), and Zhenyu Liao (Kwai Inc.)

Multi-Scale Boosted Dehazing Network With Dense Feature Fusion 2154
Hang Dong (College of Artificial Intelligence, Xi'an Jiaotong University), Jinshan Pan (Nanjing University of Science and Technology), Lei Xiang (College of Artificial Intelligence, Xi'an Jiaotong University), Zhe Hu (Hikvision Research America), Xinyi Zhang (College of Artificial Intelligence, Xi'an Jiaotong University), Fei Wang (College of Artificial Intelligence, Xi'an Jiaotong University), and Ming-Hsuan Yang (University of California, Merced; Google Research)

ClusterVO: Clustering Moving Instances and Estimating Visual Odometry for Self and Surroundings 2165
Jiahui Huang (BNRist, Department of Computer Science and Technology, Tsinghua University, Beijing), Sheng Yang (Alibaba Inc., China), Tai-Jiang Mu (BNRist, Department of Computer Science and Technology, Tsinghua University, Beijing), and Shi-Min Hu (BNRist, Department of Computer Science and Technology, Tsinghua University, Beijing)

Automatic Neural Network Compression by Sparsity-Quantization Joint Learning: A Constrained Optimization-Based Approach .2175
Haichuan Yang (Department of Computer Science, University of Rochester, Rochester, USA), Shupeng Gui (Department of Computer Science, University of Rochester, Rochester, USA), Yuhao Zhu (Department of Computer Science, University of Rochester, Rochester, USA), and Ji Liu (AI Platform, Ytech Seattle AI Lab, FeDA Lab, Kwai Inc., USA)

Normal Assisted Stereo Depth Estimation .2186
Uday Kusupati (The University of Texas at Austin), Shuo Cheng (University of California San Diego), Rui Chen (Tsinghua University), and Hao Su (University of California San Diego)

Fusing Wearable IMUs With Multi-View Images for Human Pose Estimation: A Geometric Approach .2197
Zhe Zhang (Southeast University, Nanjing, China), Chunyu Wang (Microsoft Research Asia, Beijing, China), Wenhu Qin (Southeast University, Nanjing, China), and Wenjun Zeng (Microsoft Research Asia, Beijing, China)

gDLS*: Generalized Pose-and-Scale Estimation Given Scale and Gravity Priors .2207
Victor Fragoso (Microsoft), Joseph DeGol (Microsoft), and Gang Hua (Wormpex AI)

Embodied Language Grounding With 3D Visual Feature Representations .2217
Mihir Prabhudesai (Carnegie Mellon University), Hsiao-Yu Fish Tung (Carnegie Mellon University), Syed Ashar Javed (Carnegie Mellon University), Maximilian Sieb (Carnegie Mellon University), Adam W. Harley (Carnegie Mellon University), and Katerina Fragkiadaki (Carnegie Mellon University)

Learning to Autofocus .2227
Charles Herrmann (Cornell Tech), Richard Strong Bowen (Cornell Tech), Neal Wadhwa (Google Research), Rahul Garg (Google Research), Qiurui He (Google Research), Jonathan T. Barron (Google Research), and Ramin Zabih (Cornell Tech; Google Research)

Joint Demosaicing and Denoising With Self Guidance .2237
Lin Liu (CAS Key Laboratory of GIPAS, University of Science and Technology of China; Noah's Ark Lab, Huawei Technologies), Xu Jia (Noah's Ark Lab, Huawei Technologies), Jianzhuang Liu (Noah's Ark Lab, Huawei Technologies), and Qi Tian (Noah's Ark Lab, Huawei Technologies)

Forward and Backward Information Retention for Accurate Binary Neural Networks .2247
Haotong Qin (State Key Lab of Software Development Environment, Beihang University), Ruihao Gong (State Key Lab of Software Development Environment, Beihang University), Xianglong Liu (State Key Lab of Software Development Environment, Beihang University; Beijing Advanced Innovation Center for Big Data-Based Precision Medicine, Beihang University), Mingzhu Shen (State Key Lab of Software Development Environment, Beihang University), Ziran Wei (Beijing University of Posts and Telecommunications), Fengwei Yu (SenseTime Research), and Jingkuan Song (Center for Future Media, University of Electronic Science and Technology of China)

Light Field Spatial Super-Resolution via Deep Combinatorial Geometry Embedding and Structural Consistency Regularization ..2257
Jing Jin (City University of Hong Kong), Junhui Hou (City University of Hong Kong), Jie Chen (Hong Kong Baptist University), and Sam Kwong (City University of Hong Kong)

A Multi-Hypothesis Approach to Color Constancy ..2267
Daniel Hernandez-Juarez (Huawei Noah's Ark Lab), Sarah Parisot (Huawei Noah's Ark Lab; Mila, Montréal), Benjamin Busam (Huawei Noah's Ark Lab; Technical University of Munich), Aleš Leonardis (Huawei Noah's Ark Lab), Gregory Slabaugh (Huawei Noah's Ark Lab), and Steven McDonagh (Huawei Noah's Ark Lab)

Learning to Restore Low-Light Images via Decomposition-and-Enhancement ..2278
Ke Xu (Dalian University of Technology; City University of Hong Kong), Xin Yang (Dalian University of Technology), Baocai Yin (Dalian University of Technology; Pengcheng Lab), and Rynson W.H. Lau (City University of Hong Kong)

Background Matting: The World Is Your Green Screen ..2288
Soumyadip Sengupta (University of Washington), Vivek Jayaram (University of Washington), Brian Curless (University of Washington), Steven M. Seitz (University of Washington), and Ira Kemelmacher-Shlizerman (University of Washington)

Supervised Raw Video Denoising With a Benchmark Dataset on Dynamic Scenes ..2298
Huanjing Yue (School of Electrical and Information Engineering, Tianjin University, China), Cong Cao (School of Electrical and Information Engineering, Tianjin University, China), Lei Liao (School of Electrical and Information Engineering, Tianjin University, China), Ronghe Chu (School of Electrical and Information Engineering, Tianjin University, China), and Jingyu Yang (School of Electrical and Information Engineering, Tianjin University, China)

Photometric Stereo via Discrete Hypothesis-and-Test Search ..2308
Kenji Enomoto (Osaka University), Michael Waechter (Osaka University), Kiriakos N. Kutulakos (University of Toronto), and Yasuyuki Matsushita (Osaka University)

Dynamic Convolutions: Exploiting Spatial Sparsity for Faster Inference ..2317
Thomas Verelst (ESAT-PSI, KU Leuven) and Tinne Tuytelaars (ESAT-PSI, KU Leuven)

Fixed-Point Back-Propagation Training ..2327.....
Xishan Zhang (Cambricon Technologies Corporation Limited, Beijing, China; State Key Lab of Computer Architecture, Institute of Computing Technology, CAS, Beijing, China), Shaoli Liu (Cambricon Technologies Corporation Limited, Beijing, China), Rui Zhang (Cambricon Technologies Corporation Limited, Beijing, China; State Key Lab of Computer Architecture, Institute of Computing Technology, CAS, Beijing, China), Chang Liu (Cambricon Technologies Corporation Limited, Beijing, China), Di Huang (Cambricon Technologies Corporation Limited, Beijing, China), Shiyi Zhou (Cambricon Technologies Corporation Limited, Beijing, China), Jiaming Guo (Cambricon Technologies Corporation Limited, Beijing, China), Qi Guo (State Key Lab of Computer Architecture, Institute of Computing Technology, CAS, Beijing, China), Zidong Du (Cambricon Technologies Corporation Limited, Beijing, China; State Key Lab of Computer Architecture, Institute of Computing Technology, CAS, Beijing, China), Tian Zhi (Cambricon Technologies Corporation Limited, Beijing, China; State Key Lab of Computer Architecture, Institute of Computing Technology, CAS, Beijing, China), and Yunji Chen (State Key Lab of Computer Architecture, Institute of Computing Technology, CAS, Beijing, China)

Heterogeneous Knowledge Distillation Using Information Flow Modeling ..2336.....
Nikolaos Passalis (Department of Informatics, Aristotle University of Thessaloniki, Greece), Maria Tzelepi (Department of Informatics, Aristotle University of Thessaloniki, Greece), and Anastasios Tefas (Department of Informatics, Aristotle University of Thessaloniki, Greece)

Rethinking Differentiable Search for Mixed-Precision Neural Networks ..2346.....
Zhaowei Cai (UC San Diego) and Nuno Vasconcelos (UC San Diego)

Residual Feature Aggregation Network for Image Super-Resolution ..2356.....
Jie Liu (State Key Laboratory for Novel Software Technology, Nanjing University, China), Wenjie Zhang (State Key Laboratory for Novel Software Technology, Nanjing University, China), Yuting Tang (State Key Laboratory for Novel Software Technology, Nanjing University, China), Jie Tang (State Key Laboratory for Novel Software Technology, Nanjing University, China), and Gangshan Wu (State Key Laboratory for Novel Software Technology, Nanjing University, China)

Resolution Adaptive Networks for Efficient Inference ..2366.....
Le Yang (Tsinghua University, Beijing National Research Center for Information Science and Technology (BNRist)), Yizeng Han (Tsinghua University, Beijing National Research Center for Information Science and Technology (BNRist)), Xi Chen (Harbin Institute of Technology), Shiji Song (Tsinghua University, Beijing National Research Center for Information Science and Technology (BNRist)), Jifeng Dai (SenseTime), and Gao Huang (Tsinghua University, Beijing National Research Center for Information Science and Technology (BNRist))

Learning to Forget for Meta-Learning ..2376.....
Sungyong Baik (ASRI, Department of ECE, Seoul National University), Seokil Hong (ASRI, Department of ECE, Seoul National University), and Kyoung Mu Lee (ASRI, Department of ECE, Seoul National University)

Deep Learning for Handling Kernel/model Uncertainty in Image Deconvolution .2385.....
Yuesong Nan (Department of Mathematics, National University of Singapore, Singapore) and Hui Ji (Department of Mathematics, National University of Singapore, Singapore)

Reflection Scene Separation From a Single Image .2395.....
Renjie Wan (School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore), Boxin Shi (National Engineering Laboratory for Video Technology, Department of CS, Peking University, China; Peng Cheng Laboratory, Shenzhen, China), Haoliang Li (School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore), Ling-Yu Duan (National Engineering Laboratory for Video Technology, Department of CS, Peking University, China), and Alex C. Kot (School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore)

Wavelet Synthesis Net for Disparity Estimation to Synthesize DSLR Calibre Bokeh Effect on Smartphones .2404.....
Chenchi Luo (Samsung Research America), Yingmao Li (Samsung Research America), Kaimo Lin (Samsung Research America), George Chen (Samsung Research America), Seok-Jun Lee (Samsung Research America), Jihwan Choi (Samsung Electronics), Youngjun Francis Yoo (Samsung Research America), and Michael O. Polley (Samsung Research America)

Bundle Adjustment on a Graph Processor .2413.....
Joseph Ortiz (Imperial College London, Department of Computing, UK), Mark Pupilli (Graphcore), Stefan Leutenegger (Imperial College London, Department of Computing, UK), and Andrew J. Davison (Imperial College London, Department of Computing, UK)

3D-ZeF: A 3D Zebrafish Tracking Benchmark Dataset .2423.....
Malte Pedersen (Visual Analysis of People (VAP) Laboratory, Aalborg University, Denmark), Joakim Bruslund Haurum (Visual Analysis of People (VAP) Laboratory, Aalborg University, Denmark), Stefan Hein Bengtson (Visual Analysis of People (VAP) Laboratory, Aalborg University, Denmark), and Thomas B. Moeslund (Visual Analysis of People (VAP) Laboratory, Aalborg University, Denmark)

PULSE: Self-Supervised Photo Upsampling via Latent Space Exploration of Generative Models 2434
Sachit Menon (Duke University, Durham, NC), Alexandru Damian (Duke University, Durham, NC), Shijia Hu (Duke University, Durham, NC), Nikhil Ravi (Duke University, Durham, NC), and Cynthia Rudin (Duke University, Durham, NC)

Scalability in Perception for Autonomous Driving: Waymo Open Dataset .2443.....
Pei Sun (Waymo LLC), Henrik Kretzschmar (Waymo LLC), Xerxes Dotiwalla (Waymo LLC), Aurélien Chouard (Waymo LLC), Vijaysai Patnaik (Waymo LLC), Paul Tsui (Waymo LLC), James Guo (Waymo LLC), Yin Zhou (Waymo LLC), Yuning Chai (Waymo LLC), Benjamin Caine (Google LLC), Vijay Vasudevan (Google LLC), Wei Han (Google LLC), Jiquan Ngiam (Google LLC), Hang Zhao (Waymo LLC), Aleksei Timofeev (Waymo LLC), Scott Ettinger (Waymo LLC), Maxim Krivokon (Waymo LLC), Amy Gao (Waymo LLC), Aditya Joshi (Waymo LLC), Yu Zhang (Waymo LLC), Jonathon Shlens (Google LLC), Zhifeng Chen (Google LLC), and Dragomir Anguelov (Waymo LLC)

Oral 1-3A: 3D From a Single Image and Shape-From-X (2); 3D From Multiview and Sensors (2)

Extreme Relative Pose Network Under Hybrid Representations .2452.....
Zhenpei Yang (UT Austin), Siming Yan (UT Austin), and Qixing Huang (UT Austin)

Single-Shot Monocular RGB-D Imaging Using Uneven Double Refraction .2462.....
Andreas Meuleman (KAIST), Seung-Hwan Baek (KAIST), Felix Heide (Princeton University), and Min H. Kim (KAIST)

Inverse Rendering for Complex Indoor Scenes: Shape, Spatially-Varying Lighting and SVBRDF From a Single Image .2472.....
Zhengqin Li (University of California, San Diego), Mohammad Shafiei (University of California, San Diego), Ravi Ramamoorthi (University of California, San Diego), Kalyan Sunkavalli (Adobe Research, San Jose), and Manmohan Chandraker (University of California, San Diego)

3D Packing for Self-Supervised Monocular Depth Estimation .2482.....
Vitor Guizilini (Toyota Research Institute (TRI)), Rareș Ambruș (Toyota Research Institute (TRI)), Sudeep Pillai (Toyota Research Institute (TRI)), Allan Raventos (Toyota Research Institute (TRI)), and Adrien Gaidon (Toyota Research Institute (TRI))

Cascade Cost Volume for High-Resolution Multi-View Stereo and Stereo Matching .2492.....
Xiaodong Gu (Alibaba A.I. Labs), Zhiwen Fan (Alibaba A.I. Labs), Siyu Zhu (Alibaba A.I. Labs), Zuozhuo Dai (Alibaba A.I. Labs), Feitong Tan (Alibaba A.I. Labs; Simon Fraser University), and Ping Tan (Alibaba A.I. Labs; Simon Fraser University)

From Two Rolling Shutters to One Global Shutter .2502.....
Cenek Albl (ETH Zurich), Zuzana Kukelova (VRG, FEE, CTU in Prague), Viktor Larsson (ETH Zurich), Michal Polic (CIIRC, CTU in Prague), Tomas Pajdla (CIIRC, CTU in Prague), and Konrad Schindler (ETH Zurich)

Deep Global Registration .2511.....
Christopher Choy (Stanford University), Wei Dong (Carnegie Mellon University), and Vladlen Koltun (Intel Labs)

Deep Stereo Using Adaptive Thin Volume Representation With Uncertainty Awareness .2521
Shuo Cheng (University of California, San Diego), Zexiang Xu (University of California, San Diego), Shilin Zhu (University of California, San Diego), Zhuwen Li (Nuro Inc.), Li Erran Li (Scale AI; Columbia University), Ravi Ramamoorthi (University of California, San Diego), and Hao Su (University of California, San Diego)

Why Having 10,000 Parameters in Your Camera Model Is Better Than Twelve .2532.....
Thomas Schöps (Department of Computer Science, ETH Zürich), Viktor Larsson (Department of Computer Science, ETH Zürich), Marc Pollefeys (Department of Computer Science, ETH Zürich; Microsoft Mixed Reality & AI Zurich Lab), and Torsten Sattler (Chalmers University of Technology)

Blur Aware Calibration of Multi-Focus Plenoptic Camera .2542
Mathieu Labussière (Université Clermont Auvergne, CNRS, SIGMA Clermont, Institut Pascal, France), Céline Teulière (Université Clermont Auvergne, CNRS, SIGMA Clermont, Institut Pascal, France), Frédéric Bernardin (Cerema, Équipe-projet STI, France), and Omar Ait-Aider (Université Clermont Auvergne, CNRS, SIGMA Clermont, Institut Pascal, France)

Learning Fused Pixel and Feature-Based View Reconstructions for Light Fields .2552
Jinglei Shi (INRIA Rennes - Bretagne Atlantique, France), Xiaoran Jiang (INRIA Rennes - Bretagne Atlantique, France), and Christine Guillemot (INRIA Rennes - Bretagne Atlantique, France)

SAL: Sign Agnostic Learning of Shapes From Raw Data .2562
Matan Atzmon (Weizmann Institute of Science Rehovot, Israel) and Yaron Lipman (Weizmann Institute of Science Rehovot, Israel)

Oral 1-3B: Image Retrieval; Datasets and Evaluation

Google Landmarks Dataset v2 – A Large-Scale Benchmark for Instance-Level Recognition and Retrieval .2572
Tobias Weyand (Google Research, USA), André Araujo (Google Research, USA), Bingyi Cao (Google Research, USA), and Jack Sim (Google Research, USA)

Instance Guided Proposal Network for Person Search .2582
Wenkai Dong (Center for Research on Intelligent Perception and Computing, NLPR, CASIA; School of Arti?cial Intelligence, University of Chinese Academy of Sciences), Zhaoxiang Zhang (Center for Research on Intelligent Perception and Computing, NLPR, CASIA; Center for Excellence in Brain Science and Intelligence Technology, CAS; School of Arti?cial Intelligence, University of Chinese Academy of Sciences), Chunfeng Song (Center for Research on Intelligent Perception and Computing, NLPR, CASIA; School of Arti?cial Intelligence, University of Chinese Academy of Sciences), and Tieniu Tan (Center for Research on Intelligent Perception and Computing, NLPR, CASIA; Center for Excellence in Brain Science and Intelligence Technology, CAS; School of Arti?cial Intelligence, University of Chinese Academy of Sciences)

Which Is Plagiarism: Fashion Image Retrieval Based on Regional Representation for Design Protection .2592
Yining Lang (Alibaba Group), Yuan He (Alibaba Group), Fan Yang (Alibaba Group), Jianfeng Dong (Zhejiang Gongshang Univresity; Alibaba-Zhejiang University Joint Institute of Frontier Technologies), and Hui Xue (Alibaba Group)

Inter-Task Association Critic for Cross-Resolution Person Re-Identification .2602
Zhiyi Cheng (Queen Mary University of London), Qi Dong (Queen Mary University of London), Shaogang Gong (Queen Mary University of London), and Xiatian Zhu (Vision Semantics Limited, London, UK)

FineGym: A Hierarchical Video Dataset for Fine-Grained Action Understanding .2613.....
Dian Shao (CUHK-SenseTime Joint Lab, The Chinese University of Hong Kong), Yue Zhao (CUHK-SenseTime Joint Lab, The Chinese University of Hong Kong), Bo Dai (CUHK-SenseTime Joint Lab, The Chinese University of Hong Kong), and Dahua Lin (CUHK-SenseTime Joint Lab, The Chinese University of Hong Kong)

Mapillary Street-Level Sequences: A Dataset for Lifelong Place Recognition .2623.....
Frederik Warburg (Technical University of Denmark), Søren Hauberg (Technical University of Denmark), Manuel López-Antequera (Mapillary AB), Pau Gargallo (Mapillary AB), Yubin Kuang (Mapillary AB), and Javier Civera (University of Zaragoza)

BDD100K: A Diverse Driving Dataset for Heterogeneous Multitask Learning .2633.....
Fisher Yu (UC Berkeley), Haofeng Chen (UC Berkeley), Xin Wang (UC Berkeley), Wenqi Xian (Cornell University), Yingying Chen (UC Berkeley), Fangchen Liu (UC San Diego), Vashisht Madhavan (Element, Inc.), and Trevor Darrell (UC Berkeley)

Rethinking Computer-Aided Tuberculosis Diagnosis .2643.....
Yun Liu (TKLNDST, College of Computer Science, Nankai University), Yu-Huan Wu (TKLNDST, College of Computer Science, Nankai University), Yunfeng Ban (InferVision), Huifang Wang (InferVision), and Ming-Ming Cheng (TKLNDST, College of Computer Science, Nankai University)

IntrA: 3D Intracranial Aneurysm Dataset for Deep Learning .2653.....
Xi Yang (The University of Tokyo), Ding Xia (The University of Tokyo; South China University of Technology), Taichi Kin (The University of Tokyo), and Takeo Igarashi (The University of Tokyo)

Revisiting Saliency Metrics: Farthest-Neighbor Area Under Curve .2664.....
Sen Jia (Ryerson University) and Neil D. B. Bruce (Ryerson University, Vector Institute)

Computing the Testing Error Without a Testing Set .2674.....
Ciprian A. Corneanu (Univ. Barcelona, Tawny), Sergio Escalera (Univ. Barcelona, CVC), and Aleix M. Martinez (OSU, Amazon)

Improving Confidence Estimates for Unfamiliar Examples .2683.....
Zhizhong Li (Department of Computer Science, University of Illinois Urbana Champaign) and Derek Hoiem (Department of Computer Science, University of Illinois Urbana Champaign)

Oral 1-3C: Low-Level and Physics-Based Vision

CycleISP: Real Image Restoration via Improved Data Synthesis .2693.....
Syed Waqas Zamir (Inception Institute of Artificial Intelligence, UAE), Aditya Arora (Inception Institute of Artificial Intelligence, UAE), Salman Khan (Inception Institute of Artificial Intelligence, UAE), Munawar Hayat (Inception Institute of Artificial Intelligence, UAE), Fahad Shahbaz Khan (Inception Institute of Artificial Intelligence, UAE), Ming-Hsuan Yang (University of California, Merced; Google Research), and Ling Shao (Inception Institute of Artificial Intelligence, UAE)

Enhanced Blind Face Restoration With Multi-Exemplar Images and Adaptive Spatial Feature Fusion ..2703
Xiaoming Li (School of Computer Science and Technology, Harbin Institute of Technology, China), Wenyu Li (School of Computer Science and Technology, Harbin Institute of Technology, China), Dongwei Ren (College of Intelligence and Computing, Tianjin University, China), Hongzhi Zhang (School of Computer Science and Technology, Harbin Institute of Technology, China), Meng Wang (Hefei University of Technology, China), and Wangmeng Zuo (School of Computer Science and Technology, Harbin Institute of Technology, China)

Explorable Super Resolution ..2713
Yuval Bahat (Technion - Israel Institute of Technology, Haifa, Israel) and Tomer Michaeli (Technion - Israel Institute of Technology, Haifa, Israel)

Syn2Real Transfer Learning for Image Deraining Using Gaussian Processes ..2723
Rajeev Yasarla (Johns Hopkins University, Department of Electrical and Computer Engineering, Baltimore, MD, USA), Vishwanath A. Sindagi (Johns Hopkins University, Department of Electrical and Computer Engineering, Baltimore, MD, USA), and Vishal M. Patel (Johns Hopkins University, Department of Electrical and Computer Engineering, Baltimore, MD, USA)

Deblurring by Realistic Blurring ..2734
Kaihao Zhang (Australian National University), Wenhan Luo (Tencent AI Lab), Yiran Zhong (Australian National University; ACRV), Lin Ma (Tencent AI Lab), Björn Stenger (Rakuten Institute of Technology), Wei Liu (Tencent AI Lab), and Hongdong Li (Australian National University; ACRV)

Bringing Old Photos Back to Life ..2744
Ziyu Wan (City University of Hong Kong), Bo Zhang (Microsoft Research Asia), Dongdong Chen (Microsoft Cloud + AI), Pan Zhang (University of Science and Technology of China), Dong Chen (Microsoft Research Asia), Jing Liao (City University of Hong Kong), and Fang Wen (Microsoft Research Asia)

A Physics-Based Noise Formation Model for Extreme Low-Light Raw Denoising ..2755
Kaixuan Wei (Beijing Institute of Technology), Ying Fu (Beijing Institute of Technology), Jiaolong Yang (Microsoft Research), and Hua Huang (Beijing Institute of Technology)

Learning to Super Resolve Intensity Images From Events ..2765
S. Mohammad Mostafavi I. (GIST, South Korea), Jonghyun Choi (GIST, South Korea), and Kuk-Jin Yoon (KAIST, South Korea)

Camouflaged Object Detection ..2774
Deng-Ping Fan (Inception Institute of Artificial Intelligence, UAE; College of CS, Nankai University, China), Ge-Peng Ji (School of Computer Science, Wuhan University, China), Guolei Sun (ETH Zurich, Switzerland), Ming-Ming Cheng (College of CS, Nankai University, China), Jianbing Shen (Inception Institute of Artificial Intelligence, UAE), and Ling Shao (Inception Institute of Artificial Intelligence, UAE)

Poster 1-3P

Holistically-Attracted Wireframe Parsing .2785.....
Nan Xue (Wuhan University, China; NC State University, USA), Tianfu Wu (NC State University, USA), Song Bai (University of Oxford, UK), Fudong Wang (Wuhan University, China), Gui-Song Xia (Wuhan University, China), Liangpei Zhang (Wuhan University, China), and Philip H.S. Torr (University of Oxford, UK)

Conv-MPN: Convolutional Message Passing Neural Network for Structured Outdoor Architecture Reconstruction .2795.....
Fuyang Zhang (Simon Fraser University, BC, Canada), Nelson Nauata (Simon Fraser University, BC, Canada), and Yasutaka Furukawa (Simon Fraser University, BC, Canada)

Domain Adaptation for Image Dehazing .2805.....
Yuanjie Shao (National Key Laboratory of Science and Technology on Multispectral Information Processing, School of Artificial Intelligence and Automation, Huazhong University of Science and Technology, Wuhan, China), Lerenhan Li (National Key Laboratory of Science and Technology on Multispectral Information Processing, School of Artificial Intelligence and Automation, Huazhong University of Science and Technology, Wuhan, China), Wenqi Ren (Institute of Information Engineering, Chinese Academy of Sciences, Beijing, China), Changxin Gao (National Key Laboratory of Science and Technology on Multispectral Information Processing, School of Artificial Intelligence and Automation, Huazhong University of Science and Technology, Wuhan, China), and Nong Sang (National Key Laboratory of Science and Technology on Multispectral Information Processing, School of Artificial Intelligence and Automation, Huazhong University of Science and Technology, Wuhan, China)

Auto-Encoding Twin-Bottleneck Hashing .2815.....
Yuming Shen (Inception Institute of Artificial Intelligence (IIAI), Abu Dhabi, UAE), Jie Qin (Inception Institute of Artificial Intelligence (IIAI), Abu Dhabi, UAE), Jiaxin Chen (Inception Institute of Artificial Intelligence (IIAI), Abu Dhabi, UAE), Mengyang Yu (Inception Institute of Artificial Intelligence (IIAI), Abu Dhabi, UAE), Li Liu (Inception Institute of Artificial Intelligence (IIAI), Abu Dhabi, UAE), Fan Zhu (Inception Institute of Artificial Intelligence (IIAI), Abu Dhabi, UAE), Fumin Shen (Center for Future Media, University of Electronic Science and Technology of China, China), and Ling Shao (Inception Institute of Artificial Intelligence (IIAI), Abu Dhabi, UAE)

Agriculture-Vision: A Large Aerial Image Database for Agricultural Pattern Analysis .2825.....
Mang Tik Chiu (UIUC), Xingqian Xu (UIUC), Yunchao Wei (UIUC), Zilong Huang (UIUC), Alexander G. Schwing (UIUC), Robert Brunner (UIUC), Hrant Khachatrian (Intelinair), Hovnatan Karapetyan (Intelinair), Ivan Dozier (Intelinair), Greg Rose (Intelinair), David Wilson (Intelinair), Adrian Tudor (Intelinair), Naira Hovakimyan (Intelinair; UIUC), Thomas S. Huang (UIUC), and Honghui Shi (University of Oregon; UIUC)

Bi-Directional Interaction Network for Person Search .2836
Wenkai Dong (Center for Research on Intelligent Perception and Computing, NLPR, CASIA; School of Artificial Intelligence, University of Chinese Academy of Sciences), Zhaoxiang Zhang (Center for Research on Intelligent Perception and Computing, NLPR, CASIA; Center for Excellence in Brain Science and Intelligence Technology, CAS; School of Artificial Intelligence, University of Chinese Academy of Sciences), Chunfeng Song (Center for Research on Intelligent Perception and Computing, NLPR, CASIA; School of Artificial Intelligence, University of Chinese Academy of Sciences), and Tieniu Tan (Center for Research on Intelligent Perception and Computing, NLPR, CASIA; Center for Excellence in Brain Science and Intelligence Technology, CAS; School of Artificial Intelligence, University of Chinese Academy of Sciences)

Meshlet Priors for 3D Mesh Reconstruction .2846
Abhishek Badki (NVIDIA; University of California, Santa Barbara), Orazio Gallo (NVIDIA), Jan Kautz (NVIDIA), and Pradeep Sen (University of California, Santa Barbara)

Space-Time-Aware Multi-Resolution Video Enhancement .2856
Muhammad Haris (Toyota Technological Institute, Japan), Greg Shakhnarovich (Toyota Technological Institute at Chicago), and Norimichi Ukita (Toyota Technological Institute, Japan)

FSS-1000: A 1000-Class Dataset for Few-Shot Segmentation .2866
Xiang Li (HKUST), Tianhan Wei (HKUST), Yau Pun Chen (HKUST), Yu-Wing Tai (Tencent), and Chi-Keung Tang (HKUST)

MSeg: A Composite Dataset for Multi-Domain Semantic Segmentation .2876
John Lambert (Intel Labs; Georgia Institute of Technology), Zhuang Liu (Intel Labs; University of California, Berkeley), Ozan Sener (Intel Labs), James Hays (Georgia Institute of Technology; Argo AI), and Vladlen Koltun (Intel Labs)

DeeperForensics-1.0: A Large-Scale Dataset for Real-World Face Forgery Detection .2886
Liming Jiang (Nanyang Technological University), Ren Li (SenseTime Research), Wayne Wu (Nanyang Technological University; SenseTime Research), Chen Qian (SenseTime Research), and Chen Change Loy (Nanyang Technological University)

Learning Multi-Granular Hypergraphs for Video-Based Person Re-Identification .2896
Yichao Yan (Inception Institute of Artificial Intelligence (IIAI), Abu Dhabi, UAE), Jie Qin (Inception Institute of Artificial Intelligence (IIAI), Abu Dhabi, UAE), Jiaxin Chen (Inception Institute of Artificial Intelligence (IIAI), Abu Dhabi, UAE), Li Liu (Inception Institute of Artificial Intelligence (IIAI), Abu Dhabi, UAE), Fan Zhu (Inception Institute of Artificial Intelligence (IIAI), Abu Dhabi, UAE), Ying Tai (Tencent YouTu Lab, Shanghai, China), and Ling Shao (Inception Institute of Artificial Intelligence (IIAI), Abu Dhabi, UAE)

Online Joint Multi-Metric Adaptation From Frequent Sharing-Subset Mining for Person Re-Identification .2906
Jiahuan Zhou (Department of Electrical and Computer Engineering, Northwestern University, US), Bing Su (Institute of Software, Chinese Academy of Science, China), and Ying Wu (Department of Electrical and Computer Engineering, Northwestern University, US)

Taking a Deeper Look at Co-Salient Object Detection .2916
Deng-Ping Fan (TKLNDST, College of CS, Nankai University; Inception Institute of Artificial Intelligence), Zheng Lin (TKLNDST, College of CS, Nankai University), Ge-Peng Ji (School of Computer Science, Wuhan University), Dingwen Zhang (Xidian University), Huazhu Fu (Inception Institute of Artificial Intelligence), and Ming-Ming Cheng (TKLNDST, College of CS, Nankai University)

Single-Stage 6D Object Pose Estimation .2927
Yinlin Hu (CVLab, EPFL, Switzerland), Pascal Fua (CVLab, EPFL, Switzerland), Wei Wang (CVLab, EPFL, Switzerland), and Mathieu Salzmann (CVLab, EPFL, Switzerland)

OccuSeg: Occupancy-Aware 3D Instance Segmentation .2937
Lei Han (Tsinghua University; Hong Kong University of Science and Technology), Tian Zheng (Tsinghua University), Lan Xu (Tsinghua University; Hong Kong University of Science and Technology), and Lu Fang (Tsinghua University)

Camera Trace Erasing .2947
Chang Chen (University of Science and Technology of China), Zhiwei Xiong (University of Science and Technology of China), Xiaoming Liu (Michigan State University), and Feng Wu (University of Science and Technology of China)

Deep Metric Learning via Adaptive Learnable Assessment .2957
Wenzhao Zheng (Department of Automation, Tsinghua University, China; State Key Lab of Intelligent Technologies and Systems, China; Beijing National Research Center for Information Science and Technology, China), Jiwen Lu (Department of Automation, Tsinghua University, China; State Key Lab of Intelligent Technologies and Systems, China; Beijing National Research Center for Information Science and Technology, China), and Jie Zhou (Department of Automation, Tsinghua University, China; State Key Lab of Intelligent Technologies and Systems, China; Beijing National Research Center for Information Science and Technology, China; Tsinghua Shenzhen International Graduate School, Tsinghua University, China)

Deep Representation Learning on Long-Tailed Data: A Learnable Embedding Augmentation Perspective .2967
Jialun Liu (Jilin University), Yifan Sun (Megvii Inc.), Chuchu Han (Huazhong University of Science and Technology), Zhaopeng Dou (Tsinghua University), and Wenhui Li (Jilin University)

Fantastic Answers and Where to Find Them: Immersive Question-Directed Visual Attention .2977
Ming Jiang (University of Minnesota), Shi Chen (University of Minnesota), Jinhui Yang (University of Minnesota), and Qi Zhao (University of Minnesota)

HUMBI: A Large Multiview Dataset of Human Body Expressions 2987
Zhixuan Yu (University of Minnesota), Jae Shin Yoon (University of Minnesota), In Kyu Lee (University of Minnesota), Prashanth Venkatesh (University of Minnesota), Jaesik Park (POSTECH), Jihun Yu (BinaryVR), and Hyun Soo Park (University of Minnesota)

Image Search With Text Feedback by Visiolinguistic Attention Learning 2998
Yanbei Chen (Queen Mary University of London), Shaogang Gong (Queen Mary University of London), and Loris Bazzani (Amazon)

Image Processing Using Multi-Code GAN Prior 3009
Jinjin Gu (The Chinese University of Hong Kong; The Chinese University of Hong Kong, Shenzhen), Yujun Shen (The Chinese University of Hong Kong), and Bolei Zhou (The Chinese University of Hong Kong)

What Does Plate Glass Reveal About Camera Calibration? 3019
Qian Zheng (School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore), Jinnan Chen (School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore), Zhan Lu (School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore), Boxin Shi (National Engineering Laboratory for Video Technology, Department of CS, Peking University, Beijing, China; Peng Cheng Laboratory, Shenzhen, China), Xudong Jiang (School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore), Kim-Hui Yap (School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore), Ling-Yu Duan (National Engineering Laboratory for Video Technology, Department of CS, Peking University, Beijing, China; Peng Cheng Laboratory, Shenzhen, China), and Alex C. Kot (School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore)

Zero-Assignment Constraint for Graph Matching With Outliers 3030
Fudong Wang (Wuhan University, China), Nan Xue (Wuhan University, China), Jin-Gang Yu (South China University of Technology, China), and Gui-Song Xia (Wuhan University, China)

Cascaded Deep Video Deblurring Using Temporal Sharpness Prior 3040
Jinshan Pan (Nanjing University of Science and Technology), Haoran Bai (Nanjing University of Science and Technology), and Jinhui Tang (Nanjing University of Science and Technology)

JL-DCF: Joint Learning and Densely-Cooperative Fusion Framework for RGB-D Salient Object Detection 3049
Keren Fu (College of Computer Science, Sichuan University), Deng-Ping Fan (College of CS, Nankai University; Inception Institute of Artificial Intelligence), Ge-Peng Ji (School of Computer Science, Wuhan University), and Qijun Zhao (College of Computer Science, Sichuan University)

From Fidelity to Perceptual Quality: A Semi-Supervised Approach for Low-Light Image Enhancement 3060
Wenhan Yang (City University of Hong Kong), Shiqi Wang (City University of Hong Kong), Yuming Fang (Jiangxi University of Finance and Economics), Yue Wang (ByteDance Technology Co., Ltd), and Jiaying Liu (Peking University)

Unsupervised Adaptation Learning for Hyperspectral Imagery Super-Resolution .3070.....
Lei Zhang (Inception Institute of Artificial Intelligence (IIAI), Abu Dhabi, United Arab Emirates), Jiangtao Nie (School of Computer Science, Northwestern Polytechnical University, Xi'an, China), Wei Wei (School of Computer Science, Northwestern Polytechnical University, Xi'an, China; Northwestern Polytechnical University in Shenzhen, Shenzhen, China), Yanning Zhang (School of Computer Science, Northwestern Polytechnical University, Xi'an, China), Shengcai Liao (Inception Institute of Artificial Intelligence (IIAI), Abu Dhabi, United Arab Emirates), and Ling Shao (Inception Institute of Artificial Intelligence (IIAI), Abu Dhabi, United Arab Emirates)

Central Similarity Quantization for Efficient Image and Video Retrieval .3080.....
Li Yuan (National University of Singapore), Tao Wang (National University of Singapore), Xiaopeng Zhang (Huawei Noah's Ark Lab), Francis EH Tay (National University of Singapore), Zequn Jie (Tencent AI Lab), Wei Liu (Tencent AI Lab), and Jiashi Feng (National University of Singapore)

ARCH: Animatable Reconstruction of Clothed Humans .3090.....
Zeng Huang (Facebook Reality Labs, Sausalito, USA; University of Southern California, USA), Yuanlu Xu (Facebook Reality Labs, Sausalito, USA), Christoph Lassner (Facebook Reality Labs, Sausalito, USA), Hao Li (University of Southern California, USA), and Tony Tung (Facebook Reality Labs, Sausalito, USA)

A Model-Driven Deep Neural Network for Single Image Rain Removal .3100.....
Hong Wang (Xi'an Jiaotong University), Qi Xie (Xi'an Jiaotong University), Qian Zhao (Xi'an Jiaotong University), and Deyu Meng (Xi'an Jiaotong University; Macau University of Science and Technology)

Novel Object Viewpoint Estimation Through Reconstruction Alignment .3110.....
Mohamed El Banani (University of Michigan), Jason J. Corso (University of Michigan), and David F. Fouhey (University of Michigan)

Creating Something From Nothing: Unsupervised Knowledge Distillation for Cross-Modal Hashing .3120.....
Hengtong Hu (School of Computer Science and Information Engineering, Hefei University of Technology; Key Laboratory of Knowledge Engineering with Big Data, Hefei University of Technology), Lingxi Xie (Huawei Inc.), Richang Hong (School of Computer Science and Information Engineering, Hefei University of Technology; Key Laboratory of Knowledge Engineering with Big Data, Hefei University of Technology), and Qi Tian (Huawei Inc.)

Evaluating Weakly Supervised Object Localization Methods Right .3130.....
Junsuk Choe (School of Integrated Technology, Yonsei University; Clova AI Research, NAVER Corp.), Seong Joon Oh (Clova AI Research, LINE Plus Corp.), Seungho Lee (School of Integrated Technology, Yonsei University), Sanghyuk Chun (Clova AI Research, NAVER Corp.), Zeynep Akata (University of Tuebingen), and Hyunjung Shim (School of Integrated Technology, Yonsei University)

Style Normalization and Restitution for Generalizable Person Re-Identification 3140
Xin Jin (University of Science and Technology of China), Cuiling Lan (Microsoft Research Asia, Beijing, China), Wenjun Zeng (Microsoft Research Asia, Beijing, China), Zhibo Chen (University of Science and Technology of China), and Li Zhang (University of Oxford)

Reconstruct Locally, Localize Globally: A Model Free Method for Object Pose Estimation 3150
Ming Cai (The University of Adelaide) and Ian Reid (The University of Adelaide)

RoboTHOR: An Open Simulation-to-Real Embodied AI Platform 3161
Matt Deitke (University of Washington), Winson Han (PRIOR @ Allen Institute for AI), Alvaro Herrasti (PRIOR @ Allen Institute for AI), Aniruddha Kembhavi (PRIOR @ Allen Institute for AI; University of Washington), Eric Kolve (PRIOR @ Allen Institute for AI), Roozbeh Mottaghi (PRIOR @ Allen Institute for AI; University of Washington), Jordi Salvador (PRIOR @ Allen Institute for AI), Dustin Schwenk (PRIOR @ Allen Institute for AI), Eli VanderBilt (PRIOR @ Allen Institute for AI), Matthew Wallingford (University of Washington), Luca Weihs (PRIOR @ Allen Institute for AI), Mark Yatskar (PRIOR @ Allen Institute for AI), and Ali Farhadi (University of Washington)

All in One Bad Weather Removal Using Architectural Search 3172
Ruoteng Li (National University of Singapore), Robby T. Tan (National University of Singapore; Yale-NUS College), and Loong-Fah Cheong (National University of Singapore)

Relation-Aware Global Attention for Person Re-Identification 3183
Zhizheng Zhang (University of Science and Technology of China), Cuiling Lan (Microsoft Research Asia), Wenjun Zeng (Microsoft Research Asia), Xin Jin (University of Science and Technology of China), and Zhibo Chen (University of Science and Technology of China)

HOnnotate: A Method for 3D Annotation of Hand and Object Poses 3193
Shreyas Hampali (Institute for Computer Graphics and Vision, Graz University of Technology, Austria), Mahdi Rad (Institute for Computer Graphics and Vision, Graz University of Technology, Austria), Markus Oberweger (Institute for Computer Graphics and Vision, Graz University of Technology, Austria), and Vincent Lepetit (LIGM, Ecole des Ponts, Univ Gustave Eiffel, CNRS, Marne-la-Vallée, France; Institute for Computer Graphics and Vision, Graz University of Technology, Austria)

Celeb-DF: A Large-Scale Challenging Dataset for DeepFake Forensics 3204
Yuezun Li (University at Albany, State University of New York, USA), Xin Yang (University at Albany, State University of New York, USA), Pu Sun (University of Chinese Academy of Sciences, China), Honggang Qi (University of Chinese Academy of Sciences, China), and Siwei Lyu (University at Albany, State University of New York, USA)

Deep Unfolding Network for Image Super-Resolution 3214
Kai Zhang (Computer Vision Lab, ETH Zurich, Switzerland), Luc Van Gool (Computer Vision Lab, ETH Zurich, Switzerland), and Radu Timofte (Computer Vision Lab, ETH Zurich, Switzerland)

On the Uncertainty of Self-Supervised Monocular Depth Estimation .3224.....
Matteo Poggi (Department of Computer Science and Engineering (DISI), University of Bologna, Italy), Filippo Aleotti (Department of Computer Science and Engineering (DISI), University of Bologna, Italy), Fabio Tosi (Department of Computer Science and Engineering (DISI), University of Bologna, Italy), and Stefano Mattoccia (Department of Computer Science and Engineering (DISI), University of Bologna, Italy)

Proxy Anchor Loss for Deep Metric Learning .3235.....
Sungyeon Kim (POSTECH, Pohang, Korea), Dongwon Kim (POSTECH, Pohang, Korea), Minsu Cho (POSTECH, Pohang, Korea), and Suha Kwak (POSTECH, Pohang, Korea)

Unsupervised Learning for Intrinsic Image Decomposition From a Single Image .3245.....
Yunfei Liu (State Key Laboratory of VR Technology and Systems, School of CSE, Beihang University), Yu Li (Applied Research Center (ARC), Tencent PCG), Shaodi You (University of Amsterdam, Amsterdam, Netherland), and Feng Lu (State Key Laboratory of VR Technology and Systems, School of CSE, Beihang University; Peng Cheng Laboratory, Shenzhen, China)

Multi-Domain Learning for Accurate and Few-Shot Color Constancy .3255.....
Jin Xiao (The Hong Kong Polytechnic University), Shuhang Gu (CVL, ETH Zürich), and Lei Zhang (The Hong Kong Polytechnic University; DAMO Academy, Alibaba Group)

PANDA: A Gigapixel-Level Human-Centric Video Dataset .3265.....
Xueyang Wang (Tsinghua University), Xiya Zhang (Tsinghua University), Yinheng Zhu (Tsinghua University), Yuchen Guo (Tsinghua University), Xiaoyun Yuan (Tsinghua University), Liuyu Xiang (Tsinghua University), Zerun Wang (Tsinghua University), Guiguang Ding (Tsinghua University), David Brady (Duke University), Qionghai Dai (Tsinghua University), and Lu Fang (Tsinghua University)

Cross-View Tracking for Multi-Human 3D Pose Estimation at Over 100 FPS .3276.....
Long Chen (Department of Computer Science and Technology, Tsinghua University), Haizhou Ai (Department of Computer Science and Technology, Tsinghua University), Rui Chen (Department of Computer Science and Technology, Tsinghua University), Zijie Zhuang (Department of Computer Science and Technology, Tsinghua University), and Shuang Liu (AiFi Inc.)

Spatial-Temporal Graph Convolutional Network for Video-Based Person Re-Identification .3286
Jinrui Yang (School of Data and Computer Science, Sun Yat-sen University, China; Key Laboratory of Machine Intelligence and Advanced Computing, Ministry of Education, China), Wei-Shi Zheng (School of Data and Computer Science, Sun Yat-sen University, China; Peng Cheng Laboratory, China; Key Laboratory of Machine Intelligence and Advanced Computing, Ministry of Education, China), Qize Yang (School of Data and Computer Science, Sun Yat-sen University, China; Key Laboratory of Machine Intelligence and Advanced Computing, Ministry of Education, China), Ying-Cong Chen (The Chinese University of Hong Kong, China), and Qi Tian (The Huawei Noah's Ark Lab, China)

Salience-Guided Cascaded Suppression Network for Person Re-Identification 3297
Xuesong Chen (School of Electronic and Computer Engineering, Peking University, China; Southern University of Science and Technology, China), Canmiao Fu (Tencent, China), Yong Zhao (School of Electronic and Computer Engineering, Peking University, China), Feng Zheng (Southern University of Science and Technology, China), Jingkuan Song (University of Electronic Science and Technology of China, China), Rongrong Ji (Xiamen University, China; Peng Cheng Laboratory, China), and Yi Yang (The ReLER Lab, Centre for AI, University of Technology Sydney, Australia)

Fashion Outfit Complementary Item Retrieval 3308
Yen-Liang Lin (Amazon), Son Tran (Amazon), and Larry S. Davis (Amazon)

Learning Event-Based Motion Deblurring 3317
Zhe Jiang (SenseTime Research; Sichuan University), Yu Zhang (SenseTime Research; Department of Automation, Tsinghua University), Dongqing Zou (SenseTime Research), Jimmy Ren (SenseTime Research), Jiancheng Lv (Sichuan University), and Yebin Liu (Department of Automation, Tsinghua University)

Domain Decluttering: Simplifying Images to Mitigate Synthetic-Real Domain Shift and Improve Depth Estimation 3327
Yunhan Zhao (UC Irvine), Shu Kong (Carnegie Mellon University), Daeyun Shin (UC Irvine), and Charless Fowlkes (UC Irvine)

Neural Blind Deconvolution Using Deep Priors 3338
Dongwei Ren (Tianjin Key Lab of Machine Learning, College of Intelligence and Computing, Tianjin University, China), Kai Zhang (School of Computer Science and Technology, Harbin Institute of Technology, Harbin, China), Qilong Wang (Tianjin Key Lab of Machine Learning, College of Intelligence and Computing, Tianjin University, China), Qinghua Hu (Tianjin Key Lab of Machine Learning, College of Intelligence and Computing, Tianjin University, China), and Wangmeng Zuo (School of Computer Science and Technology, Harbin Institute of Technology, Harbin, China)

Anisotropic Convolutional Networks for 3D Semantic Scene Completion 3348
Jie Li (Nanjing University of Science and Technology, China), Kai Han (University of Oxford, United Kingdom), Peng Wang (University of Wollongong, Australia), Yu Liu (The University of Adelaide, Australia), and Xia Yuan (Nanjing University of Science and Technology, China)

TDAN: Temporally-Deformable Alignment Network for Video Super-Resolution 3357
Yapeng Tian (University of Rochester), Yulun Zhang (Northeastern University), Yun Fu (Northeastern University), and Chenliang Xu (University of Rochester)

Zooming Slow-Mo: Fast and Accurate One-Stage Space-Time Video Super-Resolution 3367
Xiaoyu Xiang (Purdue University), Yapeng Tian (University of Rochester), Yulun Zhang (Northeastern University), Yun Fu (Northeastern University), Jan P. Allebach (Purdue University), and Chenliang Xu (University of Rochester)

Fast MSER 3377
Hailiang Xu (Alibaba Group; Nanjing University), Siqi Xie (Beijing Language and Culture University), and Fan Chen (Columbia University)

Unsupervised Person Re-Identification via Softened Similarity Learning 3387
Yutian Lin (Hangzhou Dianzi University), Lingxi Xie (Huawei Inc.), Yu Wu (Baidu Research; ReLER, University of Technology Sydney), Chenggang Yan (Hangzhou Dianzi University), and Qi Tian (Huawei Inc.)

COCAS: A Large-Scale Clothes Changing Person Dataset for Re-Identification 3397
Shijie Yu (ShenZhen Key Lab of Computer Vision and Pattern Recognition, SIAT-SenseTime Joint Lab, Shenzhen Institutes of Advanced Technology, Chinese Academy of Science; University of Chinese Academy of Sciences, China), Shihua Li (Institute of Microelectronics of the Chinese Academy of Sciences), Dapeng Chen (ShenZhen Key Lab of Computer Vision and Pattern Recognition, SIAT-SenseTime Joint Lab, Shenzhen Institutes of Advanced Technology, Chinese Academy of Science), Rui Zhao (ShenZhen Key Lab of Computer Vision and Pattern Recognition, SIAT-SenseTime Joint Lab, Shenzhen Institutes of Advanced Technology, Chinese Academy of Science), Junjie Yan (ShenZhen Key Lab of Computer Vision and Pattern Recognition, SIAT-SenseTime Joint Lab, Shenzhen Institutes of Advanced Technology, Chinese Academy of Science), and Yu Qiao (ShenZhen Key Lab of Computer Vision and Pattern Recognition, SIAT-SenseTime Joint Lab, Shenzhen Institutes of Advanced Technology, Chinese Academy of Science)

Learning Formation of Physically-Based Face Attributes 3407
Ruilong Li (USC Institute for Creative Technologies; University of Southern California), Karl Bladin (USC Institute for Creative Technologies), Yajie Zhao (USC Institute for Creative Technologies), Chinmay Chinara (USC Institute for Creative Technologies), Owen Ingraham (USC Institute for Creative Technologies), Pengda Xiang (USC Institute for Creative Technologies; University of Southern California), Xinglei Ren (USC Institute for Creative Technologies), Pratusha Prasad (USC Institute for Creative Technologies), Bipin Kishore (USC Institute for Creative Technologies), Jun Xing (USC Institute for Creative Technologies), and Hao Li (USC Institute for Creative Technologies; University of Southern California; Pinscreen)

Generalized Product Quantization Network for Semi-Supervised Image Retrieval 3417
Young Kyun Jang (Department of ECE, INMC, Seoul National University, Seoul Korea) and Nam Ik Cho (Department of ECE, INMC, Seoul National University, Seoul Korea)

Stereoscopic Flash and No-Flash Photography for Shape and Albedo Recovery 3427
Xu Cao (Osaka University), Michael Waechter (Osaka University), Boxin Shi (Peking University; Peng Cheng Laboratory), Ye Gao (Huawei Technologies Co., Ltd), Bo Zheng (Huawei Technologies Co., Ltd.), and Yasuyuki Matsushita (Osaka University)

Context-Aware Group Captioning via Self-Attention and Contrastive Features 3437
Zhuowan Li (Johns Hopkins University), Quan Tran (Adobe Research), Long Mai (Adobe Research), Zhe Lin (Adobe Research), and Alan L. Yuille (Johns Hopkins University)

MEBOW: Monocular Estimation of Body Orientation in the Wild .3448
Chenyan Wu (The Pennsylvania State University; Amazon Lab126), Yukun Chen (The Pennsylvania State University), Jiajia Luo (Amazon Lab126), Che-Chun Su (Amazon Lab126), Anuja Dawane (Amazon Lab126), Bikramjot Hanzra (Amazon Lab126), Zhuo Deng (Amazon Lab126), Bilan Liu (Amazon Lab126), James Z. Wang (The Pennsylvania State University), and Cheng-hao Kuo (Amazon Lab126)

Distilling Image Dehazing With Heterogeneous Task Imitation .3459
Ming Hong (Fujian Key Laboratory of Sensing and Computing for Smart City, School of Informatics, Xiamen University, Fujian, China), Yuan Xie (School of Computer Science and Technology, East China Normal University, Shanghai, China), Cuihua Li (Fujian Key Laboratory of Sensing and Computing for Smart City, School of Informatics, Xiamen University, Fujian, China), and Yanyun Qu (Fujian Key Laboratory of Sensing and Computing for Smart City, School of Informatics, Xiamen University, Fujian, China)

Select, Supplement and Focus for RGB-D Saliency Detection .3469
Miao Zhang (Dalian University of Technology, China; Key Lab for Ubiquitous Network and Service Software of Liaoning Province, Dalian University of Technology, China), Weisong Ren (Dalian University of Technology, China), Yongri Piao (Dalian University of Technology, China), Zhengkun Rong (Dalian University of Technology, China), and Huchuan Lu (Dalian University of Technology, China; Key Lab for Ubiquitous Network and Service Software of Liaoning Province, Dalian University of Technology, China; Pengcheng Lab)

Transfer Learning From Synthetic to Real-Noise Denoising With Adaptive Instance Normalization .3479
Yoonsik Kim (Departmet of ECE, INMC, Seoul National University, Seoul Korea), Jae Woong Soh (Departmet of ECE, INMC, Seoul National University, Seoul Korea), Gu Yong Park (Departmet of ECE, INMC, Seoul National University, Seoul Korea), and Nam Ik Cho (Departmet of ECE, INMC, Seoul National University, Seoul Korea)

On Joint Estimation of Pose, Geometry and svBRDF From a Handheld Scanner .3490
Carolin Schmitt (Max Planck Institute for Intelligent Systems, Tübingen; University of Tübingen), Simon Donné (Max Planck Institute for Intelligent Systems, Tübingen; University of Tübingen), Gernot Riegler (Intel Intelligent Systems Lab), Vladlen Koltun (Intel Intelligent Systems Lab), and Andreas Geiger (Max Planck Institute for Intelligent Systems, Tübingen; University of Tübingen)

Differentiable Volumetric Rendering: Learning Implicit 3D Representations Without 3D Supervision .3501
Michael Niemeyer (Max Planck Institute for Intelligent Systems, Tübingen; University of Tübingen), Lars Mescheder (Max Planck Institute for Intelligent Systems, Tübingen; University of Tübingen; Amazon, Tübingen), Michael Oechsle (Max Planck Institute for Intelligent Systems, Tübingen; University of Tübingen; ETAS GmbH, Bosch Group, Stuttgart), and Andreas Geiger (Max Planck Institute for Intelligent Systems, Tübingen; University of Tübingen)

Meta-Transfer Learning for Zero-Shot Super-Resolution 3513
Jae Woong Soh (Department of ECE, INMC, Seoul National University, Seoul, Korea), Sunwoo Cho (Department of ECE, INMC, Seoul National University, Seoul, Korea), and Nam Ik Cho (Department of ECE, INMC, Seoul National University, Seoul, Korea)

Solving Jigsaw Puzzles With Eroded Boundaries 3523
Dov Bridger (Technion, Israel), Dov Danon (Tel Aviv University, Israel), and Ayellet Tal (Technion, Israel)

Context-Aware Attention Network for Image-Text Retrieval 3533
Qi Zhang (NLPR, Institute of Automation, Chinese Academy of Sciences, Beijing, China; School of Artificial Intelligence, University of Chinese Academy of Sciences, Beijing, China), Zhen Lei (NLPR, Institute of Automation, Chinese Academy of Sciences, Beijing, China; School of Artificial Intelligence, University of Chinese Academy of Sciences, Beijing, China), Zhaoxiang Zhang (NLPR, Institute of Automation, Chinese Academy of Sciences, Beijing, China; School of Artificial Intelligence, University of Chinese Academy of Sciences, Beijing, China), and Stan Z. Li (Center for AI Research and Innovation, Westlake University, Hangzhou, China)

M-LVC: Multiple Frames Prediction for Learned Video Compression 3543
Jianping Lin (CAS Key Laboratory of Technology in Geo-Spatial Information Processing and Application System, University of Science and Technology of China, Hefei, China), Dong Liu (CAS Key Laboratory of Technology in Geo-Spatial Information Processing and Application System, University of Science and Technology of China, Hefei, China), Houqiang Li (CAS Key Laboratory of Technology in Geo-Spatial Information Processing and Application System, University of Science and Technology of China, Hefei, China), and Feng Wu (CAS Key Laboratory of Technology in Geo-Spatial Information Processing and Application System, University of Science and Technology of China, Hefei, China)

Efficient Dynamic Scene Deblurring Using Spatially Variant Deconvolution Network With Optical Flow Guided Training 3552
Yuan Yuan (School of Computer Science and Center for OPTical IMagery Analysis and Learning (OPTIMAL), Northwestern Polytechnical University, Xi'an, Shaanxi, P. R. China), Wei Su (School of Computer Science and Center for OPTical IMagery Analysis and Learning (OPTIMAL), Northwestern Polytechnical University, Xi'an, Shaanxi, P. R. China), and Dandan Ma (School of Computer Science and Center for OPTical IMagery Analysis and Learning (OPTIMAL), Northwestern Polytechnical University, Xi'an, Shaanxi, P. R. China)

Single Image Reflection Removal Through Cascaded Refinement 3562
Chao Li (School of Computer Science and Technology, Huazhong University of Science and Technology), Yixiao Yang (School of Computer Science and Technology, Huazhong University of Science and Technology), Kun He (School of Computer Science and Technology, Huazhong University of Science and Technology), Stephen Lin (Microsoft Research Asia), and John E. Hopcroft (Computer Science Department, Cornell University)

From Patches to Pictures (PaQ-2-PiQ): Mapping the Perceptual Space of Picture Quality 3572
Zhenqiang Ying (University of Texas at Austin), Haoran Niu (University of Texas at Austin), Praful Gupta (University of Texas at Austin), Dhruv Mahajan (Facebook AI), Deepti Ghadiyaram (Facebook AI), and Alan Bovik (University of Texas at Austin)

Video to Events: Recycling Video Datasets for Event Cameras 3583
Daniel Gehrig (Dept. Informatics, Univ. of Zurich and Dept. of Neuroinformatics, Univ. of Zurich and ETH Zurich), Mathias Gehrig (Dept. Informatics, Univ. of Zurich and Dept. of Neuroinformatics, Univ. of Zurich and ETH Zurich), Javier Hidalgo-Carrió (Dept. Informatics, Univ. of Zurich and Dept. of Neuroinformatics, Univ. of Zurich and ETH Zurich), and Davide Scaramuzza (Dept. Informatics, Univ. of Zurich and Dept. of Neuroinformatics, Univ. of Zurich and ETH Zurich)

Composed Query Image Retrieval Using Locally Bounded Features 3593
Mehrdad Hosseinzadeh (University of Manitoba, Canada) and Yang Wang (University of Manitoba, Canada)

Spatially-Attentive Patch-Hierarchical Network for Adaptive Motion Deblurring 3603
Maitreya Suin (Indian Institute of Technology Madras, India), Kuldeep Purohit (Indian Institute of Technology Madras, India), and A. N. Rajagopalan (Indian Institute of Technology Madras, India)

End-to-End Illuminant Estimation Based on Deep Metric Learning 3613
Bolei Xu (College of Computer Science and Technology, Zhejiang University of Technology; College of Information Engineering, Shenzhen University), Jingxin Liu (College of Information Engineering, Shenzhen University; Histo Pathology Diagnostic Center, Shanghai), Xianxu Hou (College of Information Engineering, Shenzhen University), Bozhi Liu (College of Information Engineering, Shenzhen University), and Guoping Qiu (College of Information Engineering, Shenzhen University; School of Computer Science, The University of Nottingham)

Variational-EM-Based Deep Learning for Noise-Blind Image Deblurring 3623
Yuesong Nan (Department of Mathematics, National University of Singapore, Singapore), Yuhui Quan (School of Computer Science & Engineering, South China University of Technology, Guangzhou , China), and Hui Ji (Department of Mathematics, National University of Singapore, Singapore)

Image Demoireing with Learnable Bandpass Filters 3633
Bolun Zheng (Hangzhou Dianzi University), Shanxin Yuan (Huawei Noah's Ark Lab), Gregory Slabaugh (Huawei Noah's Ark Lab), and Aleš Leonardis (Huawei Noah's Ark Lab)

Assessing Image Quality Issues for Real-World Problems 3643
Tai-Yin Chiu (University of Texas at Austin), Yinan Zhao (University of Texas at Austin), and Danna Gurari (University of Texas at Austin)

Memory-Efficient Hierarchical Neural Architecture Search for Image Denoising 3654
Haokui Zhang (Northwestern Polytechnical University, China; The University of Adelaide, Australia), Ying Li (Northwestern Polytechnical University, China), Hao Chen (The University of Adelaide, Australia), and Chunhua Shen (The University of Adelaide, Australia)

Blindly Assess Image Quality in the Wild Guided by a Self-Adaptive Hyper Network .3664.....
Shaolin Su (School of Computer Science and Engineering, Northwestern Polytechnical University), Qingsen Yan (School of Computer Science and Engineering, Northwestern Polytechnical University), Yu Zhu (School of Computer Science and Engineering, Northwestern Polytechnical University), Cheng Zhang (School of Computer Science and Engineering, Northwestern Polytechnical University), Xin Ge (School of Computer Science and Engineering, Northwestern Polytechnical University), Jinqiu Sun (School of Computer Science and Engineering, Northwestern Polytechnical University), and Yanning Zhang (School of Computer Science and Engineering, Northwestern Polytechnical University)

Perceptual Quality Assessment of Smartphone Photography .3674.....
Yuming Fang (Jiangxi University of Finance and Economics), Hanwei Zhu (Jiangxi University of Finance and Economics), Yan Zeng (Jiangxi University of Finance and Economics), Kede Ma (City University of Hong Kong), and Zhou Wang (University of Waterloo)

Don't Hit Me! Glass Detection in Real-World Scenes .3684.....
Haiyang Mei (Dalian University of Technology), Xin Yang (Dalian University of Technology; Advanced Institute of Information Technology Peking University), Yang Wang (Dalian University of Technology), Yuanyuan Liu (Dalian University of Technology), Shengfeng He (South China University of Technology), Qiang Zhang (Dalian University of Technology), Xiaopeng Wei (Dalian University of Technology), and Rynson W.H. Lau

Progressive Mirror Detection .3694.....
Jiaying Lin (Department of Computer Science, City University of Hong Kong), Guodong Wang (Department of Computer Science, City University of Hong Kong), and Rynson W.H. Lau (Department of Computer Science, City University of Hong Kong)

Oral 1-4A: Scene Analysis and Understanding

Category-Level Articulated Object Pose Estimation .3703.....
Xiaolong Li (Virginia Tech), He Wang (Stanford University), Li Yi (Google Research), Leonidas J. Guibas (Stanford University), A. Lynn Abbott (Virginia Tech), and Shuran Song (Columbia University)

Unbiased Scene Graph Generation From Biased Training .3713.....
Kaihua Tang (Nanyang Technological University), Yulei Niu (Renmin University of China), Jianqiang Huang (Nanyang Technological University; Damo Academy, Alibaba Group), Jiaxin Shi (Tsinghua University), and Hanwang Zhang (Nanyang Technological University)

Dynamic Graph Message Passing Networks .3723.....
Li Zhang (University of Oxford), Dan Xu (University of Oxford), Anurag Arnab (Google Research), and Philip H.S. Torr (University of Oxford)

Weakly Supervised Visual Semantic Parsing .3733.....
Alireza Zareian (Columbia University, New York, NY, USA), Svebor Karaman (Columbia University, New York, NY, USA), and Shih-Fu Chang (Columbia University, New York, NY, USA)

GPS-Net: Graph Property Sensing Network for Scene Graph Generation 3743
Xin Lin (School of Electronic and Information Engineering, South China University of Technology), Changxing Ding (School of Electronic and Information Engineering, South China University of Technology), Jinquan Zeng (School of Electronic and Information Engineering, South China University of Technology), and Dacheng Tao (UBTECH Sydney AI Centre, School of Computer Science, Faculty of Engineering, The University of Sydney, Australia)

End-to-End Optimization of Scene Layout 3753
Andrew Luo (Carnegie Mellon University), Zhoutong Zhang (Massachusetts Institute of Technology), Jiajun Wu (Stanford University), and Joshua B. Tenenbaum (Massachusetts Institute of Technology)

Unsupervised Intra-Domain Adaptation for Semantic Segmentation Through Self-Supervision 3763
Fei Pan (KAIST, South Korea), Inkyu Shin (KAIST, South Korea), Francois Rameau (KAIST, South Korea), Seokju Lee (KAIST, South Korea), and In So Kweon (KAIST, South Korea)

Dual Super-Resolution Learning for Semantic Segmentation 3773
Li Wang (Xilinx Inc., Beijing, China), Dong Li (Xilinx Inc., Beijing, China), Yousong Zhu (Institute of Automation, Chinese Academy of Sciences, Beijing, China), Lu Tian (Xilinx Inc., Beijing, China), and Yi Shan (Xilinx Inc., Beijing, China)

Self-Supervised Scene De-Occlusion 3783
Xiaohang Zhan (CUHK - SenseTime Joint Lab, The Chinese University of Hong Kong), Xingang Pan (CUHK - SenseTime Joint Lab, The Chinese University of Hong Kong), Bo Dai (CUHK - SenseTime Joint Lab, The Chinese University of Hong Kong), Ziwei Liu (CUHK - SenseTime Joint Lab, The Chinese University of Hong Kong), Dahua Lin (CUHK - SenseTime Joint Lab, The Chinese University of Hong Kong), and Chen Change Loy (Nanyang Technological University)

BANet: Bidirectional Aggregation Network With Occlusion Handling for Panoptic Segmentation 3792
Yifeng Chen (Zhejiang University), Guangchen Lin (Zhejiang University), Songyuan Li (Zhejiang University), Omar Bourahla (Zhejiang University), Yiming Wu (Zhejiang University), Fangfang Wang (Zhejiang University), Junyi Feng (Zhejiang University), Mingliang Xu (Zhengzhou University), and Xi Li (Zhejiang University)

Oral 1-4B: Medical, Biological and Cell Microscopy

CPR-GCN: Conditional Partial-Residual Graph Convolutional Network in Automated Anatomical Labeling of Coronary Arteries 3802
Han Yang (DAMO Academy, Alibaba Group), Xingjian Zhen (University of Wisconsin Madison), Ying Chi (DAMO Academy, Alibaba Group), Lei Zhang (DAMO Academy, Alibaba Group), and Xian-Sheng Hua (DAMO Academy, Alibaba Group)

Cross-View Correspondence Reasoning Based on Bipartite Graph Convolutional Network for Mammogram Mass Detection .3811
Yuhang Liu (Deepwise AI Lab), Fandong Zhang (Center for Data Science, Peking University), Qianyi Zhang (Deepwise AI Lab), Siwen Wang (Deepwise AI Lab), Yizhou Wang (Center on Frontiers of Computing Studies, Dept. of Computer Science & Technology, Advanced Institute of Information Technology, Peking University), and Yizhou Yu (Deepwise AI Lab)

MPM: Joint Representation of Motion and Position Map for Cell Tracking .3822
Junya Hayashida (Kyushu University, Fukuoka, Japan), Kazuya Nishimura (Kyushu University, Fukuoka, Japan), and Ryoma Bise (Kyushu University, Fukuoka, Japan)

Deep Distance Transform for Tubular Structure Segmentation in CT Scans .3832
Yan Wang (Johns Hopkins University), Xu Wei (University of California San Diego), Fengze Liu (Johns Hopkins University), Jieneng Chen (Tongji University), Yuyin Zhou (Johns Hopkins University), Wei Shen (Johns Hopkins University), Elliot K. Fishman (The Johns Hopkins University School of Medicine), and Alan L. Yuille (Johns Hopkins University)

Instance Segmentation of Biological Images Using Harmonic Embeddings .3842
Victor Kulikov (PicsArt Inc., Moscow, Russian Federation) and Victor Lempitsky (Samsung AI Center Moscow, Skolkovo Institute of Science and Technology)

Multi-scale Domain-adversarial Multiple-instance CNN for Cancer Subtype Classification with Unannotated Histopathological Images .3851
Noriaki Hashimoto (Nagoya Institute of Technology), Daisuke Fukushima (Nagoya Institute of Technology), Ryoichi Koga (Nagoya Institute of Technology), Yusuke Takagi (Nagoya Institute of Technology), Kaho Ko (Nagoya Institute of Technology), Kei Kohno (Nagoya University Hospital), Masato Nakaguro (Nagoya University Hospital), Shigeo Nakamura (Nagoya University Hospital), Hidekata Hontani (Nagoya Institute of Technology), and Ichiro Takeuchi (Nagoya Institute of Technology; RIKEN)

SOS: Selective Objective Switch for Rapid Immunofluorescence Whole Slide Image Classification .3861
Sam Maksoud (The University of Queensland, Australia; Sullivan Nicolaides Pathology, Australia), Kun Zhao (The University of Queensland, Australia), Peter Hobson (Sullivan Nicolaides Pathology, Australia), Anthony Jennings (Sullivan Nicolaides Pathology, Australia), and Brian C. Lovell (The University of Queensland, Australia)

Oral 1-4C: Transfer/Low-Shot/Semi/Unsupervised Learning (1)

Task Agnostic Robust Learning on Corrupt Outputs by Correlation-Guided Mixture Density Networks .3871
Sungjoon Choi (Kakao Brain), Sanghoon Hong (Kakao Brain), Kyungjae Lee (Seoul National University), and Sungbin Lim (UNIST)

METAL: Minimum Effort Temporal Activity Localization in Untrimmed Videos 3881
Da Zhang (University of California, Santa Barbara), Xiyang Dai (Microsoft), and Yuan-Fang Wang (University of California, Santa Barbara)

Neural Data Server: A Large-Scale Search Engine for Transfer Learning Data 3892
Xi Yan (University of Toronto; Vector Institute), David Acuna (University of Toronto; Vector Institute; NVIDIA), and Sanja Fidler (University of Toronto; Vector Institute; NVIDIA)

Revisiting Knowledge Distillation via Label Smoothing Regularization 3902
Li Yuan (National University of Singapore), Francis EH Tay (National University of Singapore), Guilin Li (Huawei Noah's Ark Lab), Tao Wang (National University of Singapore), and Jiashi Feng (National University of Singapore)

WCP: Worst-Case Perturbations for Semi-Supervised Deep Learning 3911
Liheng Zhang (Laboratory for MAchine Perception and LEarning (MAPLE)) and Guo-Jun Qi (Laboratory for MAchine Perception and LEarning (MAPLE); Futurewei Technologies)

DEPARA: Deep Attribution Graph for Deep Knowledge Transferability 3921
Jie Song (Zhejiang University), Yixin Chen (Zhejiang University), Jingwen Ye (Zhejiang University), Xinchao Wang (Stevens Institute of Technology), Chengchao Shen (Zhejiang University), Feng Mao (Alibaba Group), and Mingli Song (Zhejiang University)

Conditional Channel Gated Networks for Task-Aware Continual Learning 3930
Davide Abati (University of Modena and Reggio Emilia), Jakub Tomczak (Qualcomm AI Research, Qualcomm Technologies Netherlands B.V.), Tijmen Blankevoort (Qualcomm AI Research, Qualcomm Technologies Netherlands B.V.), Simone Calderara (University of Modena and Reggio Emilia), Rita Cucchiara (University of Modena and Reggio Emilia), and Babak Ehteshami Bejnordi (Qualcomm AI Research, Qualcomm Technologies Netherlands B.V.)

Towards Discriminability and Diversity: Batch Nuclear-Norm Maximization Under Label Insufficient Situations 3940
Shuhao Cui (Key Lab of Intell. Info. Process., Inst. of Comput. Tech., CAS, Beijing, China; University of Chinese Academy of Sciences, Beijing, China), Shuhui Wang (Key Lab of Intell. Info. Process., Inst. of Comput. Tech., CAS, Beijing, China), Junbao Zhuo (Key Lab of Intell. Info. Process., Inst. of Comput. Tech., CAS, Beijing, China; University of Chinese Academy of Sciences, Beijing, China), Liang Li (Key Lab of Intell. Info. Process., Inst. of Comput. Tech., CAS, Beijing, China), Qingming Huang (Key Lab of Intell. Info. Process., Inst. of Comput. Tech., CAS, Beijing, China; University of Chinese Academy of Sciences, Beijing, China; Peng Cheng Laboratory, Shenzhen, China), and Qi Tian (Noah's Ark Lab, Huawei Technologies)

Poster 1-4P

FocalMix: Semi-Supervised Learning for 3D Medical Image Detection .3950
Dong Wang (Center for Data Science, Peking University), Yuan Zhang (Key Laboratory of Machine Perception, MOE, School of EECS, Peking University), Kexin Zhang (Key Laboratory of Machine Perception, MOE, School of EECS, Peking University; Yizhun Medical AI Co., Ltd), and Liwei Wang (Center for Data Science, Peking University; Key Laboratory of Machine Perception, MOE, School of EECS, Peking University)

Learning 3D Semantic Scene Graphs From 3D Indoor Reconstructions .3960
Johanna Wald (Technische Universität München), Helisa Dhamo (Technische Universität München), Nassir Navab (Technische Universität München), and Federico Tombari (Technische Universität München; Google)

Self-Supervised Viewpoint Learning From Image Collections .3970
Siva Karthik Mustikovela (NVIDIA; Heidelberg University), Varun Jampani (NVIDIA), Shalini De Mello (NVIDIA), Sifei Liu (NVIDIA), Umar Iqbal (NVIDIA), Carsten Rother (Heidelberg University), and Jan Kautz (NVIDIA)

Two-Shot Spatially-Varying BRDF and Shape Estimation .3981
Mark Boss (University of Tübingen), Varun Jampani (NVIDIA), Kihwan Kim (NVIDIA), Hendrik P.A. Lensch (University of Tübingen), and Jan Kautz (NVIDIA)

Variational Context-Deformable ConvNets for Indoor Scene Parsing .3991
Zhitong Xiong (School of Computer Science and Center for OPTical IMagery Analysis and Learning (OPTIMAL), Northwestern Polytechnical University, Xi'an, Shaanxi, P. R. China), Yuan Yuan (School of Computer Science and Center for OPTical IMagery Analysis and Learning (OPTIMAL), Northwestern Polytechnical University, Xi'an, Shaanxi, P. R. China), Nianhui Guo (School of Computer Science and Center for OPTical IMagery Analysis and Learning (OPTIMAL), Northwestern Polytechnical University, Xi'an, Shaanxi, P. R. China), and Qi Wang (School of Computer Science and Center for OPTical IMagery Analysis and Learning (OPTIMAL), Northwestern Polytechnical University, Xi'an, Shaanxi, P. R. China)

Strip Pooling: Rethinking Spatial Pooling for Scene Parsing .4002
Qibin Hou (National University of Singapore), Li Zhang (University of Oxford), Ming-Ming Cheng (CS, Nankai University), and Jiashi Feng (National University of Singapore)

Few-Shot Object Detection With Attention-RPN and Multi-Relation Detector .4012
Qi Fan (HKUST), Wei Zhuo (Tencent), Chi-Keung Tang (HKUST), and Yu-Wing Tai (Tencent)

What Can Be Transferred: Unsupervised Domain Adaptation for Endoscopic Lesions Segmentation .4022.....
Jiahua Dong (State Key Laboratory of Robotics, Shenyang Institute of Automation, Chinese Academy of Sciences, Shenyang, China; Institutes for Robotics and Intelligent Manufacturing, Chinese Academy of Sciences, Shenyang, China; University of Chinese Academy of Sciences, Beijing, China), Yang Cong (State Key Laboratory of Robotics, Shenyang Institute of Automation, Chinese Academy of Sciences, Shenyang, China; Institutes for Robotics and Intelligent Manufacturing, Chinese Academy of Sciences, Shenyang, China), Gan Sun (State Key Laboratory of Robotics, Shenyang Institute of Automation, Chinese Academy of Sciences, Shenyang, China; Institutes for Robotics and Intelligent Manufacturing, Chinese Academy of Sciences, Shenyang, China), Bineng Zhong (Huaqiao University, Xiamen, Fujian, China), and Xiaowei Xu (Department of Information Science, University of Arkansas at Little Rock, Arkansas, USA)

ADINet: Attribute Driven Incremental Network for Retinal Image Classification .4032.....
Qier Meng (Research Center for Medical Bigdata, National Institute of Informatics) and Satoh Shin'ichi (Research Center for Medical Bigdata, National Institute of Informatics)

Unsupervised Domain Adaptation With Hierarchical Gradient Synchronization .4042.....
Lanqing Hu (Key Lab of Intelligent Information Processing of Chinese Academy of Sciences (CAS), Institute of Computing Technology, CAS, Beijing , China; University of Chinese Academy of Sciences, Beijing, China), Meina Kan (Key Lab of Intelligent Information Processing of Chinese Academy of Sciences (CAS), Institute of Computing Technology, CAS, Beijing , China; University of Chinese Academy of Sciences, Beijing, China), Shiguang Shan (Key Lab of Intelligent Information Processing of Chinese Academy of Sciences (CAS), Institute of Computing Technology, CAS, Beijing , China; University of Chinese Academy of Sciences, Beijing, China; CAS Center for Excellence in Brain Science and Intelligence Technology, Shanghai, China), and Xilin Chen (Key Lab of Intelligent Information Processing of Chinese Academy of Sciences (CAS), Institute of Computing Technology, CAS, Beijing , China; University of Chinese Academy of Sciences, Beijing, China)

Deep Grouping Model for Unified Perceptual Parsing .4052.....
Zhiheng Li (University of Rochester), Wenxuan Bao (Tsinghua University), Jiayang Zheng (University of Rochester), and Chenliang Xu (University of Rochester)

Where Am I Looking At? Joint Location and Orientation Estimation by Cross-View Matching .4063
Yujiao Shi (Australian National University; Australian Centre for Robotic Vision), Xin Yu (Australian National University; Australian Centre for Robotic Vision; University of Technology Sydney), Dylan Campbell (Australian National University; Australian Centre for Robotic Vision), and Hongdong Li (Australian National University; Australian Centre for Robotic Vision)

Gum-Net: Unsupervised Geometric Matching for Fast and Accurate 3D Subtomogram Image Alignment and Averaging ..4072
Xiangrui Zeng (Computational Biology Department, Carnegie Mellon University, USA) and Min Xu (Computational Biology Department, Carnegie Mellon University, USA)

FDA: Fourier Domain Adaptation for Semantic Segmentation ..4084
Yanchao Yang (UCLA Vision Lab) and Stefano Soatto (UCLA Vision Lab)

Foreground-Aware Relation Network for Geospatial Object Segmentation in High Spatial Resolution Remote Sensing Imagery ..4095
Zhuo Zheng (Wuhan University, Wuhan, China), Yanfei Zhong (Wuhan University, Wuhan, China), Junjue Wang (Wuhan University, Wuhan, China), and Ailong Ma (Wuhan University, Wuhan, China)

When2com: Multi-Agent Perception via Communication Graph Grouping ..4105
Yen-Cheng Liu (Georgia Institute of Technology), Junjiao Tian (Georgia Institute of Technology), Nathaniel Glaser (Georgia Institute of Technology), and Zsolt Kira (Georgia Institute of Technology)

Learning Human-Object Interaction Detection Using Interaction Points ..4115
Tiancai Wang (MEGVII Technology), Tong Yang (MEGVII Technology), Martin Danelljan (ETH Zurich, Switzerland), Fahad Shahbaz Khan (IIAI, UAE; Linköping University, Sweden), Xiangyu Zhang (MEGVII Technology), and Jian Sun (MEGVII Technology)

C2FNAS: Coarse-to-Fine Neural Architecture Search for 3D Medical Image Segmentation ..4125
Qihang Yu (The Johns Hopkins University), Dong Yang (NVIDIA), Holger Roth (NVIDIA), Yutong Bai (The Johns Hopkins University), Yixiao Zhang (The Johns Hopkins University), Alan L. Yuille (The Johns Hopkins University), and Daguang Xu (NVIDIA)

Adaptive Subspaces for Few-Shot Learning ..4135
Christian Simon (The Australian National University; Data61-CSIRO), Piotr Koniusz (The Australian National University; Data61-CSIRO), Richard Nock (The Australian National University; The University of Sydney; Data61-CSIRO), and Mehrtash Harandi (Monash University; Data61-CSIRO)

Learning to Detect Important People in Unlabelled Images for Semi-Supervised Important People Detection ..4145
Fa-Ting Hong (School of Data and Computer Science, Sun Yat-sen University, China; Accuvision Technology Co. Ltd.; Key Laboratory of Machine Intelligence and Advanced Computing, Ministry of Education, China), Wei-Hong Li (VICO Group, School of Informatics, University of Edinburgh, United Kingdom), and Wei-Shi Zheng (School of Data and Computer Science, Sun Yat-sen University, China; Peng Cheng Laboratory, China; Key Laboratory of Machine Intelligence and Advanced Computing, Ministry of Education, China)

Stochastic Sparse Subspace Clustering ..4154
Ying Chen (SICE, Beijing University of Posts and Telecommunications), Chun-Guang Li (SICE, Beijing University of Posts and Telecommunications), and Chong You (EECS, University of California, Berkeley)

CRNet: Cross-Reference Networks for Few-Shot Segmentation ..4164
*Weide Liu (Nanyang Technological University, Singapore), Chi Zhang (Nanyang Technological University, Singapore), Guosheng Lin (Nanyang Technological University, Singapore), and Fayao Liu (A*Star, Singapore)*

Shoestring: Graph-Based Semi-Supervised Classification With Severely Limited Labeled Data 4173
Wanyu Lin (University of Toronto), Zhaolin Gao (University of Toronto), and Baochun Li (University of Toronto)

Uninformed Students: Student-Teacher Anomaly Detection With Discriminative Latent Embeddings ..4182
Paul Bergmann (MVTec Software GmbH), Michael Fauser (MVTec Software GmbH), David Sattlegger (MVTec Software GmbH), and Carsten Steger (MVTec Software GmbH)

3D Sketch-Aware Semantic Scene Completion via Semi-Supervised Structure Prior ..4192.....
Xiaokang Chen (Key Laboratory of Machine Perception (MOE), School of EECS, Peking University), Kwan-Yee Lin (SenseTime Research), Chen Qian (SenseTime Research), Gang Zeng (Key Laboratory of Machine Perception (MOE), School of EECS, Peking University), and Hongsheng Li (The Chinese University of Hong Kong)

Graph-Guided Architecture Search for Real-Time Semantic Segmentation ..4202.....
Peiwen Lin (SenseTime Research), Peng Sun (Zhejiang University), Guangliang Cheng (SenseTime Research), Sirui Xie (University of California, Los Angeles), Xi Li (Zhejiang University), and Jianping Shi (SenseTime Research)

Composing Good Shots by Exploiting Mutual Relations ..4212.....
Debang Li (CRISE, Institute of Automation, Chinese Academy of Sciences, Beijing, China; School of Artificial Intelligence, University of Chinese Academy of Sciences, Beijing, China), Junge Zhang (CRISE, Institute of Automation, Chinese Academy of Sciences, Beijing, China; School of Artificial Intelligence, University of Chinese Academy of Sciences, Beijing, China), Kaiqi Huang (CRISE, Institute of Automation, Chinese Academy of Sciences, Beijing, China; School of Artificial Intelligence, University of Chinese Academy of Sciences, Beijing, China; CAS Center for Excellence in Brain Science and Intelligence Technology, Beijing, China), and Ming-Hsuan Yang (University of California, Merced; Google Research)

Organ at Risk Segmentation for Head and Neck Cancer Using Stratified Learning and Neural Architecture Search ..4222.....
Dazhou Guo (PAII Inc.), Dakai Jin (PAII Inc.), Zhuotun Zhu (The Johns Hopkins University), Tsung-Ying Ho (Chang Gung Memorial Hospital), Adam P. Harrison (PAII Inc.), Chun-Hung Chao (National Tsing Hua University), Jing Xiao (Ping An Technology), and Le Lu (PAII Inc.)

G2L-Net: Global to Local Network for Real-Time 6D Pose Estimation With Embedding Vector Features 4232
Wei Chen (School of Computer Science, University of Birmingham; School of Computer Science, National University of Defense Technology), Xi Jia (School of Computer Science, University of Birmingham), Hyung Jin Chang (School of Computer Science, University of Birmingham), Jinming Duan (School of Computer Science, University of Birmingham), and Aleš Leonardis (School of Computer Science, University of Birmingham)

Unsupervised Instance Segmentation in Microscopy Images via Panoptic Domain Adaptation and Task Re-Weighting 4242
Dongnan Liu (School of Computer Science, University of Sydney, Australia), Donghao Zhang (School of Computer Science, University of Sydney, Australia), Yang Song (School of Computer Science and Engineering, University of New South Wales, Australia), Fan Zhang (Brigham and Women's Hospital, Harvard Medical School, USA), Lauren O'Donnell (Brigham and Women's Hospital, Harvard Medical School, USA), Heng Huang (Department of Electrical and Computer Engineering, University of Pittsburgh, USA), Mei Chen (Microsoft Corporation, USA), and Weidong Cai (School of Computer Science, University of Sydney, Australia)

Single-Stage Semantic Segmentation From Image Labels 4252
Nikita Araslanov (Department of Computer Science, TU Darmstadt) and Stefan Roth (Department of Computer Science, TU Darmstadt)

Cascaded Human-Object Interaction Recognition 4262
Tianfei Zhou (Inception Institute of Artificial Intelligence, UAE), Wenguan Wang (ETH Zurich, Switzerland), Siyuan Qi (Google, USA), Haibin Ling (Stony Brook University, USA), and Jianbing Shen (Inception Institute of Artificial Intelligence, UAE)

DuDoRNet: Learning a Dual-Domain Recurrent Network for Fast MRI Reconstruction With Deep T1 Prior 4272
Bo Zhou (Department of Biomedical Engineering, Yale University) and S. Kevin Zhou (Chinese Academy of Sciences; Peng Cheng Laboratory, Shenzhen)

Learning Integral Objects With Intra-Class Discriminator for Weakly-Supervised Semantic Segmentation ..4282
Junsong Fan (Center for Research on Intelligent Perception and Computing (CRIPAC), National Laboratory of Pattern Recognition (NLPR), Institute of Automation, Chinese Academy of Sciences (CASIA); School of Artificial Intelligence, University of Chinese Academy of Sciences (UCAS)), Zhaoxiang Zhang (Center for Research on Intelligent Perception and Computing (CRIPAC), National Laboratory of Pattern Recognition (NLPR), Institute of Automation, Chinese Academy of Sciences (CASIA); School of Artificial Intelligence, University of Chinese Academy of Sciences (UCAS); Center for Excellence in Brain Science and Intelligence Technology, CAS), Chunfeng Song (Center for Research on Intelligent Perception and Computing (CRIPAC), National Laboratory of Pattern Recognition (NLPR), Institute of Automation, Chinese Academy of Sciences (CASIA); School of Artificial Intelligence, University of Chinese Academy of Sciences (UCAS)), and Tieniu Tan (Center for Research on Intelligent Perception and Computing (CRIPAC), National Laboratory of Pattern Recognition (NLPR), Institute of Automation, Chinese Academy of Sciences (CASIA); School of Artificial Intelligence, University of Chinese Academy of Sciences (UCAS); Center for Excellence in Brain Science and Intelligence Technology, CAS)

FPConv: Learning Local Flattening for Point Convolution ..4292
Yiqun Lin (The Chinese University of Hong Kong, Shenzhen; Shenzhen Research Institute of Big Data), Zizheng Yan (The Chinese University of Hong Kong, Shenzhen; Shenzhen Research Institute of Big Data), Haibin Huang (Kuaishou Technology), Dong Du (Shenzhen Research Institute of Big Data; University of Science and Technology of China), Ligang Liu (University of Science and Technology of China), Shuguang Cui (The Chinese University of Hong Kong, Shenzhen; Shenzhen Research Institute of Big Data), and Xiaoguang Han (The Chinese University of Hong Kong, Shenzhen; Shenzhen Research Institute of Big Data)

Rotation Equivariant Graph Convolutional Network for Spherical Image Classification ..4302
Qin Yang (Shanghai Jiao Tong University), Chenglin Li (Shanghai Jiao Tong University), Wenrui Dai (Shanghai Jiao Tong University), Junni Zou (Shanghai Jiao Tong University), Guo-Jun Qi (Futurewei Technologies), and Hongkai Xiong (Shanghai Jiao Tong University)

FOAL: Fast Online Adaptive Learning for Cardiac Motion Estimation ..4312
Hanchao Yu (University of Illinois at Urbana-Champaign), Shanhui Sun (United Imaging Intelligence, Cambridge, MA), Haichao Yu (University of Illinois at Urbana-Champaign), Xiao Chen (United Imaging Intelligence, Cambridge, MA), Honghui Shi (University of Oregon), Thomas S. Huang (University of Illinois at Urbana-Champaign), and Terrence Chen (United Imaging Intelligence, Cambridge, MA)

ScrabbleGAN: Semi-Supervised Varying Length Handwritten Text Generation ..4323
Sharon Fogel (Amazon Rekognition, Israel), Hadar Averbuch-Elor (Cornell Tech, Cornell University), Sarel Cohen (Amazon Rekognition, Israel), Shai Mazor (Amazon Rekognition, Israel), and Roee Litman (Amazon Rekognition, Israel)

Cross-Domain Semantic Segmentation via Domain-Invariant Interactive Relation Transfer .4333
Fengmao Lv (Center of Statistical Research & School of Statistics, Southwestern University of Finance and Economics, China), Tao Liang (Center of Statistical Research & School of Statistics, Southwestern University of Finance and Economics, China; Content Platform of Center & Content Development Platform, Tencent, China), Xiang Chen (Content Platform of Center & Content Development Platform, Tencent, China), and Guosheng Lin (School of Computer Science and Engineering, Nanyang Technological University, Singapore)

Inflated Episodic Memory With Region Self-Attention for Long-Tailed Visual Recognition .4343
Linchao Zhu (Baidu Research; ReLER, University of Technology Sydney) and Yi Yang (ReLER, University of Technology Sydney)

Multimodal Future Localization and Emergence Prediction for Objects in Egocentric View With a Reachability Prior .4353
Osama Makansi (University of Freiburg), Özgün Çiçek (University of Freiburg), Kevin Buchicchio (IMRA-EUROPE), and Thomas Brox (University of Freiburg)

Structure Preserving Generative Cross-Domain Learning .4363
Haifeng Xia (Department of ECE, Indiana University-Purdue University Indianapolis) and Zhengming Ding (Department of CIT, Indiana University-Purdue University Indianapolis)

Reverse Perspective Network for Perspective-Aware Object Counting .4373
Yifan Yang (School of Computer Science and Technology, UCAS, Beijing, China), Guorong Li (School of Computer Science and Technology, UCAS, Beijing, China; Key Lab of Big Data Mining and Knowledge Management, UCAS, Beijing, China), Zhe Wu (School of Computer Science and Technology, UCAS, Beijing, China), Li Su (School of Computer Science and Technology, UCAS, Beijing, China; Key Lab of Big Data Mining and Knowledge Management, UCAS, Beijing, China), Qingming Huang (School of Computer Science and Technology, UCAS, Beijing, China; Key Lab of Big Data Mining and Knowledge Management, UCAS, Beijing, China; Key Lab of Intelligent Information Processing, Institute of Computing Technology, CAS, Beijing, China), and Nicu Sebe (University of Trento, Trento, Italy)

Multi-Path Region Mining for Weakly Supervised 3D Semantic Segmentation on Point Clouds 4383
Jiacheng Wei (Nanyang Technological University, Singapore), Guosheng Lin (Nanyang Technological University, Singapore), Kim-Hui Yap (Nanyang Technological University, Singapore), Tzu-Yi Hung (Delta Research Center, Singapore), and Lihua Xie (Nanyang Technological University, Singapore)

Reliable Weighted Optimal Transport for Unsupervised Domain Adaptation .4393
Renjun Xu (Zhejiang University, China), Pelen Liu (Zhejiang University, China), Liyan Wang (Zhejiang University, China), Chao Chen (Zhejiang University, China), and Jindong Wang (Microsoft Research)

ImVoteNet: Boosting 3D Object Detection in Point Clouds With Image Votes .4403
Charles R. Qi (Facebook AI), Xinlei Chen (Facebook AI), Or Litany (Facebook AI; Stanford University), and Leonidas J. Guibas (Facebook AI; Stanford University)

Understanding Road Layout From Videos as a Whole .4413.....
Buyu Liu (NEC Laboratories America), Bingbing Zhuang (NEC Laboratories America), Samuel Schulter (NEC Laboratories America), Pan Ji (NEC Laboratories America), and Manmohan Chandraker (NEC Laboratories America; UC San Diego)

Bi-Directional Relationship Inferring Network for Referring Image Segmentation .4423.....
Zhiwei Hu (Dalian University of Technology, China), Guang Feng (Dalian University of Technology, China), Jiayu Sun (Dalian University of Technology, China), Lihe Zhang (Dalian University of Technology, China), and Huchuan Lu (Dalian University of Technology, China; Peng Cheng Laboratory)

Perspective Plane Program Induction From a Single Image .4433.....
Yikai Li (MIT CSAIL; Shanghai Jiao Tong University), Jiayuan Mao (MIT CSAIL), Xiuming Zhang (MIT CSAIL), William T. Freeman (MIT CSAIL; Google Research), Joshua B. Tenenbaum (MIT CSAIL), and Jiajun Wu (Stanford University)

DeepFLASH: An Efficient Network for Learning-Based Medical Image Registration .4443.....
Jian Wang (University of Virginia) and Miaomiao Zhang (University of Virginia)

Semi-Supervised Learning for Few-Shot Image-to-Image Translation .4452.....
Yaxing Wang (Computer Vision Center, Universitat Autònoma de Barcelona, Spain), Salman Khan (Inception Institute of Artificial Intelligence, UAE), Abel Gonzalez-Garcia (Computer Vision Center, Universitat Autònoma de Barcelona, Spain), Joost van de Weijer (Computer Vision Center, Universitat Autònoma de Barcelona, Spain), and Fahad Shahbaz Khan (Inception Institute of Artificial Intelligence, UAE; CVL, Linköping University, Sweden)

Semantic Correspondence as an Optimal Transport Problem .4462.....
Yanbin Liu (ReLER, University of Technology Sydney), Linchao Zhu (ReLER, University of Technology Sydney), Makoto Yamada (RIKEN AIP; Kyoto University), and Yi Yang (ReLER, University of Technology Sydney)

How Much Time Do You Have? Modeling Multi-Duration Saliency .4472.....
Camilo Fosco (Massachusetts Institute of Technology), Anelise Newman (Massachusetts Institute of Technology), Pat Sukhum (Harvard University), Yun Bin Zhang (Harvard University), Nanxuan Zhao (City University of Hong Kong), Aude Oliva (Massachusetts Institute of Technology), and Zoya Bylinskii (Adobe Research)

Fine-Grained Generalized Zero-Shot Learning via Dense Attribute-Based Attention .4482.....
Dat Huynh (Northeastern University) and Ehsan Elhamifar (Northeastern University)

Online Depth Learning Against Forgetting in Monocular Videos ..4493.....
Zhenyu Zhang (PCA Lab, Nanjing University of Science and Technology, China), Stéphane Lathuilière (DISI, University of Trento, via Sommarive 14, Povo (TN), Italy; Télécom Paris, Multimedia Group, France), Elisa Ricci (DISI, University of Trento, via Sommarive 14, Povo (TN), Italy; Technologies of Vision, Fondazione Bruno Kessler, Via Sommarive 18, Povo (TN), Italy), Nicu Sebe (DISI, University of Trento, via Sommarive 14, Povo (TN), Italy), Yan Yan (PCA Lab, Nanjing University of Science and Technology, China), and Jian Yang (PCA Lab, Nanjing University of Science and Technology, China)

Few-Shot Learning of Part-Specific Probability Space for 3D Shape Segmentation ..4503.....
Lingjing Wang (NYU Multimedia and Visual Computing Lab New York University Abu Dhabi, Abu Dhabi, UAE New York University, New York, USA), Xiang Li (NYU Multimedia and Visual Computing Lab New York University Abu Dhabi, Abu Dhabi, UAE New York University, New York, USA), and Yi Fang (NYU Multimedia and Visual Computing Lab New York University Abu Dhabi, Abu Dhabi, UAE New York University, New York, USA)

Pattern-Structure Diffusion for Multi-Task Learning ..4513.....
Ling Zhou (PCA Lab, Key Lab of Intelligent Perception and Systems for High-Dimensional Information of Ministry of Education, School of Computer Science and Engineering, Nanjing University of Science and Technology), Zhen Cui (PCA Lab, Key Lab of Intelligent Perception and Systems for High-Dimensional Information of Ministry of Education, School of Computer Science and Engineering, Nanjing University of Science and Technology), Chunyan Xu (PCA Lab, Key Lab of Intelligent Perception and Systems for High-Dimensional Information of Ministry of Education, School of Computer Science and Engineering, Nanjing University of Science and Technology), Zhenyu Zhang (PCA Lab, Key Lab of Intelligent Perception and Systems for High-Dimensional Information of Ministry of Education, School of Computer Science and Engineering, Nanjing University of Science and Technology), Chaoqun Wang (PCA Lab, Key Lab of Intelligent Perception and Systems for High-Dimensional Information of Ministry of Education, School of Computer Science and Engineering, Nanjing University of Science and Technology), Tong Zhang (PCA Lab, Key Lab of Intelligent Perception and Systems for High-Dimensional Information of Ministry of Education, School of Computer Science and Engineering, Nanjing University of Science and Technology), and Jian Yang (PCA Lab, Key Lab of Intelligent Perception and Systems for High-Dimensional Information of Ministry of Education, School of Computer Science and Engineering, Nanjing University of Science and Technology)

Training Noise-Robust Deep Neural Networks via Meta-Learning ..4523.....
Zhen Wang (Tianjin Key Lab of Machine Learning, College of Intelligence and Computing, Tianjin University, China), Guosheng Hu (AnyVision), and Qinghua Hu (Tianjin Key Lab of Machine Learning, College of Intelligence and Computing, Tianjin University, China)

Fusion-Aware Point Convolution for Online Semantic 3D Scene Segmentation .4533.....
Jiazhao Zhang (National University of Defense Technology), Chenyang Zhu (National University of Defense Technology), Lintao Zheng (National University of Defense Technology), and Kai Xu (National University of Defense Technology; SpeedBot Robotics Ltd.)

Universal Source-Free Domain Adaptation .4543.....
Jogendra Nath Kundu (Video Analytics Lab, CDS, Indian Institute of Science, Bangalore), Naveen Venkat (Video Analytics Lab, CDS, Indian Institute of Science, Bangalore), Rahul M V (Video Analytics Lab, CDS, Indian Institute of Science, Bangalore), and R. Venkatesh Babu (Video Analytics Lab, CDS, Indian Institute of Science, Bangalore)

Exploring Spatial-Temporal Multi-Frequency Analysis for High-Fidelity and Temporal-Consistency Video Prediction .4553.....
Beibei Jin (Research Center for Intelligent Computing Systems, State Key Laboratory of Computer Architecture, Institute of Computing Technology, Chinese Academy of Sciences), Yu Hu (Research Center for Intelligent Computing Systems, State Key Laboratory of Computer Architecture, Institute of Computing Technology, Chinese Academy of Sciences), Qiankun Tang (Research Center for Intelligent Computing Systems, State Key Laboratory of Computer Architecture, Institute of Computing Technology, Chinese Academy of Sciences), Jingyu Niu (Research Center for Intelligent Computing Systems, State Key Laboratory of Computer Architecture, Institute of Computing Technology, Chinese Academy of Sciences), Zhiping Shi (Capital Normal University), Yinhe Han (Research Center for Intelligent Computing Systems, State Key Laboratory of Computer Architecture, Institute of Computing Technology, Chinese Academy of Sciences), and Xiaowei Li (Research Center for Intelligent Computing Systems, State Key Laboratory of Computer Architecture, Institute of Computing Technology, Chinese Academy of Sciences)

Varicolored Image De-Hazing .4563.....
Akshay Dudhane (Computer Vision and Pattern Recognition Lab, Indian Institute of Technology Ropar, INDIA), Kuldeep M. Biradar (Computer Vision and Pattern Recognition Lab, Indian Institute of Technology Ropar, INDIA), Prashant W. Patil (Computer Vision and Pattern Recognition Lab, Indian Institute of Technology Ropar, INDIA), Praful Hambarde (Computer Vision and Pattern Recognition Lab, Indian Institute of Technology Ropar, INDIA), and Subrahmanyam Murala (Computer Vision and Pattern Recognition Lab, Indian Institute of Technology Ropar, INDIA)

SpSequenceNet: Semantic Segmentation Network on 4D Point Clouds .4573.....
Hanyu Shi (Nanyang Technological University), Guosheng Lin (Nanyang Technological University), Hao Wang (Nanyang Technological University), Tzu-Yi Hung (Delta Research Center), and Zhenhua Wang (Nanyang Technological University)

Separating Particulate Matter From a Single Microscopic Image .4583.....
Tushar Sandhan (Department of ECE, ASRI, Seoul National University, South Korea) and Jin Young Choi (Department of ECE, ASRI, Seoul National University, South Korea)

Adaptive Dilated Network With Self-Correction Supervision for Counting .4593.....
Shuai Bai (Beijing University of Posts and Telecommunications), Zhiqun He (Sense Time Group Limited), Yu Qiao (Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences), Hanzhe Hu (Peking University), Wei Wu (Sense Time Group Limited), and Junjie Yan (Sense Time Group Limited)

PointPainting: Sequential Fusion for 3D Object Detection .4603.....
Sourabh Vora (nuTonomy: An APTIV Company), Alex H. Lang (nuTonomy: An APTIV Company), Bassam Helou (nuTonomy: An APTIV Company), and Oscar Beijbom (nuTonomy: An APTIV Company)

Rethinking Zero-Shot Video Classification: End-to-End Training for Realistic Applications .4612
Biagio Brattoli (Heidelberg University), Joseph Tighe (Amazon), Fedor Zhdanov (Amazon), Pietro Perona (Amazon), and Krzysztof Chalupka (Amazon)

Learning to Select Base Classes for Few-Shot Classification .4623.....
Linjun Zhou (Tsinghua University; Noah's Ark Lab, Huawei Technologies), Peng Cui (Tsinghua University), Xu Jia (Noah's Ark Lab, Huawei Technologies), Shiqiang Yang (Tsinghua University), and Qi Tian (Noah's Ark Lab, Huawei Technologies)

CONSAC: Robust Multi-Model Fitting by Conditional Sample Consensus .4633.....
Florian Kluger (Leibniz University Hannover), Eric Brachmann (Heidelberg University), Hanno Ackermann (Leibniz University Hannover), Carsten Rother (Heidelberg University), Michael Ying Yang (University of Twente), and Bodo Rosenhahn (Leibniz University Hannover)

Fast Symmetric Diffeomorphic Image Registration with Convolutional Neural Networks .4643
Tony C.W. Mok (Department of Computer Science and Engineering, The Hong Kong University of Science and Technology) and Albert C.S. Chung (Department of Computer Science and Engineering, The Hong Kong University of Science and Technology)

Distilled Semantics for Comprehensive Scene Understanding from Videos .4653.....
Fabio Tosi (Department of Computer Science and Engineering (DISI), University of Bologna, Italy), Filippo Aleotti (Department of Computer Science and Engineering (DISI), University of Bologna, Italy), Pierluigi Zama Ramirez (Department of Computer Science and Engineering (DISI), University of Bologna, Italy), Matteo Poggi (Department of Computer Science and Engineering (DISI), University of Bologna, Italy), Samuele Salti (Department of Computer Science and Engineering (DISI), University of Bologna, Italy), Luigi Di Stefano (Department of Computer Science and Engineering (DISI), University of Bologna, Italy), and Stefano Mattoccia (Department of Computer Science and Engineering (DISI), University of Bologna, Italy)

Modeling Biological Immunity to Adversarial Examples .4665.....
Edward Kim (Department of Computer Science, Drexel University, PA), Jocelyn Rego (Department of Computer Science, Drexel University, PA), Yijing Watkins (Los Alamos National Laboratory, Los Alamos, NM), and Garrett T. Kenyon (Los Alamos National Laboratory, Los Alamos, NM)

DOA-GAN: Dual-Order Attentive Generative Adversarial Network for Image Copy-Move Forgery Detection and Localization ..4675
Ashraful Islam (Rensselaer Polytechnic Institute, Troy, NY), Chengjiang Long (Kitware Inc., NY), Arslan Basharat (Kitware Inc., NY), and Anthony Hoogs (Kitware Inc., NY)

Correspondence-Free Material Reconstruction using Sparse Surface Constraints ..4685
Sebastian Weiss (Technical University of Munich, Germany), Robert Maier (Technical University of Munich, Germany), Daniel Cremers (Technical University of Munich, Germany), Rüdiger Westermann (Technical University of Munich, Germany), and Nils Thuerey (Technical University of Munich, Germany)

Augmenting Colonoscopy Using Extended and Directional CycleGAN for Lossy Image Translation.. 4695
Shawn Mathew (Stony Brook University), Saad Nadeem (Memorial Sloan Kettering Cancer Center), Sruti Kumari (Stony Brook University), and Arie Kaufman (Stony Brook University)

Attention Scaling for Crowd Counting ..4705
Xiaoheng Jiang (School of Information Engineering, Zhengzhou University), Li Zhang (School of Information Engineering, Zhengzhou University), Mingliang Xu (School of Information Engineering, Zhengzhou University), Tianzhu Zhang (School of Information Science and Technology, University of Science and Technology of China), Pei Lv (School of Information Engineering, Zhengzhou University), Bing Zhou (School of Information Engineering, Zhengzhou University), Xin Yang (School of Computer Science and Technology, Dalian University of Technology), and Yanwei Pang (School of Electrical and Information Engineering, Tianjin University)

Shape Reconstruction by Learning Differentiable Surface Representations ..4715
Jan Bednařík (CVLab, EPFL, Switzerland), Shaifali Parashar (CVLab, EPFL, Switzerland), Erhan Gündoğdu (CVLab, EPFL, Switzerland), Mathieu Salzmann (CVLab, EPFL, Switzerland), and Pascal Fua (CVLab, EPFL, Switzerland)

A Spatiotemporal Volumetric Interpolation Network for 4D Dynamic Medical Image ..4725
Yuyu Guo (Institute for Medical Imaging Technology, School of Biomedical Engineering, Shanghai Jiao Tong University, China; School of Computer Science, University of Sydney, Australia), Lei Bi (School of Computer Science, University of Sydney, Australia), Euijoon Ahn (School of Computer Science, University of Sydney, Australia), Dagan Feng (School of Computer Science, University of Sydney, Australia), Qian Wang (Institute for Medical Imaging Technology, School of Biomedical Engineering, Shanghai Jiao Tong University, China), and Jinman Kim (School of Computer Science, University of Sydney, Australia)

Attention-Based Context Aware Reasoning for Situation Recognition ..4735
Thilini Cooray (Singapore University of Technology and Design (SUTD)), Ngai-Man Cheung (Singapore University of Technology and Design (SUTD)), and Wei Lu (Singapore University of Technology and Design (SUTD))

PatchVAE: Learning Local Latent Codes for Recognition ..4745
Kamal Gupta (University of Maryland, College Park), Saurabh Singh (Google Research), and Abhinav Shrivastava (University of Maryland, College Park)

Self-Supervised Monocular Trained Depth Estimation Using Self-Attention and Discrete Disparity Volume ..4755
Adrian Johnston (Australian Institute for Machine Learning, School of Computer Science, University of Adelaide) and Gustavo Carneiro (Australian Institute for Machine Learning, School of Computer Science, University of Adelaide)

STAViS: Spatio-Temporal AudioVisual Saliency Network ..4765
Antigoni Tsiami (School of E.C.E., National Technical University of Athens, Greece), Petros Koutras (School of E.C.E., National Technical University of Athens, Greece), and Petros Maragos (School of E.C.E., National Technical University of Athens, Greece)

More Grounded Image Captioning by Distilling Image-Text Matching Model ..4776
Yuanen Zhou (Key Laboratory of Knowledge Engineering with Big Data (Ministry of Education); School of Computer Science and Information Engineering, Hefei University of Technology), Meng Wang (Key Laboratory of Knowledge Engineering with Big Data (Ministry of Education); School of Computer Science and Information Engineering, Hefei University of Technology), Daqing Liu (University of Science and Technology of China), Zhenzhen Hu (Key Laboratory of Knowledge Engineering with Big Data (Ministry of Education); School of Computer Science and Information Engineering, Hefei University of Technology), and Hanwang Zhang (Nanyang Technological University)

DUNIT: Detection-Based Unsupervised Image-to-Image Translation ..4786
Deblina Bhattacharjee (School of Computer and Communication Sciences, EPFL, Switzerland), Seungryong Kim (School of Computer and Communication Sciences, EPFL, Switzerland), Guillaume Vizier (School of Computer and Communication Sciences, EPFL, Switzerland), and Mathieu Salzmann (School of Computer and Communication Sciences, EPFL, Switzerland)

Learning to Observe: Approximating Human Perceptual Thresholds for Detection of Suprathreshold Image Transformations ..4796
Alan Dolhasz (Digital Media Technology Lab, Birmingham City University), Carlo Harvey (Digital Media Technology Lab, Birmingham City University), and Ian Williams (Digital Media Technology Lab, Birmingham City University)

Show, Edit and Tell: A Framework for Editing Image Captions ..4807
Fawaz Sammani (Multimedia University) and Luke Melas-Kyriazi (Harvard University)

Structure Boundary Preserving Segmentation for Medical Image With Ambiguous Boundary 4816

Hong Joo Lee (Image and Video Systems Lab, School of Electrical Engineering, KAIST, South Korea), Jung Uk Kim (Image and Video Systems Lab, School of Electrical Engineering, KAIST, South Korea), Sangmin Lee (Image and Video Systems Lab, School of Electrical Engineering, KAIST, South Korea), Hak Gu Kim (Image and Video Systems Lab, School of Electrical Engineering, KAIST, South Korea), and Yong Man Ro (Image and Video Systems Lab, School of Electrical Engineering, KAIST, South Korea)

Predicting Cognitive Declines Using Longitudinally Enriched Representations for Imaging Biomarkers ..4826.....

Lyujian Lu (Department of Computer Science, Colorado School of Mines, Golden, Colorado, USA), Hua Wang (Department of Computer Science, Colorado School of Mines, Golden, Colorado, USA), Saad Elbeleidy (Department of Computer Science, Colorado School of Mines, Golden, Colorado, USA), and Feiping Nie (School of Computer Science and Center for OPTical IMagery Analysis and Learning (OPTIMAL), Northwestern Polytechnical University, Xi'an, P. R. China)

Predicting Lymph Node Metastasis Using Histopathological Images Based on Multiple Instance Learning With Deep Graph Convolution ..4836.....

Yu Zhao (Tencent AI Lab; Technical University of Munich), Fan Yang (Tencent AI Lab), Yuqi Fang (The Chinese University of Hong Kong), Hailing Liu (Sixth Affiliated Hospital of Sun Yat-sen University), Niyun Zhou (Tencent AI Lab), Jun Zhang (Tencent AI Lab), Jiarui Sun (Tencent AI Lab), Sen Yang (Tencent AI Lab), Bjoern Menze (Technical University of Munich), Xinjuan Fan (Sixth Affiliated Hospital of Sun Yat-sen University), and Jianhua Yao (Tencent AI Lab)

Extremely Dense Point Correspondences Using a Learned Feature Descriptor ..4846.....

Xingtong Liu (Johns Hopkins University), Yiping Zheng (Johns Hopkins University), Benjamin Killeen (Johns Hopkins University), Masaru Ishii (Johns Hopkins Medical Institutions), Gregory D. Hager (Johns Hopkins University), Russell H. Taylor (Johns Hopkins University), and Mathias Unberath (Johns Hopkins University)

Oral 2-1A: 3D From Multiview and Sensors (3)

Local Deep Implicit Functions for 3D Shape ..4856.....

Kyle Genova (Princeton University; Google Research), Forrester Cole (Google Research), Avneesh Sud (Google Research), Aaron Sarna (Google Research), and Thomas Funkhouser (Princeton University; Google Research)

PointGroup: Dual-Set Point Grouping for 3D Instance Segmentation ..4866.....

Li Jiang (The Chinese University of Hong Kong), Hengshuang Zhao (The Chinese University of Hong Kong), Shaoshuai Shi (The Chinese University of Hong Kong), Shu Liu (SmartMore), Chi-Wing Fu (The Chinese University of Hong Kong), and Jiaya Jia (The Chinese University of Hong Kong; SmartMore)

Cost Volume Pyramid Based Depth Inference for Multi-View Stereo .4876
Jiayu Yang (Australian National University), Wei Mao (Australian National University), Jose M. Alvarez (NVIDIA), and Miaomiao Liu (Australian National University; Australian Centre for Robotic Vision)

RoutedFusion: Learning Real-Time Depth Map Fusion .4886
Silvan Weder (ETH Zurich), Johannes Schönberger (Microsoft), Marc Pollefeys (ETH Zurich/Microsoft), and Martin R. Oswald (ETH Zurich)

VOLDOR: Visual Odometry From Log-Logistic Dense Optical Flow Residuals .4897
Zhixiang Min (Stevens Institute of Technology), Yiding Yang (Stevens Institute of Technology), and Enrique Dunn (Stevens Institute of Technology)

Learning to Optimize Non-Rigid Tracking .4909
Yang Li (The University of Tokyo; Technical University Munich), Aljaž Božič (Technical University Munich), Tianwei Zhang (The University of Tokyo), Yanli Ji (The University of Tokyo; UESTC), Tatsuya Harada (The University of Tokyo; RIKEN), and Matthias Nießner (Technical University Munich)

KFNet: Learning Temporal Camera Relocalization Using Kalman Filtering .4918
Lei Zhou (Hong Kong University of Science and Technology), Zixin Luo (Hong Kong University of Science and Technology), Tianwei Shen (Hong Kong University of Science and Technology), Jiahui Zhang (Tsinghua University), Mingmin Zhen (Hong Kong University of Science and Technology), Yao Yao (Hong Kong University of Science and Technology), Tian Fang (Everest Innovation Technology), and Long Quan (Hong Kong University of Science and Technology)

Information-Driven Direct RGB-D Odometry .4928
Alejandro Fontán (University of Zaragoza; German Aerospace Center (DLR)), Javier Civera (University of Zaragoza), and Rudolph Triebel (German Aerospace Center (DLR); Technical University of Munich)

SuperGlue: Learning Feature Matching With Graph Neural Networks .4937
Paul-Edouard Sarlin (ETH Zurich), Daniel DeTone (Magic Leap, Inc.), Tomasz Malisiewicz (Magic Leap, Inc.), and Andrew Rabinovich (Magic Leap, Inc.)

Reinforced Feature Points: Optimizing Feature Detection and Description for a High-Level Task .4947
Aritra Bhowmik (TU Dresden), Stefan Gumhold (TU Dresden), Carsten Rother (Heidelberg University), and Eric Brachmann (Heidelberg University)

Oral 2-1B: Face, Gesture, and Body Pose (1)

ReDA:Reinforced Differentiable Attribute for 3D Face Reconstruction .4957
Wenbin Zhu (Microsoft Cloud and AI), HsiangTao Wu (Microsoft Cloud and AI), Zeyu Chen (Microsoft Cloud and AI), Noranart Vesdapunt (Microsoft Cloud and AI), and Baoyuan Wang (Microsoft Cloud and AI)

EventCap: Monocular 3D Capture of High-Speed Human Motions Using an Event Camera .4967
Lan Xu (Tsinghua-Berkeley Shenzhen Institute, Tsinghua University, China; Robotics Institute, Hong Kong University of Science and Technology, Hong Kong), Weipeng Xu (Max Planck Institute for Informatics, Saarland Informatics Campus, Germany), Vladislav Golyanik (Max Planck Institute for Informatics, Saarland Informatics Campus, Germany), Marc Habermann (Max Planck Institute for Informatics, Saarland Informatics Campus, Germany), Lu Fang (Tsinghua-Berkeley Shenzhen Institute, Tsinghua University, China), and Christian Theobalt (Max Planck Institute for Informatics, Saarland Informatics Campus, Germany)

Cross-Modal Deep Face Normals With Deactivable Skip Connections .4978
Victoria Fernández Abrevaya (Inria, Univ. Grenoble Alpes, CNRS, Grenoble INP, LJK, France), Adnane Boukhayma (Inria, Univ. Rennes, CNRS, IRISA, M2S, France), Philip H.S. Torr (University of Oxford, UK), and Edmond Boyer (Inria, Univ. Grenoble Alpes, CNRS, Grenoble INP, LJK, France)

Weakly-Supervised Mesh-Convolutional Hand Reconstruction in the Wild .4989
Dominik Kulon (Imperial College London; Ariel AI), Riza Alp Güler (Imperial College London; Ariel AI), Iasonas Kokkinos (Ariel AI), Michael M. Bronstein (Imperial College London; USI Lugano; Twitter), and Stefanos Zafeiriou (Imperial College London; Ariel AI)

Face X-Ray for More General Face Forgery Detection .5000
Lingzhi Li (Peking University), Jianmin Bao (Microsoft Research Asia), Ting Zhang (Microsoft Research Asia), Hao Yang (Microsoft Research Asia), Dong Chen (Microsoft Research Asia), Fang Wen (Microsoft Research Asia), and Baining Guo (Microsoft Research Asia)

A Morphable Face Albedo Model .5010
William A. P. Smith (University of York, UK), Alassane Seck (ARM Ltd, UK; Aberystwyth University, UK), Hannah Dee (Aberystwyth University, UK), Bernard Tiddeman (Aberystwyth University, UK), Joshua B. Tenenbaum (MIT - BCS, CSAIL & CBMM, USA), and Bernhard Egger (MIT - BCS, CSAIL & CBMM, USA)

Cascade EF-GAN: Progressive Facial Expression Editing With Local Focuses .5020
Rongliang Wu (Nanyang Technological University), Gongjie Zhang (Nanyang Technological University), Shijian Lu (Nanyang Technological University), and Tao Chen (Fudan University)

GanHand: Predicting Human Grasp Affordances in Multi-Object Scenes .5030
Enric Corona (Institut de Robòtica i Informàtica Industrial, CSIC-UPC, Barcelona, Spain), Albert Pumarola (Institut de Robòtica i Informàtica Industrial, CSIC-UPC, Barcelona, Spain), Guillem Alenyà (Institut de Robòtica i Informàtica Industrial, CSIC-UPC, Barcelona, Spain), Francesc Moreno-Noguer (Institut de Robòtica i Informàtica Industrial, CSIC-UPC, Barcelona, Spain), and Grégory Rogez (NAVER LABS Europe)

Deep Spatial Gradient and Temporal Depth Learning for Face Anti-Spoofing ..5041.....
Zezheng Wang (AIBEE), Zitong Yu (CMVS, University of Oulu), Chenxu Zhao (Academy of Sciences, Mininglamp Technology), Xiangyu Zhu (CBSR&NLPR, CASIA), Yunxiao Qin (Northwestern Polytechnical University), Qiusheng Zhou (JD Digits), Feng Zhou (AIBEE), and Zhen Lei (CBSR&NLPR, CASIA)

DeepCap: Monocular Human Performance Capture Using Weak Supervision ..5051.....
Marc Habermann (Max Planck Institute for Informatics; Saarland Informatics Campus), Weipeng Xu (Max Planck Institute for Informatics; Saarland Informatics Campus), Michael Zollhöfer (Stanford University), Gerard Pons-Moll (Max Planck Institute for Informatics; Saarland Informatics Campus), and Christian Theobalt (Max Planck Institute for Informatics; Saarland Informatics Campus)

Attention Mechanism Exploits Temporal Contexts: Real-Time 3D Human Pose Reconstruction 5063
Ruixu Liu (University of Dayton), Ju Shen (University of Dayton), He Wang (University of Dayton), Chen Chen (University of North Carolina at Charlotte), Sen-ching Cheung (University of Kentucky), and Vijayan Asari (University of Dayton)

Advancing High Fidelity Identity Swapping for Forgery Detection ..5073.....
Lingzhi Li (Peking University), Jianmin Bao (Microsoft Research), Hao Yang (Microsoft Research), Dong Chen (Microsoft Research), and Fang Wen (Microsoft Research)

Oral 2-1C: Image and Video Synthesis (1)

Controllable Person Image Synthesis With Attribute-Decomposed GAN ..5083.....
Yifang Men (Wangxuan Institute of Computer Technology, Peking University, China), Yiming Mao (Bytedance AI Lab), Yuning Jiang (Bytedance AI Lab), Wei-Ying Ma (Bytedance AI Lab), and Zhouhui Lian (Wangxuan Institute of Computer Technology, Peking University, China)

Attentive Normalization for Conditional Image Generation ..5093.....
Yi Wang (The Chinese University of Hong Kong), Ying-Cong Chen (The Chinese University of Hong Kong), Xiangyu Zhang (MEGVII Technology), Jian Sun (MEGVII Technology), and Jiaya Jia (The Chinese University of Hong Kong)

SEAN: Image Synthesis With Semantic Region-Adaptive Normalization ..5103.....
Peihao Zhu (KAUST), Rameen Abdal (KAUST), Yipeng Qin (MEGVII Technology), and Peter Wonka (KAUST)

Blurry Video Frame Interpolation .5113.....
Wang Shen (Institute of Image Communication and Network Engineering, Shanghai Jiao Tong University), Wenbo Bao (Institute of Image Communication and Network Engineering, Shanghai Jiao Tong University), Guangtao Zhai (Institute of Image Communication and Network Engineering, Shanghai Jiao Tong University), Li Chen (Institute of Image Communication and Network Engineering, Shanghai Jiao Tong University), Xiongkuo Min (Institute of Image Communication and Network Engineering, Shanghai Jiao Tong University), and Zhiyong Gao (Institute of Image Communication and Network Engineering, Shanghai Jiao Tong University)

Learning Physics-Guided Face Relighting Under Directional Light .5123.....
Thomas Nestmeyer (MPI for Intelligent Systems), Jean-François Lalonde (Universit´e Laval), Iain Matthews (Epic Games), and Andreas Lehrmann (Borealis AI)

Disentangled Image Generation Through Structured Noise Injection .5133.....
Yazeed Alharbi (King Abdullah University for Science and Technology (KAUST)) and Peter Wonka (KAUST)

Cross-Domain Correspondence Learning for Exemplar-Based Image Translation .5142.....
Pan Zhang (University of Science and Technology of China), Bo Zhang (Microsoft Research Asia), Dong Chen (Microsoft Research Asia), Lu Yuan (Microsoft Cloud+AI), and Fang Wen (Microsoft Research Asia)

Disentangled and Controllable Face Image Generation via 3D Imitative-Contrastive Learning .....
5153
Yu Deng (Tsinghua University; Microsoft Research Asia), Jiaolong Yang (Microsoft Research Asia), Dong Chen (Microsoft Research Asia), Fang Wen (Microsoft Research Asia), and Xin Tong (Microsoft Research Asia)

Single Image Reflection Removal With Physically-Based Training Images .5163.....
Soomin Kim (Korea Advanced Institute of Science and Technology (KAIST)), Yuchi Huo (Korea Advanced Institute of Science and Technology (KAIST)), and Sung-Eui Yoon (Korea Advanced Institute of Science and Technology (KAIST))

SketchyCOCO: Image Generation From Freehand Scene Sketches .5173.....
Chengying Gao (School of Data and Computer Science, Sun Yat-sen University, China), Qi Liu (School of Data and Computer Science, Sun Yat-sen University, China), Qi Xu (School of Data and Computer Science, Sun Yat-sen University, China), Limin Wang (State Key Laboratory for Novel Software Technology, Nanjing University, China), Jianzhuang Liu (Noah's Ark Lab, Huawei Technologies), and Changqing Zou (HMI Lab, Huawei Technologies)

Image Based Virtual Try-On Network From Unpaired Data .5183.....
Assaf Neuberger (Amazon Lab126), Eran Borenstein (Amazon Lab126), Bar Hilleli (Amazon Lab126), Eduard Oks (Amazon Lab126), and Sharon Alpert (Amazon Lab126)

PSGAN: Pose and Expression Robust Spatial-Aware GAN for Customizable Makeup Transfer 5193
Wentao Jiang (School of Computer Science and Engineering, Beihang University), Si Liu (School of Computer Science and Engineering, Beihang University), Chen Gao (Institute of Information Engineering, Chinese Academy of Sciences; University of Chinese Academy of Sciences), Jie Cao (Institute of Automation, Chinese Academy of Sciences; University of Chinese Academy of Sciences), Ran He (Institute of Automation, Chinese Academy of Sciences; University of Chinese Academy of Sciences), Jiashi Feng (National University of Singapore), and Shuicheng Yan (YITU Tech)

Poster 2-1P

RetinaFace: Single-Shot Multi-Level Face Localisation in the Wild 5202
Jiankang Deng (Imperial College; InsightFace; FaceSoft), Jia Guo (InsightFace), Evangelos Ververas (Imperial College; FaceSoft), Irene Kotsia (Middlesex University London), and Stefanos Zafeiriou (Imperial College; FaceSoft)

Semantic Image Manipulation Using Scene Graphs 5212
Helisa Dhamo (Technische Universität München), Azade Farshad (Technische Universität München), Iro Laina (Technische Universität München; University of Oxford), Nassir Navab (Technische Universität München; Johns Hopkins University), Gregory D. Hager (Johns Hopkins University), Federico Tombari (Technische Universität München; Google), and Christian Rupprecht (University of Oxford)

A Stochastic Conditioning Scheme for Diverse Human Motion Prediction 5222
Sadegh Aliakbarian (Australian National University; ACRV; Data61, CSIRO), Fatemeh Sadat Saleh (Australian National University; ACRV), Mathieu Salzmann (CVLab, EPFL), Lars Petersson (Australian National University; Data61, CSIRO), and Stephen Gould (Australian National University; ACRV)

Transferring Dense Pose to Proximal Animal Classes 5232
Artsiom Sanakoyeu (Heidelberg University), Vasil Khalidov (Facebook AI Research), Maureen S. McCarthy (MPI for Evolutionary Anthropology), Andrea Vedaldi (Facebook AI Research), and Natalia Neverova (Facebook AI Research)

Weakly-Supervised 3D Human Pose Learning via Multi-View Images in the Wild 5242
Umar Iqbal (NVIDIA), Pavlo Molchanov (NVIDIA), and Jan Kautz (NVIDIA)

VIBE: Video Inference for Human Body Pose and Shape Estimation 5252
Muhammed Kocabas (Max Planck Institute for Intelligent Systems, Tübingen, Germany; Max Planck ETH Center for Learning Systems), Nikos Athanasiou (Max Planck Institute for Intelligent Systems, Tübingen, Germany), and Michael J. Black (Max Planck Institute for Intelligent Systems, Tübingen, Germany)

G3AN: Disentangling Appearance and Motion for Video Generation 5263
Yaohui Wang (Inria; Université Côte d'Azur), Piotr Bilinski (University of Warsaw), Francois Bremond (Inria; Université Côte d'Azur), and Antitza Dantcheva (Inria; Université Côte d'Azur)

Domain Adaptive Image-to-Image Translation .5273.....
Ying-Cong Chen (The Chinese University of Hong Kong), Xiaogang Xu (The Chinese University of Hong Kong), and Jiaya Jia (The Chinese University of Hong Kong; SmartMore)

GAN Compression: Efficient Architectures for Interactive Conditional GANs .5283.....
Muyang Li (Massachusetts Institute of Technology; Shanghai Jiao Tong University), Ji Lin (Massachusetts Institute of Technology), Yaoyao Ding (Massachusetts Institute of Technology; Shanghai Jiao Tong University), Zhijian Liu (Massachusetts Institute of Technology), Jun-Yan Zhu (Adobe Research), and Song Han (Massachusetts Institute of Technology)

Searching Central Difference Convolutional Networks for Face Anti-Spoofing .5294.....
Zitong Yu (CMVS, University of Oulu), Chenxu Zhao (Mininglamp Academy of Sciences, Mininglamp Technology), Zezheng Wang (Aibee), Yunxiao Qin (Northwestern Polytechnical University), Zhuo Su (CMVS, University of Oulu), Xiaobai Li (CMVS, University of Oulu), Feng Zhou (Aibee), and Guoying Zhao (CMVS, University of Oulu)

TransMoMo: Invariance-Driven Unsupervised Video Motion Retargeting .5305.....
Zhuoqian Yang (Robotics Institute, Carnegie Mellon University), Wentao Zhu (Peking University), Wayne Wu (BNRist, Tsinghua University), Chen Qian (SenseTime Research), Qiang Zhou (BNRist, Tsinghua University), Bolei Zhou (CUHK), and Chen Change Loy (Nanyang Technological University)

AdaCoF: Adaptive Collaboration of Flows for Video Frame Interpolation .5315.....
Hyeongmin Lee (Yonsei University), Taeoh Kim (Yonsei University), Tae-young Chung (Yonsei University), Daehyun Pak (Yonsei University), Yuseok Ban (Agency for Defense Development), and Sangyoun Lee (Yonsei University)

FReeNet: Multi-Identity Face Reenactment .5325.....
Jiangning Zhang (Zhejiang University), Xianfang Zeng (Zhejiang University), Mengmeng Wang (Zhejiang University), Yusu Pan (Zhejiang University), Liang Liu (Zhejiang University), Yong Liu (Zhejiang University), Yu Ding (Fuxi AI Lab, NetEase), and Changjie Fan (Fuxi AI Lab, NetEase)

Novel View Synthesis of Dynamic Scenes With Globally Coherent Depths From a Monocular Camera .5335.....
Jae Shin Yoon (University of Minnesota), Kihwan Kim (NVIDIA), Orazio Gallo (NVIDIA), Hyun Soo Park (University of Minnesota), and Jan Kautz (NVIDIA)

Monocular Real-Time Hand Shape and Motion Capture Using Multi-Modal Data .5345.....
Yuxiao Zhou (BNRist and School of Software, Tsinghua University), Marc Habermann (Max Planck Institute for Informatics; Saarland Informatics Campus), Weipeng Xu (Max Planck Institute for Informatics; Saarland Informatics Campus), Ikhsanul Habibie (Max Planck Institute for Informatics; Saarland Informatics Campus), Christian Theobalt (Max Planck Institute for Informatics; Saarland Informatics Campus), and Feng Xu (BNRist and School of Software, Tsinghua University)

The GAN That Warped: Semantic Attribute Editing With Unpaired Data .5355.....
Garoe Dorta (University of Bath; Anthropics Technology Ltd.), Sara Vicente (Anthropics Technology Ltd.), Neill D. F. Campbell (University of Bath), and Ivor J. A. Simpson (Anthropics Technology Ltd.; University of Sussex)

4D Visualization of Dynamic Events From Unconstrained Multi-View Videos .5365.....
Aayush Bansal (Carnegie Mellon University), Minh Vo (Carnegie Mellon University), Yaser Sheikh (Carnegie Mellon University), Deva Ramanan (Carnegie Mellon University), and Srinivasa Narasimhan (Carnegie Mellon University)

Global-Local Bidirectional Reasoning for Unsupervised Representation Learning of 3D Point Clouds .5375.....
Yongming Rao (Department of Automation, Tsinghua University, China; State Key Lab of Intelligent Technologies and Systems, China; Beijing National Research Center for Information Science and Technology, China), Jiwen Lu (Department of Automation, Tsinghua University, China; State Key Lab of Intelligent Technologies and Systems, China; Beijing National Research Center for Information Science and Technology, China), and Jie Zhou (Department of Automation, Tsinghua University, China; State Key Lab of Intelligent Technologies and Systems, China; Beijing National Research Center for Information Science and Technology, China; Tsinghua Shenzhen International Graduate School, Tsinghua University, China)

HigherHRNet: Scale-Aware Representation Learning for Bottom-Up Human Pose Estimation 5385
Bowen Cheng (UIUC), Bin Xiao (Microsoft), Jingdong Wang (Microsoft), Honghui Shi (UIUC; University of Oregon), Thomas S. Huang (UIUC), and Lei Zhang (Microsoft)

Detecting Attended Visual Targets in Video .5395.....
Eunji Chong (Georgia Institute of Technology), Yongxin Wang (Carnegie Mellon University), Nataniel Ruiz (Boston University), and James M. Rehg (Georgia Institute of Technology)

Closed-Loop Matters: Dual Regression Networks for Single Image Super-Resolution .5406.....
Yong Guo (South China University of Technology, Guangzhou Laboratory, Microsoft Research Asia, Baidu Inc.), Jian Chen (South China University of Technology, Guangzhou Laboratory, Microsoft Research Asia, Baidu Inc.), Jingdong Wang (South China University of Technology, Guangzhou Laboratory, Microsoft Research Asia, Baidu Inc.), Qi Chen (South China University of Technology, Guangzhou Laboratory, Microsoft Research Asia, Baidu Inc.), Jiezhang Cao (South China University of Technology, Guangzhou Laboratory, Microsoft Research Asia, Baidu Inc.), Zeshuai Deng (South China University of Technology, Guangzhou Laboratory, Microsoft Research Asia, Baidu Inc.), Yanwu Xu (South China University of Technology, Guangzhou Laboratory, Microsoft Research Asia, Baidu Inc.), and Mingkui Tan (South China University of Technology, Guangzhou Laboratory, Microsoft Research Asia, Baidu Inc.)

Neural Voxel Renderer: Learning an Accurate and Controllable Rendering Tool .5416.....
Konstantinos Rematas (Google Research) and Vittorio Ferrari (Google Research)

Neural Contours: Learning to Draw Lines From 3D Shapes .5427
Difan Liu (University of Massachusetts Amherst), Mohamed Nabail (University of Massachusetts Amherst), Aaron Hertzmann (Adobe Research), and Evangelos Kalogerakis (University of Massachusetts Amherst)

Softmax Splatting for Video Frame Interpolation .5436
Simon Niklaus (Portland State University) and Feng Liu (Portland State University)

CIAGAN: Conditional Identity Anonymization Generative Adversarial Networks .5446
Maxim Maximov (Technical University Munich), Ismail Elezi (University of Venice), and Laura Leal-Taixé (Technical University Munich)

Probabilistic Structural Latent Representation for Unsupervised Embedding .5456
Mang Ye (Inception Institute of Artificial Intelligence, Abu Dhabi, UAE) and Jianbing Shen (Inception Institute of Artificial Intelligence, Abu Dhabi, UAE)

Semantically Multi-Modal Image Synthesis .5466
Zhen Zhu (Huazhong University of Science and Technology), Zhiliang Xu (Huazhong University of Science and Technology), Ansheng You (Peking University), and Xiang Bai (Huazhong University of Science and Technology)

Nested Scale-Editing for Conditional Image Synthesis .5476
Lingzhi Zhang (University of Pennsylvania), Jiancong Wang (University of Pennsylvania), Yinshuang Xu (University of Pennsylvania), Jie Min (University of Pennsylvania), Tarmily Wen (University of Pennsylvania), James C. Gee (University of Pennsylvania), and Jianbo Shi (University of Pennsylvania)

UnrealText: Synthesizing Realistic Scene Text Images From the Unreal World .5487
Shangbang Long (Carnegie Mellon University) and Cong Yao (Megvii (Face++) Technology Inc.)

Fast Texture Synthesis via Pseudo Optimizer .5497
Wu Shi (ShenZhen Key Lab of Computer Vision and Pattern Recognition, SIAT-SenseTime Joint Lab, Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences; SIAT Branch, Shenzhen Institute of Artificial Intelligence and Robotics for Society) and Yu Qiao (ShenZhen Key Lab of Computer Vision and Pattern Recognition, SIAT-SenseTime Joint Lab, Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences; SIAT Branch, Shenzhen Institute of Artificial Intelligence and Robotics for Society)

Towards Learning Structure via Consensus for Face Segmentation and Parsing .5507
Iacopo Masi (USC Information Sciences Institute, Marina del Rey, CA, USA), Joe Mathai (USC Information Sciences Institute, Marina del Rey, CA, USA), and Wael AbdAlmageed (USC Information Sciences Institute, Marina del Rey, CA, USA)

CookGAN: Causality Based Text-to-Image Synthesis .5518
Bin Zhu (City University of Hong Kong) and Chong-Wah Ngo (City University of Hong Kong)

Weakly Supervised Discriminative Feature Learning With State Information for Person Identification 5527
Hong-Xing Yu (School of Data and Computer Science, Sun Yat-sen University, China) and Wei-Shi Zheng (School of Data and Computer Science, Sun Yat-sen University, China; Peng Cheng Laboratory, China; Key Laboratory of Machine Intelligence and Advanced Computing, Ministry of Education, China)

Future Video Synthesis With Object Motion Prediction 5538
Yue Wu (HKUST), Rongrong Gao (HKUST), Jaesik Park (POSTECH), and Qifeng Chen (HKUST)

MaskGAN: Towards Diverse and Interactive Facial Image Manipulation 5548
Cheng-Han Lee (SenseTime Research), Ziwei Liu (The Chinese University of Hong Kong), Lingyun Wu (SenseTime Research), and Ping Luo (The University of Hong Kong)

A Graduated Filter Method for Large Scale Robust Estimation 5558
Huu Le (Chalmers University of Technology, Sweden) and Christopher Zach (Chalmers University of Technology, Sweden)

Deep Face Super-Resolution With Iterative Collaboration Between Attentive Recovery and Landmark Estimation 5568
Cheng Ma (Department of Automation, Tsinghua University, China; State Key Lab of Intelligent Technologies and Systems, China; Beijing National Research Center for Information Science and Technology, China), Zhenyu Jiang (Department of Automation, Tsinghua University, China), Yongming Rao (Department of Automation, Tsinghua University, China; State Key Lab of Intelligent Technologies and Systems, China; Beijing National Research Center for Information Science and Technology, China), Jiwen Lu (Department of Automation, Tsinghua University, China; State Key Lab of Intelligent Technologies and Systems, China; Beijing National Research Center for Information Science and Technology, China), and Jie Zhou (Department of Automation, Tsinghua University, China; State Key Lab of Intelligent Technologies and Systems, China; Beijing National Research Center for Information Science and Technology, China; Tsinghua Shenzhen International Graduate School, Tsinghua University, China)

Coherent Reconstruction of Multiple Humans From a Single Image 5578
Wen Jiang (Zhejiang University), Nikos Kolotouros (University of Pennsylvania), Georgios Pavlakos (University of Pennsylvania), Xiaowei Zhou (Zhejiang University), and Kostas Daniilidis (University of Pennsylvania)

PointASNL: Robust Point Clouds Processing Using Nonlocal Neural Networks With Adaptive Sampling 5588
Xu Yan (The Chinese University of Hong Kong (Shenzhen); Shenzhen Research Institute of Big Data), Chaoda Zheng (Shenzhen Research Institute of Big Data; South China University of Technology), Zhen Li (The Chinese University of Hong Kong (Shenzhen); Shenzhen Research Institute of Big Data), Sheng Wang (Tencent AI Lab), and Shuguang Cui (The Chinese University of Hong Kong (Shenzhen); Shenzhen Research Institute of Big Data)

A Neural Rendering Framework for Free-Viewpoint Relighting .5598.....
Zhang Chen (ShanghaiTech University; Shanghai Institute of Microsystem and Information Technology; University of Chinese Academy of Sciences), Anpei Chen (ShanghaiTech University), Guli Zhang (ShanghaiTech University), Chengyuan Wang (Shanghai University), Yu Ji (DGene, Inc.), Kiriakos N. Kutulakos (University of Toronto), and Jingyi Yu (ShanghaiTech University)

A Multi-Task Mean Teacher for Semi-Supervised Shadow Detection .5610.....
Zhihao Chen (College of Intelligence and Computing, Tianjin University), Lei Zhu (Department of Computer Science and Engineering, The Chinese University of Hong Kong; College of Intelligence and Computing, Tianjin University), Liang Wan (College of Intelligence and Computing, Tianjin University), Song Wang (College of Intelligence and Computing, Tianjin University; Department of Computer Science and Engineering, University of South Carolina), Wei Feng (College of Intelligence and Computing, Tianjin University), and Pheng-Ann Heng (Department of Computer Science and Engineering, The Chinese University of Hong Kong; Shenzhen Key Laboratory of Virtual Reality and Human Interaction Technology, Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, China)

GroupFace: Learning Latent Groups and Constructing Group-Based Representations for Face Recognition .5620.....
Yonghyun Kim (Kakao Enterprise), Wonpyo Park (Kakao Corp.), Myung-Cheol Roh (Kakao Enterprise), and Jongju Shin (Kakao Enterprise)

Channel Attention Based Iterative Residual Learning for Depth Map Super-Resolution .5630.
Xibin Song (Baidu Research; National Engineering Laboratory of Deep Learning Technology and Application, China), Yuchao Dai (Northwestern Polytechnical University, China), Dingfu Zhou (Baidu Research; National Engineering Laboratory of Deep Learning Technology and Application, China), Liu Liu (Australian National University, Australia; Australian Centre for Robotic Vision, Australia), Wei Li (Shandong University, China), Hongdong Li (Australian National University, Australia; Australian Centre for Robotic Vision, Australia), and Ruigang Yang (Baidu Research; National Engineering Laboratory of Deep Learning Technology and Application, China; University of Kentucky, Kentucky, USA)

Time Flies: Animating a Still Image With Time-Lapse Video As Reference .5640.....
Chia-Chi Cheng (National Chiao Tung University, Taiwan), Hung-Yu Chen (National Chiao Tung University, Taiwan), and Wei-Chen Chiu (National Chiao Tung University, Taiwan)

SER-FIQ: Unsupervised Estimation of Face Image Quality Based on Stochastic Embedding Robustness .5650.....
Philipp Terhörst (Fraunhofer Institute for Computer Graphics Research IGD, Darmstadt, Germany; Technical University of Darmstadt, Darmstadt, Germany), Jan Niklas Kolf (Technical University of Darmstadt, Darmstadt, Germany), Naser Damer (Fraunhofer Institute for Computer Graphics Research IGD, Darmstadt, Germany; Technical University of Darmstadt, Darmstadt, Germany), Florian Kirchbuchner (Fraunhofer Institute for Computer Graphics Research IGD, Darmstadt, Germany; Technical University of Darmstadt, Darmstadt, Germany), and Arjan Kuijper (Fraunhofer Institute for Computer Graphics Research IGD, Darmstadt, Germany; Technical University of Darmstadt, Darmstadt, Germany)

Grid-GCN for Fast and Scalable Point Cloud Learning .5660.....
Qiangeng Xu (University of Southern California), Xudong Sun (Tusimple, Inc), Cho-Ying Wu (University of Southern California), Panqu Wang (Tusimple, Inc), and Ulrich Neumann (University of Southern California)

Domain Balancing: Face Recognition on Long-Tailed Domains .5670.....
Dong Cao (CBSR & NLPR, Institute of Automation, Chinese Academy of Sciences, Beijing, China; School of Artificial Intelligence, University of Chinese Academy of Sciences, Beijing, China), Xiangyu Zhu (CBSR & NLPR, Institute of Automation, Chinese Academy of Sciences, Beijing, China; School of Artificial Intelligence, University of Chinese Academy of Sciences, Beijing, China), Xingyu Huang (Tianjin University), Jianzhu Guo (CBSR & NLPR, Institute of Automation, Chinese Academy of Sciences, Beijing, China; School of Artificial Intelligence, University of Chinese Academy of Sciences, Beijing, China), and Zhen Lei (Tianjin University)

AdversarialNAS: Adversarial Neural Architecture Search for GANs .5679.....
Chen Gao (Institute of Information Engineering, Chinese Academy of Sciences; University of Chinese Academy of Sciences; Yitu Technology), Yunpeng Chen (Yitu Technology), Si Liu (School of Computer Science and Engineering, Beihang University), Zhenxiong Tan (Beijing Forestry University), and Shuicheng Yan (Yitu Technology)

Image Super-Resolution With Cross-Scale Non-Local Attention and Exhaustive Self-Exemplars Mining .5689.....
Yiqun Mei (IFP Group, UIUC), Yuchen Fan (IFP Group, UIUC), Yuqian Zhou (IFP Group, UIUC), Lichao Huang (Horizon Robotics), Thomas S. Huang (IFP Group, UIUC), and Honghui Shi (University of Oregon; IFP Group, UIUC)

The Devil Is in the Details: Delving Into Unbiased Data Processing for Human Pose Estimation .5699.....
Junjie Huang (XForwardAI Technology Co., Ltd, Beijing, China), Zheng Zhu (Tsinghua University, Beijing, China), Feng Guo (XForwardAI Technology Co., Ltd, Beijing, China), and Guan Huang (XForwardAI Technology Co., Ltd, Beijing, China)

Data Uncertainty Learning in Face Recognition ..5709.....
Jie Chang (Megvii Inc.), Zhonghao Lan (University of Science and Technology of China), Changmao Cheng (Megvii Inc.), and Yichen Wei (Megvii Inc.)

Regularizing Discriminative Capability of CGANs for Semi-Supervised Generative Learning ..5719
Yi Liu (School of Computer Science and Engineering, South China University of Technology), Guangchang Deng (School of Computer Science and Engineering, South China University of Technology), Xiangping Zeng (School of Computer Science and Engineering, South China University of Technology), Si Wu (School of Computer Science and Engineering, South China University of Technology; Department of Computer Science, City University of Hong Kong), Zhiwen Yu (School of Computer Science and Engineering, South China University of Technology), and Hau-San Wong (Department of Computer Science, City University of Hong Kong)

FM2u-Net: Face Morphological Multi-Branch Network for Makeup-Invariant Face Verification 5729
Wenxuan Wang (Fudan University, China), Yanwei Fu (Fudan University, China), Xuelin Qian (Fudan University, China), Yu-Gang Jiang (Fudan University, China), Qi Tian (Noah's Ark Lab, Huawei Technologies), and Xiangyang Xue (Fudan University, China)

UCTGAN: Diverse Image Inpainting Based on Unsupervised Cross-Space Translation ..5740....
Lei Zhao (College of Computer Science and Technology, Zhejiang University), Qihang Mo (College of Computer Science and Technology, Zhejiang University), Sihuan Lin (College of Computer Science and Technology, Zhejiang University), Zhizhong Wang (College of Computer Science and Technology, Zhejiang University), Zhiwen Zuo (College of Computer Science and Technology, Zhejiang University), Haibo Chen (College of Computer Science and Technology, Zhejiang University), Wei Xing (College of Computer Science and Technology, Zhejiang University), and Dongming Lu (College of Computer Science and Technology, Zhejiang University)

Decoupled Representation Learning for Skeleton-Based Gesture Recognition ..5750.....
Jianbo Liu (National Laboratory of Pattern Recognition, Institute of Automation, Chinese Academy of Sciences), Yongcheng Liu (National Laboratory of Pattern Recognition, Institute of Automation, Chinese Academy of Sciences; School of Artificial Intelligence, University of Chinese Academy of Sciences), Ying Wang (National Laboratory of Pattern Recognition, Institute of Automation, Chinese Academy of Sciences), Véronique Prinet (National Laboratory of Pattern Recognition, Institute of Automation, Chinese Academy of Sciences), Shiming Xiang (National Laboratory of Pattern Recognition, Institute of Automation, Chinese Academy of Sciences; School of Artificial Intelligence, University of Chinese Academy of Sciences), and Chunhong Pan (School of Artificial Intelligence, University of Chinese Academy of Sciences)

An Efficient PointLSTM for Point Clouds Based Gesture Recognition ..5760
Yuecong Min (Key Lab of Intelligent Information Processing of Chinese Academy of Sciences (CAS), Institute of Computing Technology, CAS, Beijing, China; University of Chinese Academy of Sciences, Beijing, China), Yanxiao Zhang (Key Lab of Intelligent Information Processing of Chinese Academy of Sciences (CAS), Institute of Computing Technology, CAS, Beijing, China; University of Chinese Academy of Sciences, Beijing, China), Xiujuan Chai (Agricultural Information Institute, Chinese Academy of Agricultural Sciences, Beijing, China), and Xilin Chen (Key Lab of Intelligent Information Processing of Chinese Academy of Sciences (CAS), Institute of Computing Technology, CAS, Beijing, China; University of Chinese Academy of Sciences, Beijing, China)

Editing in Style: Uncovering the Local Semantics of GANs ..5770
Edo Collins (School of Computer and Communication Sciences, EPFL, Switzerland), Raja Bala (Interactive and Analytics Lab, Palo Alto Research Center, Palo Alto, CA), Bob Price (Interactive and Analytics Lab, Palo Alto Research Center, Palo Alto, CA), and Sabine Süsstrunk (School of Computer and Communication Sciences, EPFL, Switzerland)

On the Detection of Digital Face Manipulation ..5780
Hao Dang (Department of Computer Science and Engineering, Michigan State University), Feng Liu (Department of Computer Science and Engineering, Michigan State University), Joel Stehouwer (Department of Computer Science and Engineering, Michigan State University), Xiaoming Liu (Department of Computer Science and Engineering, Michigan State University), and Anil K. Jain (Department of Computer Science and Engineering, Michigan State University)

Learning Texture Transformer Network for Image Super-Resolution ..5790
Fuzhi Yang (Department of Computer Science and Engineering, MoE Key Lab of Artificial Intelligence, AI Institute, Shanghai Jiao Tong University), Huan Yang (Microsoft Research, Beijing, P.R. China), Jianlong Fu (Microsoft Research, Beijing, P.R. China), Hongtao Lu (Department of Computer Science and Engineering, MoE Key Lab of Artificial Intelligence, AI Institute, Shanghai Jiao Tong University), and Baining Guo (Microsoft Research, Beijing, P.R. China)

Reference-Based Sketch Image Colorization Using Augmented-Self Reference and Dense Semantic Correspondence ..5800
Junsoo Lee (KAIST), Eungyeup Kim (KAIST), Yunsung Lee (Korea University), Dongjun Kim (KAIST), Jaehyuk Chang (NAVER WEBTOON Corp), and Jaegul Choo (KAIST)

Deblurring Using Analysis-Synthesis Networks Pair ..5810
Adam Kaufman (School of Computer Science and Engineering, The Hebrew University of Jerusalem, Israel) and Raanan Fattal (School of Computer Science and Engineering, The Hebrew University of Jerusalem, Israel)

Exploring Unlabeled Faces for Novel Attribute Discovery ..5820
Hyojin Bahng (Korea University), Sunghyo Chung (Kakao Corp.), Seungjoo Yoo (Kakao Corp.), and Jaegul Choo (KAIST)

Neural Pose Transfer by Spatially Adaptive Instance Normalization .5830
Jiashun Wang (Fudan University), Chao Wen (Fudan University), Yanwei Fu (Fudan University), Haitao Lin (Fudan University), Tianyun Zou (Fudan University), Xiangyang Xue (Fudan University), and Yinda Zhang (Google LLC)

Fine-Grained Image-to-Image Transformation Towards Visual Recognition .5839
Wei Xiong (University of Rochester), Yutong He (University of Rochester), Yixuan Zhang (University of Rochester), Wenhan Luo (Tencent AI Lab), Lin Ma (Tencent AI Lab), and Jiebo Luo (University of Rochester)

Deep Facial Non-Rigid Multi-View Stereo .5849
Ziqian Bai (Simon Fraser University), Zhaopeng Cui (ETH Zürich), Jamal Ahmed Rahim (Simon Fraser University), Xiaoming Liu (Michigan State University), and Ping Tan (Simon Fraser University)

Attention-Driven Cropping for Very High Resolution Facial Landmark Detection .5860
Prashanth Chandran (Department of Computer Science, ETH Zurich; DisneyResearch Studios, Zurich), Derek Bradley (DisneyResearch Studios, Zurich), Markus Gross (Department of Computer Science, ETH Zurich; DisneyResearch Studios, Zurich), and Thabo Beeler (DisneyResearch Studios, Zurich)

Towards Unsupervised Learning of Generative Models for 3D Controllable Image Synthesis .5870
Yiyi Liao (Max Planck Institute for Intelligent Systems, Tübingen; University of Tübingen), Katja Schwarz (Max Planck Institute for Intelligent Systems, Tübingen; University of Tübingen), Lars Mescheder (Max Planck Institute for Intelligent Systems, Tübingen; University of Tübingen; Amazon, Tübingen), and Andreas Geiger (Max Planck Institute for Intelligent Systems, Tübingen; University of Tübingen)

End-to-End Pseudo-LiDAR for Image-Based 3D Object Detection .5880
Rui Qian (Cornell Univeristy; Cornell Tech), Divyansh Garg (Cornell Univeristy), Yan Wang (Cornell Univeristy), Yurong You (Cornell Univeristy), Serge Belongie (Cornell Univeristy; Cornell Tech), Bharath Hariharan (Cornell Univeristy), Mark Campbell (Cornell Univeristy), Kilian Q. Weinberger (Cornell Univeristy), and Wei-Lun Chao (The Ohio State University)

Towards High-Fidelity 3D Face Reconstruction From In-the-Wild Images Using Graph Convolutional Networks .5890
Jiangke Lin (NetEase Fuxi AI Lab, Hangzhou, China), Yi Yuan (NetEase Fuxi AI Lab, Hangzhou, China), Tianjia Shao (State Key Lab of CAD&CG, Zhejiang University, Hangzhou, China), and Kun Zhou (State Key Lab of CAD&CG, Zhejiang University, Hangzhou, China)

CurricularFace: Adaptive Curriculum Learning Loss for Deep Face Recognition .5900
Yuge Huang (Youtu Lab, Tencent), Yuhan Wang (Zhejiang University), Ying Tai (Youtu Lab, Tencent), Xiaoming Liu (Michigan State University), Pengcheng Shen (Youtu Lab, Tencent), Shaoxin Li (Youtu Lab, Tencent), Jilin Li (Youtu Lab, Tencent), and Feiyue Huang (Youtu Lab, Tencent)

Rotate-and-Render: Unsupervised Photorealistic Face Rotation From Single-View Images .5910
Hang Zhou (The Chinese University of Hong Kong), Jihao Liu (SenseTime Research), Ziwei Liu (The Chinese University of Hong Kong), Yu Liu (The Chinese University of Hong Kong), and Xiaogang Wang (The Chinese University of Hong Kong)

One-Shot Domain Adaptation for Face Generation .5920
Chao Yang (Facebook AI) and Ser-Nam Lim (Facebook AI)

BidNet: Binocular Image Dehazing Without Explicit Disparity Estimation .5930
Yanwei Pang (Tianjin Key Laboratory of Brain-inspired Intelligence Technology, School of Electrical and Information Engineering, Tianjin University, China), Jing Nie (Tianjin Key Laboratory of Brain-inspired Intelligence Technology, School of Electrical and Information Engineering, Tianjin University, China), Jin Xie (Tianjin Key Laboratory of Brain-inspired Intelligence Technology, School of Electrical and Information Engineering, Tianjin University, China), Jungong Han (University of Warwick, UK), and Xuelong Li (Northwestern Polytechnical University, China)

Deep Shutter Unrolling Network .5940
Peidong Liu (Computer Vision and Geometry Group, ETH Zürich, Switzerland), Zhaopeng Cui (Computer Vision and Geometry Group, ETH Zürich, Switzerland), Viktor Larsson (Computer Vision and Geometry Group, ETH Zürich, Switzerland), and Marc Pollefeys (Computer Vision and Geometry Group, ETH Zürich, Switzerland; Microsoft Artificial Intelligence and Mixed Reality Lab, Zürich, Switzerland)

Joint Texture and Geometry Optimization for RGB-D Reconstruction .5949
Yanping Fu (School of Computer Science, Wuhan University, China), Qingan Yan (Silicon Valley Research Center, JD.com, United States), Jie Liao (School of Computer Science, Wuhan University, China), and Chunxia Xiao (School of Computer Science, Wuhan University, China; National Engineering Research Center for Multimedia Software, Wuhan University, China; Institute of Artificial Intelligence, Wuhan University, China)

Deep 3D Capture: Geometry and Reflectance From Sparse Multi-View Images .5959
Sai Bi (UC San Diego), Zexiang Xu (UC San Diego), Kalyan Sunkavalli (Adobe Research), David Kriegman (UC San Diego), and Ravi Ramamoorthi (UC San Diego)

Auto-Tuning Structured Light by Optical Stochastic Gradient Descent .5969
Wenzheng Chen (University of Toronto, Toronto, Canada; Vector Institute, Toronto, Canada), Parsa Mirdehghan (University of Toronto, Toronto, Canada), Sanja Fidler (University of Toronto, Toronto, Canada; Vector Institute, Toronto, Canada; NVIDIA, Toronto, Canada), and Kiriakos N. Kutulakos (University of Toronto, Toronto, Canada)

MARMVS: Matching Ambiguity Reduced Multiple View Stereo for Efficient Large Scale Scene Reconstruction .5980
Zhenyu Xu (College of Computer Science, Sichuan Uiversity, China), Yiguang Liu (College of Computer Science, Sichuan Uiversity, China), Xuelei Shi (College of Computer Science, Sichuan Uiversity, China), Ying Wang (College of Computer Science, Sichuan Uiversity, China), and Yunan Zheng (College of Computer Science, Sichuan Uiversity, China)

Uncertainty Based Camera Model Selection .5990.....
Michal Polic (CTU in Prague), Stanislav Steidl (CTU in Prague), Cenek Albl (ETH Zurich), Zuzana Kukelova (CTU in Prague), and Tomas Pajdla (CTU in Prague)

Local Implicit Grid Representations for 3D Scenes .6000.....
Chiyu Jiang (UC Berkeley; Google Research), Avneesh Sud (Google Research), Ameesh Makadia (Google Research), Jingwei Huang (Google Research; Stanford University), Matthias Nießner (Technical University of Munich), and Thomas Funkhouser (Google Research)

TetraTSDF: 3D Human Reconstruction From a Single Image With a Tetrahedral Outer Shell .6010
Hayato Onizuka (Kyushu University), Zehra Hayirci (Technical University of Munich), Diego Thomas (Kyushu University), Akihiro Sugimoto (National Institute of Informatics), Hideaki Uchiyama (Kyushu University), and Rin-ichiro Taniguchi (Kyushu University)

Averaging Essential and Fundamental Matrices in Collinear Camera Settings .6020.....
Amnon Geifman (Weizmann Institute of Science), Yoni Kasten (Weizmann Institute of Science), Meirav Galun (Weizmann Institute of Science), and Ronen Basri (Weizmann Institute of Science)

On the Distribution of Minima in Intrinsic-Metric Rotation Averaging .6030.....
Kyle Wilson (Washington College, Department of Math and Computer Science, Chestertown, MD) and David Bindel (Cornell University, Department of Computer Science, Ithaca, NY)

Lightweight Multi-View 3D Pose Estimation Through Camera-Disentangled Representation .6039
Edoardo Remelli (CVLab, EPFL, Lausanne, Switzerland), Shangchen Han (Facebook Reality Labs, Redmond, USA), Sina Honari (CVLab, EPFL, Lausanne, Switzerland), Pascal Fua (CVLab, EPFL, Lausanne, Switzerland), and Robert Wang (Facebook Reality Labs, Redmond, USA)

A Novel Recurrent Encoder-Decoder Structure for Large-Scale Multi-View Stereo Reconstruction From an Open Aerial Dataset .6049.....
Jin Liu (School of Remote Sensing and Information Engineering, Wuhan University) and Shunping Ji (Facebook Reality Labs, Redmond, USA)

Factorized Higher-Order CNNs With an Application to Spatio-Temporal Emotion Estimation .6059
Jean Kossaifi (NVIDIA), Antoine Toisoul (Samsung AI Center), Adrian Bulat (Samsung AI Center), Yannis Panagakis (University of Athens), Timothy M. Hospedales (Samsung AI Center), and Maja Pantic (Imperial College London)

Effectively Unbiased FID and Inception Score and Where to Find Them .6069.....
Min Jin Chong (University of Illinois at Urbana-Champaign) and David Forsyth (University of Illinois at Urbana-Champaign)

Robust Homography Estimation via Dual Principal Component Pursuit .6079.....
Tianjiao Ding (School of Information Science and Technology, ShanghaiTech University, PRC), Yunchen Yang (School of Information Science and Technology, ShanghaiTech University, PRC), Zhihui Zhu (Department of Electrical and Computer Engineering, University of Denver, USA), Daniel P. Robinson (Department of Industrial and Systems Engineering, Lehigh University, USA), René Vidal (Mathematical Institute for Data Science, Johns Hopkins University, USA), Laurent Kneip (School of Information Science and Technology, ShanghaiTech University, PRC), and Manolis C. Tsakiris (School of Information Science and Technology, ShanghaiTech University, PRC)

Non-Adversarial Video Synthesis With Learned Priors .6089.....
Abhishek Aich (University of California, Riverside), Akash Gupta (University of California, Riverside), Rameswar Panda (IBM Research AI, Cambridge), Rakib Hyder (University of California, Riverside), M. Salman Asif (University of California, Riverside), and Amit K. Roy-Chowdhury (University of California, Riverside)

Uncertainty-Aware Mesh Decoder for High Fidelity 3D Face Reconstruction .6099.....
Gun-Hee Lee (Department of Computer and Radio Communications Engineering, Korea University, Seoul, South Korea) and Seong-Whan Lee (Department of Artificial Intelligence, Korea University, Seoul, South Korea)

Oral 2-2A: Face, Gesture, and Body Pose (2)

3FabRec: Fast Few-Shot Face Alignment by Reconstruction .6109.....
Björn Browatzki (Dept. of Artificial Intelligence, Korea University, Seoul) and Christian Wallraven (Dept. of Artificial Intelligence, Korea University, Seoul)

Weakly-Supervised Domain Adaptation via GAN and Mesh Model for Estimating 3D Hand Poses Interacting Objects .6120.....
Seungryul Baek (Imperial College London), Kwang In Kim (UNIST), and Tae-Kyun Kim (Imperial College London)

Vec2Face: Unveil Human Faces From Their Blackbox Features in Face Recognition .6131.....
Chi Nhan Duong (Concordia University, Canada), Thanh-Dat Truong (University of Arkansas, USA), Khoa Luu (University of Arkansas, USA), Kha Gia Quach (Concordia University, Canada), Hung Bui (VinAI Research), and Kaushik Roy (North Carolina A&T State University, USA)

StyleRig: Rigging StyleGAN for 3D Control Over Portrait Images .6141.....
Ayush Tewari (MPI Informatics, Saarland Informatics Campus), Mohamed Elgharib (MPI Informatics, Saarland Informatics Campus), Gaurav Bharaj (Technicolor), Florian Bernard (MPI Informatics, Saarland Informatics Campus), Hans-Peter Seidel (MPI Informatics, Saarland Informatics Campus), Patrick Pérez (Valeo.ai), Michael Zollhöfer (Stanford University), and Christian Theobalt (MPI Informatics, Saarland Informatics Campus)

Self-Supervised 3D Human Pose Estimation via Part Guided Novel Image Synthesis .6151.....
Jogendra Nath Kundu (Indian Institute of Science, Bangalore), Siddharth Seth (Indian Institute of Science, Bangalore), Varun Jampani (Google Research), Mugalodi Rakesh (Indian Institute of Science, Bangalore), R. Venkatesh Babu (Indian Institute of Science, Bangalore), and Anirban Chakraborty (Indian Institute of Science, Bangalore)

Learning Meta Face Recognition in Unseen Domains .6162.....
Jianzhu Guo (CBSR & NLPR, Institute of Automation, Chinese Academy of Sciences, Beijing, China; School of Artificial Intelligence, University of Chinese Academy of Sciences, Beijing, China), Xiangyu Zhu (CBSR & NLPR, Institute of Automation, Chinese Academy of Sciences, Beijing, China; School of Artificial Intelligence, University of Chinese Academy of Sciences, Beijing, China), Chenxu Zhao (Mininglamp Academy of Sciences, Mininglamp Technology), Dong Cao (CBSR & NLPR, Institute of Automation, Chinese Academy of Sciences, Beijing, China; School of Artificial Intelligence, University of Chinese Academy of Sciences, Beijing, China), Zhen Lei (CBSR & NLPR, Institute of Automation, Chinese Academy of Sciences, Beijing, China; School of Artificial Intelligence, University of Chinese Academy of Sciences, Beijing, China), and Stan Z. Li (School of Engineering, Westlake University, Hangzhou, China)

Cascaded Deep Monocular 3D Human Pose Estimation With Evolutionary Training Data .6172
Shichao Li (The Hong Kong University of Science and Technology), Lei Ke (The Hong Kong University of Science and Technology), Kevin Pratama (The Hong Kong University of Science and Technology), Yu-Wing Tai (Tencent), Chi-Keung Tang (The Hong Kong University of Science and Technology), and Kwang-Ting Cheng (The Hong Kong University of Science and Technology)

GHUM & GHUML: Generative 3D Human Shape and Articulated Pose Models .6183.....
Hongyi Xu (Google Research), Eduard Gabriel Bazavan (Google Research), Andrei Zanfir (Google Research), William T. Freeman (Google Research), Rahul Sukthankar (Google Research), and Cristian Sminchisescu (Google Research)

Generating 3D People in Scenes Without People .6193.....
Yan Zhang (ETH Zürich, Switzerland; Institute of Neural Information Processing, Ulm University, Germany), Mohamed Hassan (Max Planck Institute for Intelligent Systems, Tübingen, Germany), Heiko Neumann (Institute of Neural Information Processing, Ulm University, Germany), Michael J. Black (Max Planck Institute for Intelligent Systems, Tübingen, Germany), and Siyu Tang (ETH Zürich, Switzerland)

Transferring Cross-Domain Knowledge for Video Sign Language Recognition .6204.....
Dongxu Li (The Australian National University; Australian Centre for Robotic Vision (ACRV)), Xin Yu (The Australian National University; Australian Centre for Robotic Vision (ACRV); Australian Centre for Robotic Vision (ACRV)), Chenchen Xu (The Australian National University; DATA61-CSIRO), Lars Petersson (The Australian National University; DATA61-CSIRO), and Hongdong Li (The Australian National University; Australian Centre for Robotic Vision (ACRV))

Bodies at Rest: 3D Human Pose and Shape Estimation From a Pressure Image Using Synthetic Data .6214
Henry M. Clever (Georgia Institute of Technology, Atlanta, GA, USA), Zackory Erickson (Georgia Institute of Technology, Atlanta, GA, USA), Ariel Kapusta (Georgia Institute of Technology, Atlanta, GA, USA), Greg Turk (Georgia Institute of Technology, Atlanta, GA, USA), C. Karen Liu (Stanford University, Stanford, CA, USA), and Charles C. Kemp (Georgia Institute of Technology, Atlanta, GA, USA)

Bayesian Adversarial Human Motion Synthesis .6224
Rui Zhao (Amazon), Hui Su (RPI and IBM Research), and Qiang Ji (RPI)

Oral 2-2B: Motion and Tracking (1)

LSM: Learning Subspace Minimization for Low-Level Vision .6234
Chengzhou Tang (Simon Fraser University), Lu Yuan (Microsoft), and Ping Tan (Simon Fraser University)

Learning a Neural Solver for Multiple Object Tracking .6246
Guillem Brasó (Technical University of Munich) and Laura Leal-Taixé (Technical University of Munich)

GLU-Net: Global-Local Universal Network for Dense Flow and Correspondences .6257
Prune Truong (Computer Vision Lab, D-ITET, ETH Zürich, Switzerland), Martin Danelljan (Computer Vision Lab, D-ITET, ETH Zürich, Switzerland), and Radu Timofte (Computer Vision Lab, D-ITET, ETH Zürich, Switzerland)

SiamCAR: Siamese Fully Convolutional Classification and Regression for Visual Tracking .6268
Dongyan Guo (Zhejiang University of Technology, China), Jun Wang (Zhejiang University of Technology, China), Ying Cui (Zhejiang University of Technology, China), Zhenhua Wang (Zhejiang University of Technology, China), and Shengyong Chen (Tianjin University of Technology, China)

MaskFlownet: Asymmetric Feature Matching With Learnable Occlusion Mask .6277
Shengyu Zhao (Institute for Interdisciplinary Information Sciences, Tsinghua University, Beijing , China; Microsoft Research, Beijing , China), Yilun Sheng (Institute for Interdisciplinary Information Sciences, Tsinghua University, Beijing , China; Microsoft Research, Beijing , China), Yue Dong (Institute for Interdisciplinary Information Sciences, Tsinghua University, Beijing , China), Eric I-Chao Chang (Microsoft Research, Beijing , China), and Yan Xu (Microsoft Research, Beijing , China; State Key Laboratory of Software Development Environment and Key Laboratory of Biomechanics and Mechanobiology of Ministry of Education and Research Institute of Beihang University in Shenzhen and Beijing Advanced Innovation Center for Biomedical Engineering, Beihang University, Beijing, China.)

Tracking by Instance Detection: A Meta-Learning Approach .6287
Guangting Wang (University of Science and Technology of China), Chong Luo (Microsoft Research Asia), Xiaoyan Sun (Microsoft Research Asia), Zhiwei Xiong (University of Science and Technology of China), and Wenjun Zeng (Microsoft Research Asia)

High-Performance Long-Term Tracking With Meta-Updater ..6297.....
Kenan Dai (School of Information and Communication Engineering, Dalian University of Technology, China), Yunhua Zhang (University of Amsterdam), Dong Wang (School of Information and Communication Engineering, Dalian University of Technology, China), Jianhua Li (School of Information and Communication Engineering, Dalian University of Technology, China), Huchuan Lu (School of Information and Communication Engineering, Dalian University of Technology, China; Peng Cheng Laboratory), and Xiaoyun Yang (China Science IntelliCloud Technology Co., Ltd)

TubeTK: Adopting Tubes to Track Multi-Object in a One-Step Training Model ..6307.....
Bo Pang (Shanghai Jiao Tong University), Yizhuo Li (Shanghai Jiao Tong University), Yifan Zhang (Shanghai Jiao Tong University), Muchen Li (Huazhong University of Science and Technology), and Cewu Lu (Institute and MoE Key Lab of Artificial Intelligence, AI Institute, Shanghai Jiao Tong University, China)

Collaborative Motion Prediction via Neural Motion Message Passing ..6318.....
Yue Hu (Cooperative Medianet Innovation Center, Shanghai Jiao Tong University), Siheng Chen (Mitsubishi Electric Research Laboratories), Ya Zhang (Cooperative Medianet Innovation Center, Shanghai Jiao Tong University), and Xiao Gu (Cooperative Medianet Innovation Center, Shanghai Jiao Tong University)

P2B: Point-to-Box Network for 3D Object Tracking in Point Clouds ..6328.....
Haozhe Qi (National Key Laboratory of Science and Technology on Multi-Spectral Information Processing, School of Artificial Intelligence and Automation, Huazhong University of Science and Technology, Wuhan , China), Chen Feng (National Key Laboratory of Science and Technology on Multi-Spectral Information Processing, School of Artificial Intelligence and Automation, Huazhong University of Science and Technology, Wuhan , China), Zhiguo Cao (National Key Laboratory of Science and Technology on Multi-Spectral Information Processing, School of Artificial Intelligence and Automation, Huazhong University of Science and Technology, Wuhan , China), Feng Zhao (National Key Laboratory of Science and Technology on Multi-Spectral Information Processing, School of Artificial Intelligence and Automation, Huazhong University of Science and Technology, Wuhan , China), and Yang Xiao (National Key Laboratory of Science and Technology on Multi-Spectral Information Processing, School of Artificial Intelligence and Automation, Huazhong University of Science and Technology, Wuhan , China)

Self-Supervised Deep Visual Odometry With Online Adaptation .6338.....
Shunkai Li (Key Laboratory of Machine Perception (MOE), School of EECS, Peking University PKU-SenseTime Machine Vision Joint Lab), Xin Wang (Key Laboratory of Machine Perception (MOE), School of EECS, Peking University PKU-SenseTime Machine Vision Joint Lab), Yingdian Cao (Key Laboratory of Machine Perception (MOE), School of EECS, Peking University PKU-SenseTime Machine Vision Joint Lab), Fei Xue (Key Laboratory of Machine Perception (MOE), School of EECS, Peking University PKU-SenseTime Machine Vision Joint Lab), Zike Yan (Key Laboratory of Machine Perception (MOE), School of EECS, Peking University PKU-SenseTime Machine Vision Joint Lab), and Hongbin Zha (Key Laboratory of Machine Perception (MOE), School of EECS, Peking University PKU-SenseTime Machine Vision Joint Lab)

Globally Optimal Contrast Maximisation for Event-Based Motion Estimation .6348.....
Daqi Liu (School of Computer Science, The University of Adelaide), Álvaro Parra (School of Computer Science, The University of Adelaide), and Tat-Jun Chin (School of Computer Science, The University of Adelaide)

Oral 2-2C: Representation Learning

D3Feat: Joint Learning of Dense Detection and Description of 3D Local Features .6358.....
Xuyang Bai (Hong Kong University of Science and Technology), Zixin Luo (Hong Kong University of Science and Technology), Lei Zhou (Hong Kong University of Science and Technology), Hongbo Fu (City University of Hong Kong), Long Quan (Hong Kong University of Science and Technology), and Chiew-Lan Tai (Hong Kong University of Science and Technology)

Towards Backward-Compatible Representation Learning .6367.....
Yantao Shen (AWS/Amazon AI), Yuanjun Xiong (AWS/Amazon AI), Wei Xia (AWS/Amazon AI), and Stefano Soatto (AWS/Amazon AI)

PointAugment: An Auto-Augmentation Framework for Point Cloud Classification .6377.....
Ruihui Li (The Chinese University of Hong Kong), Xianzhi Li (The Chinese University of Hong Kong), Pheng-Ann Heng (The Chinese University of Hong Kong), and Chi-Wing Fu (The Chinese University of Hong Kong)

Cross-Batch Memory for Embedding Learning .6387.....
Xun Wang (Malong Technologies), Haozhi Zhang (Malong Technologies), Weilin Huang (Malong Technologies), and Matthew R. Scott (Malong Technologies)

Circle Loss: A Unified Perspective of Pair Similarity Optimization .6397.....
Yifan Sun (MEGVII Technology), Changmao Cheng (MEGVII Technology), Yuhan Zhang (Beihang University), Chi Zhang (MEGVII Technology), Liang Zheng (Australian National University), Zhongdao Wang (Tsinghua University), and Yichen Wei (MEGVII Technology)

Steering Self-Supervised Feature Learning Beyond Local Pixel Statistics .6407.....
Simon Jenni (University of Bern), Hailin Jin (Adobe Research), and Paolo Favaro (University of Bern)

Hyperbolic Image Embeddings .6417
Valentin Khrulkov (Skolkovo Institute of Science and Technology (Skoltech), Moscow; Yandex, Moscow), Leyla Mirvakhabova (Skolkovo Institute of Science and Technology (Skoltech), Moscow), Evgeniya Ustinova (Skolkovo Institute of Science and Technology (Skoltech), Moscow), Ivan Oseledets (Skolkovo Institute of Science and Technology (Skoltech), Moscow; Institute of Numerical Mathematics of the Russian Academy of Sciences, Moscow), and Victor Lempitsky (Skolkovo Institute of Science and Technology (Skoltech), Moscow; Samsung AI Center, Moscow)

Controllable Orthogonalization in Training DNNs .6428
Lei Huang (Inception Institute of Artificial Intelligence (IIAI), Abu Dhabi, UAE), Li Liu (Inception Institute of Artificial Intelligence (IIAI), Abu Dhabi, UAE), Fan Zhu (Inception Institute of Artificial Intelligence (IIAI), Abu Dhabi, UAE), Diwen Wan (Inception Institute of Artificial Intelligence (IIAI), Abu Dhabi, UAE; University of Electronic Science and Technology of China, Chengdu, China), Zehuan Yuan (ByteDance AI Lab, Beijing, China), Bo Li (University of Illinois at Urbana-Champaign Illinois, USA), and Ling Shao (Inception Institute of Artificial Intelligence (IIAI), Abu Dhabi, UAE)

An Investigation Into the Stochasticity of Batch Whitening .6438
Lei Huang (Inception Institute of Artificial Intelligence (IIAI), Abu Dhabi, UAE), Lei Zhao (n/a), Yi Zhou (Inception Institute of Artificial Intelligence (IIAI), Abu Dhabi, UAE), Fan Zhu (Inception Institute of Artificial Intelligence (IIAI), Abu Dhabi, UAE), Li Liu (Inception Institute of Artificial Intelligence (IIAI), Abu Dhabi, UAE), and Ling Shao (Inception Institute of Artificial Intelligence (IIAI), Abu Dhabi, UAE)

Poster 2-2P

High-Order Information Matters: Learning Relation and Topology for Occluded Person Re-Identification .6448
Guan'an Wang (Institute of Automation, CAS), Shuo Yang (Beijing Institute of Technology), Huanyu Liu (MEGVII Technology), Zhicheng Wang (MEGVII Technology), Yang Yang (Institute of Automation, CAS), Shuliang Wang (Beijing Institute of Technology), Gang Yu (MEGVII Technology), Erjin Zhou (MEGVII Technology), and Jian Sun (MEGVII Technology)

Same Features, Different Day: Weakly Supervised Feature Learning for Seasonal Invariance .6458
Jaime Spencer (Centre for Vision, Speech and Signal Processing (CVSSP), University of Surrey), Richard Bowden (Centre for Vision, Speech and Signal Processing (CVSSP), University of Surrey), and Simon Hadfield (Centre for Vision, Speech and Signal Processing (CVSSP), University of Surrey)

Learning to Dress 3D People in Generative Clothing .6468.....
Qianli Ma (Max Planck Institute for Intelligent Systems, Tübingen, Germany), Jinlong Yang (Max Planck Institute for Intelligent Systems, Tübingen, Germany), Anurag Ranjan (Max Planck Institute for Intelligent Systems, Tübingen, Germany; University of Tübingen, Germany), Sergi Pujades (Université Grenoble Alpes, Inria, CNRS, Grenoble INP, LJK, France), Gerard Pons-Moll (Max Planck Institute for Informatics, Saarland Informatics Campus, Germany), Siyu Tang (ETH Zürich, Switzerland; MPI-IS and University of Tübingen), and Michael J. Black (Max Planck Institute for Intelligent Systems, Tübingen, Germany)

MAST: A Memory-Augmented Self-Supervised Tracker .6478.....
Zihang Lai (Visual Geometry Group, Department of Engineering Science, University of Oxford), Erika Lu (Visual Geometry Group, Department of Engineering Science, University of Oxford), and Weidi Xie (Visual Geometry Group, Department of Engineering Science, University of Oxford)

Learning by Analogy: Reliable Supervision From Transformations for Unsupervised Optical Flow Estimation .6488.....
Liang Liu (Zhejiang University), Jiangning Zhang (Zhejiang University), Ruifei He (Zhejiang University), Yong Liu (Zhejiang University), Yabiao Wang (Youtu Lab, Tencent), Ying Tai (Youtu Lab, Tencent), Donghao Luo (Youtu Lab, Tencent), Chengjie Wang (Youtu Lab, Tencent), Jilin Li (Youtu Lab, Tencent), and Feiyue Huang (Youtu Lab, Tencent)

GNN3DMOT: Graph Neural Network for 3D Multi-Object Tracking With 2D-3D Multi-Feature Learning .6498.....
Xinshuo Weng (Robotics Institute, Carnegie Mellon University), Yongxin Wang (Robotics Institute, Carnegie Mellon University), Yunze Man (Robotics Institute, Carnegie Mellon University), and Kris M. Kitani (Robotics Institute, Carnegie Mellon University)

ClusterFit: Improving Generalization of Visual Representations .6508.....
Xueting Yan (Facebook AI), Ishan Misra (Facebook AI), Abhinav Gupta (Facebook AI), Deepti Ghadiyaram (Facebook AI), and Dhruv Mahajan (Facebook AI)

Learning Dynamic Relationships for 3D Human Motion Prediction .6518.....
Qiongjie Cui (Nanjing University of Science and Technology, Nanjing, China), Huaijiang Sun (Nanjing University of Science and Technology, Nanjing, China), and Fei Yang (Nanjing University of Science and Technology, Nanjing, China)

Knowledge As Priors: Cross-Modal Knowledge Generalization for Datasets Without Superior Knowledge .6527.....
Long Zhao (Rutgers University), Xi Peng (University of Delaware), Yuxiao Chen (Rutgers University), Mubbasir Kapadia (Rutgers University), and Dimitris N. Metaxas (Rutgers University)

S3VAE: Self-Supervised Sequential VAE for Representation Disentanglement and Data Generation .6537
Yizhe Zhu (NEC Labs America; Department of Computer Science, Rutgers University), Martin Renqiang Min (NEC Labs America), Asim Kadav (NEC Labs America), and Hans Peter Graf (NEC Labs America)

Video Playback Rate Perception for Self-Supervised Spatio-Temporal Representation Learning..... 6547
Yuan Yao (University of Chinese Academy of Sciences, Beijing, China), Chang Liu (University of Chinese Academy of Sciences, Beijing, China), Dezhao Luo (Institute of Information Engineering, Chinese Academy of Sciences, Beijing, China), Yu Zhou (Institute of Information Engineering, Chinese Academy of Sciences, Beijing, China), and Qixiang Ye (University of Chinese Academy of Sciences, Beijing, China)

Learning to Manipulate Individual Objects in an Image .6557
Yanchao Yang (UCLA Vision Lab), Yutong Chen (Tsinghua University), and Stefano Soatto (UCLA Vision Lab)

PADS: Policy-Adapted Sampling for Visual Similarity Learning .6567
Karsten Roth (Heidelberg Collaboratory for Image Processing / IWR Heidelberg University, Germany), Timo Milbich (Heidelberg Collaboratory for Image Processing / IWR Heidelberg University, Germany), and Björn Ommer (Heidelberg Collaboratory for Image Processing / IWR Heidelberg University, Germany)

Siam R-CNN: Visual Tracking by Re-Detection .6577
Paul Voigtlaender (RWTH Aachen University), Jonathon Luiten (RWTH Aachen University; University of Oxford), Philip H.S. Torr (University of Oxford), and Bastian Leibe (RWTH Aachen University)

ASLFeat: Learning Local Features of Accurate Shape and Localization .6588
Zixin Luo (Hong Kong University of Science and Technology), Lei Zhou (Hong Kong University of Science and Technology), Xuyang Bai (Hong Kong University of Science and Technology), Hongkai Chen (Hong Kong University of Science and Technology), Jiahui Zhang (Tsinghua University), Yao Yao (Hong Kong University of Science and Technology), Shiwei Li (Everest Innovation Technology), Tian Fang (Everest Innovation Technology), and Long Quan (Hong Kong University of Science and Technology)

Filter Grafting for Deep Neural Networks .6598
Fanxu Meng (School of Computer Science and Technology, Harbin Institute of Technology, Shenzhen, China; Tencent Youtu Lab, Shanghai, China), Hao Cheng (Tencent Youtu Lab, Shanghai, China), Ke Li (Tencent Youtu Lab, Shanghai, China), Zhixin Xu (School of Computer Science and Technology, Harbin Institute of Technology, Shenzhen, China), Rongrong Ji (Department of Artificial Intelligence, School of Informatics, Xiamen University, China; Peng Cheng Laboratory, China), Xing Sun (Tencent Youtu Lab, Shanghai, China), and Guangming Lu (School of Computer Science and Technology, Harbin Institute of Technology, Shenzhen, China)

HOPE-Net: A Graph-Based Model for Hand-Object Pose Estimation .6607
Bardia Doosti (Luddy School of Informatics, Computing, and Engineering, Indiana University Bloomington), Shujon Naha (Luddy School of Informatics, Computing, and Engineering, Indiana University Bloomington), Majid Mirbagheri (Institute for Learning and Brain Sciences, University of Washington), and David J. Crandall (Luddy School of Informatics, Computing, and Engineering, Indiana University Bloomington)

DeepFaceFlow: In-the-Wild Dense 3D Facial Motion Estimation .6617
Mohammad Rami Koujan (College of Engineering, Mathematics and Physical Sciences, University of Exeter, UK; FaceSoft.io, London, UK), Anastasios Roussos (College of Engineering, Mathematics and Physical Sciences, University of Exeter, UK; Institute of Computer Science, Foundation for Research and Technology-Hellas (FORTH-ICS), Greece; FaceSoft.io, London, UK), and Stefanos Zafeiriou (Department of Computing, Imperial College London, UK; FaceSoft.io, London, UK)

Learning for Video Compression With Hierarchical Quality and Recurrent Enhancement .6627
Ren Yang (ETH Zürich, Switzerland), Fabian Mentzer (ETH Zürich, Switzerland), Luc Van Gool (ETH Zürich, Switzerland), and Radu Timofte (ETH Zürich, Switzerland)

Learning Better Lossless Compression Using Lossy Compression .6637
Fabian Mentzer (ETH Zurich), Luc Van Gool (ETH Zurich), and Michael Tschannen (Google Research, Brain Team)

Flow2Stereo: Effective Self-Supervised Learning of Optical Flow and Stereo Matching .6647
Pengpeng Liu (The Chinese University of Hong Kong), Irwin King (The Chinese University of Hong Kong), Michael R. Lyu (The Chinese University of Hong Kong), and Jia Xu (Huya AI)

Multi-Scale Fusion Subspace Clustering Using Similarity Constraint .6657
Zhiyuan Dang (School of Electronic Engineering, Xidian University, Xi'an, China), Cheng Deng (School of Electronic Engineering, Xidian University, Xi'an, China), Xu Yang (School of Electronic Engineering, Xidian University, Xi'an, China), and Heng Huang (Huya AI)

Siamese Box Adaptive Network for Visual Tracking .6667
Zedu Chen (Department of Computer Science and Technology, Huaqiao University), Bineng Zhong (Department of Computer Science and Technology, Huaqiao University; Key Laboratory of Intelligent Perception and Systems for High-Dimensional Information of Ministry of Education, Nanjing University of Science and Technology), Guorong Li (School of Computer Science and Technology, University of Chinese Academy of Sciences), Shengping Zhang (Harbin Institute of Technology; Peng Cheng Laboratory), and Rongrong Ji (Department of Artificial Intelligence, School of Informatics, Xiamen University; Peng Cheng Laboratory)

Cross-Domain Face Presentation Attack Detection via Multi-Domain Disentangled Representation Learning .6677
Guoqing Wang (Key Laboratory of Intelligent Information Processing of Chinese Academy of Sciences (CAS), Institute of Computing Technology, CAS, Beijing , China; University of Chinese Academy of Sciences, Beijing, China), Hu Han (Key Laboratory of Intelligent Information Processing of Chinese Academy of Sciences (CAS), Institute of Computing Technology, CAS, Beijing , China; Peng Cheng Laboratory, Shenzhen, China), Shiguang Shan (Key Laboratory of Intelligent Information Processing of Chinese Academy of Sciences (CAS), Institute of Computing Technology, CAS, Beijing , China; University of Chinese Academy of Sciences, Beijing, China; Peng Cheng Laboratory, Shenzhen, China), and Xilin Chen (Key Laboratory of Intelligent Information Processing of Chinese Academy of Sciences (CAS), Institute of Computing Technology, CAS, Beijing , China; University of Chinese Academy of Sciences, Beijing, China)

Online Deep Clustering for Unsupervised Representation Learning .6687
*Xiaohang Zhan (CUHK - SenseTime Joint Lab, The Chinese University of Hong Kong), Jiahao Xie (Nanyang Technological University), Ziwei Liu (CUHK - SenseTime Joint Lab, The Chinese University of Hong Kong), Yew-Soon Ong (Nanyang Technological University; AI3, A*STAR, Singapore), and Chen Change Loy (Nanyang Technological University)*

Density-Aware Feature Embedding for Face Clustering .6697
Senhui Guo (SenseTime Group Limited), Jing Xu (SenseTime Group Limited), Dapeng Chen (SenseTime Group Limited), Chao Zhang (Samsung Research China - Beijing(SRC-B)), Xiaogang Wang (CUHK), and Rui Zhao (SenseTime Group Limited)

Self-Supervised Learning of Pretext-Invariant Representations .6706
Ishan Misra (Facebook AI Research) and Laurens van der Maaten (Facebook AI Research)

ROAM: Recurrently Optimizing Tracking Model .6717
Tianyu Yang (Tencent AI Lab; City University of Hong Kong), Pengfei Xu (Didi Chuxing), Runbo Hu (Didi Chuxing), Hua Chai (Didi Chuxing), and Antoni B. Chan (City University of Hong Kong)

Deformable Siamese Attention Networks for Visual Object Tracking .6727
Yuechen Yu (Malong Technologies), Yilei Xiong (Malong Technologies), Weilin Huang (Malong Technologies), and Matthew R. Scott (Malong Technologies)

15 Keypoints Is All You Need .6737
Michael Snower (Brown University), Asim Kadav (NEC Labs America), Farley Lai (NEC Labs America), and Hans Peter Graf (NEC Labs America)

Optical Flow in the Dark .6748
Yinqiang Zheng (National Institute of Informatics), Mingfang Zhang (Pengcheng Laboratory; Nanjing University), and Feng Lu (Pengcheng Laboratory; State Key Lab. of VR Technology and Systems, School of CSE, Beihang University)

Sketch-BERT: Learning Sketch Bidirectional Encoder Representation From Transformers by Self-Supervised Learning of Sketch Gestalt .6757
Hangyu Lin (School of Data Science, Fudan University), Yanwei Fu (School of Data Science, Fudan University), Xiangyang Xue (School of Computer Science, Fudan University; School of Data Science, and MOE Frontiers Center for Brain Science, Shanghai Key Lab of Intelligent Information Processing Fudan University), and Yu-Gang Jiang (School of Computer Science, Fudan University; School of Data Science, and MOE Frontiers Center for Brain Science, Shanghai Key Lab of Intelligent Information Processing Fudan University)

A Unified Object Motion and Affinity Model for Online Multi-Object Tracking .6767
Junbo Yin (Beijing Lab of Intelligent Information Technology, School of Computer Science, Beijing Institute of Technology, China), Wenguan Wang (ETH Zurich, Switzerland), Qinghao Meng (Beijing Lab of Intelligent Information Technology, School of Computer Science, Beijing Institute of Technology, China), Ruigang Yang (Baidu Research; National Engineering Laboratory of Deep Learning Technology and Application, China; University of Kentucky, Kentucky, USA), and Jianbing Shen (Inception Institute of Artificial Intelligence, UAE; Beijing Lab of Intelligent Information Technology, School of Computer Science, Beijing Institute of Technology, China)

Sub-Frame Appearance and 6D Pose Estimation of Fast Moving Objects .6777
Denys Rozumnyi (Department of Computer Science, ETH Zurich; Visual Recognition Group, Faculty of Electrical Engineering, Czech Technical University in Prague, Czech Republic), Jan Kotera (Czech Academy of Sciences, UTIA, Prague, Czech Republic), Filip Šroubek (Czech Academy of Sciences, UTIA, Prague, Czech Republic), and Jiří Matas (Visual Recognition Group, Faculty of Electrical Engineering, Czech Technical University in Prague, Czech Republic)

How to Train Your Deep Multi-Object Tracker .6786
Yihong Xu (Inria, LJK, Univ. Grenoble Alpes, France), Aljoša Šep (Technical University of Munich, Germany), Yutong Ban (Inria, LJK, Univ. Grenoble Alpes, France; Distributed Robotics Lab, CSAIL, MIT, USA), Radu Horaud (Inria, LJK, Univ. Grenoble Alpes, France), Laura Leal-Taixé (Technical University of Munich, Germany), and Xavier Alameda-Pineda (Inria, LJK, Univ. Grenoble Alpes, France)

TPNet: Trajectory Proposal Network for Motion Prediction .6796
Liangji Fang (SenseTime Group Limited), Qinhong Jiang (SenseTime Group Limited), Jianping Shi (SenseTime Group Limited), and Bolei Zhou (The Chinese University of Hong Kong)

Large Scale Video Representation Learning via Relational Graph Clustering .6806
Hyodong Lee (MIT), Joonseok Lee (Google Research), Joe Yue-Hei Ng (Google Research), and Paul Natsev (Google Research)

Towards Universal Representation Learning for Deep Face Recognition .6816
Yichun Shi (Michigan State University; NEC Labs America), Xiang Yu (NEC Labs America), Kihyuk Sohn (NEC Labs America), Manmohan Chandraker (NEC Labs America; University of California, San Diego), and Anil K. Jain (Michigan State University)

Robust Partial Matching for Person Search in the Wild .6826.....
Yingji Zhong (Peking University), Xiaoyu Wang (Intellifusion; The Chinese University of Hong Kong, Shenzhen), and Shiliang Zhang (Peking University)

Correlation-Guided Attention for Corner Detection Based Visual Tracking .6835.....
Fei Du (School of Computer Science and Technology, Harbin Institute of Technology, China), Peng Liu (School of Computer Science and Technology, Harbin Institute of Technology, China), Wei Zhao (School of Computer Science and Technology, Harbin Institute of Technology, China), and Xianglong Tang (School of Computer Science and Technology, Harbin Institute of Technology, China)

Learning Multi-Object Tracking and Segmentation From Automatic Annotations .6845.....
Lorenzo Porzi (Mapillary Researchy), Markus Hofinger (Graz University of Technology), Idoia Ruiz (Computer Vision Center, UAB), Joan Serrat (Computer Vision Center, UAB), Samuel Rota Bulò (Mapillary Researchy), and Peter Kontschieder (Mapillary Researchy)

PandaNet: Anchor-Based Single-Shot Multi-Person 3D Pose Estimation .6855.....
Abdallah Benzine (CEA LIST Vision and Learning Lab for Scene Analysis; Sorbonne University, CNRS, Institute for Intelligent Systems and Robotics), Florian Chabot (CEA LIST Vision and Learning Lab for Scene Analysis), Bertrand Luvison (CEA LIST Vision and Learning Lab for Scene Analysis), Quoc Cuong Pham (CEA LIST Vision and Learning Lab for Scene Analysis), and Catherine Achard (Sorbonne University, CNRS, Institute for Intelligent Systems and Robotics)

Rotation Consistent Margin Loss for Efficient Low-Bit Face Recognition .6865.....
Yudong Wu (SenseTime Group Limited), Yichao Wu (SenseTime Group Limited), Ruihao Gong (SenseTime Group Limited; BeiHang University), Yuanhao Lv (SenseTime Group Limited), Ken Chen (SenseTime Group Limited), Ding Liang (SenseTime Group Limited), Xiaolin Hu (Tsinghua University), Xianglong Liu (BeiHang University), and Junjie Yan (SenseTime Group Limited)

Joint Spatial-Temporal Optimization for Stereo 3D Object Tracking .6876.....
Peiliang Li (The Hong Kong University of Science and Technology), Jieqi Shi (The Hong Kong University of Science and Technology), and Shaojie Shen (The Hong Kong University of Science and Technology)

Unity Style Transfer for Person Re-Identification .6886.....
Chong Liu (State Key Laboratory of Computer Science, Institute of Software, Chinese Academy of Sciences, China; University of Chinese Academy of Sciences, Beijing, China), Xiaojun Chang (Monash University, Melbourne, Australia), and Yi-Dong Shen (State Key Laboratory of Computer Science, Institute of Software, Chinese Academy of Sciences, China)

Suppressing Uncertainties for Large-Scale Facial Expression Recognition ..6896
Kai Wang (ShenZhen Key Lab of Computer Vision and Pattern Recognition, SIAT-SenseTime Joint Lab, Shenzhen Institutes of Advanced Technology, Chinese Academy of Science; University of Chinese Academy of Sciences, China), Xiaojiang Peng (ShenZhen Key Lab of Computer Vision and Pattern Recognition, SIAT-SenseTime Joint Lab, Shenzhen Institutes of Advanced Technology, Chinese Academy of Science), Jianfei Yang (Nanyang Technological University Singapore), Shijian Lu (Nanyang Technological University Singapore), and Yu Qiao (ShenZhen Key Lab of Computer Vision and Pattern Recognition, SIAT-SenseTime Joint Lab, Shenzhen Institutes of Advanced Technology, Chinese Academy of Science)

Multiview-Consistent Semi-Supervised Learning for 3D Human Pose Estimation ..6906
Rahul Mitra (IIT Bombay), Nitesh B. Gundavarapu (UC San Diego), Abhishek Sharma (Axogyan AI), and Arjun Jain (IISc Bangalore)

Regularizing Neural Networks via Minimizing Hyperspherical Energy ..6916
Rongmei Lin (Emory University), Weiyang Liu (Georgia Institute of Technology), Zhen Liu (Mila, Université de Montréal), Chen Feng (New York University), Zhiding Yu (NVIDIA), James M. Rehg (Georgia Institute of Technology), Li Xiong (Emory University), and Le Song (Georgia Institute of Technology)

Learning Representations by Predicting Bags of Visual Words ..6926
Spyros Gidaris (Valeo.ai), Andrei Bursuc (Valeo.ai), Nikos Komodakis (University of Crete), Patrick Pérez (Valeo.ai), and Matthieu Cord (Valeo.ai)

AnimalWeb: A Large-Scale Hierarchical Dataset of Annotated Animal Faces ..6937
Muhammad Haris Khan (Inception Institute of Artificial Intelligence, UAE), John McDonagh (University of Nottingham, UK), Salman Khan (Inception Institute of Artificial Intelligence, UAE), Muhammad Shahabuddin (Comsats University Islamabad, Pakistan), Aditya Arora (Inception Institute of Artificial Intelligence, UAE), Fahad Shahbaz Khan (Inception Institute of Artificial Intelligence, UAE), Ling Shao (Inception Institute of Artificial Intelligence, UAE), and Georgios Tzimiropoulos (Queen Mary University of London, UK)

A Transductive Approach for Video Object Segmentation ..6947
Yizhuo Zhang (Carnegie Mellon University), Zhirong Wu (Microsoft Research Asia), Houwen Peng (Microsoft Research Asia), and Stephen Lin (Microsoft Research Asia)

Dynamic Face Video Segmentation via Reinforcement Learning ..6957
Yujiang Wang (Imperial College London; Samsung AI Center Cambridge), Mingzhi Dong (University College London), Jie Shen (Imperial College London; Samsung AI Center Cambridge), Yang Wu (Kyoto University), Shiyang Cheng (Samsung AI Center Cambridge), and Maja Pantic (Imperial College London; Samsung AI Center Cambridge)

Implicit Functions in Feature Space for 3D Shape Reconstruction and Completion .6968.....
Julian Chibane (Max Planck Institute for Informatics, Saarland Informatics Campus, Germany; University of Würzburg, Germany), Thiemo Alldieck (Max Planck Institute for Informatics, Saarland Informatics Campus, Germany; Computer Graphics Lab, TU Braunschweig, Germany), and Gerard Pons-Moll (Max Planck Institute for Informatics, Saarland Informatics Campus, Germany)

Semantic Drift Compensation for Class-Incremental Learning .6980.....
Lu Yu (School of Automation, Northwestern Polytechnical University, Xi'an, China; School of Automation, Northwestern Polytechnical University, Xi'an, China), Bartłomiej Twardowski (Computer Vision Center, Universitat Autonoma de Barcelona, Barcelona, Spain), Xialei Liu (Computer Vision Center, Universitat Autonoma de Barcelona, Barcelona, Spain), Luis Herranz (Computer Vision Center, Universitat Autonoma de Barcelona, Barcelona, Spain), Kai Wang (Computer Vision Center, Universitat Autonoma de Barcelona, Barcelona, Spain), Yongmei Cheng (School of Automation, Northwestern Polytechnical University, Xi'an, China), Shangling Jui (Huawei Kirin Solution, Shanghai, China), and Joost van de Weijer (Computer Vision Center, Universitat Autonoma de Barcelona, Barcelona, Spain)

Context-Aware Human Motion Prediction .6990.....
Enric Corona (Institut de Robòtica i Informàtica Industrial, CSIC-UPC, Barcelona, Spain), Albert Pumarola (Institut de Robòtica i Informàtica Industrial, CSIC-UPC, Barcelona, Spain), Guillem Alenyà (Institut de Robòtica i Informàtica Industrial, CSIC-UPC, Barcelona, Spain), and Francesc Moreno-Noguer (Institut de Robòtica i Informàtica Industrial, CSIC-UPC, Barcelona, Spain)

DeepDeform: Learning Non-Rigid RGB-D Reconstruction With Semi-Supervised Data .7000...
Aljaž Božič (Technical University of Munich), Michael Zollhöfer (Stanford University), Christian Theobalt (Max Planck Institute for Informatics), and Matthias Nießner (Technical University of Munich)

Optical Non-Line-of-Sight Physics-Based 3D Human Pose Estimation .7011.....
Mariko Isogawa (Carnegie Mellon University), Ye Yuan (Carnegie Mellon University), Matthew O'Toole (Carnegie Mellon University), and Kris M. Kitani (Carnegie Mellon University)

Learning to Transfer Texture From Clothing Images to 3D Humans .7021.....
Aymen Mir (Max Planck Institute for Informatics, Saarland Informatics Campus, Germany), Thiemo Alldieck (Max Planck Institute for Informatics, Saarland Informatics Campus, Germany; Computer Graphics Lab, TU Braunschweig, Germany), and Gerard Pons-Moll (Max Planck Institute for Informatics, Saarland Informatics Campus, Germany)

UniPose: Unified Human Pose Estimation in Single Images and Videos .7033.....
Bruno Artacho (Rochester Institute of Technology, Rochester, NY) and Andreas Savakis (Rochester Institute of Technology, Rochester, NY)

Minimal Solutions to Relative Pose Estimation From Two Views Sharing a Common Direction With Unknown Focal Length ..7043
Yaqing Ding (Lab Key of Intelligent Perception and Systems for High-Dimensional Information of Ministry of Education, and Jiangsu Key Lab of Image and Video Understanding for Social Security, School of Computer Science and Engineering, Nanjing University of Science and Technology.), Jian Yang (Lab Key of Intelligent Perception and Systems for High-Dimensional Information of Ministry of Education, and Jiangsu Key Lab of Image and Video Understanding for Social Security, School of Computer Science and Engineering, Nanjing University of Science and Technology.), Jean Ponce (INRIA, Paris, France; Département d'informatique de l'ENS, ENS, CNRS, PSL University, Paris, France), and Hui Kong (Lab Key of Intelligent Perception and Systems for High-Dimensional Information of Ministry of Education, and Jiangsu Key Lab of Image and Video Understanding for Social Security, School of Computer Science and Engineering, Nanjing University of Science and Technology.)

3D Human Mesh Regression With Dense Correspondence ..7052
Wang Zeng (The Chinese University of Hong Kong), Wanli Ouyang (The University of Sydney), Ping Luo (The University of Hong Kong), Wentao Liu (SenseTime Research), and Xiaogang Wang (The Chinese University of Hong Kong; SenseTime Research)

Cross-Modal Pattern-Propagation for RGB-T Tracking ..7062
Chaoqun Wang (PCALab, Key Lab of Intelligent Perception and Systems for High-Dimensional, Information of Ministry of Education, School of Computer Science and Engineering, Nanjing University of Science and Technology), Chunyan Xu (PCALab, Key Lab of Intelligent Perception and Systems for High-Dimensional, Information of Ministry of Education, School of Computer Science and Engineering, Nanjing University of Science and Technology), Zhen Cui (PCALab, Key Lab of Intelligent Perception and Systems for High-Dimensional, Information of Ministry of Education, School of Computer Science and Engineering, Nanjing University of Science and Technology), Ling Zhou (PCALab, Key Lab of Intelligent Perception and Systems for High-Dimensional, Information of Ministry of Education, School of Computer Science and Engineering, Nanjing University of Science and Technology), Tong Zhang (PCALab, Key Lab of Intelligent Perception and Systems for High-Dimensional, Information of Ministry of Education, School of Computer Science and Engineering, Nanjing University of Science and Technology), Xiaoya Zhang (PCALab, Key Lab of Intelligent Perception and Systems for High-Dimensional, Information of Ministry of Education, School of Computer Science and Engineering, Nanjing University of Science and Technology), and Jian Yang (PCALab, Key Lab of Intelligent Perception and Systems for High-Dimensional, Information of Ministry of Education, School of Computer Science and Engineering, Nanjing University of Science and Technology)

Distilling Knowledge From Graph Convolutional Networks .7.0.7.2.....
Yiding Yang (Department of Computer Science, Stevens Institute of Technology, USA), Jiayan Qiu (UBTECH Sydney AI Centre, School of Computer Science, FEIT, The University of Sydney, Australia), Mingli Song (College of Computer Science and Technology, Zhejiang University, China), Dacheng Tao (UBTECH Sydney AI Centre, School of Computer Science, FEIT, The University of Sydney, Australia), and Xinchao Wang (Department of Computer Science, Stevens Institute of Technology, USA)

Learning Identity-Invariant Motion Representations for Cross-ID Face Reenactment .7.0.8.2.....
Po-Hsiang Huang (Graduate Institute of Communication Engineering, National Taiwan University, Taiwan), Fu-En Yang (Graduate Institute of Communication Engineering, National Taiwan University, Taiwan), and Yu-Chiang Frank Wang (Graduate Institute of Communication Engineering, National Taiwan University, Taiwan; ASUS Intelligent Cloud Services, Taiwan)

Distribution-Aware Coordinate Representation for Human Pose Estimation .7.0.9.1.....
Feng Zhang (School of Computer Science and Engineering, University of Electronic Science and Technology of China), Xiatian Zhu (Centre for Vision, Speech and Signal Processing, University of Surrey), Hanbin Dai (School of Automation Engineering, University of Electronic Science and Technology of China), Mao Ye (School of Computer Science and Engineering, University of Electronic Science and Technology of China), and Ce Zhu (School of Information and Communication Engineering, University of Electronic Science and Technology of China)

Parsing-Based View-Aware Embedding Network for Vehicle Re-Identification .7.1.0.1.....
Dechao Meng (Key Lab of Intell. Info. Process., Inst. of Comput. Tech., CAS, Beijing, China; University of Chinese Academy of Sciences, China), Liang Li (Key Lab of Intell. Info. Process., Inst. of Comput. Tech., CAS, Beijing, China), Xuejing Liu (Key Lab of Intell. Info. Process., Inst. of Comput. Tech., CAS, Beijing, China; University of Chinese Academy of Sciences, China), Yadong Li (Megvii Inc, Beijing, China), Shijie Yang (Key Lab of Intell. Info. Process., Inst. of Comput. Tech., CAS, Beijing, China), Zheng-Jun Zha (University of Science and Technology of China, China), Xingyu Gao (Institute of Microelectronics, Chinese Academy of Sciences, Beijing, China), Shuhui Wang (Key Lab of Intell. Info. Process., Inst. of Comput. Tech., CAS, Beijing, China), and Qingming Huang (University of Chinese Academy of Sciences, China; Key Lab of Intell. Info. Process., Inst. of Comput. Tech., CAS, Beijing, China; Peng Cheng Laboratory, Shenzhen, China)

HandVoxNet: Deep Voxel-Based Network for 3D Hand Shape and Pose Estimation From a Single Depth Map .7.1.1.1.....
Jameel Malik (TU Kaiserslautern; DFKI Kaiserslautern; NUST Pakistan), Ibrahim Abdelaziz (TU Kaiserslautern; DFKI Kaiserslautern), Ahmed Elhayek (DFKI Kaiserslautern; UPM Saudi Arabia), Soshi Shimada (MPII Saarland), Sk Aziz Ali (TU Kaiserslautern; DFKI Kaiserslautern), Vladislav Golyanik (MPII Saarland), Christian Theobalt (MPII Saarland), and Didier Stricker (TU Kaiserslautern; DFKI Kaiserslautern)

Determinant Regularization for Gradient-Efficient Graph Matching .7.12.1.....
Tianshu Yu (Arizona State University), Junchi Yan (Shanghai Jiao Tong University), and Baoxin Li (Arizona State University)

D3S – A Discriminative Single Shot Segmentation Tracker .7.13.1.....
Alan Lukežič (Faculty of Computer and Information Science, University of Ljubljana, Slovenia), Jiří Matas (Faculty of Electrical Engineering, Czech Technical University in Prague, Czech Republic), and Matej Kristan (Faculty of Computer and Information Science, University of Ljubljana, Slovenia)

MANTRA: Memory Augmented Networks for Multiple Trajectory Prediction .7.14.1.....
Francesco Marchetti (MICC, University of Florence), Federico Becattini (MICC, University of Florence), Lorenzo Seidenari (MICC, University of Florence), and Alberto Del Bimbo (MICC, University of Florence)

End-to-End Model-Free Reinforcement Learning for Urban Driving Using Implicit Affordances .....
7151
Marin Toromanoff (Center for Robotics, MINES ParisTech, PSL; Valeo Driving Assistance Research; Valeo.ai), Emilie Wirbel (Valeo Driving Assistance Research; Valeo.ai), and Fabien Moutarde (Center for Robotics, MINES ParisTech, PSL)

GraphTER: Unsupervised Learning of Graph Transformation Equivariant Representations via Auto-Encoding Node-Wise Transformations .7.16.1.....
Xiang Gao (Wangxuan Institute of Computer Technology, Peking University, Beijing), Wei Hu (Wangxuan Institute of Computer Technology, Peking University, Beijing), and Guo-Jun Qi (Futurewei Technologies)

Can Facial Pose and Expression Be Separated With Weak Perspective Camera? .7.17.1.....
Evangelos Sariyanidi (Center for Autism Research, Children's Hospital of Philadelphia), Casey J. Zampella (Center for Autism Research, Children's Hospital of Philadelphia), Robert T. Schultz (Center for Autism Research, Children's Hospital of Philadelphia; University of Pennsylvania), and Birkan Tunc (Center for Autism Research, Children's Hospital of Philadelphia; University of Pennsylvania)

Probabilistic Regression for Visual Tracking .7.18.1.....
Martin Danelljan (Computer Vision Lab, D-ITET, ETH Züurich, Switzerland), Luc Van Gool (Computer Vision Lab, D-ITET, ETH Zürich, Switzerland), and Radu Timofte (Computer Vision Lab, D-ITET, ETH Zürich, Switzerland)

3DRegNet: A Deep Neural Network for 3D Point Registration .7.19.1.....
G. Dias Pais (Instituto Superior Técnico, Lisboa), Srikumar Ramalingam (Google Research, NY), Venu Madhav Govindu (Indian Institute of Science, Bengaluru), Jacinto C. Nascimento (Instituto Superior Técnico, Lisboa), Rama Chellappa (University of Maryland, College Park), and Pedro Miraldo (Instituto Superior Técnico, Lisboa)

Compressed Volumetric Heatmaps for Multi-Person 3D Pose Estimation .7.20.2.....
Matteo Fabbri (University of Modena and Reggio Emilia), Fabio Lanzi (University of Modena and Reggio Emilia), Simone Calderara (University of Modena and Reggio Emilia), Stefano Alletto (Panasonic R&D Company of America), and Rita Cucchiara (University of Modena and Reggio Emilia)

Three-Dimensional Reconstruction of Human Interactions .7212.....
Mihai Fieraru (Institute of Mathematics of the Romanian Academy), Mihai Zanfir (Institute of Mathematics of the Romanian Academy), Elisabeta Oneata (Institute of Mathematics of the Romanian Academy), Alin-Ionut Popa (Institute of Mathematics of the Romanian Academy), Vlad Olaru (Institute of Mathematics of the Romanian Academy), and Cristian Sminchisescu (Lund University; Institute of Mathematics of the Romanian Academy)

Distribution-Induced Bidirectional Generative Adversarial Network for Graph Representation Learning .7222.....
Shuai Zheng (Institute of Information Science, Beijing Jiaotong University, Beijing, China; Beijing Key Laboratory of Advanced Information Science and Network Technology, Beijing, China), Zhenfeng Zhu (Institute of Information Science, Beijing Jiaotong University, Beijing, China; Beijing Key Laboratory of Advanced Information Science and Network Technology, Beijing, China), Xingxing Zhang (Institute of Information Science, Beijing Jiaotong University, Beijing, China; Beijing Key Laboratory of Advanced Information Science and Network Technology, Beijing, China), Zhizhe Liu (Institute of Information Science, Beijing Jiaotong University, Beijing, China; Beijing Key Laboratory of Advanced Information Science and Network Technology, Beijing, China), Jian Cheng (NLPR, Institute of Automation, Chinese Academy of Sciences, Beijing, China; University of Chinese Academy of Sciences, Beijing, China), and Yao Zhao (Institute of Information Science, Beijing Jiaotong University, Beijing, China; Beijing Key Laboratory of Advanced Information Science and Network Technology, Beijing, China)

Minimal Solvers for 3D Scan Alignment With Pairs of Intersecting Lines .7232.....
André Mateus (Instituto Superior Técnico, Lisboa), Srikumar Ramalingam (Google), and Pedro Miraldo (Instituto Superior Técnico, Lisboa)

Wavelet Integrated CNNs for Noise-Robust Image Classification .7243.....
Qiufu Li (Computer Vision Institute, School of Computer Science & Software Engineering, Shenzhen University; Shenzhen Institute of Artificial Intelligence & Robotics for Society), Linlin Shen (Computer Vision Institute, School of Computer Science & Software Engineering, Shenzhen University; Shenzhen Institute of Artificial Intelligence & Robotics for Society), Sheng Guo (Malong Technologies), and Zhihui Lai (Computer Vision Institute, School of Computer Science & Software Engineering, Shenzhen University; Shenzhen Institute of Artificial Intelligence & Robotics for Society)

Embedding Expansion: Augmentation in Embedding Space for Deep Metric Learning .7253...
Byungsoo Ko (Clova Vision, NAVER Corp.) and Geonmo Gu (Clova Vision, NAVER Corp.)

PropagationNet: Propagate Points to Curve to Learn Structure Information .7263.....
Xiehe Huang (Pattern Recognition & Intelligent System Laboratory, School of Information and Communication Engineering, Beijing University of Posts and Telecommunications; AI Labs, DiDi Chuxing), Weihong Deng (Pattern Recognition & Intelligent System Laboratory, School of Information and Communication Engineering, Beijing University of Posts and Telecommunications), Haifeng Shen (AI Labs, DiDi Chuxing), Xiubao Zhang (AI Labs, DiDi Chuxing), and Jieping Ye (AI Labs, DiDi Chuxing)

Sequential 3D Human Pose and Shape Estimation From Point Clouds .7273.....
Kangkan Wang (Key Lab of Intelligent Perception and Systems for High-Dimensional Information of Ministry of Education; Jiangsu Key Lab of Image and Video Understanding for Social Security, School of Computer Science and Engineering, Nanjing University of Science and Technology, China), Jin Xie (Key Lab of Intelligent Perception and Systems for High-Dimensional Information of Ministry of Education; Jiangsu Key Lab of Image and Video Understanding for Social Security, School of Computer Science and Engineering, Nanjing University of Science and Technology, China), Guofeng Zhang (State Key Laboratory of CAD&CG, Zhejiang University, China; ZJU-SenseTime Joint Lab of 3D Vision), Lei Liu (Key Lab of Intelligent Perception and Systems for High-Dimensional Information of Ministry of Education), and Jian Yang (Key Lab of Intelligent Perception and Systems for High-Dimensional Information of Ministry of Education; Jiangsu Key Lab of Image and Video Understanding for Social Security, School of Computer Science and Engineering, Nanjing University of Science and Technology, China)

Improving the Robustness of Capsule Networks to Image Affine Transformations .7283.....
Jindong Gu (University of Munich, Siemens AG, Corporate Technology) and Volker Tresp (University of Munich, Siemens AG, Corporate Technology)

Noise Modeling, Synthesis and Classification for Generic Object Anti-Spoofing .7292.....
Joel Stehouwer (Department of Computer Science and Engineering, Michigan State University), Amin Jourabloo (Department of Computer Science and Engineering, Michigan State University), Yaojie Liu (Department of Computer Science and Engineering, Michigan State University), and Xiaoming Liu (Department of Computer Science and Engineering, Michigan State University)

Quaternion Product Units for Deep Learning on 3D Rotation Groups .7302.....
Xuan Zhang (MoE Key Lab of Artificial Intelligence, AI Institute, Shanghai Jiao Tong University, Shanghai, China), Shaofei Qin (MoE Key Lab of Artificial Intelligence, AI Institute, Shanghai Jiao Tong University, Shanghai, China), Yi Xu (MoE Key Lab of Artificial Intelligence, AI Institute, Shanghai Jiao Tong University, Shanghai, China), and Hongteng Xu (Infinia ML, Inc., Duke University, Durham, NC, USA)

Unsupervised Representation Learning for Gaze Estimation .7312.....
Yu Yu (Idiap Research Institute, CH-1920, Martigny, Switzerland EPFL, CH-1015, Lausanne, Switzerland) and Jean-Marc Odobez (Idiap Research Institute, CH-1920, Martigny, Switzerland EPFL, CH-1015, Lausanne, Switzerland)

P–nets: Deep Polynomial Neural Networks .7323.....
Grigorios G. Chrysos (Department of Computing, Imperial College London, UK), Stylianos Moschoglou (Department of Computing, Imperial College London, UK; Facesoft.io), Giorgos Bouritsas (Department of Computing, Imperial College London, UK), Yannis Panagakis (3 Department of Informatics and Telecommunications, University of Athens, GR), Jiankang Deng (Department of Computing, Imperial College London, UK; Facesoft.io), and Stefanos Zafeiriou (Department of Computing, Imperial College London, UK; Facesoft.io)

Hierarchically Robust Representation Learning .7334.....
Qi Qian (Alibaba Group), Juhua Hu (School of Engineering and Technology University of Washington, Tacoma, USA), and Hao Li (Alibaba Group)

How Useful Is Self-Supervised Pretraining for Visual Tasks? .7343.....
Alejandro Newell (Princeton University) and Jia Deng (Princeton University)

Oral 2-3A: Face, Gesture, and Body Pose (3); Motion and Tracking (2)

Copy and Paste GAN: Face Hallucination From Shaded Thumbnails .7353.....
Yang Zhang (School of Automation, Southeast University, China; Key Laboratory of Measurement and Control of Complex Systems of Engineering, Ministry of Education, Southeast University, China; Centre for Artificial Intelligence, University of Technology Sydney, Australia), Ivor W. Tsang (Centre for Artificial Intelligence, University of Technology Sydney, Australia), Yawei Luo (School of Computer Science and Technology, Huazhong University of Science and Technology, China), Chang-Hui Hu (School of Automation, Southeast University, China; Key Laboratory of Measurement and Control of Complex Systems of Engineering, Ministry of Education, Southeast University, China; School of Automation, Nanjing University of Posts and Telecommunications, China), Xiaobo Lu (School of Automation, Southeast University, China; Key Laboratory of Measurement and Control of Complex Systems of Engineering, Ministry of Education, Southeast University, China), and Xin Yu (Centre for Artificial Intelligence, University of Technology Sydney, Australia; Australian Centre for Robotic Vision, Australian National University, Australia)

TailorNet: Predicting Clothing in 3D as a Function of Human Pose, Shape and Garment Style 7363
Chaitanya Patel (Max Planck Institute for Informatics, Saarland Informatics Campus, Germany), Zhouyingcheng Liao (Max Planck Institute for Informatics, Saarland Informatics Campus, Germany), and Gerard Pons-Moll (Max Planck Institute for Informatics, Saarland Informatics Campus, Germany)

Object-Occluded Human Shape and Pose Estimation From a Single Color Image .7374.....
Tianshu Zhang (Southeast University, China), Buzhen Huang (Southeast University, China), and Yangang Wang (Southeast University, China)

Recursive Least-Squares Estimator-Aided Online Learning for Visual Tracking .7384.....
Jin Gao (NLPR, Institute of Automation, CAS; University of Chinese Academy of Sciences), Weiming Hu (NLPR, Institute of Automation, CAS; University of Chinese Academy of Sciences), and Yan Lu (Microsoft Research)

Self-Supervised Monocular Scene Flow Estimation .7394.....
Junhwa Hur (Department of Computer Science, TU Darmstadt) and Stefan Roth (Department of Computer Science, TU Darmstadt)

Learning Fast and Robust Target Models for Video Object Segmentation .7404.....
Andreas Robinson (CVL, Linköping University, Sweden), Felix Järemo Lawin (CVL, Linköping University, Sweden), Martin Danelljan (CVL, ETH Zurich, Switzerland), Fahad Shahbaz Khan (CVL, Linköping University, Sweden; IIAI, UAE), and Michael Felsberg (CVL, Linköping University, Sweden)

Reciprocal Learning Networks for Human Trajectory Prediction .7414.....
Hao Sun (University of Missouri), Zhiqun Zhao (University of Missouri), and Zhihai He (University of Missouri)

Nonparametric Object and Parts Modeling With Lie Group Dynamics .7424.....
David S. Hayden (Computer Science and Artificial Intelligence Laboratory, Massachusetts Institute of Technology, USA), Jason Pacheco (Computer Science and Artificial Intelligence Laboratory, Massachusetts Institute of Technology, USA), and John W. Fisher III (Computer Science and Artificial Intelligence Laboratory, Massachusetts Institute of Technology, USA)

Oral 2-3B: Image and Video Synthesis (2); Neural Generative Models

Learning to Shadow Hand-Drawn Sketches .7434.....
Qingyuan Zheng (University of Maryland, Baltimore County), Zhuoru Li (Project HAT), and Adam Bargteil (University of Maryland, Baltimore County)

Intuitive, Interactive Beard and Hair Synthesis With Generative Models .7444.....
Kyle Olszewski (University of Southern California; USC ICT), Duygu Ceylan (Adobe Inc.), Jun Xing (USC ICT; miHoYo), Jose Echevarria (Adobe Inc.), Zhili Chen (Adobe Inc.; ByteDance Research), Weikai Chen (USC ICT; Tencent America), and Hao Li (University of Southern California; USC ICT; Pinscreen Inc.)

Semantic Pyramid for Image Generation .7455.....
Assaf Shocher (Google Research; Weizmann Institute of Science), Yossi Gandelsman (Google Research), Inbar Mosseri (Google Research), Michal Yarom (Google Research), Michal Irani (Google Research; Weizmann Institute of Science), William T. Freeman (Google Research), and Tali Dekel (Google Research)

SynSin: End-to-End View Synthesis From a Single Image .7465.....
Olivia Wiles (University of Oxford), Georgia Gkioxari (Facebook AI Research), Richard Szeliski (Facebook), and Justin Johnson (Facebook AI Research; University of Michigan)

A Characteristic Function Approach to Deep Implicit Generative Modeling .7476.....
Abdul Fatir Ansari (Department of Computer Science), Jonathan Scarlett (Department of Computer Science; Department of Mathematics, National University of Singapore), and Harold Soh (Department of Computer Science)

High-Resolution Daytime Translation Without Domain Labels .7485.....
Ivan Anokhin (Samsung AI Center, Moscow), Pavel Solovev (Samsung AI Center, Moscow), Denis Korzhenkov (Samsung AI Center, Moscow), Alexey Kharlamov (Samsung AI Center, Moscow), Taras Khakhulin (Samsung AI Center, Moscow; Skolkovo Institute of Science and Technology, Moscow), Aleksei Silvestrov (Samsung AI Center, Moscow), Sergey Nikolenko (National Research University Higher School of Economics, St.-Petersburg; Samsung AI Center, Moscow), Victor Lempitsky (Samsung AI Center, Moscow; Skolkovo Institute of Science and Technology, Moscow), and Gleb Sterkin (Samsung AI Center, Moscow)

Leveraging 2D Data to Learn Textured 3D Mesh Generation .7495.....
Paul Henderson (IST Austria), Vagia Tsiminaki (IBM Research Zürich), and Christoph H. Lampert (IST Austria)

Contextual Residual Aggregation for Ultra High-Resolution Image Inpainting .7505.....
Zili Yi (Huawei Technologies Canada Co. Ltd.), Qiang Tang (Huawei Technologies Canada Co. Ltd.), Shekoofeh Azizi (Huawei Technologies Canada Co. Ltd.), Daesik Jang (Huawei Technologies Canada Co. Ltd.), and Zhan Xu (Huawei Technologies Canada Co. Ltd.)

Flow Contrastive Estimation of Energy-Based Models .7515.....
Ruiqi Gao (UCLA), Erik Nijkamp (UCLA), Diederik P. Kingma (Google), Zhen Xu (Google), Andrew M. Dai (Google), and Ying Nian Wu (UCLA)

Oral 2-3C: Optimization and Learning Methods

Hardware-in-the-Loop End-to-End Optimization of Camera Image Processing Pipelines .7526
Ali Mosleh (Algolux), Avinash Sharma (Algolux), Emmanuel Onzon (Algolux), Fahim Mannan (Algolux), Nicolas Robidoux (Algolux), and Felix Heide (Algolux; Princeton University)

Search to Distill: Pearls Are Everywhere but Not the Eyes .7536.....
Yu Liu (Google AI; Multimedia Laboratory, The Chinese University of Hong Kong), Xuhui Jia (Google AI), Mingxing Tan (Google Brain), Raviteja Vemulapalli (Google AI), Yukun Zhu (Google AI), Bradley Green (Google AI), and Xiaogang Wang (Multimedia Laboratory, The Chinese University of Hong Kong)

Total Deep Variation for Linear Inverse Problems .7546.....
Erich Kobler (Graz University of Technology), Alexander Effland (Graz University of Technology), Karl Kunisch (University of Graz), and Thomas Pock (Graz University of Technology)

Relative Interior Rule in Block-Coordinate Descent .7556
Tomáš Werner (Faculty of Electrical Engineering, Czech Technical University in Prague, Czech Republic), Daniel Průša (Faculty of Electrical Engineering, Czech Technical University in Prague, Czech Republic), and Tomáš Dlask (Faculty of Electrical Engineering, Czech Technical University in Prague, Czech Republic)

Learning Combinatorial Solver for Graph Matching .7565
Tao Wang (The Beijing Key Laboratory of Traffic Data Analysis and Mining, Beijing Jiaotong University, Beijing, China; HiScene Information Technologies, Shanghai), He Liu (The Beijing Key Laboratory of Traffic Data Analysis and Mining, Beijing Jiaotong University, Beijing, China), Yidong Li (The Beijing Key Laboratory of Traffic Data Analysis and Mining, Beijing Jiaotong University, Beijing, China), Yi Jin (The Beijing Key Laboratory of Traffic Data Analysis and Mining, Beijing Jiaotong University, Beijing, China), Xiaohui Hou (HiScene Information Technologies, Shanghai, China), and Haibin Ling (Stony Brook University, Stony Brook, USA)

SampleNet: Differentiable Point Cloud Sampling .7575
Itai Lang (Tel Aviv University), Asaf Manor (Tel Aviv University), and Shai Avidan (Tel Aviv University)

Can We Learn Heuristics for Graphical Model Inference Using Reinforcement Learning? .7586
Safa Messaoud (University of Illinois at Urbana-Champaign), Maghav Kumar (University of Illinois at Urbana-Champaign), and Alexander G. Schwing (University of Illinois at Urbana-Champaign)

Quasi-Newton Solver for Robust Non-Rigid Registration .7597
Yuxin Yao (University of Science and Technology of China), Bailin Deng (Cardiff University), Weiwei Xu (Zhejiang University), and Juyong Zhang (University of Science and Technology of China)

Rethinking Class-Balanced Methods for Long-Tailed Visual Recognition From a Domain Adaptation Perspective .7607
Muhammad Abdullah Jamal (University of Central Florida), Matthew Brown (Google), Ming-Hsuan Yang (University of California at Merced; Google), Liqiang Wang (University of Central Florida), and Boqing Gong (Google)

Optimizing Rank-Based Metrics With Blackbox Differentiation .7617
Michal Rolínek (Max-Planck-Institute for Intelligent Systems, Tübingen, Germany), Vít Musil (Università degli Studi di Firenze, Italy), Anselm Paulus (Max-Planck-Institute for Intelligent Systems, Tübingen, Germany), Marin Vlastelica (Max-Planck-Institute for Intelligent Systems, Tübingen, Germany), Claudio Michaelis (University of Tübingen, Germany), and Georg Martius (Max-Planck-Institute for Intelligent Systems, Tübingen, Germany)

Poster 2-3P

DualSDF: Semantic Shape Manipulation Using a Two-Level Representation .7628
Zekun Hao (Cornell Tech, Cornell University), Hadar Averbuch-Elor (Cornell Tech, Cornell University), Noah Snavely (Cornell Tech, Cornell University), and Serge Belongie (Cornell Tech, Cornell University)

Dynamic Hierarchical Mimicking Towards Consistent Optimization Objectives .7639
Duo Li (The Hong Kong University of Science and Technology) and Qifeng Chen (The Hong Kong University of Science and Technology)

Deep Homography Estimation for Dynamic Scenes .7649
Hoang Le (Portland State University), Feng Liu (Portland State University), Shu Zhang (Google), and Aseem Agarwala (Adobe Research)

PF-Net: Point Fractal Network for 3D Point Cloud Completion .7659
Zitian Huang (Shanghai Jiao Tong University), Yikuan Yu (Shanghai Jiao Tong University; SenseTime), Jiawen Xu (Shanghai Jiao Tong University), Feng Ni (SenseTime), and Xinyi Le (Shanghai Jiao Tong University)

On the Regularization Properties of Structured Dropout .7668
Ambar Pal (Mathematical Institute for Data Science, Johns Hopkins University, USA), Connor Lane (Mathematical Institute for Data Science, Johns Hopkins University, USA), René Vidal (Mathematical Institute for Data Science, Johns Hopkins University, USA), and Benjamin D. Haeffele (Mathematical Institute for Data Science, Johns Hopkins University, USA)

Learning Oracle Attention for High-Fidelity Face Completion .7677
Tong Zhou (South China University of Technology), Changxing Ding (South China University of Technology), Shaowen Lin (South China University of Technology), Xinchao Wang (Stevens Institute of Technology), and Dacheng Tao (UBTECH Sydney AI Centre, School of Computer Science, Faculty of Engineering, The University of Sydney, Australia)

Deep Image Spatial Transformation for Person Image Generation .7687
Yurui Ren (School of Electronic and Computer Engineering, Peking University; Peng Cheng Laboratory), Xiaoming Yu (School of Electronic and Computer Engineering, Peking University; Peng Cheng Laboratory), Junming Chen (School of Electronic and Computer Engineering, Peking University; Peng Cheng Laboratory), Thomas H. Li (Advanced Institute of Information Technology, Peking University; School of Electronic and Computer Engineering, Peking University), and Ge Li (School of Electronic and Computer Engineering, Peking University; Peng Cheng Laboratory)

Learning to Optimize on SPD Manifolds .7697
Zhi Gao (Beijing Laboratory of Intelligent Information Technology, School of Computer Science, Beijing Institute of Technology, Beijing, China), Yuwei Wu (Beijing Laboratory of Intelligent Information Technology, School of Computer Science, Beijing Institute of Technology, Beijing, China), Yunde Jia (Beijing Laboratory of Intelligent Information Technology, School of Computer Science, Beijing Institute of Technology, Beijing, China), and Mehrtash Harandi (Department of Electrical and Computer Systems Eng., Monash University, and Data61, Australia)

Deep 3D Portrait From a Single Image .7707
Sicheng Xu (Beijing Institute of Technology), Jiaolong Yang (Microsoft Research Asia), Dong Chen (Microsoft Research Asia), Fang Wen (Microsoft Research Asia), Yu Deng (Tsinghua University), Yunde Jia (Beijing Institute of Technology), and Xin Tong (Microsoft Research Asia)

RDCFace: Radial Distortion Correction for Face Recognition .7718
He Zhao (Key Laboratory of Machine Perception (MOE), School of EECS, Peking University), Xianghua Ying (Key Laboratory of Machine Perception (MOE), School of EECS, Peking University), Yongjie Shi (Key Laboratory of Machine Perception (MOE), School of EECS, Peking University), Xin Tong (Key Laboratory of Machine Perception (MOE), School of EECS, Peking University), Jingsi Wen (Key Laboratory of Machine Perception (MOE), School of EECS, Peking University), and Hongbin Zha (Key Laboratory of Machine Perception (MOE), School of EECS, Peking University)

Global-Local GCN: Large-Scale Label Noise Cleansing for Face Recognition .7728
Yaobin Zhang (Beijing University of Posts and Telecommunications), Weihong Deng (Beijing University of Posts and Telecommunications), Mei Wang (Beijing University of Posts and Telecommunications), Jiani Hu (Beijing University of Posts and Telecommunications), Xian Li (Canon Information Technology (Beijing) Co., Ltd), Dongyue Zhao (Canon Information Technology (Beijing) Co., Ltd), and Dongchao Wen (Canon Information Technology (Beijing) Co., Ltd)

MISC: Multi-Condition Injection and Spatially-Adaptive Compositing for Conditional Person Image Synthesis .7738
Shuchen Weng (NELVT, Dept. of CS, Peking University), Wenbo Li (Samsung Research America AI Center), Dawei Li (Samsung Research America AI Center), Hongxia Jin (Samsung Research America AI Center), and Boxin Shi (NELVT, Dept. of CS, Peking University)

SAINT: Spatially Aware Interpolation NeTwork for Medical Slice Synthesis .7747
Cheng Peng (University of Maryland, College Park), Wei-An Lin (University of Maryland, College Park), Haofu Liao (University of Rochester), Rama Chellappa (University of Maryland, College Park), and S. Kevin Zhou (Chinese Academy of Sciences; Peng Cheng Laboratory, Shenzhen)

Recurrent Feature Reasoning for Image Inpainting ..7757
Jingyuan Li (National Engineering Research Center for Multimedia Software, School of Computer Science and Institute of Artificial Intelligence, Wuhan University, China), Ning Wang (National Engineering Research Center for Multimedia Software, School of Computer Science and Institute of Artificial Intelligence, Wuhan University, China), Lefei Zhang (National Engineering Research Center for Multimedia Software, School of Computer Science and Institute of Artificial Intelligence, Wuhan University, China), Bo Du (National Engineering Research Center for Multimedia Software, School of Computer Science and Institute of Artificial Intelligence, Wuhan University, China), and Dacheng Tao (UBTECH Sydney AI Centre, School of Computer Science, Faculty of Engineering, The University of Sydney, Australia)

Structure-Preserving Super Resolution With Gradient Guidance ..7766
Cheng Ma (Department of Automation, Tsinghua University, China; State Key Lab of Intelligent Technologies and Systems, China; Beijing National Research Center for Information Science and Technology, China), Yongming Rao (Department of Automation, Tsinghua University, China; State Key Lab of Intelligent Technologies and Systems, China; Beijing National Research Center for Information Science and Technology, China), Yean Cheng (Department of Automation, Tsinghua University, China), Ce Chen (Department of Automation, Tsinghua University, China), Jiwen Lu (Department of Automation, Tsinghua University, China; State Key Lab of Intelligent Technologies and Systems, China; Beijing National Research Center for Information Science and Technology, China), and Jie Zhou (Department of Automation, Tsinghua University, China; State Key Lab of Intelligent Technologies and Systems, China; Beijing National Research Center for Information Science and Technology, China; Tsinghua Shenzhen International Graduate School, Tsinghua University, China)

Epipolar Transformers ..7776
Yihui He (Carnegie Mellon University), Rui Yan (Carnegie Mellon University), Katerina Fragkiadaki (Carnegie Mellon University), and Shoou-I Yu (Facebook Reality Labs)

Diversified Arbitrary Style Transfer via Deep Feature Perturbation ..7786
Zhizhong Wang (College of Computer Science and Technology, Zhejiang University), Lei Zhao (College of Computer Science and Technology, Zhejiang University), Haibo Chen (College of Computer Science and Technology, Zhejiang University), Lihong Qiu (College of Computer Science and Technology, Zhejiang University), Qihang Mo (College of Computer Science and Technology, Zhejiang University), Sihuan Lin (College of Computer Science and Technology, Zhejiang University), Wei Xing (College of Computer Science and Technology, Zhejiang University), and Dongming Lu (College of Computer Science and Technology, Zhejiang University)

MSG-GAN: Multi-Scale Gradients for Generative Adversarial Networks ..7796
Animesh Karnewar (TomTom) and Oliver Wang (Adobe Research)

Overcoming Multi-Model Forgetting in One-Shot NAS With Diversity Maximization .7806.....
Miao Zhang (Beijing Institute of Technology; University of Technology Sydney), Huiqi Li (Beijing Institute of Technology), Shirui Pan (Monash University), Xiaojun Chang (Monash University), and Steven Su (University of Technology Sydney)

Select to Better Learn: Fast and Accurate Deep Learning Using Data Selection From Nonlinear Manifolds .7816.....
Mohsen Joneidi (Department of Electrical and Computer Engineering, University of Central Florida), Saeed Vahidian (Department of Electrical and Computer Engineering, University of California, San Diego), Ashkan Esmaeili (Department of Electrical and Computer Engineering, University of Central Florida), Weijia Wang (Department of Electrical and Computer Engineering, University of California, San Diego), Nazanin Rahnavard (Department of Electrical and Computer Engineering, University of Central Florida), Bill Lin (Department of Electrical and Computer Engineering, University of California, San Diego), and Mubarak Shah (University of Central Florida, Center for Research in Computer Vision)

Neural Point Cloud Rendering via Multi-Plane Projection .7827.....
Peng Dai (University of Electronic Science and Technology of China), Yinda Zhang (Google Research), Zhuwen Li (Nuro Inc), Shuaicheng Liu (University of Electronic Science and Technology of China), and Bing Zeng (University of Electronic Science and Technology of China)

Wish You Were Here: Context-Aware Human Generation .7837.....
Oran Gafni (Facebook AI Research) and Lior Wolf (Facebook AI Research and Tel-Aviv University)

Towards Photo-Realistic Virtual Try-On by Adaptively GeneratingPreserving Image Content .7847
Han Yang (Harbin Institute of Technology; SenseTime Research), Ruimao Zhang (SenseTime Research), Xiaobao Guo (SenseTime Research), Wei Liu (Tencent AI Lab), Wangmeng Zuo (Harbin Institute of Technology), and Ping Luo (The University of Hong Kong)

Breaking the Cycle – Colleagues Are All You Need .7857.....
Ori Nizan (Technion, Israel) and Ayellet Tal (Technion, Israel)

Local Class-Specific and Global Image-Level Generative Adversarial Networks for Semantic-Guided Scene Generation .7867.....
Hao Tang (University of Trento), Dan Xu (University of Oxford), Yan Yan (Texas State University), Philip H.S. Torr (University of Oxford), and Nicu Sebe (University of Trento; Huawei Research Ireland)

ManiGAN: Text-Guided Image Manipulation .7877.....
Bowen Li (University of Oxford), Xiaojuan Qi (University of Oxford; University of Hong Kong), Thomas Lukasiewicz (University of Oxford), and Philip H.S. Torr (University of Oxford)

Watch Your Up-Convolution: CNN Based Generative Deep Neural Networks Are Failing to Reproduce Spectral Distributions .7887
Ricard Durall (Competence Center High Performance Computing, Fraunhofer ITWM, Kaiserslautern, Germany; IWR, University of Heidelberg, Germany), Margret Keuper (Data and Web Science Group, University of Mannheim, Germany), and Janis Keuper (Competence Center High Performance Computing, Fraunhofer ITWM, Kaiserslautern, Germany; Institute for Machine Learning and Analytics, Offenburg University, Germany)

Belief Propagation Reloaded: Learning BP-Layers for Labeling Problems .7897
Patrick Knöbelreiter (Graz University of Technology), Christian Sormann (Graz University of Technology), Alexander Shekhovtsov (Czech Technical University in Prague), Friedrich Fraundorfer (Graz University of Technology), and Thomas Pock (Graz University of Technology)

Barycenters of Natural Images - Constrained Wasserstein Barycenters for Image Morphing .7907
Dror Simon (Technion, Haifa, Israel) and Aviad Aberdam (Technion, Haifa, Israel)

Guided Variational Autoencoder for Disentanglement Learning .7917
Zheng Ding (Tsinghua University; UC San Diego), Yifan Xu (UC San Diego), Weijian Xu (UC San Diego), Gaurav Parmar (UC San Diego), Yang Yang (Qualcomm, Inc.), Max Welling (Qualcomm, Inc.; University of Amsterdam), and Zhuowen Tu (UC San Diego)

Cross-Spectral Face Hallucination via Disentangling Independent Factors .7927
Boyan Duan (NLPR & CEBSIT & CRIPAC, CASIA), Chaoyou Fu (NLPR & CEBSIT & CRIPAC, CASIA; University of Chinese Academy of Sciences), Yi Li (NLPR & CEBSIT & CRIPAC, CASIA; University of Chinese Academy of Sciences), Xingguang Song (Central Media Technology Institute, Huawei Technology Co., Ltd.), and Ran He (NLPR & CEBSIT & CRIPAC, CASIA; University of Chinese Academy of Sciences)

Learned Image Compression With Discretized Gaussian Mixture Likelihoods and Attention Modules .7936
Zhengxue Cheng (Department of Computer Science and Communication Engineering, Waseda University, Tokyo, Japan), Heming Sun (Waseda Research Institute for Science and Engineering, Tokyo, Japan; JST, Japan), Masaru Takeuchi (Waseda Research Institute for Science and Engineering, Tokyo, Japan), and Jiro Katto (Department of Computer Science and Communication Engineering, Waseda University, Tokyo, Japan)

C-Flow: Conditional Generative Flow Models for Images and 3D Point Clouds .7946
Albert Pumarola (Institut de Robòtica i Informàtica Industrial, CSIC-UPC, Barcelona, Spain), Stefan Popov (Google Research, Zürich, Switzerland), Francesc Moreno-Noguer (Institut de Robòtica i Informàtica Industrial, CSIC-UPC, Barcelona, Spain), and Vittorio Ferrari (Google Research, Zürich, Switzerland)

Cogradient Descent for Bilinear Optimization .7956
Li'an Zhuo (School of Automation Science and Electrical Engineering, Beihang University), Baochang Zhang (School of Automation Science and Electrical Engineering, Beihang University), Linlin Yang (University of Bonn), Hanlin Chen (School of Automation Science and Electrical Engineering, Beihang University), Qixiang Ye (University of Chinese Academy of Sciences), David Doermann (University at Buffalo), Rongrong Ji (School of Information Science and Engineering, Xiamen University), and Guodong Guo (Institute of Deep Learning, Baidu; National Engineering Lab for Deep Learning Tech. and App.)

Instance-Aware Image Colorization .7965
Jheng-Wei Su (National Tsing Hua University), Hung-Kuo Chu (National Tsing Hua University), and Jia-Bin Huang (Virginia Tech)

Joint Training of Variational Auto-Encoder and Latent Energy-Based Model .7975
Tian Han (Department of Computer Science, Stevens Institute of Technology), Erik Nijkamp (Department of Statistics, University of California, Los Angeles), Linqi Zhou (Department of Statistics, University of California, Los Angeles), Bo Pang (Department of Statistics, University of California, Los Angeles), Song-Chun Zhu (Department of Statistics, University of California, Los Angeles), and Ying Nian Wu (Department of Statistics, University of California, Los Angeles)

Adaptive Loss-Aware Quantization for Multi-Bit Networks .7985
Zhongnan Qu (Computer Engineering Group, ETH Zurich, Switzerland), Zimu Zhou (School of Information Systems, Singapore Management University, Singapore), Yun Cheng (Computer Engineering Group, ETH Zurich, Switzerland), and Lothar Thiele (Computer Engineering Group, ETH Zurich, Switzerland)

ScopeFlow: Dynamic Scene Scoping for Optical Flow .7995
Aviram Bar-Haim (Tel Aviv University) and Lior Wolf (Tel Aviv University; Facebook AI Research)

Video Super-Resolution With Temporal Group Attention .8005
Takashi Isobe (Department of Electronic Engineering, Tsinghua University; Noah's Ark Lab, Huawei Technologies), Songjiang Li (Noah's Ark Lab, Huawei Technologies), Xu Jia (Noah's Ark Lab, Huawei Technologies), Shanxin Yuan (Noah's Ark Lab, Huawei Technologies), Gregory Slabaugh (Noah's Ark Lab, Huawei Technologies), Chunjing Xu (Noah's Ark Lab, Huawei Technologies), Ya-Li Li (Department of Electronic Engineering, Tsinghua University), Shengjin Wang (Department of Electronic Engineering, Tsinghua University), and Qi Tian (Noah's Ark Lab, Huawei Technologies)

Group Sparsity: The Hinge Between Filter Pruning and Decomposition for Network Compression.. 8015
Yawei Li (Computer Vision Lab, ETH Zürich, Switzerland), Shuhang Gu (Computer Vision Lab, ETH Zürich, Switzerland), Christoph Mayer (Computer Vision Lab, ETH Zürich, Switzerland), Luc Van Gool (Computer Vision Lab, ETH Zürich, Switzerland; KU Leuven, Belgium), and Radu Timofte (Computer Vision Lab, ETH Zürich, Switzerland)

3D Photography Using Context-Aware Layered Depth Inpainting .8025
Meng-Li Shih (Virginia Tech; National Tsing Hua University), Shih-Yang Su (Virginia Tech), Johannes Kopf (Facebook), and Jia-Bin Huang (Virginia Tech)

MixNMatch: Multifactor Disentanglement and Encoding for Conditional Image Generation .8036
Yuheng Li (University of California, Davis), Krishna Kumar Singh (University of California, Davis), Utkarsh Ojha (University of California, Davis), and Yong Jae Lee (University of California, Davis)

Low-Rank Compression of Neural Nets: Learning the Rank of Each Layer .8046
Yerlan Idelbayev (Dept. CSE, University of California, Merced) and Miguel Á. Carreira-Perpiñán (Dept. CSE, University of California, Merced)

Global Texture Enhancement for Fake Face Detection in the Wild .8057
Zhengzhe Liu (University of Oxford), Xiaojuan Qi (University of Oxford; The University of Hong Kong), and Philip H.S. Torr (University of Oxford)

Panoptic-Based Image Synthesis .8067
Aysegul Dundar (NVIDIA Corporation), Karan Sapra (NVIDIA Corporation), Guilin Liu (NVIDIA Corporation), Andrew Tao (NVIDIA Corporation), and Bryan Catanzaro (NVIDIA Corporation)

Lighthouse: Predicting Lighting Volumes for Spatially-Coherent Illumination .8077
Pratul P. Srinivasan (UC Berkeley), Ben Mildenhall (UC Berkeley), Matthew Tancik (UC Berkeley), Jonathan T. Barron (Google Research), Richard Tucker (Google Research), and Noah Snavely (Google Research)

Learning to Cartoonize Using White-Box Cartoon Representations .8087
Xinrui Wang (ByteDance; The University of Tokyo; Style2Paints Research) and Jinze Yu (The University of Tokyo)

End-to-End Learnable Geometric Vision by Backpropagating PnP Optimization .8097
Bo Chen (The University of Adelaide), Álvaro Parra (The University of Adelaide), Jiewei Cao (The University of Adelaide), Nan Li (Shenzhen University), and Tat-Jun Chin (The University of Adelaide)

Analyzing and Improving the Image Quality of StyleGAN .8107
Tero Karras (NVIDIA), Samuli Laine (NVIDIA), Miika Aittala (NVIDIA), Janne Hellsten (NVIDIA), Jaakko Lehtinen (NVIDIA and Aalto University), and Timo Aila (NVIDIA)

Fashion Editing With Adversarial Parsing Learning .8117
Haoye Dong (School of Data and Computer Science, Sun Yat-sen University; Guangdong Key Laboratory of Big Data Analysis and Processing, Guangzhou , P.R.China), Xiaodan Liang (School of Intelligent Systems Engineering, Sun Yat-sen University), Yixuan Zhang (Petuum Inc.), Xujie Zhang (School of Data and Computer Science, Sun Yat-sen University), Xiaohui Shen (ByteDance AI Lab), Zhenyu Xie (School of Data and Computer Science, Sun Yat-sen University), Bowen Wu (School of Data and Computer Science, Sun Yat-sen University), and Jian Yin (School of Data and Computer Science, Sun Yat-sen University; Guangdong Key Laboratory of Big Data Analysis and Processing, Guangzhou , P.R.China)

Augment Your Batch: Improving Generalization Through Instance Repetition .8126.....
Elad Hoffer (Habana-Labs, Caesarea, Israel), Tal Ben-Nun (Department of Computer Science, ETH Zurich, Switzerland), Itay Hubara (Habana-Labs, Caesarea, Israel), Niv Giladi (Department of Electrical Engineering, Technion, Haifa, Israel), Torsten Hoefler (Department of Computer Science, ETH Zurich, Switzerland), and Daniel Soudry (Department of Electrical Engineering, Technion, Haifa, Israel)

ARShadowGAN: Shadow Generative Adversarial Network for Augmented Reality in Single Light Scenes .8136.....
Daquan Liu (School of Computer Science, Wuhan University), Chengjiang Long (Kitware Inc., NY, USA), Hongpan Zhang (School of Computer Science, Wuhan University), Hanning Yu (School of Computer Science, Wuhan University), Xinzhi Dong (School of Computer Science, Wuhan University), and Chunxia Xiao (School of Computer Science, Wuhan University; National Engineering Research Center For Multimedia Software, Wuhan University; Institute of Artificial Intelligence, Wuhan University)

An End-to-End Edge Aggregation Network for Moving Object Segmentation .8146.....
Prashant W. Patil (CVPR Lab, Indian Institute of Technology Ropar, INDIA), Kuldeep M. Biradar (CVPR Lab, Indian Institute of Technology Ropar, INDIA), Akshay Dudhane (CVPR Lab, Indian Institute of Technology Ropar, INDIA), and Subrahmanyam Murala (CVPR Lab, Indian Institute of Technology Ropar, INDIA)

Learning Video Stabilization Using Optical Flow .8156.....
Jiyang Yu (University of California, San Diego) and Ravi Ramamoorthi (University of California, San Diego)

Reusing Discriminators for Encoding: Towards Unsupervised Image-to-Image Translation .8165
Runfa Chen (Institute for Artificial Intelligence, Tsinghua University (THUAI), Beijing National Research Center for Information Science and Technology (BNRist), State Key Lab on Intelligent Technology and Systems, Department of Computer Science and Technology, Tsinghua University, Beijing, P.R.China), Wenbing Huang (Institute for Artificial Intelligence, Tsinghua University (THUAI), Beijing National Research Center for Information Science and Technology (BNRist), State Key Lab on Intelligent Technology and Systems, Department of Computer Science and Technology, Tsinghua University, Beijing, P.R.China), Binghui Huang (Institute for Artificial Intelligence, Tsinghua University (THUAI), Beijing National Research Center for Information Science and Technology (BNRist), State Key Lab on Intelligent Technology and Systems, Department of Computer Science and Technology, Tsinghua University, Beijing, P.R.China), Fuchun Sun (Institute for Artificial Intelligence, Tsinghua University (THUAI), Beijing National Research Center for Information Science and Technology (BNRist), State Key Lab on Intelligent Technology and Systems, Department of Computer Science and Technology, Tsinghua University, Beijing, P.R.China), and Bin Fang (Institute for Artificial Intelligence, Tsinghua University (THUAI), Beijing National Research Center for Information Science and Technology (BNRist), State Key Lab on Intelligent Technology and Systems, Department of Computer Science and Technology, Tsinghua University, Beijing, P.R.China)

Robust Design of Deep Neural Networks Against Adversarial Attacks Based on Lyapunov Theory… 8175
Arash Rahnama (Modzy), Andre T. Nguyen (Booz Allen Hamilton), and Edward Raff (Booz Allen Hamilton)

StarGAN v2: Diverse Image Synthesis for Multiple Domains .8185……
Yunjey Choi (Clova AI Research, NAVER Corp.), Youngjung Uh (Clova AI Research, NAVER Corp.), Jaejun Yoo (Clova AI Research, NAVER Corp.), and Jung-Woo Ha (Clova AI Research, NAVER Corp.)

Warping Residual Based Image Stitching for Large Parallax .8195……
Kyu-Yul Lee (School of Electrical and Computer Engineering, UNIST, Ulsan, Korea) and Jae-Young Sim (School of Electrical and Computer Engineering, UNIST, Ulsan, Korea)

A U-Net Based Discriminator for Generative Adversarial Networks .8204……
Edgar Schönfeld (Bosch Center for Artificial Intelligence), Bernt Schiele (Max Planck Institute for Informatics), and Anna Khoreva (Bosch Center for Artificial Intelligence)

Unpaired Portrait Drawing Generation via Asymmetric Cycle Mapping .8214……
Ran Yi (CS Dept, BNRist, Tsinghua University, China), Yong-Jin Liu (CS Dept, BNRist, Tsinghua University, China), Yu-Kun Lai (School of Computer Science and Informatics, Cardiff University, UK), and Paul L. Rosin (School of Computer Science and Informatics, Cardiff University, UK)

When to Use Convolutional Neural Networks for Inverse Problems .8223……
Nathaniel Chodosh (Carnegie Mellon University) and Simon Lucey (Carnegie Mellon University; Argo AI)

LUVLi Face Alignment: Estimating Landmarks' Location, Uncertainty, and Visibility Likelihood .8233……
Abhinav Kumar (University of Utah), Tim K. Marks (Mitsubishi Electric Research Labs (MERL)), Wenxuan Mou (University of Manchester), Ye Wang (Mitsubishi Electric Research Labs (MERL)), Michael Jones (Mitsubishi Electric Research Labs (MERL)), Anoop Cherian (Mitsubishi Electric Research Labs (MERL)), Toshiaki Koike-Akino (Mitsubishi Electric Research Labs (MERL)), Xiaoming Liu (Michigan State University), and Chen Feng (New York University)

Affinity Graph Supervision for Visual Recognition .8244……
Chu Wang (McGill University), Babak Samari (McGill University), Vladimir G. Kim (Adobe Research), Siddhartha Chaudhuri (Adobe Research; IIT Bombay), and Kaleem Siddiqi (McGill University)

Unsupervised Magnification of Posture Deviations Across Subjects .8253……
Michael Dorkenwald (HCI / IWR, Heidelberg University, Germany), Uta Büchler (HCI / IWR, Heidelberg University, Germany), and Björn Ommer (HCI / IWR, Heidelberg University, Germany)

Accurate Estimation of Body Height From a Single Depth Image via a Four-Stage Developing Network .8264……
Fukun Yin (College of Computer Science and Electronic Engineering, Hunan University, Changsha, China) and Shizhe Zhou (College of Computer Science and Electronic Engineering, Hunan University, Changsha, China)

Fast Soft Color Segmentation ..8274
Naofumi Akimoto (Keio University), Huachun Zhu (Preferred Networks), Yanghua Jin (Preferred Networks), and Yoshimitsu Aoki (Keio University)

Global Optimality for Point Set Registration Using Semidefinite Programming ..8284
José Pedro Iglesias (Chalmers University of Technology, Sweden), Carl Olsson (Chalmers University of Technology, Sweden; Lund University, Sweden), and Fredrik Kahl (Chalmers University of Technology, Sweden)

Image2StyleGAN++: How to Edit the Embedded Images? ..8293
Rameen Abdal (KAUST), Yipeng Qin (Cardiff University), and Peter Wonka (KAUST)

SQE: a Self Quality Evaluation Metric for Parameters Optimization in Multi-Object Tracking ..8303
Yanru Huang (Tsinghua University), Feiyu Zhu (Megvii Inc.), Zheni Zeng (Tsinghua University), Xi Qiu (Megvii Inc.), Yuan Shen (Tsinghua University), and Jianan Wu (Megvii Inc.)

EventSR: From Asynchronous Events to Image Reconstruction, Restoration, and Super-Resolution via End-to-End Adversarial Learning ..8312
Lin Wang (Visual Intelligence Lab., KAIST, Korea), Tae-Kyun Kim (ICVL Lab., Imperial College London, UK), and Kuk-Jin Yoon (Visual Intelligence Lab., KAIST, Korea)

Hierarchical Pyramid Diverse Attention Networks for Face Recognition ..8323
Qiangchang Wang (West Virginia University, Morgantown, USA), Tianyi Wu (Institute of Deep Learning, Baidu Research, Beijing, China; National Engineering Laboratory for Deep Learning Technology and Application, Beijing, China), He Zheng (Institute of Deep Learning, Baidu Research, Beijing, China; National Engineering Laboratory for Deep Learning Technology and Application, Beijing, China), and Guodong Guo (West Virginia University, Morgantown, USA; Institute of Deep Learning, Baidu Research, Beijing, China; National Engineering Laboratory for Deep Learning Technology and Application, Beijing, China)

RGBD-Dog: Predicting Canine Pose from RGBD Sensors ..8333
Sinéad Kearney (University of Bath), Wenbin Li (University of Bath), Martin Parsons (University of Bath), Kwang In Kim (UNIST), and Darren Cosker (University of Bath)

Multi-Scale Progressive Fusion Network for Single Image Deraining ..8343
Kui Jiang (Wuhan University), Zhongyuan Wang (Wuhan University), Peng Yi (Wuhan University), Chen Chen (University of North Carolina at Charlotte), Baojin Huang (Wuhan University), Yimin Luo (King's College London), Jiayi Ma (Wuhan University), and Junjun Jiang (Harbin Institute of Technology)

Learning a Neural 3D Texture Space From 2D Exemplars ..8353
Philipp Henzler (University College London), Niloy J. Mitra (University College London; Adobe Research), and Tobias Ritschel (University College London)

BachGAN: High-Resolution Image Synthesis From Salient Object Layout .8362
Yandong Li (University of Central Florida), Yu Cheng (Microsoft Dynamics 365 AI Research), Zhe Gan (Microsoft Dynamics 365 AI Research), Licheng Yu (Microsoft Dynamics 365 AI Research), Liqiang Wang (University of Central Florida), and Jingjing Liu (Microsoft Dynamics 365 AI Research)

Rethinking Data Augmentation for Image Super-resolution: A Comprehensive Analysis and a New Strategy .8372
Jaejun Yoo (EPFL.), Namhyuk Ahn (Ajou University), and Kyung-Ah Sohn (Ajou University)

On Positive-Unlabeled Classification in GAN .8382
Tianyu Guo (Key Lab of Machine Perception (MOE), Dept. of Machine Intelligence, Peking University.; UBTECH Sydney AI Centre, School of Computer Science, Faculty of Engineering, University of Sydney), Chang Xu (UBTECH Sydney AI Centre, School of Computer Science, Faculty of Engineering, University of Sydney), Jiajun Huang (UBTECH Sydney AI Centre, School of Computer Science, Faculty of Engineering, University of Sydney), Yunhe Wang (Noah's Ark Lab, Huawei Technologies.), Boxin Shi (NELVT, Dept. of CS, Peking University.; Peng Cheng Laboratory), Chao Xu (Key Lab of Machine Perception (MOE), Dept. of Machine Intelligence, Peking University.), and Dacheng Tao (UBTECH Sydney AI Centre, School of Computer Science, Faculty of Engineering, University of Sydney)

DoveNet: Deep Image Harmonization via Domain Verification .8391
Wenyan Cong (MoE Key Lab of Artificial Intelligence, Shanghai Jiao Tong University), Jianfu Zhang (MoE Key Lab of Artificial Intelligence, Shanghai Jiao Tong University), Li Niu (MoE Key Lab of Artificial Intelligence, Shanghai Jiao Tong University), Liu Liu (MoE Key Lab of Artificial Intelligence, Shanghai Jiao Tong University), Zhixin Ling (MoE Key Lab of Artificial Intelligence, Shanghai Jiao Tong University), Weiyuan Li (East China Normal University), and Liqing Zhang (MoE Key Lab of Artificial Intelligence, Shanghai Jiao Tong University)

Noise Robust Generative Adversarial Networks .8401
Takuhiro Kaneko (The University of Tokyo) and Tatsuya Harada (The University of Tokyo; RIKEN)

Normalizing Flows With Multi-Scale Autoregressive Priors .8412
Apratim Bhattacharyya (Max Planck Institute for Informatics, Saarland Informatics Campus), Shweta Mahajan (Department of Computer Science, TU Darmstadt), Mario Fritz (CISPA Helmholtz Center for Information Security, Saarland Informatics Campus), Bernt Schiele (Max Planck Institute for Informatics, Saarland Informatics Campus), and Stefan Roth (Department of Computer Science, TU Darmstadt)

Robust Reference-Based Super-Resolution With Similarity-Aware Deformable Convolution .8422
Gyumin Shim (Robotics and Computer Vision Laboratory, Korea Advanced Institute of Science and Technology, Republic of Korea), Jinsun Park (Robotics and Computer Vision Laboratory, Korea Advanced Institute of Science and Technology, Republic of Korea), and In So Kweon (Robotics and Computer Vision Laboratory, Korea Advanced Institute of Science and Technology, Republic of Korea)

Painting Many Pasts: Synthesizing Time Lapse Videos of Paintings .8432
Amy Zhao (MIT), Guha Balakrishnan (MIT), Kathleen M. Lewis (MIT), Frédo Durand (MIT), John V. Guttag (MIT), and Adrian V. Dalca (MIT)

GeoDA: A Geometric Framework for Black-Box Adversarial Attacks .8443
Ali Rahmati (Department of ECE, North Carolina State University), Seyed-Mohsen Moosavi-Dezfooli (Institue for Machine Learning, ETH Zurich), Pascal Frossard (Ecole Polytechnique Federale de Lausanne), and Huaiyu Dai (Department of ECE, North Carolina State University)

GAMIN: Generative Adversarial Multiple Imputation Network for Highly Missing Data .8453
Seongwook Yoon (Korea University, Seoul, Republic of Korea) and Sanghoon Sull (Korea University, Seoul, Republic of Korea)

An Internal Covariate Shift Bounding Algorithm for Deep Neural Networks by Unitizing Layers' Outputs .8462
You Huang (Fuzhou University) and Yuanlong Yu (Fuzhou University)

A Unified Optimization Framework for Low-Rank Inducing Penalties .8471
Marcus Valtonen Örnhag (Centre for Mathematical Sciences, Lund University) and Carl Olsson (Department of Electrical Engineering, Chalmers University of Technology)

Single-Side Domain Generalization for Face Anti-Spoofing .8481
Yunpei Jia (Key Lab of Intelligent Information Processing of Chinese Academy of Sciences (CAS), Institute of Computing Technology, CAS, Beijing, China; University of Chinese Academy of Sciences, Beijing, China), Jie Zhang (Key Lab of Intelligent Information Processing of Chinese Academy of Sciences (CAS), Institute of Computing Technology, CAS, Beijing, China; University of Chinese Academy of Sciences, Beijing, China), Shiguang Shan (Key Lab of Intelligent Information Processing of Chinese Academy of Sciences (CAS), Institute of Computing Technology, CAS, Beijing, China; University of Chinese Academy of Sciences, Beijing, China; CAS Center for Excellence in Brain Science and Intelligence Technology, Shanghai, China), and Xilin Chen (Key Lab of Intelligent Information Processing of Chinese Academy of Sciences (CAS), Institute of Computing Technology, CAS, Beijing, China; University of Chinese Academy of Sciences, Beijing, China)

The Knowledge Within: Methods for Data-Free Model Compression .8491
Matan Haroush (Habana Labs Research, Caesarea, Israel), Itay Hubara (Habana Labs Research, Caesarea, Israel; Department of Electrical Engineering, Technion, Haifa, Israel), Elad Hoffer (Habana Labs Research, Caesarea, Israel), and Daniel Soudry (Department of Electrical Engineering, Technion, Haifa, Israel)

Scale-Space Flow for End-to-End Optimized Video Compression .8500
Eirikur Agustsson (Google Research, Perception Team), David Minnen (Google Research, Perception Team), Nick Johnston (Google Research, Perception Team), Johannes Ballé (Google Research, Perception Team), Sung Jin Hwang (Google Research, Perception Team), and George Toderici (Google Research, Perception Team)

Dynamic Neural Relational Inference .8510
Colin Graber (University of Illinois at Urbana-Champaign) and Alexander G. Schwing (University of Illinois at Urbana-Champaign)

Oral 2-4A: Segmentation, Grouping and Shape (1)

Real-Time Panoptic Segmentation From Dense Detections .8520
Rui Hou (Toyota Research Institute; University of Michigan, Ann Arbor), Jie Li (Toyota Research Institute), Arjun Bhargava (Toyota Research Institute), Allan Raventos (Toyota Research Institute), Vitor Guizilini (Toyota Research Institute), Chao Fang (Toyota Research Institute), Jerome Lynch (University of Michigan, Ann Arbor), and Adrien Gaidon (Toyota Research Institute)

Deep Snake for Real-Time Instance Segmentation .8530
Sida Peng (Zhejiang University), Wen Jiang (Zhejiang University), Huaijin Pi (Zhejiang University), Xiuli Li (Deepwise AI Lab), Hujun Bao (Zhejiang University), and Xiaowei Zhou (Zhejiang University)

AdaCoSeg: Adaptive Shape Co-Segmentation With Group Consistency Loss .8540
Chenyang Zhu (Simon Fraser University; National University of Defense Technology), Kai Xu (National University of Defense Technology), Siddhartha Chaudhuri (Adobe Research; IIT Bombay), Li Yi (Google Research), Leonidas J. Guibas (Stanford University), and Hao Zhang (Simon Fraser University)

Learning Dynamic Routing for Semantic Segmentation .8550
Yanwei Li (Institute of Automation, Chinese Academy of Sciences; University of Chinese Academy of Sciences), Lin Song (Xi'an Jiaotong University), Yukang Chen (Institute of Automation, Chinese Academy of Sciences; University of Chinese Academy of Sciences), Zeming Li (Megvii Technology), Xiangyu Zhang (Megvii Technology), Xingang Wang (Institute of Automation, Chinese Academy of Sciences), and Jian Sun (Megvii Technology)

Boosting Semantic Human Matting With Coarse Annotations .8560
Jinlin Liu (Alibaba Group; Department of Automation, Tsinghua University), Yuan Yao (Alibaba Group), Wendi Hou (Alibaba Group), Miaomiao Cui (Alibaba Group), Xuansong Xie (Alibaba Group), Changshui Zhang (Department of Automation, Tsinghua University), and Xian-Sheng Hua (Alibaba Group)

BlendMask: Top-Down Meets Bottom-Up for Instance Segmentation .8570
Hao Chen (The University of Adelaide, Australia), Kunyang Sun (Southeast University, China; The University of Adelaide, Australia), Zhi Tian (The University of Adelaide, Australia), Chunhua Shen (The University of Adelaide, Australia), Yongming Huang (Southeast University, China), and Youliang Yan (Huawei Noah's Ark Lab)

UC-Net: Uncertainty Inspired RGB-D Saliency Detection via Conditional Variational Autoencoders .8579
Jing Zhang (Australian National University; ACRV; Data61), Deng-Ping Fan (CS, Nankai University; Inception Institute of Artificial Intelligence (IIAI), Abu Dhabi, UAE), Yuchao Dai (Northwestern Polytechnical University), Saeed Anwar (Australian National University; Data61), Fatemeh Sadat Saleh (Australian National University; ACRV), Tong Zhang (Australian National University), and Nick Barnes (Australian National University)

Deep Geometric Functional Maps: Robust Feature Learning for Shape Correspondence .8589
Nicolas Donati (LIX, École Polytechnique), Abhishek Sharma (LIX, École Polytechnique), and Maks Ovsjanikov (LIX, École Polytechnique)

Deep Polarization Cues for Transparent Object Segmentation .8599
Agastya Kalra (Akasha Imaging), Vage Taamazyan (Akasha Imaging), Supreeth Krishna Rao (Akasha Imaging), Kartik Venkataraman (Akasha Imaging), Ramesh Raskar (Akasha Imaging; MIT Media Lab), and Achuta Kadambi (Akasha Imaging; University of California, Los Angeles (UCLA))

DualConvMesh-Net: Joint Geodesic and Euclidean Convolutions on 3D Meshes .8609
Jonas Schult (RWTH Aachen University), Francis Engelmann (RWTH Aachen University), Theodora Kontogianni (RWTH Aachen University), and Bastian Leibe (RWTH Aachen University)

F-BRS: Rethinking Backpropagating Refinement for Interactive Segmentation .8620
Konstantin Sofiiuk (Samsung AI Center – Moscow), Ilia Petrov (Samsung AI Center – Moscow), Olga Barinova (Samsung AI Center – Moscow), and Anton Konushin (Samsung AI Center – Moscow)

Approximating shapes in images with low-complexity polygons .8630
Muxingzi Li (Université Côte d'Azur, Inria), Florent Lafarge (Université Côte d'Azur, Inria), and Renaud Marlet (Valeo.ai & LIGM, Ecole des Ponts, Univ Gustave Eiffel, CNRS, Marne-la-Vallée, France)

Oral 2-4B: Explainable AI; Fairness, Accountability, Transparency and Ethics in Vision

Towards Visually Explaining Variational Autoencoders .8639
Wenqian Liu (Northeastern University, USA), Runze Li (University of California Riverside, USA), Meng Zheng (Rensselaer Polytechnic Institute, USA), Srikrishna Karanam (United Imaging Intelligence, USA), Ziyan Wu (United Imaging Intelligence, USA), Bir Bhanu (University of California Riverside, USA), Richard J. Radke (Rensselaer Polytechnic Institute, USA), and Octavia Camps (Northeastern University, USA)

Towards Global Explanations of Convolutional Neural Networks With Concept Attribution .8649
Weibin Wu (Department of Computer Science and Engineering, The Chinese University of Hong Kong), Yuxin Su (Department of Computer Science and Engineering, The Chinese University of Hong Kong), Xixian Chen (Tencent), Shenglin Zhao (Tencent), Irwin King (Department of Computer Science and Engineering, The Chinese University of Hong Kong), Michael R. Lyu (Department of Computer Science and Engineering, The Chinese University of Hong Kong), and Yu-Wing Tai (Tencent)

Interpretable and Accurate Fine-grained Recognition via Region Grouping .8659
Zixuan Huang (Department of Computer Sciences) and Yin Li (Department of Biostatistics and Medical Informatics; Department of Computer Sciences)

SAM: The Sensitivity of Attribution Methods to Hyperparameters .8670
Naman Bansal (Auburn University), Chirag Agarwal (University of Illinois at Chicago), and Anh Nguyen (Auburn University)

High-Frequency Component Helps Explain the Generalization of Convolutional Neural Networks.. 8681

Haohan Wang (School of Computer Science, Carnegie Mellon University), Xindi Wu (School of Computer Science, Carnegie Mellon University), Zeyi Huang (School of Computer Science, Carnegie Mellon University), and Eric P. Xing (School of Computer Science, Carnegie Mellon University)

CNN-Generated Images Are Surprisingly Easy to Spot... for Now .8692

Sheng-Yu Wang (UC Berkeley), Oliver Wang (Adobe Research), Richard Zhang (Adobe Research), Andrew Owens (UC Berkeley; University of Michigan), and Alexei A. Efros (UC Berkeley)

FALCON: A Fourier Transform Based Approach for Fast and Secure Convolutional Neural Network Predictions .8702

Shaohua Li (University of Science and Technology of China), Kaiping Xue (University of Science and Technology of China), Bin Zhu (University of Science and Technology of China), Chenkai Ding (University of Science and Technology of China), Xindi Gao (University of Science and Technology of China), David Wei (Fordham University), and Tao Wan (CableLabs)

Oral 2-4C: Transfer/Low-Shot/Semi/Unsupervised Learning (2)

Dreaming to Distill: Data-Free Knowledge Transfer via DeepInversion .8712

Hongxu Yin (NVIDIA; Princeton University), Pavlo Molchanov (NVIDIA), Jose M. Alvarez (NVIDIA), Zhizhong Li (NVIDIA; University of Illinois at Urbana-Champaign), Arun Mallya (NVIDIA), Derek Hoiem (University of Illinois at Urbana-Champaign), Niraj K. Jha (Princeton University), and Jan Kautz (NVIDIA)

Unsupervised Domain Adaptation via Structurally Regularized Deep Clustering .8722

Hui Tang (South China University of Technology, Guangdong, China), Ke Chen (South China University of Technology, Guangdong, China), and Kui Jia (South China University of Technology, Guangdong, China)

HyperSTAR: Task-Aware Hyperparameters for Deep Networks .8733

Gaurav Mittal (Microsoft), Chang Liu (Northeastern University), Nikolaos Karianakis (Microsoft), Victor Fragoso (Microsoft), Mei Chen (Microsoft), and Yun Fu (Northeastern University)

ActBERT: Learning Global-Local Video-Text Representations .8743

Linchao Zhu (Baidu Research; ReLER, University of Technology Sydney) and Yi Yang (ReLER, University of Technology Sydney)

State-Relabeling Adversarial Active Learning .8753
Beichen Zhang (University of Chinese Academy of Sciences, Beijing, China), Liang Li (Key Lab of Intell. Info. Process., Inst. of Comput. Tech., Chinese Academy of Sciences, China), Shijie Yang (University of Chinese Academy of Sciences, Beijing, China; Key Lab of Intell. Info. Process., Inst. of Comput. Tech., Chinese Academy of Sciences, China), Shuhui Wang (Key Lab of Intell. Info. Process., Inst. of Comput. Tech., Chinese Academy of Sciences, China), Zheng-Jun Zha (University of Science and Technology of China, China), and Qingming Huang (University of Chinese Academy of Sciences, Beijing, China; Key Lab of Intell. Info. Process., Inst. of Comput. Tech., Chinese Academy of Sciences, China; Peng Cheng Laboratory, Shenzhen, China)

Erasing Integrated Learning: A Simple Yet Effective Approach for Weakly Supervised Object Localization .8763
Jinjie Mai (School of Data and Computer Science, Sun Yat-sen University), Meng Yang (School of Data and Computer Science, Sun Yat-sen University; The Key Laboratory of Machine Intelligence and Advanced Computing, Ministry of Education, Sun Yat-sen University), and Wenfeng Luo (School of Data and Computer Science, Sun Yat-sen University)

A Shared Multi-Attention Framework for Multi-Label Zero-Shot Learning .8773
Dat Huynh (Northeastern University) and Ehsan Elhamifar (Northeastern University)

Self-Supervised Learning of Interpretable Keypoints From Unlabelled Videos .8784
Tomas Jakab (Visual Geometry Group, University of Oxford), Ankush Gupta (DeepMind, London), Hakan Bilen (School of Informatics, University of Edinburgh), and Andrea Vedaldi (Visual Geometry Group, University of Oxford)

Poster 2-4P

Few-Shot Open-Set Recognition Using Meta-Learning .8795
Bo Liu (UC, San Diego), Hao Kang (Wormpex AI Research), Haoxiang Li (Wormpex AI Research), Gang Hua (Wormpex AI Research), and Nuno Vasconcelos (UC, San Diego)

Few-Shot Learning via Embedding Adaptation With Set-to-Set Functions .8805
Han-Jia Ye (Nanjing University), Hexiang Hu (USC), De-Chuan Zhan (Nanjing University), and Fei Sha (USC & Google)

Temporally Distributed Networks for Fast Video Semantic Segmentation .8815
Ping Hu (Boston University), Fabian Caba (Adobe Research), Oliver Wang (Adobe Research), Zhe Lin (Adobe Research), Stan Sclaroff (Boston University), and Federico Perazzi (Adobe Research)

Benchmarking the Robustness of Semantic Segmentation Models .8825
Christoph Kamann (Visual Learning Lab, Heidelberg University (HCI/IWR)) and Carsten Rother (Visual Learning Lab, Heidelberg University (HCI/IWR))

There and Back Again: Revisiting Backpropagation Saliency Methods .8836.....
Sylvestre-Alvise Rebuffi (Visual Geometry Group, University of Oxford), Ruth Fong (Visual Geometry Group, University of Oxford), Xu Ji (Visual Geometry Group, University of Oxford), and Andrea Vedaldi (Visual Geometry Group, University of Oxford)

Deep Semantic Clustering by Partition Confidence Maximisation .8846.....
Jiabo Huang (Queen Mary University of London), Shaogang Gong (Queen Mary University of London), and Xiatian Zhu (University of Surrey)

StructEdit: Learning Structural Shape Variations .8856.....
Kaichun Mo (Stanford University), Paul Guerrero (Adobe Research), Li Yi (Google Research), Hao Su (UC San Diego), Peter Wonka (KAUST), Niloy J. Mitra (Adobe Research; University College London), and Leonidas J. Guibas (Stanford University; Facebook AI Research)

Harmonizing Transferability and Discriminability for Adapting Object Detectors .8866.....
Chaoqi Chen (Fujian Key Laboratory of Sensing and Computing for Smart City, School of Informatics, Xiamen University, China), Zebiao Zheng (Fujian Key Laboratory of Sensing and Computing for Smart City, School of Informatics, Xiamen University, China), Xinghao Ding (Fujian Key Laboratory of Sensing and Computing for Smart City, School of Informatics, Xiamen University, China), Yue Huang (Fujian Key Laboratory of Sensing and Computing for Smart City, School of Informatics, Xiamen University, China), and Qi Dou (Department of Computer Science and Engineering, The Chinese University of Hong Kong)

Fast Video Object Segmentation With Temporal Aggregation Network and Dynamic Template Matching .8876.....
Xuhua Huang (The Hong Kong University of Science and Technology), Jiarui Xu (The Hong Kong University of Science and Technology), Yu-Wing Tai (Tencent), and Chi-Keung Tang (The Hong Kong University of Science and Technology)

CascadePSP: Toward Class-Agnostic and Very High-Resolution Segmentation via Global and Local Refinement .8887.....
Ho Kei Cheng (HKUST), Jihoon Chung (HKUST), Yu-Wing Tai (Tencent), and Chi-Keung Tang (HKUST)

Correlating Edge, Pose With Parsing .8897.....
Ziwei Zhang (School of Electronics Engineering and Computer Science, Peking University), Chi Su (Kingsoft Cloud), Liang Zheng (Australian National University), and Xiaodong Xie (School of Electronics Engineering and Computer Science, Peking University)

VecRoad: Point-Based Iterative Graph Exploration for Road Graphs Extraction .8907.....
Yong-Qiang Tan (TKLNDST, College of CS, Nankai University), Shang-Hua Gao (TKLNDST, College of CS, Nankai University), Xuan-Yi Li (TKLNDST, College of CS, Nankai University), Ming-Ming Cheng (TKLNDST, College of CS, Nankai University), and Bo Ren (TKLNDST, College of CS, Nankai University)

Towards Fairness in Visual Recognition: Effective Strategies for Bias Mitigation .8916.....
Zeyu Wang (Princeton University), Klint Qinami (Princeton University), Ioannis Christos Karakozis (Princeton University), Kyle Genova (Princeton University), Prem Nair (Princeton University), Kenji Hata (Princeton University), and Olga Russakovsky (Princeton University)

Hierarchical Human Parsing With Typed Part-Relation Reasoning ..8926.....
Wenguan Wang (ETH Zurich, Switzerland; Inception Institute of Artificial Intelligence, UAE), Hailong Zhu (Tianjin Key Laboratory of Brain-inspired Intelligence Technology, School of Electrical and Information Engineering, Tianjin University, China), Jifeng Dai (SenseTime Research), Yanwei Pang (Tianjin Key Laboratory of Brain-inspired Intelligence Technology, School of Electrical and Information Engineering, Tianjin University, China), Jianbing Shen (Inception Institute of Artificial Intelligence, UAE), and Ling Shao (Inception Institute of Artificial Intelligence, UAE)

Compositional Convolutional Neural Networks: A Deep Architecture With Innate Robustness to Partial Occlusion ..8937.....
Adam Kortylewski (Johns Hopkins University), Ju He (Johns Hopkins University), Qing Liu (Johns Hopkins University), and Alan L. Yuille (Johns Hopkins University)

Spatial Pyramid Based Graph Reasoning for Semantic Segmentation ..8947.....
Xia Li (Zhejiang Lab; Key Laboratory of Machine Perception, Shenzhen Graduate School, Peking University; Key Laboratory of Machine Perception (MOE), School of EECS, Peking University), Yibo Yang (Academy for Advanced Interdisciplinary Studies, Peking University; Key Laboratory of Machine Perception (MOE), School of EECS, Peking University), Qijie Zhao (Wangxuan Institute of Computer Technology, Peking University), Tiancheng Shen (Academy for Advanced Interdisciplinary Studies, Peking University; Key Laboratory of Machine Perception (MOE), School of EECS, Peking University), Zhouchen Lin (Key Laboratory of Machine Perception (MOE), School of EECS, Peking University), and Hong Liu (Key Laboratory of Machine Perception, Shenzhen Graduate School, Peking University)

Learning Video Object Segmentation From Unlabeled Videos ..8957.....
Xiankai Lu (Inception Institute of Artificial Intelligence, UAE), Wenguan Wang (ETH Zurich, Switzerland), Jianbing Shen (Inception Institute of Artificial Intelligence, UAE), Yu-Wing Tai (Tencent), David J. Crandall (Indiana University, USA), and Steven C. H. Hoi (Salesforce Research Asia, Singapore; Singapore Management University, Singapore)

Part-Aware Context Network for Human Parsing .8968.....
Xiaomei Zhang (National Laboratory of Pattern Recognition, Institute of Automation, CAS, Beijing , China, School of Artificial Intelligence, University of Chinese Academy of Sciences, Beijing, China), Yingying Chen (National Laboratory of Pattern Recognition, Institute of Automation, CAS, Beijing , China, School of Artificial Intelligence, University of Chinese Academy of Sciences, Beijing, China), Bingke Zhu (National Laboratory of Pattern Recognition, Institute of Automation, CAS, Beijing , China, School of Artificial Intelligence, University of Chinese Academy of Sciences, Beijing, China), Jinqiao Wang (National Laboratory of Pattern Recognition, Institute of Automation, CAS, Beijing , China, School of Artificial Intelligence, University of Chinese Academy of Sciences, Beijing, China), and Ming Tang (National Laboratory of Pattern Recognition, Institute of Automation, CAS, Beijing , China, School of Artificial Intelligence, University of Chinese Academy of Sciences, Beijing, China)

SCOUT: Self-Aware Discriminant Counterfactual Explanations .8978.....
Pei Wang (Department of Electrical and Computer Engineering, University of California, San Diego) and Nuno Vasconcelos (Department of Electrical and Computer Engineering, University of California, San Diego)

Weakly-Supervised Semantic Segmentation via Sub-Category Exploration .8988.....
Yu-Ting Chang (UC Merced), Qiaosong Wang (eBay Inc.), Wei-Chih Hung (UC Merced), Robinson Piramuthu (eBay Inc.), Yi-Hsuan Tsai (NEC Labs America), and Ming-Hsuan Yang (UC Merced; Google Research)

Continual Learning With Extended Kronecker-Factored Approximate Curvature .8998.....
Janghyeon Lee (School of Electrical Engineering, KAIST), Hyeong Gwon Hong (Graduate School of AI, KAIST), Donggyu Joo (School of Electrical Engineering, KAIST), and Junmo Kim (School of Electrical Engineering, KAIST; Graduate School of AI, KAIST)

Phase Consistent Ecological Domain Adaptation .9008.....
Yanchao Yang (UCLA Vision Lab), Dong Lao (KAUST), Ganesh Sundaramoorthi (KAUST & UTRC), and Stefano Soatto (UCLA Vision Lab)

AD-Cluster: Augmented Discriminative Clustering for Domain Adaptive Person Re-Identification .9018.....
Yunpeng Zhai (School of Electronic and Computer Engineering, Peking University, China; NELVT, School of EE&CS, Peking University, Beijing, China), Shijian Lu (Nanyang Technological University, Singapore), Qixiang Ye (University of Chinese Academy of Sciences, China; Peng Cheng Laboratory, China), Xuebo Shan (School of Electronic and Computer Engineering, Peking University, China; NELVT, School of EE&CS, Peking University, Beijing, China), Jie Chen (School of Electronic and Computer Engineering, Peking University, China; Peng Cheng Laboratory, China), Rongrong Ji (Xiamen University, China; Peng Cheng Laboratory, China), and Yonghong Tian (School of Electronic and Computer Engineering, Peking University, China; NELVT, School of EE&CS, Peking University, Beijing, China; Peng Cheng Laboratory, China)

3D-MPA: Multi-Proposal Aggregation for 3D Semantic Instance Segmentation .9028.....
Francis Engelmann (RWTH Aachen University; Google), Martin Bokeloh (Google), Alireza Fathi (Google), Bastian Leibe (RWTH Aachen University), and Matthias Nießner (Technical University Munich)

Deep Active Learning for Biased Datasets via Fisher Kernel Self-Supervision .9038.....
Denis Gudovskiy (Panasonic β AI Lab), Alec Hodgkinson (Panasonic β AI Lab), Takuya Yamaguchi (Panasonic AI Solutions Center), and Sotaro Tsukizawa (Panasonic AI Solutions Center)

Adaptive Graph Convolutional Network With Attention Graph Clustering for Co-Saliency Detection .9047.....
Kaihua Zhang (B-DAT and CICAEET, Nanjing University of Information Science and Technology, China), Tengpeng Li (B-DAT and CICAEET, Nanjing University of Information Science and Technology, China), Shiwen Shen (JD Digits, USA), Bo Liu (JD Digits, USA), Jin Chen (B-DAT and CICAEET, Nanjing University of Information Science and Technology, China), and Qingshan Liu (B-DAT and CICAEET, Nanjing University of Information Science and Technology, China)

A2dele: Adaptive and Attentive Depth Distiller for Efficient RGB-D Salient Object Detection .9057.....
Yongri Piao (Dalian University of Technology, China), Zhengkun Rong (Dalian University of Technology, China), Miao Zhang (Dalian University of Technology, China; Key Lab for Ubiquitous Network and Service Software of Liaoning Province, Dalian University of Technology, China), Weisong Ren (Dalian University of Technology, China), and Huchuan Lu (Dalian University of Technology, China; Pengcheng Lab)

Deep Fair Clustering for Visual Learning .9067.....
Peizhao Li (Brandeis University), Han Zhao (Carnegie Mellon University), and Hongfu Liu (Brandeis University)

Bidirectional Graph Reasoning Network for Panoptic Segmentation .9077.....
Yangxin Wu (Sun Yat-sen University), Gengwei Zhang (Sun Yat-sen University), Yiming Gao (Sun Yat-sen University), Xiajun Deng (Sun Yat-sen University), Ke Gong (DarkMatter AI Research), Xiaodan Liang (Sun Yat-sen University; DarkMatter AI Research), and Liang Lin (Sun Yat-sen University; DarkMatter AI Research)

Exploit Clues From Views: Self-Supervised and Regularized Learning for Multiview Object Recognition .9087.....
Chih-Hui Ho (University of California, San Diego), Bo Liu (University of California, San Diego), Tz-Ying Wu (University of California, San Diego), and Nuno Vasconcelos (University of California, San Diego)

Spherical Space Domain Adaptation With Robust Pseudo-Label Loss .9098.....
Xiang Gu (Xi'an Jiaotong University, Xi'an, China), Jian Sun (Xi'an Jiaotong University, Xi'an, China), and Zongben Xu (Xi'an Jiaotong University, Xi'an, China)

Stochastic Classifiers for Unsupervised Domain Adaptation ..9108.....
Zhihe Lu (CVSSP, University of Surrey; iFlyTek-Surrey Joint Research Centre on Artificial Intelligence), Yongxin Yang (CVSSP, University of Surrey; iFlyTek-Surrey Joint Research Centre on Artificial Intelligence), Xiatian Zhu (CVSSP, University of Surrey), Cong Liu (iFlyTek-Surrey Joint Research Centre on Artificial Intelligence), Yi-Zhe Song (CVSSP, University of Surrey; iFlyTek-Surrey Joint Research Centre on Artificial Intelligence), and Tao Xiang (CVSSP, University of Surrey; iFlyTek-Surrey Joint Research Centre on Artificial Intelligence)

Unsupervised Learning of Intrinsic Structural Representation Points ..9118.....
Nenglun Chen (The University of Hong Kong), Lingjie Liu (Max Planck Institute for Informatics), Zhiming Cui (The University of Hong Kong), Runnan Chen (The University of Hong Kong), Duygu Ceylan (Adobe Research), Changhe Tu (Shandong University), and Wenping Wang (The University of Hong Kong)

PolyTransform: Deep Polygon Transformer for Instance Segmentation ..9128.....
Justin Liang (Uber Advanced Technologies Group), Namdar Homayounfar (Uber Advanced Technologies Group; University of Toronto), Wei-Chiu Ma (Uber Advanced Technologies Group; MIT), Yuwen Xiong (Uber Advanced Technologies Group; University of Toronto), Rui Hu (Uber Advanced Technologies Group), and Raquel Urtasun (Uber Advanced Technologies Group; University of Toronto)

Interactive Two-Stream Decoder for Accurate and Fast Saliency Detection ..9138.....
Huajun Zhou (School of Data and Computer Science, Sun Yat-sen University, China), Xiaohua Xie (School of Data and Computer Science, Sun Yat-sen University, China; Guangdong Province Key Laboratory of Information Security Technology, China; Key Laboratory of Machine Intelligence and Advanced Computing, Ministry of Education, China), Jian-Huang Lai (School of Data and Computer Science, Sun Yat-sen University, China; Guangdong Province Key Laboratory of Information Security Technology, China; Key Laboratory of Machine Intelligence and Advanced Computing, Ministry of Education, China), Zixuan Chen (School of Data and Computer Science, Sun Yat-sen University, China), and Lingxiao Yang (School of Data and Computer Science, Sun Yat-sen University, China)

Towards Better Generalization: Joint Depth-Pose Learning Without PoseNet ..9148.....
Wang Zhao (Department of Computer Science and Technology, Tsinghua University, Beijing, China), Shaohui Liu (Department of Computer Science and Technology, Tsinghua University, Beijing, China), Yezhi Shu (Department of Computer Science and Technology, Tsinghua University, Beijing, China), and Yong-Jin Liu (Department of Computer Science and Technology, Tsinghua University, Beijing, China)

LT-Net: Label Transfer by Learning Reversible Voxel-Wise Correspondence for One-Shot Medical Image Segmentation .9159
Shuxin Wang (Xiamen University; Jarvis Lab, Tencent), Shilei Cao (Jarvis Lab, Tencent), Dong Wei (Jarvis Lab, Tencent), Renzhen Wang (Xi'an Jiaotong University), Kai Ma (Jarvis Lab, Tencent), Liansheng Wang (Xiamen University), Deyu Meng (Macau University of Science and Technology; Xi'an Jiaotong University), and Yefeng Zheng (Jarvis Lab, Tencent)

FGN: Fully Guided Network for Few-Shot Instance Segmentation .9169
Zhibo Fan (South China University of Technology), Jin-Gang Yu (South China University of Technology; Guangzhou Laboratory), Zhihao Liang (South China University of Technology; Guangzhou Laboratory), Jiarong Ou (South China University of Technology), Changxin Gao (Huazhong University of Science and Technology), Gui-Song Xia (Wuhan University), and Yuanqing Li (South China University of Technology; Guangzhou Laboratory)

A Quantum Computational Approach to Correspondence Problems on Point Sets .9179
Vladislav Golyanik (Max Planck Institute for Informatics, Saarland Informatics Campus) and Christian Theobalt (Max Planck Institute for Informatics, Saarland Informatics Campus)

Data-Efficient Semi-Supervised Learning by Reliable Edge Mining .9189
Peibin Chen (Peking University), Tao Ma (Peking University), Xu Qin (Peking University), Weidi Xu (Ant Financial Services Group), and Shuchang Zhou (Megvii)

NestedVAE: Isolating Common Factors via Weak Supervision .9199
Matthew J. Vowels (Centre for Vision, Speech and Signal Processing, University of Surrey, Guildford, UK), Necati Cihan Camgöz (Centre for Vision, Speech and Signal Processing, University of Surrey, Guildford, UK), and Richard Bowden (Centre for Vision, Speech and Signal Processing, University of Surrey, Guildford, UK)

Progressive Adversarial Networks for Fine-Grained Domain Adaptation .9210
Sinan Wang (School of Software, BNRist, Tsinghua University, China; Research Center for Big Data, Tsinghua University, China; Beijing Key Laboratory for Industrial Big Data System and Application), Xinyang Chen (School of Software, BNRist, Tsinghua University, China; Research Center for Big Data, Tsinghua University, China; Beijing Key Laboratory for Industrial Big Data System and Application), Yunbo Wang (School of Software, BNRist, Tsinghua University, China; Research Center for Big Data, Tsinghua University, China; Beijing Key Laboratory for Industrial Big Data System and Application), Mingsheng Long (School of Software, BNRist, Tsinghua University, China; Research Center for Big Data, Tsinghua University, China; Beijing Key Laboratory for Industrial Big Data System and Application), and Jianmin Wang (School of Software, BNRist, Tsinghua University, China; Research Center for Big Data, Tsinghua University, China; Beijing Key Laboratory for Industrial Big Data System and Application)

A Disentangling Invertible Interpretation Network for Explaining Latent Representations .9220
Patrick Esser (Heidelberg Collaboratory for Image Processing, IWR, Heidelberg University, Germany), Robin Rombach (Heidelberg Collaboratory for Image Processing, IWR, Heidelberg University, Germany), and Björn Ommer (Heidelberg Collaboratory for Image Processing, IWR, Heidelberg University, Germany)

Modeling the Background for Incremental Learning in Semantic Segmentation .9230.....
Fabio Cermelli (Politecnico di Torino; Italian Institute of Technology), Massimiliano Mancini (Italian Institute of Technology; Fondazione Bruno Kessler; Sapienza University of Rome), Samuel Rota Bulò (Mapillary Research), Elisa Ricci (Fondazione Bruno Kessler; University of Trento), and Barbara Caputo (Politecnico di Torino; Italian Institute of Technology)

Interpreting the Latent Space of GANs for Semantic Face Editing .9240.....
Yujun Shen (The Chinese University of Hong Kong), Jinjin Gu (The Chinese University of Hong Kong, Shenzhen), Xiaoou Tang (The Chinese University of Hong Kong), and Bolei Zhou (The Chinese University of Hong Kong)

Super-BPD: Super Boundary-to-Pixel Direction for Fast Image Segmentation .9250.....
Jianqiang Wan (Huazhong University of Science and Technology), Yang Liu (Huazhong University of Science and Technology), Donglai Wei (Harvard University), Xiang Bai (Huazhong University of Science and Technology), and Yongchao Xu (Huazhong University of Science and Technology)

Self-Learning With Rectification Strategy for Human Parsing .9260.....
Tao Li (Beijing Lab of Intelligent Information Technology, School of Computer Science, Beijing Institute of Technology, China), Zhiyuan Liang (Beijing Lab of Intelligent Information Technology, School of Computer Science, Beijing Institute of Technology, China), Sanyuan Zhao (Beijing Lab of Intelligent Information Technology, School of Computer Science, Beijing Institute of Technology, China), Jiahao Gong (Beijing Lab of Intelligent Information Technology, School of Computer Science, Beijing Institute of Technology, China), and Jianbing Shen (Inception Institute of Artificial Intelligence, Abu Dhabi, UAE; Beijing Lab of Intelligent Information Technology, School of Computer Science, Beijing Institute of Technology, China)

Hyperbolic Visual Embedding Learning for Zero-Shot Recognition .9270.....
Shaoteng Liu (Shanghai Key Lab of Intelligent Information Processing, School of Computer Science, Fudan University; Xi'an Jiaotong University), Jingjing Chen (Shanghai Key Lab of Intelligent Information Processing, School of Computer Science, Fudan University), Liangming Pan (National University of Singapore), Chong-Wah Ngo (City University of Hong Kong), Tat-Seng Chua (National University of Singapore), and Yu-Gang Jiang (Shanghai Key Lab of Intelligent Information Processing, School of Computer Science, Fudan University)

Sequential Mastery of Multiple Visual Tasks: Networks Naturally Learn to Learn and Forget to Forget .9279.....
Guy Davidson (NYU Center for Data Science) and Michael C. Mozer (Google Research, University of Colorado at Boulder)

Distilling Effective Supervision From Severe Label Noise .9291.....
Zizhao Zhang (Google Cloud AI, Google Brain), Han Zhang (Google Cloud AI, Google Brain), Sercan Ö. Arik (Google Cloud AI, Google Brain), Honglak Lee (Google Cloud AI, Google Brain), and Tomas Pfister (Google Cloud AI, Google Brain)

Eternal Sunshine of the Spotless Net: Selective Forgetting in Deep Networks .9301.....
Aditya Golatkar (UCLA), Alessandro Achille (UCLA), and Stefano Soatto (UCLA)

CenterMask: Single Shot Instance Segmentation With Point Representation .9310.....
Yuqing Wang (Meituan Dianping Group), Zhaoliang Xu (Meituan Dianping Group), Hao Shen (Meituan Dianping Group), Baoshan Cheng (Meituan Dianping Group), and Lirong Yang (Meituan Dianping Group)

Mitigating Bias in Face Recognition Using Skewness-Aware Reinforcement Learning .9319.....
Mei Wang (Beijing University of Posts and Telecommunications) and Weihong Deng (Beijing University of Posts and Telecommunications)

MineGAN: Effective Knowledge Transfer From GANs to Target Domains With Few Images .9329
Yaxing Wang (Computer Vision Center, Universitat Autònoma de Barcelona, Spain), Abel Gonzalez-Garcia (Computer Vision Center, Universitat Autònoma de Barcelona, Spain), David Berga (Computer Vision Center, Universitat Autònoma de Barcelona, Spain), Luis Herranz (Computer Vision Center, Universitat Autònoma de Barcelona, Spain), Fahad Shahbaz Khan (Inception Institute of Artificial Intelligence, UAE; CVL, Linköping University, Sweden), and Joost van de Weijer (Computer Vision Center, Universitat Autònoma de Barcelona, Spain)

DLWL: Improving Detection for Lowshot Classes With Weakly Labelled Data .9339.....
Vignesh Ramanathan (Facebook), Rui Wang (Facebook), and Dhruv Mahajan (Facebook)

Unsupervised Deep Shape Descriptor With Point Distribution Learning .9350.....
Yi Shi (NYU Multimedia and Visual Computing Lab, New York University, Abu Dhabi, UAE; New York University, USA), Mengchen Xu (NYU Multimedia and Visual Computing Lab, New York University, Abu Dhabi, UAE; New York University, USA), Shuaihang Yuan (NYU Multimedia and Visual Computing Lab, New York University, Abu Dhabi, UAE; New York University, USA), and Yi Fang (NYU Multimedia and Visual Computing Lab, New York University, Abu Dhabi, UAE; New York University, USA)

Stylization-Based Architecture for Fast Deep Exemplar Colorization .9360.....
Zhongyou Xu (Shanghai Key Laboratory of Multidimensional Information Processing and the School of Computer Science and Technology, East China Normal University), Tingting Wang (Shanghai Key Laboratory of Multidimensional Information Processing and the School of Computer Science and Technology, East China Normal University), Faming Fang (Shanghai Key Laboratory of Multidimensional Information Processing and the School of Computer Science and Technology, East China Normal University), Yun Sheng (Liverpool John Moores University), and Guixu Zhang (Shanghai Key Laboratory of Multidimensional Information Processing and the School of Computer Science and Technology, East China Normal University)

Cars Can't Fly Up in the Sky: Improving Urban-Scene Segmentation via Height-Driven Attention Networks 9370
Sungha Choi (A&B Center, LG Electronics, Seoul, South Korea; Korea University, Seoul, South Korea), Joanne T. Kim (Lawrence Livermore National Laboratory, USA; Korea University, Seoul, South Korea), and Jaegul Choo (KAIST, Daejeon, South Korea)

State-Aware Tracker for Real-Time Video Object Segmentation 9381
Xi Chen (College of Electrical Engineering, Zhejiang University), Zuoxin Li (Megvii Inc.), Ye Yuan (Megvii Inc.), Gang Yu (Megvii Inc.), Jianxin Shen (College of Electrical Engineering, Zhejiang University), and Donglian Qi (College of Electrical Engineering, Zhejiang University)

Iteratively-Refined Interactive 3D Medical Image Segmentation With Multi-Agent Reinforcement Learning 9391
Xuan Liao (Cooperative Medianet Innovation Center, Shanghai Jiao Tong University), Wenhao Li (Multi-agent Artificial Intelligence Laboratory, East China Normal University), Qisen Xu (Multi-agent Artificial Intelligence Laboratory, East China Normal University), Xiangfeng Wang (Multi-agent Artificial Intelligence Laboratory, East China Normal University), Bo Jin (Multi-agent Artificial Intelligence Laboratory, East China Normal University), Xiaoyun Zhang (Cooperative Medianet Innovation Center, Shanghai Jiao Tong University), Yanfeng Wang (Cooperative Medianet Innovation Center, Shanghai Jiao Tong University), and Ya Zhang (Cooperative Medianet Innovation Center, Shanghai Jiao Tong University)

ENSEI: Efficient Secure Inference via Frequency-Domain Homomorphic Convolution for Privacy-Preserving Visual Recognition 9400
Song Bian (Department of Communications and Computer Engineering, Kyoto University), Tianchen Wang (Department of Computer Science and Engineering, University of Notre Dame), Masayuki Hiromoto (Department of Communications and Computer Engineering, Kyoto University), Yiyu Shi (Department of Computer Science and Engineering, University of Notre Dame), and Takashi Sato (Department of Communications and Computer Engineering, Kyoto University)

Multi-Scale Interactive Network for Salient Object Detection 9410
Youwei Pang (Dalian University of Technology, China), Xiaoqi Zhao (Dalian University of Technology, China), Lihe Zhang (Dalian University of Technology, China), and Huchuan Lu (Dalian University of Technology, China; Peng Cheng Laboratory)

Interactive Multi-Label CNN Learning With Partial Labels 9420
Dat Huynh (Northeastern University) and Ehsan Elhamifar (Northeastern University)

ViewAL: Active Learning With Viewpoint Entropy for Semantic Segmentation 9430
Yawar Siddiqui (Technical University of Munich), Julien Valentin (Google), and Matthias Nießner (Technical University of Munich)

Scene-Adaptive Video Frame Interpolation via Meta-Learning .9441.....
Myungsub Choi (ASRI, Department of ECE, Seoul National University), Janghoon Choi (ASRI, Department of ECE, Seoul National University), Sungyong Baik (ASRI, Department of ECE, Seoul National University), Tae Hyun Kim (Department of CS, Hanyang University), and Kyoung Mu Lee (ASRI, Department of ECE, Seoul National University)

Action Segmentation With Joint Self-Supervised Temporal Domain Adaptation .9451.....
Min-Hung Chen (Georgia Institute of Technology), Baopu Li (Baidu USA), Yingze Bao (Baidu USA), Ghassan AlRegib (Georgia Institute of Technology), and Zsolt Kira (Georgia Institute of Technology)

Pixel Consensus Voting for Panoptic Segmentation .9461.....
Haochen Wang (Carnegie Mellon University), Ruotian Luo (TTI-Chicago), Michael Maire (University of Chicago), and Greg Shakhnarovich (TTI-Chicago)

Minimizing Discrete Total Curvature for Image Processing .9471.....
Qiuxiang Zhong (Center for Applied Mathematics, Tianjin University, China), Yutong Li (Center for Applied Mathematics, Tianjin University, China), Yijie Yang (Center for Applied Mathematics, Tianjin University, China), and Yuping Duan (Center for Applied Mathematics, Tianjin University, China)

Towards Robust Image Classification Using Sequential Attention Models .9480.....
Daniel Zoran (DeepMind, London, UK), Mike Chrzanowski (DeepMind, London, UK), Po-Sen Huang (DeepMind, London, UK), Sven Gowal (DeepMind, London, UK), Alex Mott (DeepMind, London, UK), and Pushmeet Kohli (DeepMind, London, UK)

Discovering Synchronized Subsets of Sequences: A Large Scale Solution .9490.....
Evangelos Sariyanidi (Center for Autism Research, Children's Hospital of Philadelphia), Casey J. Zampella (Center for Autism Research, Children's Hospital of Philadelphia), Keith G. Bartley (Center for Autism Research, Children's Hospital of Philadelphia), John D. Herrington (Center for Autism Research, Children's Hospital of Philadelphia; University of Pennsylvania), Theodore D. Satterthwaite (University of Pennsylvania), Robert T. Schultz (Center for Autism Research, Children's Hospital of Philadelphia; University of Pennsylvania), and Birkan Tunc (Center for Autism Research, Children's Hospital of Philadelphia; University of Pennsylvania)

Going Deeper With Lean Point Networks .9500.....
Eric-Tuan Le (University College London), Iasonas Kokkinos (University College London; Ariel AI), and Niloy J. Mitra (University College London; Adobe Research)

Efficient and Robust Shape Correspondence via Sparsity-Enforced Quadratic Assignment .9510
Rui Xiang (Department of Mathematics, UC Irvine), Rongjie Lai (Department of Mathematics, Rensselaer Polytechnic Institute), and Hongkai Zhao (Department of Mathematics, UC Irvine)

Explainable Object-Induced Action Decision for Autonomous Vehicles .9520.....
Yiran Xu (Department of Electrical and Computer Engineering, University of California, San Diego), Xiaoyin Yang (Department of Electrical and Computer Engineering, University of California, San Diego), Lihang Gong (Department of Electrical and Computer Engineering, University of California, San Diego), Hsuan-Chu Lin (Department of Electrical and Computer Engineering, University of California, San Diego), Tz-Ying Wu (Department of Electrical and Computer Engineering, University of California, San Diego), Yunsheng Li (Department of Electrical and Computer Engineering, University of California, San Diego), and Nuno Vasconcelos (Department of Electrical and Computer Engineering, University of California, San Diego)

Spatially Attentive Output Layer for Image Classification .9530.....
Ildoo Kim (Kakao Brain, Seongnam, South Korea), Woonhyuk Baek (Kakao Brain, Seongnam, South Korea), and Sungwoong Kim (Kakao Brain, Seongnam, South Korea)

Attack to Explain Deep Representation .9540.....
Mohammad A. A. K. Jalwana (Computer Science and Software Engineering, The University of Western Australia), Naveed Akhtar (Computer Science and Software Engineering, The University of Western Australia), Mohammed Bennamoun (Computer Science and Software Engineering, The University of Western Australia), and Ajmal Mian (Computer Science and Software Engineering, The University of Western Australia)

Computing Valid P-Values for Image Segmentation by Selective Inference .9550.....
Kosuke Tanizaki (Nagoya Institute of Technology), Noriaki Hashimoto (Nagoya Institute of Technology), Yu Inatsu (RIKEN), Hidekata Hontani (Nagoya Institute of Technology), and Ichiro Takeuchi (Nagoya Institute of Technology; RIKEN)

Unsupervised Learning From Video With Deep Neural Embeddings .9560.....
Chengxu Zhuang (Stanford University), Tianwei She (Stanford University), Alex Andonian (MIT), Max Sobol Mark (Stanford University), and Daniel Yamins (Stanford University)

Partial Weight Adaptation for Robust DNN Inference .9570.....
Xiufeng Xie (Hewlett Packard Labs) and Kyu-Han Kim (Hewlett Packard Labs)

Probability Weighted Compact Feature for Domain Adaptive Retrieval .9579.....
Fuxiang Huang (Learning Intelligence & Vision Essential (LiVE) Group, School of Microelectronics and Communication Engineering, Chongqing University, China), Lei Zhang (Learning Intelligence & Vision Essential (LiVE) Group, School of Microelectronics and Communication Engineering, Chongqing University, China), Yang Yang (University of Electronic Science and Technology of China), and Xichuan Zhou (Learning Intelligence & Vision Essential (LiVE) Group, School of Microelectronics and Communication Engineering, Chongqing University, China)

Where Does It End? – Reasoning About Hidden Surfaces by Object Intersection Constraints .9589
Michael Strecke (Embodied Vision Group, Max Planck Institute for Intelligent Systems, Tübingen) and Jörg Stückler (Embodied Vision Group, Max Planck Institute for Intelligent Systems, Tübingen)

PolarNet: An Improved Grid Representation for Online LiDAR Point Clouds Semantic Segmentation .9598.....
Yang Zhang (Department of Computer Science, University of Central Florida), Zixiang Zhou (Department of Computer Science, University of Central Florida), Philip David (Computational and Information Sciences Directorate, U.S. Army Research Laboratory), Xiangyu Yue (Department of Electrical Engineering and Computer Sciences, University of California, Berkeley), Zerong Xi (Department of Computer Science, University of Central Florida), Boqing Gong (Department of Computer Science, University of Central Florida), and Hassan Foroosh (Department of Computer Science, University of Central Florida)

Pathological Retinal Region Segmentation From OCT Images Using Geometric Relation Based Augmentation .9608.....
Dwarikanath Mahapatra (IIAI, Abu Dhabi), Behzad Bozorgtabar (LTS5, EPFL, Lausanne; CIBM, Laussane; CHUV, Lausanne), and Ling Shao (IIAI, Abu Dhabi)

Transferring and Regularizing Prediction for Semantic Segmentation .9618.....
Yiheng Zhang (University of Science and Technology of China, Hefei, China), Zhaofan Qiu (University of Science and Technology of China, Hefei, China), Ting Yao (JD AI Research, Beijing, China), Chong-Wah Ngo (City University of Hong Kong, Kowloon, Hong Kong), Dong Liu (University of Science and Technology of China, Hefei, China), and Tao Mei (JD AI Research, Beijing, China)

PREDICT & CLUSTER: Unsupervised Skeleton Based Action Recognition .9628.....
Kun Su (Department of Electrical & Computer Engineering, University of Washington, USA), Xiulong Liu (Department of Electrical & Computer Engineering, University of Washington, USA), and Eli Shlizerman (Department of Electrical & Computer Engineering, University of Washington, USA; Department of Applied Mathematics, University of Washington, USA)

Model Adaptation: Unsupervised Domain Adaptation Without Source Data .9638.....
Rui Li (Department of Computer Science, City University of Hong Kong), Qianfen Jiao (Department of Computer Science, City University of Hong Kong), Wenming Cao (Department of Statistics and Actuarial Science, The University of Hong Kong), Hau-San Wong (Department of Computer Science, City University of Hong Kong), and Si Wu (School of Computer Science and Engineering, South China University of Technology)

Evade Deep Image Retrieval by Stashing Private Images in the Hash Space .9648.....
Yanru Xiao (Old Dominion University, Norfolk, VA), Cong Wang (Old Dominion University, Norfolk, VA), and Xing Gao (University of Memphis, Memphis, TN)

Advisable Learning for Self-Driving Vehicles by Internalizing Observation-to-Action Rules .9658
Jinkyu Kim (EECS, University of California, Berkeley), Suhong Moon (EECS, University of California, Berkeley), Anna Rohrbach (EECS, University of California, Berkeley), Trevor Darrell (EECS, University of California, Berkeley), and John Canny (EECS, University of California, Berkeley)

ProAlignNet: Unsupervised Learning for Progressively Aligning Noisy Contours .9668.....
VSR Veeravasarapu (Verisk AI, Verisk Analytics), Abhishek Goel (Verisk AI, Verisk Analytics), Deepak Mittal (Verisk AI, Verisk Analytics), and Maneesh Singh (Verisk AI, Verisk Analytics)

Attribution in Scale and Space .9677.....
Shawn Xu (Google AI Healthcare), Subhashini Venugopalan (Google Research), and Mukund Sundararajan (Google Inc.)

Towards Causal VQA: Revealing and Reducing Spurious Correlations by Invariant and Covariant Semantic Editing .9687.....
Vedika Agarwal (Max Planck Institute for Informatics Saarland Informatics Campus; TomTom), Rakshith Shetty (Max Planck Institute for Informatics Saarland Informatics Campus), and Mario Fritz (CISPA Helmholtz Center for Information Security Saarland Informatics Campus)

Oral 3-1A: Recognition (Detection, Categorization) (1)

Deep Relational Reasoning Graph Network for Arbitrary Shape Text Detection .9696.....
Shi-Xue Zhang (School of Computer and Communication Engineering, University of Science and Technology Beijing), Xiaobin Zhu (School of Computer and Communication Engineering, University of Science and Technology Beijing), Jie-Bo Hou (School of Computer and Communication Engineering, University of Science and Technology Beijing), Chang Liu (School of Computer and Communication Engineering, University of Science and Technology Beijing), Chun Yang (School of Computer and Communication Engineering, University of Science and Technology Beijing), Hongfa Wang (Tencent Technology (Shenzhen) Co. Ltd), and Xu-Cheng Yin (School of Computer and Communication Engineering, University of Science and Technology Beijing; Institute of Artificial Intelligence, University of Science and Technology Beijing; USTB-EEasyTech Joint Lab of Artificial Intelligence)

Large-Scale Object Detection in the Wild From Imbalanced Multi-Labels .9706.....
Junran Peng (University of Chinese Academy of Sciences; SenseTime Group Limited; Center for Research on Intelligent Perception and Computing, CASIA), Xingyuan Bu (SenseTime Group Limited), Ming Sun (SenseTime Group Limited), Zhaoxiang Zhang (University of Chinese Academy of Sciences; Center for Research on Intelligent Perception and Computing, CASIA), Tieniu Tan (University of Chinese Academy of Sciences; Center for Research on Intelligent Perception and Computing, CASIA), and Junjie Yan (SenseTime Group Limited)

BBN: Bilateral-Branch Network With Cumulative Learning for Long-Tailed Visual Recognition 9716
Boyan Zhou (Megvii Technology), Quan Cui (Megvii Technology; Waseda University), Xiu-Shen Wei (Megvii Technology), and Zhao-Min Chen (Megvii Technology; Nanjing University)

Momentum Contrast for Unsupervised Visual Representation Learning .9726.....
Kaiming He (Facebook AI Research (FAIR)), Haoqi Fan (Facebook AI Research (FAIR)), Yuxin Wu (Facebook AI Research (FAIR)), Saining Xie (Facebook AI Research (FAIR)), and Ross Girshick (Facebook AI Research (FAIR))

Classifying, Segmenting, and Tracking Object Instances in Video with Mask Propagation .9736
Gedas Bertasius (Facebook AI) and Lorenzo Torresani (Facebook AI)

Weakly Supervised Fine-Grained Image Classification via Guassian Mixture Model Oriented Discriminative Learning .9746.....
Zhihui Wang (International School of Information Science & Engineering, Dalian University of Technology, China; Key Laboratory for Ubiquitous Network and Service Software of Liaoning Province, China), Shijie Wang (International School of Information Science & Engineering, Dalian University of Technology, China), Shuhui Yang (International School of Information Science & Engineering, Dalian University of Technology, China), Haojie Li (International School of Information Science & Engineering, Dalian University of Technology, China; Key Laboratory for Ubiquitous Network and Service Software of Liaoning Province, China), Jianjun Li (School of Computer Science and Technology, Hangzhou Dianzi University, China), and Zezhou Li (Shanghai Pinlan Data Technology)

Bridging the Gap Between Anchor-Based and Anchor-Free Detection via Adaptive Training Sample Selection .9756.....
Shifeng Zhang (CBSR, NLPR, CASIA; SAI, UCAS), Cheng Chi (AIR, CAS), Yongqiang Yao (BUPT), Zhen Lei (CBSR, NLPR, CASIA; SAI, UCAS), and Stan Z. Li (Westlake University)

Learning User Representations for Open Vocabulary Image Hashtag Prediction .9766.....
Thibaut Durand (Borealis AI Simon Fraser University)

Sketch Less for More: On-the-Fly Fine-Grained Sketch-Based Image Retrieval .9776.....
Ayan Kumar Bhunia (SketchX, CVSSP, University of Surrey, United Kingdom), Yongxin Yang (SketchX, CVSSP, University of Surrey, United Kingdom), Timothy M. Hospedales (SketchX, CVSSP, University of Surrey, United Kingdom; University of Edinburgh, United Kingdom), Tao Xiang (SketchX, CVSSP, University of Surrey, United Kingdom), and Yi-Zhe Song (SketchX, CVSSP, University of Surrey, United Kingdom)

Few-Shot Pill Recognition .9786.....
Suiyi Ling (University of Nantes), Andréas Pastor (University of Nantes), Jing Li (Alibaba Group), Zhaohui Che (Shanghai Jiao Tong University), Junle Wang (Tencent), Jieun Kim (Hanyang University), and Patrick Le Callet (University of Nantes)

PointRend: Image Segmentation As Rendering .9796.....
Alexander Kirillov (Facebook AI Research (FAIR)), Yuxin Wu (Facebook AI Research (FAIR)), Kaiming He (Facebook AI Research (FAIR)), and Ross Girshick (Facebook AI Research (FAIR))

ABCNet: Real-Time Scene Text Spotting With Adaptive Bezier-Curve Network .9806.....
Yuliang Liu (South China University of Technology; University of Adelaide, Australia), Hao Chen (University of Adelaide, Australia), Chunhua Shen (University of Adelaide, Australia), Tong He (University of Adelaide, Australia), Lianwen Jin (South China University of Technology; University of Adelaide, Australia), and Liangwei Wang (Huawei Noah's Ark Lab)

Oral 3-1B: Video Analysis and Understanding

Learning Temporal Co-Attention Models for Unsupervised Video Action Localization .9816....
Guoqiang Gong (Wangxuan Institute of Computer Technology, Peking University), Xinghan Wang (Wangxuan Institute of Computer Technology, Peking University), Yadong Mu (Wangxuan Institute of Computer Technology, Peking University), and Qi Tian (Noah's Ark Lab, Huawei)

Spatiotemporal Fusion in 3D CNNs: A Probabilistic View .9826.....
Yizhou Zhou (University of Science and Technology of China), Xiaoyan Sun (Microsoft Research Asia), Chong Luo (Microsoft Research Asia), Zheng-Jun Zha (University of Science and Technology of China), and Wenjun Zeng (Microsoft Research Asia)

Uncertainty-Aware Score Distribution Learning for Action Quality Assessment .9836.....
Yansong Tang (Department of Automation, Tsinghua University, China; State Key Lab of Intelligent Technologies and Systems, China; Beijing National Research Center for Information Science and Technology, China), Zanlin Ni (Department of Automation, Tsinghua University, China), Jiahuan Zhou (Electrical and Computer Engineering Department, Northwestern University), Danyang Zhang (Department of Automation, Tsinghua University, China), Jiwen Lu (Department of Automation, Tsinghua University, China; State Key Lab of Intelligent Technologies and Systems, China; Beijing National Research Center for Information Science and Technology, China), Ying Wu (Electrical and Computer Engineering Department, Northwestern University), and Jie Zhou (Department of Automation, Tsinghua University, China; State Key Lab of Intelligent Technologies and Systems, China; Beijing National Research Center for Information Science and Technology, China; Tsinghua Shenzhen International Graduate School, Tsinghua University, China)

Learning Interactions and Relationships Between Movie Characters .9846.....
Anna Kukleva (Inria Paris, France; Max-Planck-Institute for Informatics, Saarbrücken, Germany), Makarand Tapaswi (Inria Paris, France), and Ivan Laptev (Inria Paris, France)

Video Panoptic Segmentation .9856.....
Dahun Kim (KAIS), Sanghyun Woo (KAIS), Joon-Young Lee (Adobe Research), and In So Kweon (KAIS)

Understanding Human Hands in Contact at Internet Scale .9866.....
Dandan Shan (University of Michigan), Jiaqi Geng (University of Michigan), Michelle Shu (Johns Hopkins University), and David F. Fouhey (University of Michigan)

End-to-End Learning of Visual Representations From Uncurated Instructional Videos .9876...
Antoine Miech (ENS/Inria), Jean-Baptiste Alayrac (DeepMind), Lucas Smaira (DeepMind), Ivan Laptev (ENS/Inria), Josef Sivic (ENS/Inria; CIIRC CTU), and Andrew Zisserman (DeepMind; VGG Oxford)

You2Me: Inferring Body Pose in Egocentric Video via First and Second Person Interactions .9887
Evonne Ng (UC Berkeley; UT Austin), Donglai Xiang (Carnegie Mellon University), Hanbyul Joo (Facebook AI Research), and Kristen Grauman (UT Austin; Facebook AI Research)

Learning a Weakly-Supervised Video Actor-Action Segmentation Model With a Wise Selection 9898
Jie Chen (Department of Computer Science, University of Rochester), Zhiheng Li (Department of Computer Science, University of Rochester), Jiebo Luo (Department of Computer Science, University of Rochester), and Chenliang Xu (Department of Computer Science, University of Rochester)

Learning to Measure the Static Friction Coefficient in Cloth Contact .9909.....
Abdullah Haroon Rasheed (Univ. Grenoble Alpes, Inria, CNRS, Grenoble INP, LJK, Grenoble, France), Victor Romero (Univ. Grenoble Alpes, Inria, CNRS, Grenoble INP, LJK, Grenoble, France; Sorbonne Université, CNRS, Institut Jean le Rond d'Alembert, Paris, France), Florence Bertails-Descoubes (Univ. Grenoble Alpes, Inria, CNRS, Grenoble INP, LJK, Grenoble, France), Stefanie Wuhrer (Univ. Grenoble Alpes, Inria, CNRS, Grenoble INP, LJK, Grenoble, France), Jean-Sebastien Franco (Univ. Grenoble Alpes, Inria, CNRS, Grenoble INP, LJK, Grenoble, France), and Arnaud Lazarus (Sorbonne Université, CNRS, Institut Jean le Rond d'Alembert, Paris, France)

SpeedNet: Learning the Speediness in Videos .9919.....
Sagie Benaim (Google Research; Tel Aviv University), Ariel Ephrat (Google Research), Oran Lang (Google Research), Inbar Mosseri (Google Research), William T. Freeman (Google Research), Michael Rubinstein (Google Research), Michal Irani (Google Research; Weizmann Institute), and Tali Dekel (Google Research)

Telling Left From Right: Learning Spatial Correspondence of Sight and Sound .9929.....
Karren Yang (MIT), Bryan Russell (Adobe Research), and Justin Salamon (Adobe Research)

Oral 3-1C: Vision & Language

Visual-Textual Capsule Routing for Text-Based Video Segmentation .9939.....
Bruce McIntosh (Center for Research in Computer Vision, University of Central Florida, USA), Kevin Duarte (Center for Research in Computer Vision, University of Central Florida, USA), Yogesh S Rawat (Center for Research in Computer Vision, University of Central Florida, USA), and Mubarak Shah (Center for Research in Computer Vision, University of Central Florida, USA)

Graph-Structured Referring Expression Reasoning in the Wild .9949.....
Sibei Yang (The University of Hong Kong), Guanbin Li (Sun Yat-sen University), and Yizhou Yu (The University of Hong Kong; Deepwise AI Lab)

Say As You Wish: Fine-Grained Control of Image Caption Generation With Abstract Scene Graphs .9959.....
Shizhe Chen (Renmin University of China), Qin Jin (Renmin University of China), Peng Wang (Northwestern Polytechnical University), and Qi Wu (University of Adelaide)

Hierarchical Conditional Relation Networks for Video Question Answering .9969.....
Thao Minh Le (Applied Artificial Intelligence Institute, Deakin University, Australia), Vuong Le (Applied Artificial Intelligence Institute, Deakin University, Australia), Svetha Venkatesh (Applied Artificial Intelligence Institute, Deakin University, Australia), and Truyen Tran (Applied Artificial Intelligence Institute, Deakin University, Australia)

REVERIE: Remote Embodied Visual Referring Expression in Real Indoor Environments .9979..
Yuankai Qi (Australia Centre for Robotic Vision, The University of Adelaide; Harbin Institute of Technology, Weihai), Qi Wu (Australia Centre for Robotic Vision, The University of Adelaide), Peter Anderson (Georgia Institute of Technology), Xin Wang (University of California, Santa Barbara), William Yang Wang (University of California, Santa Barbara), Chunhua Shen (Australia Centre for Robotic Vision, The University of Adelaide), and Anton van den Hengel (Australia Centre for Robotic Vision, The University of Adelaide)

Iterative Answer Prediction With Pointer-Augmented Multimodal Transformers for TextVQA 9989
Ronghang Hu (Facebook AI Research (FAIR); University of California, Berkeley), Amanpreet Singh (Facebook AI Research (FAIR)), Trevor Darrell (University of California, Berkeley), and Marcus Rohrbach (Facebook AI Research (FAIR))

SQuINTing at VQA Models: Introspecting VQA Models With Sub-Questions .10000.....
Ramprasaath R. Selvaraju (Georgia Institute of Technology), Purva Tendulkar (Georgia Institute of Technology), Devi Parikh (Georgia Institute of Technology), Eric Horvitz (Microsoft Research), Marco Tulio Ribeiro (Microsoft Research), Besmira Nushi (Microsoft Research), and Ece Kamar (Microsoft Research)

Vision-Language Navigation With Self-Supervised Auxiliary Reasoning Tasks .10009.....
Fengda Zhu (Monash University), Yi Zhu (University of Chinese Academy of Sciences), Xiaojun Chang (Monash University), and Xiaodan Liang (Sun Yat-sen University; Dark Matter AI Inc.)

Sign Language Transformers: Joint End-to-End Sign Language Recognition and Translation .10020
Necati Cihan Camgöz (CVSSP, University of Surrey, Guildford, UK), Oscar Koller (Microsoft, Munich, Germany), Simon Hadfield (CVSSP, University of Surrey, Guildford, UK), and Richard Bowden (CVSSP, University of Surrey, Guildford, UK)

Multi-Task Collaborative Network for Joint Referring Expression Comprehension and Segmentation .10031.....
Gen Luo (Media Analytics and Computing Lab, Department of Artificial Intelligence, School of Informatics, Xiamen University, China.), Yiyi Zhou (Media Analytics and Computing Lab, Department of Artificial Intelligence, School of Informatics, Xiamen University, China.), Xiaoshuai Sun (Media Analytics and Computing Lab, Department of Artificial Intelligence, School of Informatics, Xiamen University, China.), Liujuan Cao (Media Analytics and Computing Lab, Department of Artificial Intelligence, School of Informatics, Xiamen University, China.), Chenglin Wu (DeepWisdom, China.), Cheng Deng (Xidian University, China.), and Rongrong Ji (Media Analytics and Computing Lab, Department of Artificial Intelligence, School of Informatics, Xiamen University, China.)

Counterfactual Vision and Language Learning .10041.....
Ehsan Abbasnejad (Australian Institute for Machine Learning & The University of Adelaide, Australia), Damien Teney (Australian Institute for Machine Learning & The University of Adelaide, Australia), Amin Parvaneh (Australian Institute for Machine Learning & The University of Adelaide, Australia), Javen Shi (Australian Institute for Machine Learning & The University of Adelaide, Australia), and Anton van den Hengel (Australian Institute for Machine Learning & The University of Adelaide, Australia)

Iterative Context-Aware Graph Inference for Visual Dialog .10052.....
Dan Guo (Key Laboratory of Knowledge Engineering with Big Data, Hefei University of Technology; School of Computer Science and Information Engineering, Hefei University of Technology), Hui Wang (Key Laboratory of Knowledge Engineering with Big Data, Hefei University of Technology; School of Computer Science and Information Engineering, Hefei University of Technology), Hanwang Zhang (Nanyang Technological University), Zheng-Jun Zha (University of Science and Technology of China), and Meng Wang (Key Laboratory of Knowledge Engineering with Big Data, Hefei University of Technology; School of Computer Science and Information Engineering, Hefei University of Technology)

TA-Student VQA: Multi-Agents Training by Self-Questioning .10062.....
Peixi Xiong (Northwestern Univeristy) and Ying Wu (Northwestern Univeristy)

Poster 3-1P

Exploring Self-Attention for Image Recognition .10073.....
Hengshuang Zhao (CUHK), Jiaya Jia (CUHK), and Vladlen Koltun (Intel Labs)

Cops-Ref: A New Dataset and Task on Compositional Referring Expression Comprehension .....
10083
Zhenfang Chen (The University of Hong Kong), Peng Wang (University of Wollongong), Lin Ma (Tencent AI Lab), Kwan-Yee K. Wong (The University of Hong Kong), and Qi Wu (Australian Centre for Robotic Vision, University of Adelaide)

Improving Convolutional Networks With Self-Calibrated Convolutions .10093.....
Jiang-Jiang Liu (CS, Nankai University), Qibin Hou (NUS), Ming-Ming Cheng (CS, Nankai University), Changhu Wang (ByteDance AI Lab), and Jiashi Feng (NUS)

Modality Shifting Attention Network for Multi-Modal Video Question Answering .10103.....
Junyeong Kim (Korea Advanced Institute of Science and Technology (KAIST)), Minuk Ma (Korea Advanced Institute of Science and Technology (KAIST)), Trung Pham (Korea Advanced Institute of Science and Technology (KAIST)), Kyungsu Kim (Samsung Research), and Chang D. Yoo (Korea Advanced Institute of Science and Technology (KAIST))

Learning to Structure an Image With Few Colors .10113.....
Yunzhong Hou (Australian National University), Liang Zheng (Australian National University), and Stephen Gould (Australian National University)

On the General Value of Evidence, and Bilingual Scene-Text Visual Question Answering .10123
Xinyu Wang (University of Adelaide), Yuliang Liu (University of Adelaide; South China University of Technology), Chunhua Shen (University of Adelaide), Chun Chet Ng (University of Malaya), Canjie Luo (South China University of Technology), Lianwen Jin (South China University of Technology), Chee Seng Chan (University of Malaya), Anton van den Hengel (University of Adelaide), and Liangwei Wang (Huawei Noah's Ark Lab)

From Paris to Berlin: Discovering Fashion Style Influences Around the World .10133.....
Ziad Al-Halah (The University of Texas at Austin) and Kristen Grauman (The University of Texas at Austin)

A Local-to-Global Approach to Multi-Modal Movie Scene Segmentation .10143.....
Anyi Rao (CUHK - SenseTime Joint Lab, The Chinese University of Hong Kong), Linning Xu (The Chinese University of Hong Kong, Shenzhen), Yu Xiong (CUHK - SenseTime Joint Lab, The Chinese University of Hong Kong), Guodong Xu (CUHK - SenseTime Joint Lab, The Chinese University of Hong Kong), Qingqiu Huang (CUHK - SenseTime Joint Lab, The Chinese University of Hong Kong), Bolei Zhou (CUHK - SenseTime Joint Lab, The Chinese University of Hong Kong), and Dahua Lin (CUHK - SenseTime Joint Lab, The Chinese University of Hong Kong)

G-TAD: Sub-Graph Localization for Temporal Action Detection .10153.....
Mengmeng Xu (King Abdullah University of Science and Technology (KAUST), Saudi Arabia), Chen Zhao (King Abdullah University of Science and Technology (KAUST), Saudi Arabia), David S. Rojas (King Abdullah University of Science and Technology (KAUST), Saudi Arabia), Ali Thabet (King Abdullah University of Science and Technology (KAUST), Saudi Arabia), and Bernard Ghanem (King Abdullah University of Science and Technology (KAUST), Saudi Arabia)

Detailed 2D-3D Joint Representation for Human-Object Interaction .10163.....
Yong-Lu Li (Shanghai Jiao Tong University), Xinpeng Liu (Shanghai Jiao Tong University), Han Lu (Shanghai Jiao Tong University), Shiyi Wang (Shanghai Jiao Tong University), Junqi Liu (Shanghai Jiao Tong University), Jiefeng Li (Shanghai Jiao Tong University), and Cewu Lu (Shanghai Jiao Tong University)

One-Shot Adversarial Attacks on Visual Tracking With Dual Attention .10173.....
Xuesong Chen (Peking University, School of ECE), Xiyu Yan (Tsinghua University), Feng Zheng (Southern University of Science and Technology), Yong Jiang (Tsinghua University; Peng Cheng Laboratory), Shu-Tao Xia (Tsinghua University; Peng Cheng Laboratory), Yong Zhao (Peking University, School of ECE), and Rongrong Ji (Peng Cheng Laboratory; Xiamen University)

Rethinking Classification and Localization for Object Detection .10183.....
Yue Wu (Northeastern University), Yinpeng Chen (Microsoft), Lu Yuan (Microsoft), Zicheng Liu (Microsoft), Lijuan Wang (Microsoft), Hongzhi Li (Microsoft), and Yun Fu (Northeastern University)

Correspondence Networks With Adaptive Neighbourhood Consensus .10193.....
Shuda Li (Active Vision Lab), Kai Han (Visual Geometry Group, Department of Engineering Science, University of Oxford), Theo W. Costain (Active Vision Lab), Henry Howard-Jenkins (Active Vision Lab), and Victor Prisacariu (Active Vision Lab)

Multiple Anchor Learning for Visual Object Detection .10203.....
Wei Ke (Xi'an Jiaotong University , Xi'an, China; Carnegie Mellon UniversityUSA), Tianliang Zhang (University of Chinese Academy of Sciences, Beijing, China), Zeyi Huang (Carnegie Mellon University , Pittsburgh, US), Qixiang Ye (University of Chinese Academy of Sciences, Beijing, China), Jianzhuang Liu (Shenzhen Institutes of Advanced Technology, Shenzhen, China), and Dong Huang (Carnegie Mellon University , Pittsburgh, US)

PhraseCut: Language-Based Image Segmentation in the Wild .10213.....
Chenyun Wu (University of Massachusetts Amherst), Zhe Lin (Adobe Research), Scott Cohen (Adobe Research), Trung Bui (Adobe Research), and Subhransu Maji (University of Massachusetts Amherst)

Mask Encoding for Single Shot Instance Segmentation .10223.....
Rufeng Zhang (Tongji University, China), Zhi Tian (University of Adelaide, Australia), Chunhua Shen (University of Adelaide, Australia), Mingyu You (Tongji University, China), and Youliang Yan (Huawei Noah's Ark Lab)

Action Genome: Actions As Compositions of Spatio-Temporal Scene Graphs .10233.....
Jingwei Ji (Stanford University), Ranjay Krishna (Stanford University), Li Fei-Fei (Stanford University), and Juan Carlos Niebles (Stanford University)

Learning Unseen Concepts via Hierarchical Decomposition and Composition .10245.....
Muli Yang (School of Electronic Engineering, Xidian University, Xi'an, China), Cheng Deng (School of Electronic Engineering, Xidian University, Xi'an, China), Junchi Yan (Department of CSE, and MoE Key Lab of Artificial Intelligence, Shanghai Jiao Tong University, China), Xianglong Liu (State Key Lab of Software Development Environment, Beihang University, Beijing, China), and Dacheng Tao (UBTECH Sydney AI Centre, School of CS, Faculty of Engineering, The University of Sydney, Australi)

Hi-CMD: Hierarchical Cross-Modality Disentanglement for Visible-Infrared Person Re-Identification .10254.....
Seokeon Choi (Korea Advanced Institute of Science and Technology, Daejeon, Korea), Sumin Lee (Korea Advanced Institute of Science and Technology, Daejeon, Korea), Youngeun Kim (Korea Advanced Institute of Science and Technology, Daejeon, Korea), Taekyung Kim (Korea Advanced Institute of Science and Technology, Daejeon, Korea), and Changick Kim (Korea Advanced Institute of Science and Technology, Daejeon, Korea)

In Defense of Grid Features for Visual Question Answering .10264.....
Huaizu Jiang (UMass Amherst; Facebook AI Research (FAIR)), Ishan Misra (Facebook AI Research (FAIR)), Marcus Rohrbach (Facebook AI Research (FAIR)), Erik Learned-Miller (UMass Amherst), and Xinlei Chen (Facebook AI Research (FAIR))

Multi-Mutual Consistency Induced Transfer Subspace Learning for Human Motion Segmentation . 10274
Tao Zhou (Inception Institute of Artificial Intelligence, Abu Dhabi, UAE.), Huazhu Fu (Inception Institute of Artificial Intelligence, Abu Dhabi, UAE.), Chen Gong (The Key Laboratory of Intelligent Perception and Systems for High-Dimensional Information of Ministry of Education, Nanjing University of Science and Technology, China.), Jianbing Shen (Inception Institute of Artificial Intelligence, Abu Dhabi, UAE.), Ling Shao (Inception Institute of Artificial Intelligence, Abu Dhabi, UAE.), and Fatih Porikli (Australian National University, Australia.)

Dense Regression Network for Video Grounding .10284
Runhao Zeng (School of Software Engineering, South China University of Technology, China; Peng Cheng Laboratory, Shenzhen, China), Haoming Xu (School of Software Engineering, South China University of Technology, China), Wenbing Huang (Beijing National Research Center for Information Science and Technology (BNRist), Department of Computer Science and Technology, Tsinghua University), Peihao Chen (School of Software Engineering, South China University of Technology, China), Mingkui Tan (School of Software Engineering, South China University of Technology, China), and Chuang Gan (MIT-IBM Watson AI Lab)

Neural Architecture Search for Lightweight Non-Local Networks .10294
Yingwei Li (Johns Hopkins University), Xiaojie Jin (ByteDance AI Lab), Jieru Mei (Johns Hopkins University), Xiaochen Lian (ByteDance AI Lab), Linjie Yang (ByteDance AI Lab), Cihang Xie (Johns Hopkins University), Qihang Yu (Johns Hopkins University), Yuyin Zhou (Johns Hopkins University), Song Bai (University of Oxford), and Alan L. Yuille (Johns Hopkins University)

Learning Saliency Propagation for Semi-Supervised Instance Segmentation .10304
Yanzhao Zhou (University of Chinese Academy of Sciences; UC Berkeley), Xin Wang (UC Berkeley), Jianbin Jiao (University of Chinese Academy of Sciences), Trevor Darrell (UC Berkeley), and Fisher Yu (UC Berkeley)

Speech2Action: Cross-Modal Supervision for Action Recognition .10314
Arsha Nagrani (VGG, Oxford; Google Research), Chen Sun (Google Research), David Ross (Google Research), Rahul Sukthankar (Google Research), Cordelia Schmid (Google Research), and Andrew Zisserman (VGG, Oxford; DeepMind)

Normalized and Geometry-Aware Self-Attention Network for Image Captioning .10324
Longteng Guo (National Laboratory of Pattern Recognition, Institute of Automation, Chinese Academy of Sciences; School of Artificial Intelligence, University of Chinese Academy of Sciences), Jing Liu (National Laboratory of Pattern Recognition, Institute of Automation, Chinese Academy of Sciences), Xinxin Zhu (National Laboratory of Pattern Recognition, Institute of Automation, Chinese Academy of Sciences), Peng Yao (University of Science and Technology Beijing), Shichen Lu (Wuhan University), and Hanqing Lu (National Laboratory of Pattern Recognition, Institute of Automation, Chinese Academy of Sciences)

Memory Enhanced Global-Local Aggregation for Video Object Detection .10334.....
Yihong Chen (Center of Data Science, Peking University; Zhejiang Lab), Yue Cao (Microsoft Research Asia), Han Hu (Microsoft Research Asia), and Liwei Wang (Center of Data Science, Peking University; Key Laboratory of Machine Perception, MOE, School of EECS, Peking University)

Solving Mixed-Modal Jigsaw Puzzle for Fine-Grained Sketch-Based Image Retrieval .10344...
Kaiyue Pang (SketchX, CVSSP, University of Surrey; Queen Mary University of London), Yongxin Yang (SketchX, CVSSP, University of Surrey), Timothy M. Hospedales (SketchX, CVSSP, University of Surrey; The University of Edinburgh), Tao Xiang (SketchX, CVSSP, University of Surrey), and Yi-Zhe Song (SketchX, CVSSP, University of Surrey)

LG-GAN: Label Guided Adversarial Network for Flexible Targeted Attack of Point Cloud Based Deep Networks .10353.....
Hang Zhou (University of Science and Technology of China), Dongdong Chen (Microsoft Research), Jing Liao (City University of Hong Kong), Kejiang Chen (University of Science and Technology of China), Xiaoyi Dong (University of Science and Technology of China), Kunlin Liu (University of Science and Technology of China), Weiming Zhang (University of Science and Technology of China), Gang Hua (Wormpex AI Research), and Nenghai Yu (University of Science and Technology of China)

Memory Aggregation Networks for Efficient Interactive Video Object Segmentation .10363..
Jiaxu Miao (Baidu Research; ReLER, University of Technology Sydney), Yunchao Wei (ReLER, University of Technology Sydney), and Yi Yang (ReLER, University of Technology Sydney)

VQA With No Questions-Answers Training .10373.....
Ben-Zion Vatashsky (Weizmann Institute of Science, Israel) and Shimon Ullman (Weizmann Institute of Science, Israel)

Counting Out Time: Class Agnostic Video Repetition Counting in the Wild .10384.....
Debidatta Dwibedi (Google Research), Yusuf Aytar (DeepMind), Jonathan Tompson (Google Research), Pierre Sermanet (Google Research), and Andrew Zisserman (DeepMind)

SaccadeNet: A Fast and Accurate Object Detector .10394.....
Shiyi Lan (University of Maryland, College Park), Zhou Ren (Wormpex AI Research), Yi Wu (Wormpex AI Research), Larry S. Davis (University of Maryland, College Park), and Gang Hua (Wormpex AI Research)

Multi-Granularity Reference-Aided Attentive Feature Aggregation for Video-Based Person Re-Identification .10404.....
Zhizheng Zhang (University of Science and Technology of China), Cuiling Lan (Microsoft Research Asia), Wenjun Zeng (Microsoft Research Asia), and Zhibo Chen (University of Science and Technology of China)

Video Object Grounding Using Semantic Roles in Language Description .10414.....
Arka Sadhu (University of Southern California), Kan Chen (Facebook Inc.), and Ram Nevatia (University of Southern California)

Designing Network Design Spaces .10425.....
Ilija Radosavovic (Facebook AI Research (FAIR)), Raj Prateek Kosaraju (Facebook AI Research (FAIR)), Ross Girshick (Facebook AI Research (FAIR)), Kaiming He (Facebook AI Research (FAIR)), and Piotr Dollár (Facebook AI Research (FAIR))

12-in-1: Multi-Task Vision and Language Representation Learning .10434.....
Jiasen Lu (Georgia Institute of Technology), Vedanuj Goswami (Facebook AI Research), Marcus Rohrbach (Facebook AI Research), Devi Parikh (Facebook AI Research; Georgia Institute of Technology), and Stefan Lee (Oregon State University)

MLCVNet: Multi-Level Context VoteNet for 3D Object Detection .10444.....
Qian Xie (Nanjing University of Aeronautics and Astronautics), Yu-Kun Lai (Cardiff University), Jing Wu (Cardiff University), Zhoutao Wang (Nanjing University of Aeronautics and Astronautics), Yiming Zhang (Nanjing University of Aeronautics and Astronautics), Kai Xu (National University of Defense Technology), and Jun Wang (Nanjing University of Aeronautics and Astronautics)

Listen to Look: Action Recognition by Previewing Audio .10454.....
Ruohan Gao (The University of Texas at Austin), Tae-Hyun Oh (Facebook AI Research), Kristen Grauman (The University of Texas at Austin; Facebook AI Research), and Lorenzo Torresani (Facebook AI Research)

Attention Convolutional Binary Neural Tree for Fine-Grained Visual Categorization .10465...
Ruyi Ji (State Key Laboratory of Computer Science, ISCAS, Beijing, China; University of Chinese Academy of Sciences, Beijing, China), Longyin Wen (JD Finance America Corporation, USA), Libo Zhang (State Key Laboratory of Computer Science, ISCAS, Beijing, China), Dawei Du (University at Albany, State University of New York, USA), Yanjun Wu (State Key Laboratory of Computer Science, ISCAS, Beijing, China), Chen Zhao (State Key Laboratory of Computer Science, ISCAS, Beijing, China), Xianglong Liu (Beihang University, Beijing, China), and Feiyue Huang (Tencent Youtu Lab, Beijing, China)

Music Gesture for Visual Sound Separation .10475.....
Chuang Gan (MIT; MIT-IBM Watson AI Lab), Deng Huang (MIT-IBM Watson AI Lab), Hang Zhao (MIT), Joshua B. Tenenbaum (MIT), and Antonio Torralba (MIT)

Referring Image Segmentation via Cross-Modal Progressive Comprehension .10485.....
Shaofei Huang (Institute of Information Engineering, Chinese Academy of Sciences; School of Cyber Security, University of Chinese Academy of Sciences), Tianrui Hui (Institute of Information Engineering, Chinese Academy of Sciences; School of Cyber Security, University of Chinese Academy of Sciences), Si Liu (School of Computer Science and Engineering, Beihang University), Guanbin Li (Sun Yat-sen University), Yunchao Wei (University of Technology Sydney), Jizhong Han (Institute of Information Engineering, Chinese Academy of Sciences; School of Cyber Security, University of Chinese Academy of Sciences), Luoqi Liu (360 AI Institute), and Bo Li (School of Computer Science and Engineering, Beihang University)

Cloth in the Wind: A Case Study of Physical Measurement Through Simulation .10495.....
Tom F. H. Runia (QUVA Deep Vision Lab, University of Amsterdam), Kirill Gavrilyuk (QUVA Deep Vision Lab, University of Amsterdam), Cees G. M. Snoek (QUVA Deep Vision Lab, University of Amsterdam), and Arnold W. M. Smeulders (QUVA Deep Vision Lab, University of Amsterdam)

The Garden of Forking Paths: Towards Multi-Future Trajectory Prediction .10505.....
Junwei Liang (Carnegie Mellon University), Lu Jiang (Google Research), Kevin Murphy (Google Research), Ting Yu (Google Cloud AI), and Alexander Hauptmann (Carnegie Mellon University)

CentripetalNet: Pursuing High-Quality Keypoint Pairs for Object Detection .10516.....
Zhiwei Dong (Institute of Artificial Intelligence and Robotics\, Xi'an Jiaotong University; SenseTime Research), Guoxuan Li (University of Chinese Academy of Sciences), Yue Liao (Beihang University), Fei Wang (SenseTime Research), Pengju Ren (Institute of Artificial Intelligence and Robotics\, Xi'an Jiaotong University), and Chen Qian (SenseTime Research)

PV-RCNN: Point-Voxel Feature Set Abstraction for 3D Object Detection .10526.....
Shaoshuai Shi (Multimedia Laboratory, The Chinese University of Hong Kong), Chaoxu Guo (SenseTime Research; NLPR, CASIA), Li Jiang (CSE, CUHK), Zhe Wang (SenseTime Research), Jianping Shi (SenseTime Research), Xiaogang Wang (Multimedia Laboratory, The Chinese University of Hong Kong), and Hongsheng Li (Multimedia Laboratory, The Chinese University of Hong Kong)

Graph Embedded Pose Clustering for Anomaly Detection .10536.....
Amir Markovitz (Tel-Aviv University, Tel-Aviv, Israel), Gilad Sharir (Alibaba Group), Itamar Friedman (Alibaba Group), Lihi Zelnik-Manor (Alibaba Group), and Shai Avidan (Tel-Aviv University, Tel-Aviv, Israel)

Disp R-CNN: Stereo 3D Object Detection via Shape Prior Guided Instance Disparity Estimation .10545.....
Jiaming Sun (Zhejiang University; SenseTime), Linghao Chen (Zhejiang University), Yiming Xie (Zhejiang University), Siyu Zhang (Southern University of Science and Technology), Qinhong Jiang (SenseTime), Xiaowei Zhou (Zhejiang University), and Hujun Bao (Zhejiang University)

Deepstrip: High-Resolution Boundary Refinement .10555.....
Peng Zhou (University of Maryland, College Park), Brian Price (Adobe Research, San Jose), Scott Cohen (Adobe Research, San Jose), Gregg Wilensky (Adobe Research, San Jose), and Larry S. Davis (University of Maryland, College Park)

Smoothing Adversarial Domain Attack and P-Memory Reconsolidation for Cross-Domain Person Re-Identification .10565.....
Guangcong Wang (School of Data and Computer Science, Sun Yat-sen University, China), Jian-Huang Lai (School of Data and Computer Science, Sun Yat-sen University, China; Guangdong Key Laboratory of Information Security Technology; Key Laboratory of Machine Intelligence and Advanced Computing, Ministry of Education), Wenqi Liang (School of Data and Computer Science, Sun Yat-sen University, China), and Guangrun Wang (School of Data and Computer Science, Sun Yat-sen University, China)

Meshed-Memory Transformer for Image Captioning .10575.....
Marcella Cornia (University of Modena and Reggio Emilia), Matteo Stefanini (University of Modena and Reggio Emilia), Lorenzo Baraldi (University of Modena and Reggio Emilia), and Rita Cucchiara (University of Modena and Reggio Emilia)

Learning From Noisy Anchors for One-Stage Object Detection .10585.....
Hengduo Li (University of Maryland), Zuxuan Wu (University of Maryland), Chen Zhu (University of Maryland), Caiming Xiong (Salesforce Research), Richard Socher (Salesforce Research), and Larry S. Davis (University of Maryland)

Instance-Aware, Context-Focused, and Memory-Efficient Weakly Supervised Object Detection 10595
Zhongzheng Ren (University of Illinois at Urbana-Champaign; NVIDIA), Zhiding Yu (NVIDIA), Xiaodong Yang (NVIDIA), Ming-Yu Liu (NVIDIA), Yong Jae Lee (University of California, Davis), Alexander G. Schwing (University of Illinois at Urbana-Champaign), and Jan Kautz (NVIDIA)

Density-Based Clustering for 3D Object Detection in Point Clouds .10605.....
Syeda Mariam Ahmed (National University of Singapore) and Chee Meng Chew (National University of Singapore)

Few-Shot Video Classification via Temporal Alignment .10615.....
Kaidi Cao (Stanford University), Jingwei Ji (Stanford University), Zhangjie Cao (Stanford University), Chien-Yi Chang (Stanford University), and Juan Carlos Niebles (Stanford University)

Densely Connected Search Space for More Flexible Neural Architecture Search .10625.....
Jiemin Fang (School of EIC, Huazhong University of Science and Technology), Yuzhu Sun (School of EIC, Huazhong University of Science and Technology), Qian Zhang (Horizon Robotics), Yuan Li (Horizon Robotics), Wenyu Liu (School of EIC, Huazhong University of Science and Technology), and Xinggang Wang (School of EIC, Huazhong University of Science and Technology)

Fine-Grained Video-Text Retrieval With Hierarchical Graph Reasoning .10635.....
Shizhe Chen (School of Information, Renmin University of China), Yida Zhao (School of Information, Renmin University of China), Qin Jin (School of Information, Renmin University of China), and Qi Wu (Australian Centre for Robotic Vision, University of Adelaide)

Warp to the Future: Joint Forecasting of Features and Feature Motion .10645.....
Josip Šarić (Faculty of Electrical Engineering and Computing, University of Zagreb, Croatia), Marin Oršić (Faculty of Electrical Engineering and Computing, University of Zagreb, Croatia), Tonći Antunović (Rimac Automobili, Sveta Nedelja, Croatia), Sacha Vražić (Rimac Automobili, Sveta Nedelja, Croatia), and Siniša Šegvić (Faculty of Electrical Engineering and Computing, University of Zagreb, Croatia)

Network Adjustment: Channel Search Guided by FLOPs Utilization Ratio .10655.....
Zhengsu Chen (Beihang University), Jianwei Niu (Beihang University), Lingxi Xie (Johns Hopkins University), Xuefeng Liu (Beihang University), Longhui Wei (Peking University), and Qi Tian (Xidian University)

Where Does It Exist: Spatio-Temporal Video Grounding for Multi-Form Sentences .10665....
Zhu Zhang (College of Computer Science, Zhejiang University), Zhou Zhao (College of Computer Science, Zhejiang University), Yang Zhao (College of Computer Science, Zhejiang University), Qi Wang (Alibaba Group), Huasheng Liu (Alibaba Group), and Lianli Gao (University of Electronic Science and Technology of China)

Cross-Modal Cross-Domain Moment Alignment Network for Person Search .10675.....
Ya Jing (Center for Research on Intelligent Perception and Computing (CRIPAC), National Laboratory of Pattern Recognition (NLPR); University of Chinese Academy of Sciences (UCAS)), Wei Wang (Center for Research on Intelligent Perception and Computing (CRIPAC), National Laboratory of Pattern Recognition (NLPR); University of Chinese Academy of Sciences (UCAS)), Liang Wang (Center for Research on Intelligent Perception and Computing (CRIPAC), National Laboratory of Pattern Recognition (NLPR); Center for Excellence in Brain Science and Intelligence Technology (CEBSIT), Institute of Automation, Chinese Academy of Sciences (CASIA); University of Chinese Academy of Sciences (UCAS)), and Tieniu Tan (Center for Research on Intelligent Perception and Computing (CRIPAC), National Laboratory of Pattern Recognition (NLPR); Center for Excellence in Brain Science and Intelligence Technology (CEBSIT), Institute of Automation, Chinese Academy of Sciences (CASIA); University of Chinese Academy of Sciences (UCAS))

Self-Training With Noisy Student Improves ImageNet Classification .10684.....
Qizhe Xie (Google Research, Brain Team), Minh-Thang Luong (Google Research, Brain Team), Eduard Hovy (Carnegie Mellon University), and Quoc V. Le (Google Research, Brain Team)

Learning Longterm Representations for Person Re-Identification Using Radio Signals .10696
Lijie Fan (MIT CSAIL), Tianhong Li (MIT CSAIL), Rongyao Fang (MIT CSAIL), Rumen Hristov (MIT CSAIL), Yuan Yuan (MIT CSAIL), and Dina Katabi (MIT CSAIL)

LatentFusion: End-to-End Differentiable Reconstruction and Rendering for Unseen Object Pose Estimation .10707.....
Keunhong Park (University of Washington; NVIDIA), Arsalan Mousavian (NVIDIA), Yu Xiang (NVIDIA), and Dieter Fox (University of Washington; NVIDIA)

Learning Instance Occlusion for Panoptic Segmentation .10717.....
Justin Lazarow (University of California San Diego), Kwonjoon Lee (University of California San Diego), Kunyu Shi (University of California San Diego), and Zhuowen Tu (University of California San Diego)

Vision-Dialog Navigation by Exploring Cross-Modal Memory .10727.....
Yi Zhu (University of Chinese Academy of Sciences), Fengda Zhu (Monash University), Zhaohuan Zhan (Sun Yat-sen University), Bingqian Lin (Sun Yat-sen University), Jianbin Jiao (University of Chinese Academy of Sciences), Xiaojun Chang (Monash University), and Xiaodan Liang (Sun Yat-sen University)

ALFRED: A Benchmark for Interpreting Grounded Instructions for Everyday Tasks .10737....
Mohit Shridhar (Paul G. Allen School of Computer Sci. & Eng., Univ. of Washington), Jesse Thomason (Paul G. Allen School of Computer Sci. & Eng., Univ. of Washington), Daniel Gordon (Paul G. Allen School of Computer Sci. & Eng., Univ. of Washington), Yonatan Bisk (Paul G. Allen School of Computer Sci. & Eng., Univ. of Washington; Language Technologies Institute @ Carnegie Mellon University; Allen Institute for AI), Winson Han (Allen Institute for AI), Roozbeh Mottaghi (Paul G. Allen School of Computer Sci. & Eng., Univ. of Washington; Allen Institute for AI), Luke Zettlemoyer (Paul G. Allen School of Computer Sci. & Eng., Univ. of Washington), and Dieter Fox (Paul G. Allen School of Computer Sci. & Eng., Univ. of Washington; NVIDIA)

NMS by Representative Region: Towards Crowded Pedestrian Detection by Proposal Pairing 10747
Xin Huang (Waseda University), Zheng Ge (Waseda University), Zequn Jie (Tencent AI Lab), and Osamu Yoshie (Waseda University)

Visual Commonsense R-CNN .10757.....
Tan Wang (University of Electronic Science and Technology of China; Nanyang Technological University), Jianqiang Huang (Damo Academy, Alibaba Group; Nanyang Technological University), Hanwang Zhang (Nanyang Technological University), and Qianru Sun (Singapore Management University)

What Deep CNNs Benefit From Global Covariance Pooling: An Optimization Perspective .10768
Qilong Wang (Tianjin Key Lab of Machine Learning, College of Intelligence and Computing, Tianjin University, China), Li Zhang (Tianjin Key Lab of Machine Learning, College of Intelligence and Computing, Tianjin University, China), Banggu Wu (Tianjin Key Lab of Machine Learning, College of Intelligence and Computing, Tianjin University, China), Dongwei Ren (Tianjin Key Lab of Machine Learning, College of Intelligence and Computing, Tianjin University, China), Peihua Li (Dalian University of Technology, China), Wangmeng Zuo (Harbin Institute of Technology, China), and Qinghua Hu (Tianjin Key Lab of Machine Learning, College of Intelligence and Computing, Tianjin University, China)

EfficientDet: Scalable and Efficient Object Detection .10778.....
Mingxing Tan (Google Research, Brain Team), Ruoming Pang (Google Research, Brain Team), and Quoc V. Le (Google Research, Brain Team)

Fast Template Matching and Update for Video Object Tracking and Segmentation .10788....
Mingjie Sun (XJTLU; University of Liverpool), Jimin Xiao (XJTLU), Eng Gee Lim (XJTLU), Bingfeng Zhang (XJTLU; University of Liverpool), and Yao Zhao (Beijing Jiaotong University)

Counterfactual Samples Synthesizing for Robust Visual Question Answering .10797.....
Long Chen (DCD Lab, College of Computer Science, Zhejiang University), Xin Yan (DCD Lab, College of Computer Science, Zhejiang University), Jun Xiao (DCD Lab, College of Computer Science, Zhejiang University), Hanwang Zhang (MReaL Lab, Nanyang Technological University), Shiliang Pu (Hikvision Research Institute), and Yueting Zhuang (DCD Lab, College of Computer Science, Zhejiang University)

Local-Global Video-Text Interactions for Temporal Grounding .10807.....
Jonghwan Mun (Computer Vision Lab., POSTECH, Korea; Computer Vision Lab., ASRI, Seoul National University, Korea), Minsu Cho (Computer Vision Lab., POSTECH, Korea), and Bohyung Han (Computer Vision Lab., ASRI, Seoul National University, Korea)

Set-Constrained Viterbi for Set-Supervised Action Segmentation .10817.....
Jun Li (Oregon State University) and Sinisa Todorovic (Oregon State University)

Probabilistic Video Prediction From Noisy Data With a Posterior Confidence .10827.....
Yunbo Wang (Tsinghua University), Jiajun Wu (Stanford University), Mingsheng Long (Tsinghua University), and Joshua B. Tenenbaum (Massachusetts Institute of Technology)

Beyond Short-Term Snippet: Video Relation Detection With Spatio-Temporal Global Context 10837
Chenchen Liu (Peking University), Yang Jin (Beihang University), Kehan Xu (Peking University), Guoqiang Gong (Peking University), and Yadong Mu (Peking University)

Visual Grounding in Video for Unsupervised Word Translation .10847.....
Gunnar A. Sigurdsson (Carnegie Mellon University), Jean-Baptiste Alayrac (DeepMind), Aida Nematzadeh (DeepMind), Lucas Smaira (DeepMind), Mateusz Malinowski (DeepMind), João Carreira (DeepMind), Phil Blunsom (DeepMind; Department of Engineering Science, University of Oxford), and Andrew Zisserman (DeepMind; Department of Engineering Science, University of Oxford)

Two Causal Principles for Improving Visual Dialog .10857.....
Jiaxin Qi (Nanyang Technological University), Yulei Niu (Renmin University of China), Jianqiang Huang (Nanyang Technological University; Damo Academy, Alibaba Group), and Hanwang Zhang (Nanyang Technological University)

Spatio-Temporal Graph for Video Captioning With Knowledge Distillation .10867.....
Boxiao Pan (Stanford University), Haoye Cai (Stanford University), De-An Huang (Stanford University), Kuan-Hui Lee (Toyota Research Institute), Adrien Gaidon (Toyota Research Institute), Ehsan Adeli (Stanford University), and Juan Carlos Niebles (Stanford University)

A Real-Time Cross-Modality Correlation Filtering Method for Referring Expression Comprehension .10877
Yue Liao (School of Computer Science and Engineering, Beihang University; SenseTime Research), Si Liu (School of Computer Science and Engineering, Beihang University), Guanbin Li (Sun Yat-sen University), Fei Wang (SenseTime Research), Yanjie Chen (SenseTime Research), Chen Qian (SenseTime Research), and Bo Li (School of Computer Science and Engineering, Beihang University)

Better Captioning With Sequence-Level Exploration .10887
Jia Chen (Carnegie Mellon University, Language Technology Institute) and Qin Jin (Renmin University of China, School of Information)

Violin: A Large-Scale Dataset for Video-and-Language Inference .10897
Jingzhou Liu (Carnegie Mellon University), Wenhu Chen (University of California, Santa Barbara), Yu Cheng (Microsoft Dynamics 365 AI Research), Zhe Gan (Microsoft Dynamics 365 AI Research), Licheng Yu (Microsoft Dynamics 365 AI Research), Yiming Yang (Carnegie Mellon University), and Jingjing Liu (Microsoft Dynamics 365 AI Research)

RiFeGAN: Rich Feature Generation for Text-to-Image Synthesis From Prior Knowledge .10908
Jun Cheng (CAS Key Laboratory of Human-Machine Intelligence-Synergy Systems, Shenzhen Institutes of Advanced Technology, CAS, China; The Chinese University of Hong Kong, Hong Kong, China), Fuxiang Wu (CAS Key Laboratory of Human-Machine Intelligence-Synergy Systems, Shenzhen Institutes of Advanced Technology, CAS, China; The Chinese University of Hong Kong, Hong Kong, China), Yanling Tian (Graduate School of Information, Production and Systems, Waseda University, Japan), Lei Wang (CAS Key Laboratory of Human-Machine Intelligence-Synergy Systems, Shenzhen Institutes of Advanced Technology, CAS, China; The Chinese University of Hong Kong, Hong Kong, China), and Dapeng Tao (School of Information Science and Engineering, Yunnan University, China)

Graph Structured Network for Image-Text Matching .10918
Chunxiao Liu (Institute of Information Engineering, Chinese Academy of Sciences, Beijing, China; School of Cyber Security, University of Chinese Academy of Sciences, Beijing, China), Zhendong Mao (University of Science and Technology of China, Hefei, China), Tianzhu Zhang (University of Science and Technology of China, Hefei, China), Hongtao Xie (University of Science and Technology of China, Hefei, China), Bin Wang (Xiaomi AI Lab, Beijing, China), and Yongdong Zhang (University of Science and Technology of China, Hefei, China)

Straight to the Point: Fast-Forwarding Videos via Reinforcement Learning Using Textual Data .10928
Washington Ramos (Universidade Federal de Minas Gerais (UFMG), Brazil), Michel Silva (Universidade Federal de Minas Gerais (UFMG), Brazil), Edson Araujo (Universidade Federal de Minas Gerais (UFMG), Brazil), Leandro Soriano Marcolino (Lancaster University, UK), and Erickson Nascimento (Universidade Federal de Minas Gerais (UFMG), Brazil)

Multi-Modality Cross Attention Network for Image and Sentence Matching .10938.....
Xi Wei (University of Science and Technology of China), Tianzhu Zhang (University of Science and Technology of China), Yan Li (Kuaishou Technology), Yongdong Zhang (University of Science and Technology of China), and Feng Wu (University of Science and Technology of China)

Generalized ODIN: Detecting Out-of-Distribution Image Without Learning From Out-of-Distribution Data .10948.....
Yen-Chang Hsu (Georgia Institute of Technology), Yilin Shen (Samsung Research America), Hongxia Jin (Samsung Research America), and Zsolt Kira (Georgia Institute of Technology)

Learning Augmentation Network via Influence Functions .10958.....
Donghoon Lee (Korea Advanced Institute of Science and Technology (KAIST)), Hyunsin Park (Korea Advanced Institute of Science and Technology (KAIST)), Trung Pham (Korea Advanced Institute of Science and Technology (KAIST)), and Chang D. Yoo (Korea Advanced Institute of Science and Technology (KAIST))

X-Linear Attention Networks for Image Captioning .10968.....
Yingwei Pan (JD AI Research, Beijing, China), Ting Yao (JD AI Research, Beijing, China), Yehao Li (JD AI Research, Beijing, China), and Tao Mei (JD AI Research, Beijing, China)

Oral 3-2A: Recognition (Detection, Categorization) (2)

Unsupervised Person Re-Identification via Multi-Label Classification .10978.....
Dongkai Wang (Peking University) and Shiliang Zhang (Peking University)

Overcoming Classifier Imbalance for Long-Tail Object Detection With Balanced Group Softmax.....
10988
Yu Li (Key Laboratory of Intelligent Information Processing, Institute of Computing Technology, Chinese Academy of Sciences, Beijing, China; University of Chinese Academy of Sciences, Beijing, China; Department of Electrical and Computer Engineering, National University of Singapore, Singapore), Tao Wang (Department of Electrical and Computer Engineering, National University of Singapore, Singapore; Institute of Data Science, National University of Singapore, Singapore), Bingyi Kang (Department of Electrical and Computer Engineering, National University of Singapore, Singapore), Sheng Tang (Key Laboratory of Intelligent Information Processing, Institute of Computing Technology, Chinese Academy of Sciences, Beijing, China; University of Chinese Academy of Sciences, Beijing, China), Chunfeng Wang (University of Chinese Academy of Sciences, Beijing, China), Jintao Li (Key Laboratory of Intelligent Information Processing, Institute of Computing Technology, Chinese Academy of Sciences, Beijing, China; University of Chinese Academy of Sciences, Beijing, China), and Jiashi Feng (Department of Electrical and Computer Engineering, National University of Singapore, Singapore)

What You See is What You Get: Exploiting Visibility for 3D Object Detection .10998.....
Peiyun Hu (Robotics Institute, Carnegie Mellon University), Jason Ziglar (Argo AI), David Held (Robotics Institute, Carnegie Mellon University), and Deva Ramanan (Robotics Institute, Carnegie Mellon University; Argo AI)

Deep Structure-Revealed Network for Texture Recognition .11007.....
Wei Zhai (University of Science and Technology of China), Yang Cao (University of Science and Technology of China), Zheng-Jun Zha (University of Science and Technology of China), HaiYong Xie (University of Science and Technology of China), and Feng Wu (University of Science and Technology of China)

Online Knowledge Distillation via Collaborative Learning .11017.....
Qiushan Guo (Beijing University of Posts and Telecommunications), Xinjiang Wang (SenseTime Group Limited), Yichao Wu (SenseTime Group Limited), Zhipeng Yu (SenseTime Group Limited), Ding Liang (SenseTime Group Limited), Xiaolin Hu (Tsinghua University), and Ping Luo (The University of Hong Kong)

Dynamic Convolution: Attention Over Convolution Kernels .11027.....
Yinpeng Chen (Microsoft), Xiyang Dai (Microsoft), Mengchen Liu (Microsoft), Dongdong Chen (Microsoft), Lu Yuan (Microsoft), and Zicheng Liu (Microsoft)

3DSSD: Point-Based 3D Single Stage Object Detector .11037.....
Zetong Yang (The Chinese University of Hong Kong), Yanan Sun (Hong Kong University of Science and Technology), Shu Liu (SmartMore), and Jiaya Jia (The Chinese University of Hong Kong; SmartMore)

Deep Degradation Prior for Low-Quality Image Classification .11046.....
Yang Wang (University of Science and Technology of China, Hefei, China), Yang Cao (University of Science and Technology of China, Hefei, China), Zheng-Jun Zha (University of Science and Technology of China, Hefei, China), Jing Zhang (UBTECH Sydney Artificial Intelligence Centre, The University of Sydney, Sydney, Australia), and Zhiwei Xiong (University of Science and Technology of China, Hefei, China)

ViBE: Dressing for Diverse Body Shapes .11056.....
Wei-Lin Hsiao (The University of Texas at Austin; Facebook AI Research) and Kristen Grauman (The University of Texas at Austin; Facebook AI Research)

Don't Judge an Object by Its Context: Learning to Overcome Contextual Bias .11067.....
Krishna Kumar Singh (University of California, Davis), Dhruv Mahajan (Facebook AI), Kristen Grauman (Facebook AI; University of Texas at Austin), Yong Jae Lee (University of California, Davis), Matt Feiszli (Facebook AI), and Deepti Ghadiyaram (Facebook AI)

SESS: Self-Ensembling Semi-Supervised 3D Object Detection .11076.....
Na Zhao (Deaprtment of Computer Science, National University of Singapore), Tat-Seng Chua (Deaprtment of Computer Science, National University of Singapore), and Gim Hee Lee (Deaprtment of Computer Science, National University of Singapore)

Combining Detection and Tracking for Human Pose Estimation in Videos .11085.....
Manchen Wang (AWS Rekognition), Joseph Tighe (AWS Rekognition), and Davide Modolo (AWS Rekognition)

Oral 3-2B: Vision for Robotics and Autonomous Vehicles

SAPIEN: A SimulAted Part-Based Interactive ENvironment .11094.....
Fanbo Xiang (UC San Diego), Yuzhe Qin (UC San Diego), Kaichun Mo (Stanford University), Yikuan Xia (UC San Diego), Hao Zhu (UC San Diego), Fangchen Liu (UC San Diego), Minghua Liu (UC San Diego), Hanxiao Jiang (Simon Fraser University), Yifu Yuan (UC Los Angeles), He Wang (Stanford University), Li Yi (Google Research), Angel X. Chang (Simon Fraser University), Leonidas J. Guibas (Stanford University), and Hao Su (UC San Diego)

RandLA-Net: Efficient Semantic Segmentation of Large-Scale Point Clouds .11105.....
Qingyong Hu (University of Oxford), Bo Yang (University of Oxford), Linhai Xie (University of Oxford), Stefano Rosa (University of Oxford), Yulan Guo (Sun Yat-sen University; National University of Defense Technology), Zhihua Wang (University of Oxford), Niki Trigoni (University of Oxford), and Andrew Markham (University of Oxford)

SurfelGAN: Synthesizing Realistic Sensor Data for Autonomous Driving .11115.....
Zhenpei Yang (UT Austin), Yuning Chai (Waymo), Dragomir Anguelov (Waymo), Yin Zhou (Waymo), Pei Sun (Waymo), Dumitru Erhan (Google Brain), Sean Rafferty (Waymo), and Henrik Kretzschmar (Waymo)

A Programmatic and Semantic Approach to Explaining and Debugging Neural Network Based Object Detectors .11125.....
Edward Kim (University of California, Berkeley), Divya Gopinath (NASA Ames Research Center), Corina Păsăreanu (NASA Ames Research Center), and Sanjit A. Seshia (University of California, Berkeley)

Predicting Semantic Map Representations From Images Using Pyramid Occupancy Networks 11135
Thomas Roddick (University of Cambridge) and Roberto Cipolla (University of Cambridge)

Efficient Derivative Computation for Cumulative B-Splines on Lie Groups .11145.....
Christiane Sommer (Technical University of Munich), Vladyslav Usenko (Technical University of Munich), David Schubert (Technical University of Munich), Nikolaus Demmel (Technical University of Munich), and Daniel Cremers (Technical University of Munich)

RL-CycleGAN: Reinforcement Learning Aware Simulation-to-Real .11154.....
Kanishka Rao (Google Brain, USA), Chris Harris (Google Brain, USA), Alex Irpan (Google Brain, USA), Sergey Levine (Google Brain, USA; University of California Berkeley, USA), Julian Ibarz (Google Brain, USA), and Mohi Khansari (The Moonshot Factory, USA)

LiDARsim: Realistic LiDAR Simulation by Leveraging the Real World .1.1.164.....
Sivabalan Manivasagam (Uber Advanced Technologies Group; University of Toronto), Shenlong Wang (Uber Advanced Technologies Group; University of Toronto), Kelvin Wong (Uber Advanced Technologies Group; University of Toronto), Wenyuan Zeng (Uber Advanced Technologies Group; University of Toronto), Mikita Sazanovich (Uber Advanced Technologies Group), Shuhan Tan (Uber Advanced Technologies Group), Bin Yang (Uber Advanced Technologies Group; University of Toronto), Wei-Chiu Ma (Uber Advanced Technologies Group; Massachusetts Institute of Techonology), and Raquel Urtasun (Uber Advanced Technologies Group; University of Toronto)

Just Go With the Flow: Self-Supervised Scene Flow Estimation .1.1.174.....
Himangi Mittal (Carnegie Mellon University), Brian Okorn (Carnegie Mellon University), and David Held (Carnegie Mellon University)

TITAN: Future Forecast Using Action Priors .1.1.183.....
Srikanth Malla (Honda Research Institute, USA), Behzad Dariush (Honda Research Institute, USA), and Chiho Choi (Honda Research Institute, USA)

Oral 3-2C: Machine Learning Architectures and Formulations

Robust Learning Through Cross-Task Consistency .1.1.194.....
Amir R. Zamir (Swiss Federal Institute of Technology (EPFL)), Alexander Sax (UC Berkeley), Nikhil Cheerla (Stanford University), Rohan Suri (Stanford University), Zhangjie Cao (Stanford University), Jitendra Malik (UC Berkeley), and Leonidas J. Guibas (Stanford University)

Dynamic Refinement Network for Oriented and Densely Packed Object Detection .1.1.204....
Xingjia Pan (NLPR, Institute of Automation, CAS; School of Artificial Intelligence, UCAS), Yuqiang Ren (Youtu Lab, Tencent), Kekai Sheng (Youtu Lab, Tencent), Weiming Dong (NLPR, Institute of Automation, CAS; School of Artificial Intelligence, UCAS; CASIA-LLVision Joint Lab), Haolei Yuan (Youtu Lab, Tencent), Xiaowei Guo (Youtu Lab, Tencent), Chongyang Ma (Y-Tech, Kuaishou Technology), and Changsheng Xu (NLPR, Institute of Automation, CAS; School of Artificial Intelligence, UCAS; CASIA-LLVision Joint Lab)

AOWS: Adaptive and Optimal Network Width Search With Latency Constraints .1.1.214.....
Maxim Berman (Center for Processing Speech and Images, Department of Electrical Engineering, KU Leuven), Leonid Pishchulin (Amazon Go), Ning Xu (Amazon Go), Matthew B. Blaschko (Center for Processing Speech and Images, Department of Electrical Engineering, KU Leuven), and Gérard Medioni (Amazon Go)

High-Dimensional Convolutional Networks for Geometric Pattern Recognition .1.1.224.....
Christopher Choy (Stanford University), Junha Lee (POSTECH), René Ranftl (Intel Labs), Jaesik Park (POSTECH), and Vladlen Koltun (Intel Labs)

Filter Response Normalization Layer: Eliminating Batch Dependence in the Training of Deep Neural Networks .1.1.234.....
Saurabh Singh (Google Research) and Shankar Krishnan (Google Research)

Deep Iterative Surface Normal Estimation .11244
Jan Eric Lenssen (NNAISENSE; TU Dortmund University), Christian Osendorfer (NNAISENSE), and Jonathan Masci (NNAISENSE)

Dataless Model Selection With the Deep Frame Potential .11254
Calvin Murdock (Carnegie Mellon University) and Simon Lucey (Carnegie Mellon University; Argo AI)

UNAS: Differentiable Architecture Search Meets Reinforcement Learning .11263
Arash Vahdat (NVIDIA), Arun Mallya (NVIDIA), Ming-Yu Liu (NVIDIA), and Jan Kautz (NVIDIA)

Local Context Normalization: Revisiting Local Normalization .11273
Anthony Ortiz (The University of Texas at El Paso; Microsoft AI for Good Research Lab), Caleb Robinson (Georgia Institute of Technology; Microsoft AI for Good Research Lab), Dan Morris (Microsoft Research), Olac Fuentes (The University of Texas at El Paso), Christopher Kiekintveld (The University of Texas at El Paso), Md Mahmudulla Hassan (The University of Texas at El Paso), and Nebojsa Jojic (Microsoft Research)

Poster 3-2P

ACNe: Attentive Context Normalization for Robust Permutation-Equivariant Learning .11283
Weiwei Sun (University of Victoria), Wei Jiang (University of Victoria), Eduard Trulls (Google Research, Zurich), Andrea Tagliasacchi (Google Research, Toronto), and Kwang Moo Yi (University of Victoria)

Learning Situational Driving .11293
Eshed Ohn-Bar (Max Planck Institute for Intelligent Systems, Tübingen; Boston University), Aditya Prakash (Max Planck Institute for Intelligent Systems, Tübingen), Aseem Behl (Max Planck Institute for Intelligent Systems, Tübingen; University of Tübingen), Kashyap Chitta (Max Planck Institute for Intelligent Systems, Tübingen; University of Tübingen), and Andreas Geiger (Max Planck Institute for Intelligent Systems, Tübingen; University of Tübingen)

From Depth What Can You See? Depth Completion via Auxiliary Image Reconstruction .11303
Kaiyue Lu (The Australian National University; Data61, CSIRO), Nick Barnes (The Australian National University), Saeed Anwar (Data61, CSIRO; The Australian National University), and Liang Zheng (The Australian National University)

Symmetry and Group in Attribute-Object Compositions .11313
Yong-Lu Li (Shanghai Jiao Tong University), Yue Xu (Shanghai Jiao Tong University), Xiaohan Mao (Shanghai Jiao Tong University), and Cewu Lu (Shanghai Jiao Tong University)

Noise-Aware Fully Webly Supervised Object Detection ..11323.....
Yunhang Shen (Media Analytics and Computing Lab, Department of Artificial Intelligence, School of Informatics, Xiamen University), Rongrong Ji (Media Analytics and Computing Lab, Department of Artificial Intelligence, School of Informatics, Xiamen University), Zhiwei Chen (Media Analytics and Computing Lab, Department of Artificial Intelligence, School of Informatics, Xiamen University), Xiaopeng Hong (Xi'an Jiaotong University), Feng Zheng (Department of Computer Science and Engineering, Southern University of Science and Technology), Jianzhuang Liu (Noah's Ark Lab, Huawei Technologies), Mingliang Xu (Zhengzhou University), and Qi Tian (Noah's Ark Lab, Huawei Technologies)

3D Part Guided Image Editing for Fine-Grained Object Understanding ..11333.....
Zongdai Liu (State Key Laboratory of Virtual Reality Technology and Systems, Beihang University), Feixiang Lu (Robotics and Autonomous Driving Laboratory, Baidu Research; National Engineering Laboratory of Deep Learning Technology and Application, China), Peng Wang (Robotics and Autonomous Driving Laboratory, Baidu Research; ByteDance Research), Hui Miao (State Key Laboratory of Virtual Reality Technology and Systems, Beihang University), Liangjun Zhang (Robotics and Autonomous Driving Laboratory, Baidu Research; National Engineering Laboratory of Deep Learning Technology and Application, China), Ruigang Yang (Robotics and Autonomous Driving Laboratory, Baidu Research; University of Kentucky; National Engineering Laboratory of Deep Learning Technology and Application, China), and Bin Zhou (State Key Laboratory of Virtual Reality Technology and Systems, Beihang University; Peng Cheng Laboratory, Shenzhen, China)

STINet: Spatio-Temporal-Interactive Network for Pedestrian Detection and Trajectory Prediction ..11343.....
Zhishuai Zhang (Waymo LLC; Johns Hopkins University), Jiyang Gao (Waymo LLC), Junhua Mao (Waymo LLC), Yukai Liu (Waymo LLC), Dragomir Anguelov (Waymo LLC), and Congcong Li (Waymo LLC)

Rethinking Performance Estimation in Neural Architecture Search ..11353.....
Xiawu Zheng (Media Analytics and Computing Lab, Department of Artificial Intelligence, School of Informatics, Xiamen University, China; National Institute for Data Science in Health and Medicine, Xiamen University; Peng Cheng Laboratory, Shenzhen, China), Rongrong Ji (National Institute for Data Science in Health and Medicine, Xiamen University; Peng Cheng Laboratory, Shenzhen, China), Qiang Wang (Media Analytics and Computing Lab, Department of Artificial Intelligence, School of Informatics, Xiamen University, China; Peng Cheng Laboratory, Shenzhen, China), Qixiang Ye (Peng Cheng Laboratory, Shenzhen, China; University of Chinese Academy of Sciences, China), Zhenguo Li (Noah's Ark Lab, Huawei Technologies), Yonghong Tian (Peng Cheng Laboratory, Shenzhen, China; Peking University), and Qi Tian (Noah's Ark Lab, Huawei Technologies)

Feature-Metric Registration: A Fast Semi-Supervised Approach for Robust Point Cloud Registration Without Correspondences 11363
Xiaoshui Huang (The University of Sydney Sydney, Australia), Guofeng Mei (University of Technology Sydney Sydney, Australia), and Jian Zhang (University of Technology Sydney Sydney, Australia)

Learning Multi-View Camera Relocalization With Graph Neural Networks 11372
Fei Xue (UISEE Technology Inc.), Xin Wu (Key Laboratory of Machine Perception, Peking University), Shaojun Cai (UISEE Technology Inc.), and Junqiu Wang (AVIC Beijing Changcheng Aeronautical Measurement and Control Technology Research Institute)

MotionNet: Joint Perception and Motion Prediction for Autonomous Driving Based on Bird's Eye View Maps 11382
Pengxiang Wu (Rutgers University), Siheng Chen (Mitsubishi Electric Research Laboratories), and Dimitris N. Metaxas (Rutgers University)

EcoNAS: Finding Proxies for Economical Neural Architecture Search 11393
Dongzhan Zhou (The University of Sydney, SenseTime Computer Vision Research Group, Australia), Xinchi Zhou (The University of Sydney, SenseTime Computer Vision Research Group, Australia), Wenwei Zhang (Nanyang Technological University), Chen Change Loy (Nanyang Technological University), Shuai Yi (SenseTime Research), Xuesen Zhang (SenseTime Research), and Wanli Ouyang (The University of Sydney, SenseTime Computer Vision Research Group, Australia)

Hit-Detector: Hierarchical Trinity Architecture Search for Object Detection 11402
Jianyuan Guo (Key Lab of Machine Perception (MOE), Dept. of Machine Intelligence, Peking University; Noah's Ark Lab, Huawei Technologies), Kai Han (Noah's Ark Lab, Huawei Technologies), Yunhe Wang (Noah's Ark Lab, Huawei Technologies), Chao Zhang (Key Lab of Machine Perception (MOE), Dept. of Machine Intelligence, Peking University), Zhaohui Yang (Key Lab of Machine Perception (MOE), Dept. of Machine Intelligence, Peking University), Han Wu (Key Lab of Machine Perception (MOE), Dept. of Machine Intelligence, Peking University), Xinghao Chen (Noah's Ark Lab, Huawei Technologies), and Chang Xu (School of Computer Science, Faculty of Engineering, University of Sydney)

Geometrically Principled Connections in Graph Neural Networks 11412
Shunwang Gong (Imperial College London), Mehdi Bahri (Imperial College London), Michael M. Bronstein (Imperial College London; Twitter; USI Lugano), and Stefanos Zafeiriou (Imperial College London; FaceSoft.io)

On Vocabulary Reliance in Scene Text Recognition 11422
Zhaoyi Wan (Megvii), Jielei Zhang (Megvii), Liang Zhang (China University of Mining and Technology), Jiebo Luo (University of Rochester), and Cong Yao (Megvii)

Generating Accurate Pseudo-Labels in Semi-Supervised Learning and Avoiding Overconfident Predictions via Hermite Polynomial Activations 11432
Vishnu Suresh Lokhande (University of Wisconsin-Madison, USA), Songwong Tasneeyapant (University of Wisconsin-Madison, USA), Abhay Venkatesh (n/a), Sathya N. Ravi (University of Illinois Chicago, USA), and Vikas Singh (University of Wisconsin-Madison, USA)

GraspNet-1Billion: A Large-Scale Benchmark for General Object Grasping .11441.....
Hao-Shu Fang (Shanghai Jiao Tong University), Chenxi Wang (Shanghai Jiao Tong University), Minghao Gou (Shanghai Jiao Tong University), and Cewu Lu (Shanghai Jiao Tong University)

PFRL: Pose-Free Reinforcement Learning for 6D Pose Estimation .11451.....
Jianzhun Shao (Department of Automation and BNRist, Tsinghua University, Beijing, China), Yuhang Jiang (Department of Automation and BNRist, Tsinghua University, Beijing, China), Gu Wang (Department of Automation and BNRist, Tsinghua University, Beijing, China), Zhigang Li (Department of Automation and BNRist, Tsinghua University, Beijing, China), and Xiangyang Ji (Department of Automation and BNRist, Tsinghua University, Beijing, China)

Through Fog High-Resolution Imaging Using Millimeter Wave Radar .11461.....
Junfeng Guan (University of Illinois at Urbana-Champaign), Sohrab Madani (University of Illinois at Urbana-Champaign), Suraj Jog (University of Illinois at Urbana-Champaign), Saurabh Gupta (University of Illinois at Urbana-Champaign), and Haitham Hassanieh (University of Illinois at Urbana-Champaign)

Disentangling Physical Dynamics From Unknown Factors for Unsupervised Video Prediction 11471
Vincent Le Guen (EDF R&D, Chatou, France; CEDRIC, Conservatoire National des Arts et Métiers, Paris, France) and Nicolas Thome (CEDRIC, Conservatoire National des Arts et Métiers, Paris, France)

D2Det: Towards High Quality Object Detection and Instance Segmentation .11482.....
Jiale Cao (Tianjin University), Hisham Cholakkal (Inception Institute of Artificial Intelligence (IIAI), UAE), Rao Muhammad Anwer (Inception Institute of Artificial Intelligence (IIAI), UAE), Fahad Shahbaz Khan (Inception Institute of Artificial Intelligence (IIAI), UAE), Yanwei Pang (Tianjin University), and Ling Shao (Inception Institute of Artificial Intelligence (IIAI), UAE)

LiDAR-Based Online 3D Video Object Detection With Graph-Based Message Passing and Spatiotemporal Transformer Attention .11492.....
Junbo Yin (Beijing Lab of Intelligent Information Technology, School of Computer Science, Beijing Institute of Technology, China; Baidu Research), Jianbing Shen (Beijing Lab of Intelligent Information Technology, School of Computer Science, Beijing Institute of Technology, China; Inception Institute of Artificial Intelligence, UAE), Chenye Guan (Baidu Research; National Engineering Laboratory of Deep Learning Technology and Application, China), Dingfu Zhou (Baidu Research; National Engineering Laboratory of Deep Learning Technology and Application, China), and Ruigang Yang (Baidu Research; National Engineering Laboratory of Deep Learning Technology and Application, China;University of Kentucky, Kentucky, USA)

Orthogonal Convolutional Neural Networks .11502.....
Jiayun Wang (UC Berkeley / ICSI), Yubei Chen (UC Berkeley / ICSI), Rudrasis Chakraborty (UC Berkeley / ICSI), and Stella X. Yu (UC Berkeley / ICSI)

Self-Robust 3D Point Recognition via Gather-Vector Guidance .11513.....
Xiaoyi Dong (University of Science and Technology of China), Dongdong Chen (Microsoft Cloud AI), Hang Zhou (University of Science and Technology of China), Gang Hua (Wormpex AI Research), Weiming Zhang (University of Science and Technology of China), and Nenghai Yu (University of Science and Technology of China)

VectorNet: Encoding HD Maps and Agent Dynamics From Vectorized Representation .11522
Jiyang Gao (Waymo LLC), Chen Sun (Google Research), Hang Zhao (Waymo LLC), Yi Shen (Waymo LLC), Dragomir Anguelov (Waymo LLC), Congcong Li (Waymo LLC), and Cordelia Schmid (Google Research)

ECA-Net: Efficient Channel Attention for Deep Convolutional Neural Networks .11531.....
Qilong Wang (Tianjin Key Lab of Machine Learning, College of Intelligence and Computing, Tianjin University, China), Banggu Wu (Tianjin Key Lab of Machine Learning, College of Intelligence and Computing, Tianjin University, China), Pengfei Zhu (Tianjin Key Lab of Machine Learning, College of Intelligence and Computing, Tianjin University, China), Peihua Li (Dalian University of Technology, China), Wangmeng Zuo (Harbin Institute of Technology, China), and Qinghua Hu (Tianjin Key Lab of Machine Learning, College of Intelligence and Computing, Tianjin University, China)

MTL-NAS: Task-Agnostic Neural Architecture Search Towards General-Purpose Multi-Task Learning .11540.....
Yuan Gao (Tencent AI Lab), Haoping Bai (Carnegie Mellon University), Zequn Jie (Tencent AI Lab), Jiayi Ma (Wuhan University), Kui Jia (South China University of Technology), and Wei Liu (Tencent AI Lab)

PnPNet: End-to-End Perception and Prediction With Tracking in the Loop .11550.....
Ming Liang (Uber Advanced Technologies Group), Bin Yang (Uber Advanced Technologies Group; University of Toronto), Wenyuan Zeng (Uber Advanced Technologies Group; University of Toronto), Yun Chen (Uber Advanced Technologies Group), Rui Hu (Uber Advanced Technologies Group), Sergio Casas (Uber Advanced Technologies Group; University of Toronto), and Raquel Urtasun (Uber Advanced Technologies Group; University of Toronto)

Revisiting the Sibling Head in Object Detector .11560.....
Guanglu Song (SenseTime X-Lab), Yu Liu (The Chinese University of Hong Kong, Hong Kong), and Xiaogang Wang (The Chinese University of Hong Kong, Hong Kong)

Visual Reaction: Learning to Play Catch With Your Drone .11570.....
Kuo-Hao Zeng (Paul G. Allen School of Computer Science & Engineering, University of Washington), Roozbeh Mottaghi (Paul G. Allen School of Computer Science & Engineering, University of Washington; PRIOR @ Allen Institute for AI), Luca Weihs (PRIOR @ Allen Institute for AI), and Ali Farhadi (Paul G. Allen School of Computer Science & Engineering, University of Washington)

Prime Sample Attention in Object Detection .1580
Yuhang Cao (CUHK - SenseTime Joint Lab, The Chinese University of Hong Kong), Kai Chen (CUHK - SenseTime Joint Lab, The Chinese University of Hong Kong), Chen Change Loy (Nanyang Technological University), and Dahua Lin (CUHK - SenseTime Joint Lab, The Chinese University of Hong Kong)

SpineNet: Learning Scale-Permuted Backbone for Recognition and Localization .1589
Xianzhi Du (Google Research, Brain Team), Tsung-Yi Lin (Google Research, Brain Team), Pengchong Jin (Google Research, Brain Team), Golnaz Ghiasi (Google Research, Brain Team), Mingxing Tan (Google Research, Brain Team), Yin Cui (Google Research, Brain Team), Quoc V. Le (Google Research, Brain Team), and Xiaodan Song (Google Research, Brain Team)

KeyPose: Multi-View 3D Labeling and Keypoint Estimation for Transparent Objects .1599
Xingyu Liu (Stanford University), Rico Jonschkowski (Robotics at Google), Anelia Angelova (Robotics at Google), and Kurt Konolige (Robotics at Google)

SegGCN: Efficient 3D Point Cloud Segmentation With Fuzzy Spherical Kernel .1608
Huan Lei (School of Computer Science and Software Engineering, The University of Western Australia), Naveed Akhtar (School of Computer Science and Software Engineering, The University of Western Australia), and Ajmal Mian (School of Computer Science and Software Engineering, The University of Western Australia)

nuScenes: A Multimodal Dataset for Autonomous Driving .1618
Holger Caesar (nuTonomy: An APTIV Company), Varun Bankiti (nuTonomy: An APTIV Company), Alex H. Lang (nuTonomy: An APTIV Company), Sourabh Vora (nuTonomy: An APTIV Company), Venice Erin Liong (nuTonomy: An APTIV Company), Qiang Xu (nuTonomy: An APTIV Company), Anush Krishnan (nuTonomy: An APTIV Company), Yu Pan (nuTonomy: An APTIV Company), Giancarlo Baldan (nuTonomy: An APTIV Company), and Oscar Beijbom (nuTonomy: An APTIV Company)

PVN3D: A Deep Point-Wise 3D Keypoints Voting Network for 6DoF Pose Estimation .1629
Yisheng He (Hong Kong University of Science and Technology), Wei Sun (Megvii Inc.), Haibin Huang (Kuaishou Technology), Jianran Liu (Megvii Inc.), Haoqiang Fan (Megvii Inc.), and Jian Sun (Megvii Inc.)

Probabilistic Pixel-Adaptive Refinement Networks .1639
Anne S. Wannenwetsch (Amazon, Germany; TU Darmstadt, Germany) and Stefan Roth (Amazon, Germany)

Discovering Human Interactions With Novel Objects via Zero-Shot Learning .1649
Suchen Wang (Nanyang Technological University), Kim-Hui Yap (Nanyang Technological University), Junsong Yuan (State University of New York at Buffalo), and Yap-Peng Tan (Nanyang Technological University)

Equalization Loss for Long-Tailed Object Recognition .1659
Jingru Tan (Tongji University), Changbao Wang (SenseTime Research), Buyu Li (The Chinese University of Hong Kong), Quanquan Li (SenseTime Research), Wanli Ouyang (The University of Sydney, SenseTime Computer Vision Research Group, Australia), Changqing Yin (Tongji University), and Junjie Yan (SenseTime Research)

Learning Depth-Guided Convolutions for Monocular 3D Object Detection .11669.....
Mingyu Ding (The University of Hong Kong; Gaoling School of Artificial Intelligence, Renmin University of China), Yuqi Huo (Gaoling School of Artificial Intelligence, Renmin University of China; Beijing Key Laboratory of Big Data Management and Analysis Methods, China), Hongwei Yi (Shenzhen Graduate School, Peking University), Zhe Wang (SenseTime Research), Jianping Shi (SenseTime Research), Zhiwu Lu (Gaoling School of Artificial Intelligence, Renmin University of China; Beijing Key Laboratory of Big Data Management and Analysis Methods, China), and Ping Luo (The University of Hong Kong)

Seeing Through Fog Without Seeing Fog: Deep Multimodal Sensor Fusion in Unseen Adverse Weather .11679.....
Mario Bijelic (Mercedes-Benz AG; Ulm University), Tobias Gruber (Mercedes-Benz AG; Ulm University), Fahim Mannan (Algolux), Florian Kraus (Mercedes-Benz AG; Ulm University), Werner Ritter (Mercedes-Benz AG), Klaus Dietmayer (Ulm University), and Felix Heide (Algolux; Princeton University)

Don't Even Look Once: Synthesizing Features for Zero-Shot Detection .11690.....
Pengkai Zhu (Electrical and Computer Engineering Department, Boston University), Hanxiao Wang (Electrical and Computer Engineering Department, Boston University; Onfido ltd, London, UK), and Venkatesh Saligrama (Electrical and Computer Engineering Department, Boston University)

EPOS: Estimating 6D Pose of Objects With Symmetries .11700.....
Tomáš Hodaň (Visual Recognition Group, Czech Technical University in Prague), Dániel Baráth (Visual Recognition Group, Czech Technical University in Prague; Machine Perception Research Laboratory, MTA SZTAKI, Budapest), and Jiří Matas (Visual Recognition Group, Czech Technical University in Prague)

Train in Germany, Test in the USA: Making 3D Object Detectors Generalize .11710.....
Yan Wang (Cornell University), Xiangyu Chen (Cornell University), Yurong You (Cornell University), Li Erran Li (Scale AI; Columbia University), Bharath Hariharan (Cornell University), Mark Campbell (Cornell University), Kilian Q. Weinberger (Cornell University), and Wei-Lun Chao (The Ohio State University)

Exploring Categorical Regularization for Domain Adaptive Object Detection .11721.....
Chang-Dong Xu (Megvii Research Nanjing, Megvii Technology), Xing-Ran Zhao (Megvii Research Nanjing, Megvii Technology), Xin Jin (Megvii Research Nanjing, Megvii Technology), and Xiu-Shen Wei (Megvii Research Nanjing, Megvii Technology)

Neural Implicit Embedding for Point Cloud Analysis .11731.....
Kent Fujiwara (LINE Corporation) and Taiichi Hashimoto (LINE Corporation)

Pose-Guided Visible Part Matching for Occluded Person ReID .11741.....
Shang Gao (Dalian University of Technology), Jingya Wang (UBTECH Sydney AI Center, The University of Sydney), Huchuan Lu (Dalian University of Technology; Pengcheng Lab), and Zimo Liu (Dalian University of Technology)

ContourNet: Taking a Further Step Toward Accurate Arbitrary-Shaped Scene Text Detection 11750
Yuxin Wang (University of Science and Technology of China), Hongtao Xie (University of Science and Technology of China), Zheng-Jun Zha (University of Science and Technology of China), Mengting Xing (University of Science and Technology of China), Zilong Fu (University of Science and Technology of China), and Yongdong Zhang (University of Science and Technology of China)

Exploring Data Aggregation in Policy Learning for Vision-Based Urban Autonomous Driving 11760
Aditya Prakash (Max Planck Institute for Intelligent Systems, Tübingen), Aseem Behl (Max Planck Institute for Intelligent Systems, Tübingen; University of Tübingen), Eshed Ohn-Bar (Max Planck Institute for Intelligent Systems, Tübingen; Boston University), Kashyap Chitta (Max Planck Institute for Intelligent Systems, Tübingen; University of Tübingen), and Andreas Geiger (Max Planck Institute for Intelligent Systems, Tübingen; University of Tübingen)

Look-Into-Object: Self-Supervised Structure Modeling for Object Recognition .11771.....
Mohan Zhou (Harbin Institute of Technology; JD AI Research, Beijing, China), Yalong Bai (JD AI Research, Beijing, China), Wei Zhang (JD AI Research, Beijing, China), Tiejun Zhao (Harbin Institute of Technology), and Tao Mei (JD AI Research, Beijing, China)

Recognizing Objects From Any View With Object and Viewer-Centered Representations .11781
Sainan Liu (University of California, San Diego), Vincent Nguyen (University of California, San Diego), Isaac Rehg (University of California, San Diego), and Zhuowen Tu (University of California, San Diego)

Gated Channel Transformation for Visual Recognition .11791.....
Zongxin Yang (Baidu Research; ReLER, University of Technology Sydney), Linchao Zhu (ReLER, University of Technology Sydney), Yu Wu (Baidu Research; ReLER, University of Technology Sydney), and Yi Yang (ReLER, University of Technology Sydney)

Non-Local Neural Networks With Grouped Bilinear Attentional Transforms .11801.....
Lu Chi (Peking University, Beijing, China; ByteDance AI Lab, Beijing, China), Zehuan Yuan (ByteDance AI Lab, Beijing, China), Yadong Mu (Peking University, Beijing, China), and Changhu Wang (ByteDance AI Lab, Beijing, China)

Generative-Discriminative Feature Representations for Open-Set Recognition .11811.....
Pramuditha Perera (Johns Hopkins University), Vlad I. Morariu (Adobe Research), Rajiv Jain (Adobe Research), Varun Manjunatha (Adobe Research), Curtis Wigington (Adobe Research), Vicente Ordonez (University of Virginia), and Vishal M. Patel (Johns Hopkins University)

RPM-Net: Robust Point Matching Using Learned Features .11821.....
Zi Jian Yew (Department of Computer Science, National University of Singapore) and Gim Hee Lee (Department of Computer Science, National University of Singapore)

Sideways: Depth-Parallel Training of Video Models .11831
Mateusz Malinowski (DeepMind, London, U.K.), Grzegorz Świrszcz (DeepMind, London, U.K.), João Carreira (DeepMind, London, U.K.), and Viorica Pătrăucean (DeepMind, London, U.K.)

Basis Prediction Networks for Effective Burst Denoising With Large Kernels .11841
Zhihao Xia (Washington University in St. Louis), Federico Perazzi (Adobe Research), Michaël Gharbi (Adobe Research), Kalyan Sunkavalli (Adobe Research), and Ayan Chakrabarti (Washington University in St. Louis)

Private-kNN: Practical Differential Privacy for Computer Vision .11851
Yuqing Zhu (University of California, Santa Barbara; NEC Labs America), Xiang Yu (NEC Labs America), Manmohan Chandraker (NEC Labs America; University of California, San Diego), and Yu-Xiang Wang (University of California, Santa Barbara)

SP-NAS: Serial-to-Parallel Backbone Search for Object Detection .11860
Chenhan Jiang (Huawei Noah's Ark Lab), Hang Xu (Huawei Noah's Ark Lab), Wei Zhang (Huawei Noah's Ark Lab), Xiaodan Liang (Sun Yat-Sen University), and Zhenguo Li (Huawei Noah's Ark Lab)

Structure Aware Single-Stage 3D Object Detection From Point Cloud .11870
Chenhang He (The Hong Kong Polytechnic University; DAMO Academy, Alibaba Group), Hui Zeng (The Hong Kong Polytechnic University; DAMO Academy, Alibaba Group), Jianqiang Huang (DAMO Academy, Alibaba Group), Xian-Sheng Hua (DAMO Academy, Alibaba Group), and Lei Zhang (The Hong Kong Polytechnic University; DAMO Academy, Alibaba Group)

“Looking at the Right Stuff” – Guided Semantic-Gaze for Autonomous Driving .11880
Anwesan Pal (UC San Diego), Sayan Mondal (UC San Diego), and Henrik I. Christensen (UC San Diego)

What’s Hidden in a Randomly Weighted Neural Network? .11890
Vivek Ramanujan (Allen Institute for Artificial Intelligence), Mitchell Wortsman (University of Washington), Aniruddha Kembhavi (Allen Institute for Artificial Intelligence; University of Washington), Ali Farhadi (University of Washington), and Mohammad Rastegari (University of Washington)

Structured Multi-Hashing for Model Compression .11900
Elad Eban (Google Research), Yair Movshovitz-Attias (Google Research), Hao Wu (Google Research), Mark Sandler (Google Research), Andrew Poon (Google Research), Yerlan Idelbayev (University of California, Merced), and Miguel Á. Carreira-Perpiñán (University of California, Merced)

DOPS: Learning to Detect 3D Objects and Predict Their 3D Shapes .11910
Mahyar Najibi (University of Maryland), Guangda Lai (Google), Abhijit Kundu (Google), Zhichao Lu (Google), Vivek Rathod (Google), Thomas Funkhouser (Google), Caroline Pantofaru (Google), David Ross (Google), Larry S. Davis (University of Maryland), and Alireza Fathi (Google)

AutoTrack: Towards High-Performance Visual Tracking for UAV With Automatic Spatio-Temporal Regularization ..11920
Yiming Li (Tongji University), Changhong Fu (Tongji University), Fangqiang Ding (Tongji University), Ziyuan Huang (National University of Singapore), and Geng Lu (Tsinghua University)

GP-NAS: Gaussian Process Based Neural Architecture Search ..11930
Zhihang Li (NLPR & AIR, CAS), Teng Xi (Department of Computer Vision Technology (VIS), Baidu Inc.; Department of Computer Science and Technology, Tsinghua University), Jiankang Deng (Imperial College London), Gang Zhang (Department of Computer Vision Technology (VIS), Baidu Inc.), Shengzhao Wen (Department of Computer Vision Technology (VIS), Baidu Inc.), and Ran He (NLPR & CEBSIT, CAS)

NAS-FCOS: Fast Neural Architecture Search for Object Detection ..11940
Ning Wang (School of Computer Science, Northwestern Polytechnical University, China; National Engineering Lab for Integrated Aero-Space-Ground-Ocean Big Data Application Technology, China), Yang Gao (School of Computer Science, Northwestern Polytechnical University, China; National Engineering Lab for Integrated Aero-Space-Ground-Ocean Big Data Application Technology, China), Hao Chen (The University of Adelaide, Australia), Peng Wang (School of Computer Science, Northwestern Polytechnical University, China; National Engineering Lab for Integrated Aero-Space-Ground-Ocean Big Data Application Technology, China), Zhi Tian (The University of Adelaide, Australia), Chunhua Shen (The University of Adelaide, Australia), and Yanning Zhang (School of Computer Science, Northwestern Polytechnical University, China; National Engineering Lab for Integrated Aero-Space-Ground-Ocean Big Data Application Technology, China)

TCTS: A Task-Consistent Two-Stage Framework for Person Search ..11949
Cheng Wang (University of Chinese Academy of Sciences, Beijing, China), Bingpeng Ma (University of Chinese Academy of Sciences, Beijing, China), Hong Chang (Key Lab of Intelligent Information Processing of Chinese Academy of Sciences (CAS), Institute of Computing Technology, CAS, Beijing, China; University of Chinese Academy of Sciences, Beijing, China), Shiguang Shan (Key Lab of Intelligent Information Processing of Chinese Academy of Sciences (CAS), Institute of Computing Technology, CAS, Beijing, China; University of Chinese Academy of Sciences, Beijing, China; Peng Cheng Laboratory, Shenzhen, China), and Xilin Chen (Key Lab of Intelligent Information Processing of Chinese Academy of Sciences (CAS), Institute of Computing Technology, CAS, Beijing, China; University of Chinese Academy of Sciences, Beijing, China)

SCATTER: Selective Context Attentional Scene Text Recognizer ..11959
Ron Litman (Amazon Web Services), Oron Anschel (Amazon Web Services), Shahar Tsiper (Amazon Web Services), Roee Litman (Amazon Web Services), Shai Mazor (Amazon Web Services), and R. Manmatha (Amazon Web Services)

Learning Canonical Shape Space for Category-Level 6D Object Pose and Size Estimation .11970
Dengsheng Chen (National University of Defense Technology), Jun Li (National University of Defense Technology), Zheng Wang (Taobao.com), and Kai Xu (National University of Defense Technology; SpeedBot Robotics Ltd.)

Hierarchical Scene Coordinate Classification and Regression for Visual Localization .11980
Xiaotian Li (Aalto University), Shuzhe Wang (Aalto University), Yi Zhao (Aalto University), Jakob Verbeek (Facebook AI Research), and Juho Kannala (Aalto University)

MiLeNAS: Efficient Neural Architecture Search via Mixed-Level Reformulation .11990
Chaoyang He (University of Southern California), Haishan Ye (The Chinese University of Hong Kong, Shenzhen), Li Shen (Tencent AI Lab), and Tong Zhang (Hong Kong University of Science and Technology)

Scalable Uncertainty for Computer Vision With Functional Variational Inference .12000
Eduardo D. C. Carvalho (Department of Computing, Imperial College London), Ronald Clark (Department of Computing, Imperial College London), Andrea Nicastro (Department of Computing, Imperial College London), and Paul H. J. Kelly (Department of Computing, Imperial College London)

Uncertainty-Aware CNNs for Depth Completion: Uncertainty from Beginning to End .12011
Abdelrahman Eldesokey (Computer Vision Laboratory, Linköping University, Sweden), Michael Felsberg (Computer Vision Laboratory, Linköping University, Sweden), Karl Holmquist (Computer Vision Laboratory, Linköping University, Sweden), and Michael Persson (Computer Vision Laboratory, Linköping University, Sweden)

Butterfly Transform: An Efficient FFT Based Neural Architecture Design .12021
Keivan Alizadeh Vahid (University of Washington), Anish Prabhu (University of Washington), Ali Farhadi (University of Washington), and Mohammad Rastegari (University of Washington)

A Certifiably Globally Optimal Solution to Generalized Essential Matrix Estimation .12031
Ji Zhao (TuSimple), Wanting Xu (ShanghaiTech University), and Laurent Kneip (ShanghaiTech University)

MUXConv: Information Multiplexing in Convolutional Neural Networks .12041
Zhichao Lu (Michigan State University), Kalyanmoy Deb (Michigan State University), and Vishnu Naresh Boddeti (Michigan State University)

PointGMM: A Neural GMM Network for Point Clouds .12051
Amir Hertz (Tel Aviv University), Rana Hanocka (Tel Aviv University), Raja Giryes (Tel Aviv University), and Daniel Cohen-Or (Tel Aviv University)

Noisier2Noise: Learning to Denoise From Unpaired Noisy Data .12061
Nick Moran (Algorithmic Systems Group, Analog Devices), Dan Schmidt (Algorithmic Systems Group, Analog Devices), Yu Zhong (Algorithmic Systems Group, Analog Devices), and Patrick Coady (Algorithmic Systems Group, Analog Devices)

TRPLP – Trifocal Relative Pose From Lines at Points .12070.....
Ricardo Fabbri (Rio de Janeiro State University), Timothy Duff (Georgia Tech), Hongyi Fan (Brown University), Margaret H. Regan (University of Notre Dame), David da Costa de Pinho (UENF – Brazil), Elias Tsigaridas (INRIA Paris), Charles W. Wampler (University of Notre Dame), Jonathan D. Hauenstein (University of Notre Dame), Peter J. Giblin (University of Liverpool), Benjamin Kimia (Brown University), Anton Leykin (Georgia Tech), and Tomas Pajdla (CIIRC CTU in Prague)

DSNAS: Direct Neural Architecture Search Without Parameter Retraining .12081.....
Shoukang Hu (The Chinese Univsersity of Hong Kong), Sirui Xie (University of California, Los Angeles), Hehui Zheng (Cambridge University), Chunxiao Liu (SenseTime Research), Jianping Shi (SenseTime Research), Xunying Liu (The Chinese Univsersity of Hong Kong), and Dahua Lin (The Chinese Univsersity of Hong Kong)

MonoPair: Monocular 3D Object Detection Using Pairwise Spatial Relationships .12090.....
Yongjian Chen (Alibaba Group), Lei Tai (Alibaba Group), Kai Sun (Alibaba Group), and Mingyang Li (Alibaba Group)

Regularization on Spatio-Temporally Smoothed Feature for Action Recognition .12100.....
Jinhyung Kim (KAIST), Seunghwan Cha (Carnegie Mellon University), Dongyoon Wee (Clova AI, NAVER Corp.), Soonmin Bae (Clova AI, NAVER Corp.), and Junmo Kim (KAIST)

Towards Accurate Scene Text Recognition With Semantic Reasoning Networks .12110.....
Deli Yu (School of Artificial Intelligence, University of Chinese Academy of Sciences; National Laboratory of Pattern Recognition, Institute of Automation, Chinese Academy of Sciences), Xuan Li (Department of Computer Vision Technology(VIS), Baidu Inc.), Chengquan Zhang (Department of Computer Vision Technology(VIS), Baidu Inc.), Tao Liu (Department of Computer Vision Technology(VIS), Baidu Inc.), Junyu Han (Department of Computer Vision Technology(VIS), Baidu Inc.), Jingtuo Liu (Department of Computer Vision Technology(VIS), Baidu Inc.), and Errui Ding (Department of Computer Vision Technology(VIS), Baidu Inc.)

Unsupervised Reinforcement Learning of Transferable Meta-Skills for Embodied Navigation .....
12120
Juncheng Li (Zhejiang University), Xin Wang (University of California, Santa Barbara), Siliang Tang (Zhejiang University), Haizhou Shi (Zhejiang University), Fei Wu (Zhejiang University), Yueting Zhuang (Zhejiang University), and William Yang Wang (University of California, Santa Barbara)

Inferring Attention Shift Ranks of Objects for Image Saliency .12130.....
Avishek Siris (Department of Computer Science, Swansea University), Jianbo Jiao (Department of Engineering Science, University of Oxford), Gary K.L. Tam (Department of Computer Science, Swansea University), Xianghua Xie (Department of Computer Science, Swansea University), and Rynson W.H. Lau (City University of Hong Kong)

Camera On-Boarding for Person Re-Identification Using Hypothesis Transfer Learning .12141
Sk Miraj Ahmed (University of California, Riverside), Aske R. Lejbølle (Aalborg University, Denmark), Rameswar Panda (Aalborg University, Denmark), and Amit K. Roy-Chowdhury (University of California, Riverside)

Joint Graph-Based Depth Refinement and Normal Estimation .12151
Mattia Rossi (École Polytechnique Fédérale de Lausanne), Mireille El Gheche (École Polytechnique Fédérale de Lausanne), Andreas Kuhn (Sony Europe B.V.), and Pascal Frossard (École Polytechnique Fédérale de Lausanne)

DR Loss: Improving Object Detection by Distributional Ranking .12161
Qi Qian (Alibaba Group, Bellevue, WA, USA), Lei Chen (Alibaba Group, Hangzhou, China), Hao Li (Alibaba Group, Hangzhou, China), and Rong Jin (Alibaba Group, Bellevue, WA, USA)

Self-Trained Deep Ordinal Regression for End-to-End Video Anomaly Detection .12170
Guansong Pang (The University of Adelaide, Australia), Cheng Yan (Beihang University, China; The University of Adelaide, Australia), Chunhua Shen (The University of Adelaide, Australia), Anton van den Hengel (The University of Adelaide, Australia), and Xiao Bai (Beihang University, China)

Oral 3-3A: Recognition (Detection, Categorization) (3); Segmentation, Grouping and Shape (2)

Few-Shot Class-Incremental Learning .12180
Xiaoyu Tao (Faculty of Electronic and Information Engineering, Xi'an Jiaotong University), Xiaopeng Hong (Faculty of Electronic and Information Engineering, Xi'an Jiaotong University; Research Center for Artificial Intelligence, Peng Cheng Laboratory), Xinyuan Chang (School of Software Engineering, Xi'an Jiaotong University), Songlin Dong (Faculty of Electronic and Information Engineering, Xi'an Jiaotong University), Xing Wei (School of Software Engineering, Xi'an Jiaotong University), and Yihong Gong (School of Software Engineering, Xi'an Jiaotong University)

PolarMask: Single Shot Instance Segmentation With Polar Representation .12190
Enze Xie (The University of Hong Kong; Sensetime Group Ltd), Peize Sun (Xi'an Jiaotong University), Xiaoge Song (Nanjing University), Wenhai Wang (Nanjing University), Xuebo Liu (Sensetime Group Ltd), Ding Liang (Sensetime Group Ltd), Chunhua Shen (The University of Adelaide), and Ping Luo (The University of Hong Kong)

DeepEMD: Few-Shot Image Classification With Differentiable Earth Mover's Distance and Structured Classifiers .12200
Chi Zhang (Nanyang Technological University, Singapore), Yujun Cai (Nanyang Technological University, Singapore), Guosheng Lin (Nanyang Technological University, Singapore), and Chunhua Shen (The University of Adelaide, Australia)

Detection in Crowded Scenes: One Proposal, Multiple Predictions .12211
Xuangeng Chu (Peking University), Anlin Zheng (MEGVII Technology), Xiangyu Zhang (MEGVII Technology), and Jian Sun (MEGVII Technology)

Autolabeling 3D Objects With Differentiable Rendering of SDF Shape Priors ..12221.....
Sergey Zakharov (Technical University of Munich), Wadim Kehl (Toyota Research Institute), Arjun Bhargava (Toyota Research Institute), and Adrien Gaidon (Toyota Research Institute)

Interactive Object Segmentation With Inside-Outside Guidance ..12231.....
Shiyin Zhang (Institute of Information Science, Beijing Jiaotong University; Beijing Key Laboratory of Advanced Information Science and Network Technology), Jun Hao Liew (National University of Singapore), Yunchao Wei (ReLER, University of Technology Sydney), Shikui Wei (Institute of Information Science, Beijing Jiaotong University; Beijing Key Laboratory of Advanced Information Science and Network Technology), and Yao Zhao (Institute of Information Science, Beijing Jiaotong University; Beijing Key Laboratory of Advanced Information Science and Network Technology)

Mnemonics Training: Multi-Class Incremental Learning Without Forgetting ..12242.....
Yaoyao Liu (School of Electrical and Information Engineering, Tianjin University; Max Planck Institute for Informatics, Saarland Informatics Campus), Yuting Su (School of Electrical and Information Engineering, Tianjin University), An-An Liu (School of Electrical and Information Engineering, Tianjin University), Bernt Schiele (Max Planck Institute for Informatics, Saarland Informatics Campus), and Qianru Sun (School of Information Systems, Singapore Management University)

Learning to Segment 3D Point Clouds in 2D Image Space ..12252.....
Yecheng Lyu (Worcester Polytechnic Institute), Xinming Huang (Worcester Polytechnic Institute), and Ziming Zhang (Worcester Polytechnic Institute)

Smooth Shells: Multi-Scale Shape Registration With Functional Maps ..12262.....
Marvin Eisenberger (Technical University of Munich), Zorah Lähner (Technical University of Munich), and Daniel Cremers (Technical University of Munich)

Self-Supervised Equivariant Attention Mechanism for Weakly Supervised Semantic Segmentation ..12272.....
Yude Wang (Key Lab of Intelligent Information Processing of Chinese Academy of Sciences (CAS), Institute of Computing Technology, CAS, Beijing, China; University of Chinese Academy of Sciences, Beijing, China), Jie Zhang (Key Lab of Intelligent Information Processing of Chinese Academy of Sciences (CAS), Institute of Computing Technology, CAS, Beijing, China; University of Chinese Academy of Sciences, Beijing, China), Meina Kan (Key Lab of Intelligent Information Processing of Chinese Academy of Sciences (CAS), Institute of Computing Technology, CAS, Beijing, China; University of Chinese Academy of Sciences, Beijing, China), Shiguang Shan (Key Lab of Intelligent Information Processing of Chinese Academy of Sciences (CAS), Institute of Computing Technology, CAS, Beijing, China; University of Chinese Academy of Sciences, Beijing, China; CAS Center for Excellence in Brain Science and Intelligence Technology, Shanghai, China), and Xilin Chen (Key Lab of Intelligent Information Processing of Chinese Academy of Sciences (CAS), Institute of Computing Technology, CAS, Beijing, China; University of Chinese Academy of Sciences, Beijing, China)

Oral 3-3B: Vision Applications and Systems; Vision & Other Modalities; Visual Reasoning and Logical Representation

Efficient Neural Vision Systems Based on Convolutional Image Acquisition .12282.....
Pedram Pad (Centre Suisse d'Électronique et de Microtechnique (CSEM), Neuchâtel, Switzerland), Simon Narduzzi (Centre Suisse d'Électronique et de Microtechnique (CSEM), Neuchâtel, Switzerland), Clément Kündig (Centre Suisse d'Électronique et de Microtechnique (CSEM), Neuchâtel, Switzerland), Engin Türetken (Centre Suisse d'Électronique et de Microtechnique (CSEM), Neuchâtel, Switzerland), Siavash A. Bigdeli (Centre Suisse d'Électronique et de Microtechnique (CSEM), Neuchâtel, Switzerland), and L. Andrea Dunbar (Centre Suisse d'Électronique et de Microtechnique (CSEM), Neuchâtel, Switzerland)

Visual Chirality .12292.....
Zhiqiu Lin (Cornell University), Jin Sun (Cornell University; Cornell Tech), Abe Davis (Cornell University; Cornell Tech), and Noah Snavely (Cornell University; Cornell Tech)

What Machines See Is Not What They Get: Fooling Scene Text Recognition Models With Adversarial Text Images .12301.....
Xing Xu (Center for Future Media & School of Computer Science and Engineering, University of Electronic Science and Technology of China), Jiefu Chen (Center for Future Media & School of Computer Science and Engineering, University of Electronic Science and Technology of China), Jinhui Xiao (Center for Future Media & School of Computer Science and Engineering, University of Electronic Science and Technology of China), Lianli Gao (Center for Future Media & School of Computer Science and Engineering, University of Electronic Science and Technology of China), Fumin Shen (Center for Future Media & School of Computer Science and Engineering, University of Electronic Science and Technology of China), and Heng Tao Shen (Center for Future Media & School of Computer Science and Engineering, University of Electronic Science and Technology of China)

Dynamic Traffic Modeling From Overhead Imagery .12312.....
Scott Workman (DZYNE Technologies) and Nathan Jacobs (University of Kentucky)

Satellite Image Time Series Classification With Pixel-Set Encoders and Temporal Self-Attention .12322.....
Vivien Sainte Fare Garnot (LASTIG, Univ Gustave Eiffel, France), Loic Landrieu (LASTIG, Univ Gustave Eiffel, France), Sebastien Giordano (LASTIG, Univ Gustave Eiffel, France), and Nesrine Chehata (LASTIG, Univ Gustave Eiffel, France; EA G&E Bordeaux INP, Université Bordeaux Montaigne, France)

DAVD-Net: Deep Audio-Aided Video Decompression of Talking Heads .12332.....
Xi Zhang (Shanghai Jiao Tong University), Xiaolin Wu (McMaster University), Xinliang Zhai (Shandong University), Xianye Ben (Shandong University), and Chengjie Tu (Tencent)

Learning When and Where to Zoom With Deep Reinforcement Learning .12342.....
Burak Uzkent (Department of Computer Science Stanford University) and Stefano Ermon (Department of Computer Science Stanford University)

Oral 3-3C: Transfer/Low-Shot/Semi/Unsupervised Learning (3)

Cross-Domain Detection via Graph-Induced Prototype Alignment .12352.....
Minghao Xu (Shanghai Jiao Tong University, Shanghai, China; MoE Key Lab of Artificial Intelligence, AI Institute, Shanghai Jiao Tong University), Hang Wang (Shanghai Jiao Tong University, Shanghai, China; MoE Key Lab of Artificial Intelligence, AI Institute, Shanghai Jiao Tong University), Bingbing Ni (Shanghai Jiao Tong University, Shanghai, China; MoE Key Lab of Artificial Intelligence, AI Institute, Shanghai Jiao Tong University; Huawei Hisilicon), Qi Tian (Huawei Noah's Ark Lab), and Wenjun Zhang (Shanghai Jiao Tong University, Shanghai, China)

Meta-Learning of Neural Architectures for Few-Shot Learning .12362.....
Thomas Elsken (Bosch Center for Artificial Intelligence; University of Freiburg), Benedikt Staffler (Bosch Center for Artificial Intelligence), Jan Hendrik Metzen (Bosch Center for Artificial Intelligence), and Frank Hutter (University of Freiburg; Bosch Center for Artificial Intelligence)

Towards Inheritable Models for Open-Set Domain Adaptation .12373.....
Jogendra Nath Kundu (Video Analytics Lab, CDS, Indian Institute of Science, Bangalore), Naveen Venkat (Video Analytics Lab, CDS, Indian Institute of Science, Bangalore), Ambareesh Revanur (Video Analytics Lab, CDS, Indian Institute of Science, Bangalore), Rahul M V (Video Analytics Lab, CDS, Indian Institute of Science, Bangalore), and R. Venkatesh Babu (Video Analytics Lab, CDS, Indian Institute of Science, Bangalore)

Learning From Synthetic Animals .12383.....
Jiteng Mu (Johns Hopkins University), Weichao Qiu (Johns Hopkins University), Gregory D. Hager (Johns Hopkins University), and Alan L. Yuille (Johns Hopkins University)

Distilling Cross-Task Knowledge via Relationship Matching .12393.....
Han-Jia Ye (Nanjing University), Su Lu (Nanjing University), and De-Chuan Zhan (Nanjing University)

Open Compound Domain Adaptation .12403.....
Ziwei Liu (The Chinese University of Hong Kong), Zhongqi Miao (UC Berkeley / ICSI), Xingang Pan (The Chinese University of Hong Kong), Xiaohang Zhan (The Chinese University of Hong Kong), Dahua Lin (The Chinese University of Hong Kong), Stella X. Yu (UC Berkeley / ICSI), and Boqing Gong (Google Inc.)

Poster 3-3P

Context Prior for Scene Segmentation .12413.....
Changqian Yu (Key Laboratory of Image Processing and Intelligent Control, School of Artificial Intelligence and Automation, Huazhong University of Science and Technology; The University of Adelaide, Australia), Jingbo Wang (The Chinese University of Hong Kong), Changxin Gao (Key Laboratory of Image Processing and Intelligent Control, School of Artificial Intelligence and Automation, Huazhong University of Science and Technology), Gang Yu (Tencent), Chunhua Shen (The University of Adelaide, Australia), and Nong Sang (Key Laboratory of Image Processing and Intelligent Control, School of Artificial Intelligence and Automation, Huazhong University of Science and Technology)

Tangent Images for Mitigating Spherical Distortion .12423.....
Marc Eder (University of North Carolina at Chapel Hill, USA), Mykhailo Shvets (University of North Carolina at Chapel Hill, USA), John Lim (University of North Carolina at Chapel Hill, USA), and Jan-Michael Frahm (University of North Carolina at Chapel Hill, USA)

Learning a Dynamic Map of Visual Appearance .12432.....
Tawfiq Salem (Miami University), Scott Workman (DZYNE Technologies), and Nathan Jacobs (University of Kentucky)

Webly Supervised Knowledge Embedding Model for Visual Reasoning .12442.....
Wenbo Zheng (School of Software Engineering, Xi'an Jiaotong University; The State Key Laboratory for Management and Control of Complex Systems, Institute of Automation, Chinese Academy of Sciences), Lan Yan (The State Key Laboratory for Management and Control of Complex Systems, Institute of Automation, Chinese Academy of Sciences; School of Artificial Intelligence, University of Chinese Academy of Sciences), Chao Gou (School of Intelligent Systems Engineering, Sun Yat-sen University), and Fei-Yue Wang (The State Key Laboratory for Management and Control of Complex Systems, Institute of Automation, Chinese Academy of Sciences; School of Artificial Intelligence, University of Chinese Academy of Sciences)

Gradually Vanishing Bridge for Adversarial Domain Adaptation .12452.....
Shuhao Cui (Key Lab of Intell. Info. Process., Inst. of Comput. Tech., CAS, Beijing, China; University of Chinese Academy of Sciences, Beijing, China), Shuhui Wang (Key Lab of Intell. Info. Process., Inst. of Comput. Tech., CAS, Beijing, China), Junbao Zhuo (Key Lab of Intell. Info. Process., Inst. of Comput. Tech., CAS, Beijing, China; University of Chinese Academy of Sciences, Beijing, China), Chi Su (Kingsoft Cloud, Beijing, China), Qingming Huang (Key Lab of Intell. Info. Process., Inst. of Comput. Tech., CAS, Beijing, China; University of Chinese Academy of Sciences, Beijing, China; Peng Cheng Laboratory, Shenzhen, China), and Qi Tian (Noah's Ark Lab, Huawei Technologies)

Active Speakers in Context .12462.....
Juan León Alcázar (Universidad de Los Andes), Fabian Caba (Adobe Research), Long Mai (Adobe Research), Federico Perazzi (Adobe Research), Joon-Young Lee (Adobe Research), Pablo Arbeláez (Universidad de Los Andes), and Bernard Ghanem (King Abdullah University of Science and Technology (KAUST))

Panoptic-DeepLab: A Simple, Strong, and Fast Baseline for Bottom-Up Panoptic Segmentation 12472
Bowen Cheng (UIUC; Google Research), Maxwell D. Collins (Google Research), Yukun Zhu (Google Research), Ting Liu (Google Research), Thomas S. Huang (UIUC), Hartwig Adam (Google Research), and Liang-Chieh Chen (Google Research)

Inter-Region Affinity Distillation for Road Marking Segmentation .12483.....
Yuenan Hou (The Chinese University of Hong Kong), Zheng Ma (SenseTime Group Limited), Chunxiao Liu (SenseTime Group Limited), Tak-Wai Hui (The Chinese University of Hong Kong), and Chen Change Loy (Nanyang Technological University)

Unified Dynamic Convolutional Network for Super-Resolution With Variational Degradations 12493
Yu-Syuan Xu (MediaTek Inc., Hsinchu, Taiwan), Shou-Yao Roy Tseng (MediaTek Inc., Hsinchu, Taiwan), Yu Tseng (MediaTek Inc., Hsinchu, Taiwan), Hsien-Kai Kuo (MediaTek Inc., Hsinchu, Taiwan), and Yi-Min Tsai (MediaTek Inc., Hsinchu, Taiwan)

Making Better Mistakes: Leveraging Class Hierarchies With Deep Networks .12503.....
Luca Bertinetto (www.five.ai), Romain Mueller (www.five.ai), Konstantinos Tertikas (www.five.ai), Sina Samangooei (www.five.ai), and Nicholas A. Lord (www.five.ai)

Data-Free Knowledge Amalgamation via Group-Stack Dual-GAN .12513.....
Jingwen Ye (College of Computer Science and Technology, Zhejiang University, Hangzhou, China), Yixin Ji (College of Computer Science and Technology, Zhejiang University, Hangzhou, China), Xinchao Wang (Department of Computer Science, Stevens Institute of Technology, USA), Xin Gao (Alibaba Group, Hangzhou, China), and Mingli Song (College of Computer Science and Technology, Zhejiang University, Hangzhou, China)

Screencast Tutorial Video Understanding .12523.....
Kunpeng Li (Northeastern University), Chen Fang (Adobe Research), Zhaowen Wang (Adobe Research), Seokhwan Kim (Adobe Research), Hailin Jin (Adobe Research), and Yun Fu (Northeastern University)

DSGN: Deep Stereo Geometry Network for 3D Object Detection .12533.....
Yilun Chen (The Chinese University of Hong Kong), Shu Liu (SmartMore), Xiaoyong Shen (SmartMore), and Jiaya Jia (The Chinese University of Hong Kong; SmartMore)

Weakly-Supervised Salient Object Detection via Scribble Annotations .12543.....
Jing Zhang (Australian National University, Australia; ACRV, Australia; Data61, Australia), Xin Yu (Australian National University, Australia; ACRV, Australia; ReLER, University of Technology Sydney, Australia), Aixuan Li (Northwestern Polytechnical University, China), Peipei Song (Australian National University, Australia; Data61, Australia), Bowen Liu (Northwestern Polytechnical University, China), and Yuchao Dai (Northwestern Polytechnical University, China)

Learning to Learn Single Domain Generalization .12553.....
Fengchun Qiao (University of Delaware), Long Zhao (Rutgers University), and Xi Peng (University of Delaware)

Severity-Aware Semantic Segmentation With Reinforced Wasserstein Training .12563.....
Xiaofeng Liu (Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, MA, USA; Carnegie Mellon UniversityUSA), Wenxuan Ji (Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, MA, USA; School of Artificial Intelligence, Nankai University, Tianjin, China), Jane You (Department of Computing, The Hong Kong Polytechnic University, Hong Kong, China), Georges El Fakhri (Massachusetts General Hospital, Harvard University, Boston, MA, USA), and Jonghye Woo (Massachusetts General Hospital, Harvard University, Boston, MA, USA)

Boosting Few-Shot Learning With Adaptive Margin Loss .12573.....
Aoxue Li (School of EECS, Peking University, China), Weiran Huang (Huawei Noah's Ark Lab, China), Xu Lan (Queen Mary University of London, UK), Jiashi Feng (National University of Singapore, Singapore), Zhenguo Li (Huawei Noah's Ark Lab, China), and Liwei Wang (School of EECS, Peking University, China)

JA-POLS: A Moving-Camera Background Model via Joint Alignment and Partially-Overlapping Local Subspaces .12582.....
Irit Chelly (Ben-Gurion University), Vlad Winter (Ben-Gurion University), Dor Litvak (Ben-Gurion University), David Rosen (Massachusetts Institute of Technology), and Oren Freifeld (Ben-Gurion University)

AugFPN: Improving Multi-Scale Feature Learning for Object Detection .12592.....
Chaoxu Guo (National Laboratory of Pattern Recognition, Institute of Automation, Chinese Academy of Sciences; School of Artificial Intelligence, University of Chinese Academy of Sciences), Bin Fan (National Laboratory of Pattern Recognition, Institute of Automation, Chinese Academy of Sciences; School of Automation and Electrical Engineering, University of Science and Technology Beijing), Qian Zhang (Horizon Robotics), Shiming Xiang (National Laboratory of Pattern Recognition, Institute of Automation, Chinese Academy of Sciences; School of Artificial Intelligence, University of Chinese Academy of Sciences), and Chunhong Pan (National Laboratory of Pattern Recognition, Institute of Automation, Chinese Academy of Sciences)

xMUDA: Cross-Modal Unsupervised Domain Adaptation for 3D Semantic Segmentation .12602
Maximilian Jaritz (Inria; Valeo DAR; Valeo.ai), Tuan-Hung Vu (Valeo.ai), Raoul de Charette (Inria), Emilie Wirbel (Valeo DAR; Valeo.ai), and Patrick Pérez (Valeo.ai)

Norm-Aware Embedding for Efficient Person Search .12612.....
Di Chen (PCA Lab, Key Lab of Intelligent Perception and Systems for High-Dimensional Information of Ministry of Education, School of Computer Science and Engineering, Nanjing University of Science and Technology; Max Planck Institute for Informatics, Saarland Informatics Campus), Shanshan Zhang (PCA Lab, Key Lab of Intelligent Perception and Systems for High-Dimensional Information of Ministry of Education, School of Computer Science and Engineering, Nanjing University of Science and Technology), Jian Yang (PCA Lab, Key Lab of Intelligent Perception and Systems for High-Dimensional Information of Ministry of Education, School of Computer Science and Engineering, Nanjing University of Science and Technology; Jiangsu Key Lab of Image and Video Understanding for Social Security), and Bernt Schiele (Max Planck Institute for Informatics, Saarland Informatics Campus)

Intelligent Home 3D: Automatic 3D-House Design From Linguistic Descriptions Only .12622
Qi Chen (South China University of Technology; Guangzhou Laboratory, Guangzhou, China), Qi Wu (Australian Centre for Robotic Vision, University of Adelaide, Australia), Rui Tang (Kujiale, Inc.), Yuhan Wang (Kujiale, Inc.), Shuai Wang (Kujiale, Inc.), and Mingkui Tan (South China University of Technology)

Differential Treatment for Stuff and Things: A Simple Unsupervised Domain Adaptation Method for Semantic Segmentation .12632.....
Zhonghao Wang (C3SR, UIUC), Mo Yu (IBM Research), Yunchao Wei (ReLER, UTS), Rogerio Feris (IBM Research), Jinjun Xiong (IBM Research), Wen-mei Hwu (C3SR, UIUC), Thomas S. Huang (C3SR, UIUC), and Honghui Shi (C3SR, UIUC; University of Oregon)

Robust Object Detection Under Occlusion With Context-Aware CompositionalNets .12642..
Angtian Wang (Johns Hopkins University), Yihong Sun (Johns Hopkins University), Adam Kortylewski (Johns Hopkins University), and Alan L. Yuille (Johns Hopkins University)

IMRAM: Iterative Matching With Recurrent Attention Memory for Cross-Modal Image-Text Retrieval .12652.....
Hui Chen (School of Software, BNRist, Tsinghua University), Guiguang Ding (School of Software, BNRist, Tsinghua University), Xudong Liu (Kwai Ads Platform), Zijia Lin (Microsoft Research), Ji Liu (Kwai Seattle AI Lab, Kwai FeDA Lab, Kwai AI Platform), and Jungong Han (WMG Data Science, University of Warwick)

Domain-Aware Visual Bias Eliminating for Generalized Zero-Shot Learning .12661.....
Shaobo Min (University of Science and Technology of China), Hantao Yao (National Laboratory of Pattern Recognition, Institute of Automation, Chinese Academy of Sciences), Hongtao Xie (University of Science and Technology of China), Chaoqun Wang (University of Science and Technology of China), Zheng-Jun Zha (University of Science and Technology of China), and Yongdong Zhang (University of Science and Technology of China)

Semi-Supervised Semantic Segmentation With Cross-Consistency Training .12671.....
Yassine Ouali (Université Paris-Saclay, CentraleSupélec, MICS, France), Céline Hudelot (Université Paris-Saclay, CentraleSupélec, MICS, France), and Myriam Tami (Université Paris-Saclay, CentraleSupélec, MICS, France)

Learning to Learn Cropping Models for Different Aspect Ratio Requirements .12682.....
Debang Li (CRISE, Institute of Automation, Chinese Academy of Sciences, Beijing, China; School of Artificial Intelligence, University of Chinese Academy of Sciences, Beijing, China), Junge Zhang (CRISE, Institute of Automation, Chinese Academy of Sciences, Beijing, China; School of Artificial Intelligence, University of Chinese Academy of Sciences, Beijing, China), and Kaiqi Huang (CRISE, Institute of Automation, Chinese Academy of Sciences, Beijing, China; School of Artificial Intelligence, University of Chinese Academy of Sciences, Beijing, China; CAS Center for Excellence in Brain Science and Intelligence Technology, Beijing, China)

What Makes Training Multi-Modal Classification Networks Hard? .12692.....
Weiyao Wang (Facebook AI), Du Tran (Facebook AI), and Matt Feiszli (Facebook AI)

Selective Transfer With Reinforced Transfer Network for Partial Domain Adaptation .12703.
Zhihong Chen (Institue of Information Science and Electronic Engineering, Zhejiang University), Chao Chen (Institue of Information Science and Electronic Engineering, Zhejiang University), Zhaowei Cheng (Institue of Information Science and Electronic Engineering, Zhejiang University), Boyuan Jiang (Institue of Information Science and Electronic Engineering, Zhejiang University), Ke Fang (Institue of Information Science and Electronic Engineering, Zhejiang University), and Xinyu Jin (Institue of Information Science and Electronic Engineering, Zhejiang University)

Semi-Supervised Semantic Image Segmentation With Self-Correcting Networks .12712.....
Mostafa S. Ibrahim (Simon Fraser University), Arash Vahdat (NVIDIA), Mani Ranjbar (Sportlogiq), and William G. Macready (Sanctuary AI)

Exemplar Normalization for Learning Deep Representation .12723.....
Ruimao Zhang (SenseTime Research), Zhanglin Peng (SenseTime Research), Lingyun Wu (SenseTime Research), Zhen Li (The Chinese University of Hong Kong (Shenzhen); Shenzhen Research Institute of Big Data), and Ping Luo (The University of Hong Kong)

Imitative Non-Autoregressive Modeling for Trajectory Forecasting and Imputation .12733...
Mengshi Qi (CVLab, EPFL, Switzerland; Baidu Research, China), Jie Qin (Inception Institute of Artificial Intelligence, UAE), Yu Wu (Baidu Research, China; ReLER, University of Technology Sydney, Australia), and Yi Yang (ReLER, University of Technology Sydney, Australia)

Multi-Modal Graph Neural Network for Joint Reasoning on Vision and Scene Text .12743....
Difei Gao (Key Laboratory of Intelligent Information Processing of Chinese Academy of Sciences (CAS), Institute of Computing Technology, CAS, Beijing, China; University of Chinese Academy of Sciences, Beijing, China), Ke Li (Key Laboratory of Intelligent Information Processing of Chinese Academy of Sciences (CAS), Institute of Computing Technology, CAS, Beijing, China; University of Chinese Academy of Sciences, Beijing, China), Ruiping Wang (Key Laboratory of Intelligent Information Processing of Chinese Academy of Sciences (CAS), Institute of Computing Technology, CAS, Beijing, China; University of Chinese Academy of Sciences, Beijing, China), Shiguang Shan (Key Laboratory of Intelligent Information Processing of Chinese Academy of Sciences (CAS), Institute of Computing Technology, CAS, Beijing, China; University of Chinese Academy of Sciences, Beijing, China), and Xilin Chen (Key Laboratory of Intelligent Information Processing of Chinese Academy of Sciences (CAS), Institute of Computing Technology, CAS, Beijing, China; University of Chinese Academy of Sciences, Beijing, China)

StereoGAN: Bridging Synthetic-to-Real Domain Gap by Joint Optimization of Domain Translation and Stereo Matching .12754.....
Rui Liu (CUHK-SenseTime Joint Laboratory, Chinese University of Hong Kong), Chengxi Yang (SenseTime Research), Wenxiu Sun (SenseTime Research), Xiaogang Wang (CUHK-SenseTime Joint Laboratory, Chinese University of Hong Kong), and Hongsheng Li (CUHK-SenseTime Joint Laboratory, Chinese University of Hong Kong)

Self-Supervised Domain-Aware Generative Network for Generalized Zero-Shot Learning .12764
Jiamin Wu (University of Science and Technology of China), Tianzhu Zhang (University of Science and Technology of China), Zheng-Jun Zha (University of Science and Technology of China), Jiebo Luo (University of Rochester), Yongdong Zhang (University of Science and Technology of China), and Feng Wu (University of Science and Technology of China)

Sparse Layered Graphs for Multi-Object Segmentation .12774.....
Niels Jeppesen (Department of Applied Mathematics and Computer Science, Technical University of Denmark, Denmark), Anders N. Christensen (Department of Applied Mathematics and Computer Science, Technical University of Denmark, Denmark), Vedrana A. Dahl (Department of Applied Mathematics and Computer Science, Technical University of Denmark, Denmark), and Anders B. Dahl (Department of Applied Mathematics and Computer Science, Technical University of Denmark, Denmark)

Visual-Semantic Matching by Exploring High-Order Attention and Distraction .12783.....
Yongzhi Li (Center for Data Science), Duo Zhang (EECS), and Yadong Mu (Wangxuan Institute of Computer Technology, Peking University)

End-to-End 3D Point Cloud Instance Segmentation Without Detection .12793.....
Haiyong Jiang (University of Chinese Academy of Science; Nanyang Technological University), Feilong Yan (Huya Live), Jianfei Cai (Nanyang Technological University; Monash University), Jianmin Zheng (Nanyang Technological University), and Jun Xiao (University of Chinese Academy of Science)

Deep Adversarial Decomposition: A Unified Framework for Separating Superimposed Images 12803
Zhengxia Zou (University of Michigan, Ann Arbor), Sen Lei (Beihang University), Tianyang Shi (NetEase Fuxi AI Lab), Zhenwei Shi (Beihang University), and Jieping Ye (University of Michigan, Ann Arbor; Didi Chuxing)

Differentiable Adaptive Computation Time for Visual Reasoning ..12814.....
Cristóbal Eyzaguirre (Pontificia Universidad Catolica de Chile) and Álvaro Soto (Pontificia Universidad Catolica de Chile)

DeepLPF: Deep Local Parametric Filters for Image Enhancement ..12823.....
Sean Moran (Huawei Noah's Ark Lab), Pierre Marza (Huawei Noah's Ark Lab; INSA Lyon), Steven McDonagh (Huawei Noah's Ark Lab), Sarah Parisot (Huawei Noah's Ark Lab; Mila Montréal), and Gregory Slabaugh (Huawei Noah's Ark Lab)

Instance Credibility Inference for Few-Shot Learning ..12833.....
Yikai Wang (School of Data Science, Fudan University; Shanghai Key Lab of Intelligent Information Processing, Fudan University), Chengming Xu (School of Data Science, Fudan University), Chen Liu (School of Data Science, Fudan University), Li Zhang (Department of Engineering Science, University of Oxford), and Yanwei Fu (School of Data Science, Fudan University; MOE Frontiers Center for Brain Science, Fudan University; Shanghai Key Lab of Intelligent Information Processing, Fudan University)

Learning From Web Data With Self-Organizing Memory Module ..12843.....
Yi Tu (MoE Key Lab of Artificial Intelligence, Department of Computer Science and Engineering, Shanghai Jiao Tong University, Shanghai, China), Li Niu (MoE Key Lab of Artificial Intelligence, Department of Computer Science and Engineering, Shanghai Jiao Tong University, Shanghai, China), Junjie Chen (MoE Key Lab of Artificial Intelligence, Department of Computer Science and Engineering, Shanghai Jiao Tong University, Shanghai, China), Dawei Cheng (MoE Key Lab of Artificial Intelligence, Department of Computer Science and Engineering, Shanghai Jiao Tong University, Shanghai, China), and Liqing Zhang (MoE Key Lab of Artificial Intelligence, Department of Computer Science and Engineering, Shanghai Jiao Tong University, Shanghai, China)

TransMatch: A Transfer-Learning Scheme for Semi-Supervised Few-Shot Learning ..12853...
Zhongjie Yu (University of Wisconsin-Madison), Lin Chen (Futurewei Technologies), Zhongwei Cheng (Futurewei Technologies), and Jiebo Luo (University of Rochester)

Learning the Redundancy-Free Features for Generalized Zero-Shot Object Recognition ..12862
Zongyan Han (PCALab, Nanjing University of Science and Technology), Zhenyong Fu (PCALab, Nanjing University of Science and Technology), and Jian Yang (PCALab, Nanjing University of Science and Technology)

Neural Topological SLAM for Visual Navigation ..12872.....
Devendra Singh Chaplot (Carnegie Mellon University), Ruslan Salakhutdinov (Carnegie Mellon University), Abhinav Gupta (Carnegie Mellon University; Facebook AI Research), and Saurabh Gupta (UIUC)

WaveletStereo: Learning Wavelet Coefficients of Disparity Map in Stereo Matching .12882…
Menglong Yang (School of Aeronautics and Astronautics, Sichuan University, PR China), Fangrui Wu (School of Aeronautics and Astronautics, Sichuan University, PR China), and Wei Li (School of Aeronautics and Astronautics, Sichuan University, PR China)

Robust Superpixel-Guided Attentional Adversarial Attack .12892……
Xiaoyi Dong (University of Science and Technology of China), Jiangfan Han (The Chinese University of Hong Kong), Dongdong Chen (Microsoft Cloud AI), Jiayang Liu (University of Science and Technology of China), Huanyu Bian (University of Science and Technology of China), Zehua Ma (University of Science and Technology of China), Hongsheng Li (The Chinese University of Hong Kong), Xiaogang Wang (The Chinese University of Hong Kong), Weiming Zhang (University of Science and Technology of China), and Nenghai Yu (University of Science and Technology of China)

BEDSR-Net: A Deep Shadow Removal Network From a Single Document Image .12902……
Yun-Hsuan Lin (National Taiwan University), Wen-Chin Chen (National Taiwan University), and Yung-Yu Chuang (National Taiwan University)

Cross-Domain Document Object Detection: Benchmark Suite and Method .12912……
Kai Li (Northeastern University), Curtis Wigington (Adobe Research), Chris Tensmeyer (Adobe Research), Handong Zhao (Adobe Research), Nikolaos Barmpalios (Adobe Document Cloud), Vlad I. Morariu (Adobe Research), Varun Manjunatha (Adobe Research), Tong Sun (Adobe Research), and Yun Fu (Northeastern University)

Explaining Knowledge Distillation by Quantifying the Knowledge .12922……
Xu Cheng (Shanghai Jiao Tong University), Zhefan Rao (Huazhong University of Science & Technology), Yilan Chen (Xi'an Jiaotong University), and Quanshi Zhang (Shanghai Jiao Tong University)

Exploring Bottom-Up and Top-Down Cues With Attentive Learning for Webly Supervised Object Detection .12933……
Zhonghua Wu (Nanyang Technological University), Qingyi Tao (Nanyang Technological University; NVIDIA AI Technology Center), Guosheng Lin (Nanyang Technological University), and Jianfei Cai (Nanyang Technological University; Monash University)

Enhancing Generic Segmentation With Learned Region Representations .12943……
Or Isaacs (Computer Science, Technion - Israel Institute of Technology), Oran Shayer (Computer Science, Technion - Israel Institute of Technology), and Michael Lindenbaum (Computer Science, Technion - Israel Institute of Technology)

Adaptive Hierarchical Down-Sampling for Point Cloud Classification .12953……
Ehsan Nezhadarya (Noah's Ark Lab, Huawei Technologies Inc., Toronto, Canada), Ehsan Taghavi (Noah's Ark Lab, Huawei Technologies Inc., Toronto, Canada), Ryan Razani (Noah's Ark Lab, Huawei Technologies Inc., Toronto, Canada), Bingbing Liu (Noah's Ark Lab, Huawei Technologies Inc., Toronto, Canada), and Jun Luo (Noah's Ark Lab, Huawei Technologies Inc., Toronto, Canada)

FBNetV2: Differentiable Neural Architecture Search for Spatial and Channel Dimensions .12962
Alvin Wan (UC Berkeley), Xiaoliang Dai (Facebook Inc.), Peizhao Zhang (Facebook Inc.), Zijian He (Facebook Inc.), Yuandong Tian (Facebook Inc.), Saining Xie (Facebook Inc.), Bichen Wu (Facebook Inc.), Matthew Yu (Facebook Inc.), Tao Xu (Facebook Inc.), Kan Chen (Facebook Inc.), Peter Vajda (Facebook Inc.), and Joseph E. Gonzalez (UC Berkeley)

Learning Texture Invariant Representation for Domain Adaptation of Semantic Segmentation 12972
Myeongjin Kim (Yonsei University) and Hyeran Byun (Yonsei University)

Putting Visual Object Recognition in Context .12982.....
Mengmi Zhang (Children's Hospital, Harvard Medical School; Center for Brains, Minds and Machines), Claire Tseng (Harvard College, Harvard University), and Gabriel Kreiman (Children's Hospital, Harvard Medical School; Center for Brains, Minds and Machines)

SLV: Spatial Likelihood Voting for Weakly Supervised Object Detection .12992.....
Ze Chen (Zhejiang University, Institute of Advanced Digital Technology and Instrument; Zhejiang University Embedded System Engineering Research Center, Ministry of Education of China), Zhihang Fu (Alibaba DAMO Academy, Alibaba Group), Rongxin Jiang (Zhejiang University, Institute of Advanced Digital Technology and Instrument; Zhejiang University, The State Key Laboratory of Industrial Control Technology), Yaowu Chen (Zhejiang University, Institute of Advanced Digital Technology and Instrument; Zhejiang Provincial Key Laboratory for Network Multimedia Technologies), and Xian-Sheng Hua (Alibaba DAMO Academy, Alibaba Group)

Universal Weighting Metric Learning for Cross-Modal Matching .13002.....
Jiwei Wei (Center for Future Media & School of Computer Science and Engineering, University of Electronic Science and Technology of China, China), Xing Xu (Center for Future Media & School of Computer Science and Engineering, University of Electronic Science and Technology of China, China), Yang Yang (Center for Future Media & School of Computer Science and Engineering, University of Electronic Science and Technology of China, China), Yanli Ji (Center for Future Media & School of Computer Science and Engineering, University of Electronic Science and Technology of China, China), Zheng Wang (Center for Future Media & School of Computer Science and Engineering, University of Electronic Science and Technology of China, China), and Heng Tao Shen (Center for Future Media & School of Computer Science and Engineering, University of Electronic Science and Technology of China, China)

IDA-3D: Instance-Depth-Aware 3D Object Detection From Stereo Vision for Autonomous Driving... 13012
Wanli Peng (Dalian University of Technology, China), Hao Pan (Dalian University of Technology, China), He Liu (Dalian University of Technology, China), and Yi Sun (Dalian University of Technology, China)

Label Decoupling Framework for Salient Object Detection .13022.....
Jun Wei (Key Lab of Intell. Info. Process., Inst. of Comput. Tech., CAS, Beijing, China; University of Chinese Academy of Sciences, Beijing, China), Shuhui Wang (Key Lab of Intell. Info. Process., Inst. of Comput. Tech., CAS, Beijing, China), Zhe Wu (University of Chinese Academy of Sciences, Beijing, China; Peng Cheng Laboratory, Shenzhen, China), Chi Su (Kingsoft Cloud, Beijing, China), Qingming Huang (Key Lab of Intell. Info. Process., Inst. of Comput. Tech., CAS, Beijing, China; University of Chinese Academy of Sciences, Beijing, China; Peng Cheng Laboratory, Shenzhen, China), and Qi Tian (Noah's Ark Lab, Huawei Technologies, China)

Transform and Tell: Entity-Aware News Image Captioning .13032.....
Alasdair Tran (Australian National University), Alexander Mathews (Australian National University), and Lexing Xie (Australian National University)

HAMBox: Delving Into Mining High-Quality Anchors on Face Detection .13043.....
Yang Liu (NCEPU, Beijing), Xu Tang (Baidu Inc., Beijing), Junyu Han (Baidu Inc., Beijing), Jingtuo Liu (Baidu Inc., Beijing), Dinger Rui (Baidu Inc., Beijing), and Xiang Wu (CAS, Beijing)

Hierarchical Feature Embedding for Attribute Recognition .13052.....
Jie Yang (SenseTime Group Limited; Tsinghua University), Jiarou Fan (SenseTime Group Limited), Yiru Wang (SenseTime Group Limited), Yige Wang (SenseTime Group Limited), Weihao Gan (SenseTime Group Limited), Lin Liu (Tsinghua University), and Wei Wu (SenseTime Group Limited)

Squeeze-and-Attention Networks for Semantic Segmentation .13062.....
Zilong Zhong (School of Data and Computer Science, Sun Yat-Sen Univeristy, China; Key Laboratory of Machine Intelligence and Advanced Computing, Ministry of Education, China), Zhong Qiu Lin (University of Waterloo, Waterloo, Canada), Rene Bidart (University of Waterloo, Waterloo, Canada), Xiaodan Hu (University of Waterloo, Waterloo, Canada), Ibrahim Ben Daya (University of Waterloo, Waterloo, Canada), Zhifeng Li (Mstar Technologies, Hangzhou, China), Wei-Shi Zheng (School of Data and Computer Science, Sun Yat-Sen Univeristy, China; Peng Cheng Laboratory, China; Key Laboratory of Machine Intelligence and Advanced Computing, Ministry of Education, China), Jonathan Li (University of Waterloo, Waterloo, Canada), and Alexander Wong (University of Waterloo, Waterloo, Canada)

Context R-CNN: Long Term Temporal Context for Per-Camera Object Detection .13072.....
Sara Beery (California Institute of Technology; Google), Guanhang Wu (Google), Vivek Rathod (Google), Ronny Votel (Google), and Jonathan Huang (Google)

Mixture Dense Regression for Object Detection and Human Pose Estimation .13083.....
Ali Varamesh (ESAT-PSI, KU Leuven) and Tinne Tuytelaars (ESAT-PSI, KU Leuven)

Syntax-Aware Action Targeting for Video Captioning .13093.....
Qi Zheng (UBTECH Sydney AI Centre, School of Computer Science, Faculty of Engineering, The University of Sydney, Australia), Chaoyue Wang (UBTECH Sydney AI Centre, School of Computer Science, Faculty of Engineering, The University of Sydney, Australia), and Dacheng Tao (UBTECH Sydney AI Centre, School of Computer Science, Faculty of Engineering, The University of Sydney, Australia)

Learning Visual Emotion Representations From Web Data .13103.....
Zijun Wei (Adobe Inc.), Jianming Zhang (Adobe Inc.), Zhe Lin (Adobe Inc.), Joon-Young Lee (Adobe Inc.), Niranjan Balasubramanian (Stony Brook University), Minh Hoai (Stony Brook University), and Dimitris Samaras (Stony Brook University)

The Edge of Depth: Explicit Constraints Between Segmentation and Depth .13113.....
Shengjie Zhu (Michigan State University, USA), Garrick Brazil (Michigan State University, USA), and Xiaoming Liu (Michigan State University, USA)

A Context-Aware Loss Function for Action Spotting in Soccer Videos .13123.....
Anthony Cioppa (University of Liège), Adrien Deliège (University of Liège), Silvio Giancola (KAUST), Bernard Ghanem (KAUST), Marc Van Droogenbroeck (University of Liège), Rikke Gade (Aalborg University), and Thomas B. Moeslund (Aalborg University)

Towards Learning a Generic Agent for Vision-and-Language Navigation via Pre-Training .13134
Weituo Hao (Duke University), Chunyuan Li (Microsoft Research, Redmond), Xiujun Li (Microsoft Research, Redmond), Lawrence Carin (Duke University), and Jianfeng Gao (Microsoft Research, Redmond)

Video Instance Segmentation Tracking With a Modified VAE Architecture .13144.....
Chung-Ching Lin (IBM Research AI), Ying Hung (Rutgers University), Rogerio Feris (IBM Research AI), and Linglin He (Rutgers University)

Deformation-Aware Unpaired Image Translation for Pose Estimation on Laboratory Animals .....
13155
Siyuan Li (CVLAB, EPFL, Lausanne), Semih Günel (CVLAB, EPFL, Lausanne; Neuroengineering Lab, EPFL, Lausanne), Mirela Ostrek (CVLAB, EPFL, Lausanne), Pavan Ramdya (Neuroengineering Lab, EPFL, Lausanne), Pascal Fua (CVLAB, EPFL, Lausanne), and Helge Rhodin (CVLAB, EPFL, Lausanne; Imager Lab, UBC, Vancouver)

ZeroQ: A Novel Zero Shot Quantization Framework .13166.....
Yaohui Cai (Peking University), Zhewei Yao (University of California, Berkeley), Zhen Dong (University of California, Berkeley), Amir Gholami (University of California, Berkeley), Michael W. Mahoney (University of California, Berkeley), and Kurt Keutzer (University of California, Berkeley)

Disparity-Aware Domain Adaptation in Stereo Image Restoration ..13176
Bo Yan (Shanghai Key Laboratory of Intelligent Information Processing, School of Computer Science, Fudan University), Chenxi Ma (Shanghai Key Laboratory of Intelligent Information Processing, School of Computer Science, Fudan University), Bahetiyaer Bare (Shanghai Key Laboratory of Intelligent Information Processing, School of Computer Science, Fudan University), Weimin Tan (Shanghai Key Laboratory of Intelligent Information Processing, School of Computer Science, Fudan University), and Steven C. H. Hoi (Salesforce Research Asia, Singapore Management University)

Offset Bin Classification Network for Accurate Object Detection ..13185
Heqian Qiu (University of Electronic Science and Technology of China, Chengdu, China), Hongliang Li (University of Electronic Science and Technology of China, Chengdu, China), Qingbo Wu (University of Electronic Science and Technology of China, Chengdu, China), and Hengcan Shi (University of Electronic Science and Technology of China, Chengdu, China)

TBT: Targeted Neural Network Attack With Bit Trojan ..13195
Adnan Siraj Rakin (School of Electrical, Computer and Energy Engineering, Arizona State University, USA), Zhezhi He (School of Electrical, Computer and Energy Engineering, Arizona State University, USA), and Deliang Fan (School of Electrical, Computer and Energy Engineering, Arizona State University, USA)

Maintaining Discrimination and Fairness in Class Incremental Learning ..13205
Bowen Zhao (Tsinghua University; Peng Cheng Laboratory), Xi Xiao (Tsinghua University; Peng Cheng Laboratory), Guojun Gan (University of Connecticut), Bin Zhang (Tsinghua University), and Shu-Tao Xia (Tsinghua University; Peng Cheng Laboratory)

Background Data Resampling for Outlier-Aware Classification ..13215
Yi Li (University of California, San Diego) and Nuno Vasconcelos (University of California, San Diego)

STEFANN: Scene Text Editor Using Font Adaptive Neural Network ..13225
Prasun Roy (Indian Statistical Institute, Kolkata, India), Saumik Bhattacharya (Indian Institute of Technology, Kharagpur, India), Subhankar Ghosh (Indian Statistical Institute, Kolkata, India), and Umapada Pal (Indian Statistical Institute, Kolkata, India)

Geometry and Learning Co-Supported Normal Estimation for Unstructured Point Cloud ..13235
Haoran Zhou (Nanjing University of Aeronautics and Astronautics; MIIT Key Laboratory of Pattern Analysis and Machine Intelligence), Honghua Chen (Nanjing University of Aeronautics and Astronautics), Yidan Feng (Nanjing University of Aeronautics and Astronautics; MIIT Key Laboratory of Pattern Analysis and Machine Intelligence), Qiong Wang (Shenzhen Institutes of Advanced Technology), Jing Qin (The Hong Kong Polytechnic University), Haoran Xie (Lingnan University), Fu Lee Wang (The Open University of Hong Kong), Mingqiang Wei (Nanjing University of Aeronautics and Astronautics; MIIT Key Laboratory of Pattern Analysis and Machine Intelligence), and Jun Wang (Nanjing University of Aeronautics and Astronautics)

Sequential Motif Profiles and Topological Plots for Offline Signature Verification ..13245
Elias N. Zois (University of West Attica, Greece), Evangelos Zervas (University of West Attica, Greece), Dimitrios Tsourounis (University of Patras, Patras, Greece), and George Economou (University of Patras, Patras, Greece)

Optical Flow in Dense Foggy Scenes Using Semi-Supervised Learning ..13256
Wending Yan (National University of Singapore), Aashish Sharma (National University of Singapore), and Robby T. Tan (National University of Singapore; Yale-NUS College)

A Spatial RNN Codec for End-to-End Image Compression ..13266
Chaoyi Lin (Hikvision Research Institute, Hangzhou, China), Jiabao Yao (Hikvision Research Institute, Hangzhou, China), Fangdong Chen (Hikvision Research Institute, Hangzhou, China), and Li Wang (Hikvision Research Institute, Hangzhou, China)

Object Relational Graph With Teacher-Recommended Learning for Video Captioning ..13275
Ziqi Zhang (National Laboratory of Pattern Recognition, CASIA; University of Chinese Academy of Sciences), Yaya Shi (University of Science and Technology of China), Chunfeng Yuan (National Laboratory of Pattern Recognition, CASIA), Bing Li (National Laboratory of Pattern Recognition, CASIA; PeopleAI, Inc.; State Key Laboratory of Communication Content Cognition, People's Daily Online), Peijin Wang (University of Chinese Academy of Sciences; Aerospace Information Research Institute, CAS), Weiming Hu (National Laboratory of Pattern Recognition, CASIA; University of Chinese Academy of Sciences; Center for Excellence in Brain Science and Intelligence Technology, CAS), and Zheng-Jun Zha (University of Science and Technology of China)

MMTM: Multimodal Transfer Module for CNN Fusion ..13286
Hamid Reza Vaezi Joze (Microsoft), Amirreza Shaban (Georgia Tech), Michael L. Iuzzolino (CU Boulder), and Kazuhito Koishida (Microsoft)

Generalized Zero-Shot Learning via Over-Complete Distribution ..13297
Rohit Keshari (IIIT-Delhi, India), Richa Singh (IIT Jodhpur, India), and Mayank Vatsa (IIT Jodhpur, India)

Gait Recognition via Semi-supervised Disentangled Representation Learning to Identity and Covariate Features ..13306
Xiang Li (Nanjing University of Science and Technology; Osaka University), Yasushi Makihara (Osaka University), Chi Xu (Nanjing University of Science and Technology; Osaka University), Yasushi Yagi (Osaka University), and Mingwu Ren (Nanjing University of Science and Technology)

Poster 3-4P

Unifying Training and Inference for Panoptic Segmentation ..13317
Qizhu Li (University of Oxford), Xiaojuan Qi (University of Oxford), and Philip H.S. Torr (University of Oxford)

Associate-3Ddet: Perceptual-to-Conceptual Association for 3D Point Cloud Object Detection 13326

Liang Du (Institute of Science and Technology for Brain-Inspired Intelligence, Fudan University, China; Key Laboratory of Computational Neuroscience and Brain-Inspired Intelligence (Fudan University), Ministry of Education, China), Xiaoqing Ye (Baidu Inc., China), Xiao Tan (Baidu Inc., China), Jianfeng Feng (Institute of Science and Technology for Brain-Inspired Intelligence, Fudan University, China; Key Laboratory of Computational Neuroscience and Brain-Inspired Intelligence (Fudan University), Ministry of Education, China), Zhenbo Xu (University of Science and Technology of China, China), Errui Ding (Baidu Inc., China), and Shilei Wen (Baidu Inc., China)

Interactive Image Segmentation With First Click Attention ..13336.....

Zheng Lin (TKLNDST, College of Computer Science, Nankai University), Zhao Zhang (TKLNDST, College of Computer Science, Nankai University), Lin-Zhuo Chen (TKLNDST, College of Computer Science, Nankai University), Ming-Ming Cheng (TKLNDST, College of Computer Science, Nankai University), and Shao-Ping Lu (TKLNDST, College of Computer Science, Nankai University)

NETNet: Neighbor Erasing and Transferring Network for Better Single Shot Object Detection 13346

Yazhao Li (Tianjin Key Laboratory of Brain-inspired Intelligence Technology, School of Electrical and Information Engineering, Tianjin University, China), Yanwei Pang (Tianjin Key Laboratory of Brain-inspired Intelligence Technology, School of Electrical and Information Engineering, Tianjin University, China), Jianbing Shen (Inception Institute of Artificial Intelligence, Abu Dhabi, UAE), Jiale Cao (Tianjin Key Laboratory of Brain-inspired Intelligence Technology, School of Electrical and Information Engineering, Tianjin University, China), and Ling Shao (Inception Institute of Artificial Intelligence, Abu Dhabi, UAE)

Scale-Equalizing Pyramid Convolution for Object Detection ..13356.....

Xinjiang Wang (SenseTime Research), Shilong Zhang (SenseTime Research), Zhuoran Yu (SenseTime Research), Litong Feng (SenseTime Research), and Wayne Zhang (SenseTime Research)

Learning to Cluster Faces via Confidence and Connectivity Estimation ..13366.....

Lei Yang (The Chinese University of Hong Kong), Dapeng Chen (SenseTime Group Limited), Xiaohang Zhan (The Chinese University of Hong Kong), Rui Zhao (SenseTime Group Limited), Chen Change Loy (Nanyang Technological University), and Dahua Lin (The Chinese University of Hong Kong)

Cross-Modality Person Re-Identification With Shared-Specific Feature Transfer .13376.....
Yan Lu (School of Information Science and Technology, University of Science and Technology of China, Hefei, China; Key Laboratory of Electromagnetic Space Information, Chinese Academy of Science, Hefei, China), Yue Wu (Damo Academy, Alibaba Group, Beijing, China), Bin Liu (School of Information Science and Technology, University of Science and Technology of China, Hefei, China; Key Laboratory of Electromagnetic Space Information, Chinese Academy of Science, Hefei, China), Tianzhu Zhang (School of Information Science and Technology, University of Science and Technology of China, Hefei, China), Baopu Li (Baidu Research(USA), USA), Qi Chu (School of Information Science and Technology, University of Science and Technology of China, Hefei, China; Key Laboratory of Electromagnetic Space Information, Chinese Academy of Science, Hefei, China), and Nenghai Yu (School of Information Science and Technology, University of Science and Technology of China, Hefei, China; Key Laboratory of Electromagnetic Space Information, Chinese Academy of Science, Hefei, China)

DPGN: Distribution Propagation Graph Network for Few-Shot Learning .13387.....
Ling Yang (Northwestern Polytechnical University), Liangliang Li (Megvii Technology), Zilun Zhang (Megvii Technology), Xinyu Zhou (Megvii Technology), Erjin Zhou (Megvii Technology), and Yu Liu (Megvii Technology)

Density-Aware Graph for Deep Semi-Supervised Visual Recognition .13397.....
Suichan Li (School of Information Science and Technology, University of Science and Technology of China; Key Laboratory of Electromagnetic Space Information, The Chinese Academy of Sciences), Bin Liu (School of Information Science and Technology, University of Science and Technology of China; Key Laboratory of Electromagnetic Space Information, The Chinese Academy of Sciences), Dongdong Chen (Microsoft Research), Qi Chu (School of Information Science and Technology, University of Science and Technology of China; Key Laboratory of Electromagnetic Space Information, The Chinese Academy of Sciences), Lu Yuan (Microsoft Research), and Nenghai Yu (School of Information Science and Technology, University of Science and Technology of China; Key Laboratory of Electromagnetic Space Information, The Chinese Academy of Sciences)

Unsupervised Multi-Modal Image Registration via Geometry Preserving Image-to-Image Translation .13407.....
Moab Arar (Tel Aviv University), Yiftach Ginger (Tel Aviv University), Dov Danon (Tel Aviv University), Amit H. Bermano (Tel Aviv University), and Daniel Cohen-Or (Tel Aviv University)

Binarizing MobileNet via Evolution-Based Searching .13417.....
Hai Phan (Carnegie Mellon University), Zechun Liu (Carnegie Mellon University; Hong Kong University of Science and Technology), Dang Huynh (Axon Enterprise), Marios Savvides (Carnegie Mellon University), Kwang-Ting Cheng (Hong Kong University of Science and Technology), and Zhiqiang Shen (Carnegie Mellon University)

Temporal-Context Enhanced Detection of Heavily Occluded Pedestrians .13427.....
Jialian Wu (State University of New York at Buffalo), Chunluan Zhou (Wormpex AI Research), Ming Yang (Horizon Robotics, Inc.), Qian Zhang (Horizon Robotics, Inc.), Yuan Li (Horizon Robotics, Inc.), and Junsong Yuan (State University of New York at Buffalo)

Orderless Recurrent Models for Multi-Label Classification .13437.....
Vacit Oguz Yazici (State University of New York at Buffalo; Wormpex AI Research), Abel Gonzalez-Garcia (State University of New York at Buffalo), Arnau Ramisa (Wormpex AI Research; Horizon Robotics, Inc.), Bartłomiej Twardowski (State University of New York at Buffalo), and Joost van de Weijer (State University of New York at Buffalo)

Gold Seeker: Information Gain From Policy Distributions for Goal-Oriented Vision-and-Langauge Reasoning .13447.....
Ehsan Abbasnejad (Australian Institute for Machine Learning & The University of Adelaide, Australia), Iman Abbasnejad (Fugro Australia Marine), Qi Wu (Australian Institute for Machine Learning & The University of Adelaide, Australia), Javen Shi (Australian Institute for Machine Learning & The University of Adelaide, Australia), and Anton van den Hengel (Australian Institute for Machine Learning & The University of Adelaide, Australia)

Rethinking the Route Towards Weakly Supervised Object Localization .13457.....
Chen-Lin Zhang (National Key Laboratory for Novel Software Technology, Nanjing University, Nanjing, China), Yun-Hao Cao (National Key Laboratory for Novel Software Technology, Nanjing University, Nanjing, China), and Jianxin Wu (National Key Laboratory for Novel Software Technology, Nanjing University, Nanjing, China)

Adversarial Feature Hallucination Networks for Few-Shot Learning .13467.....
Kai Li (Department of Electrical and Computer Engineering, Northeastern University, Boston, USA), Yulun Zhang (Department of Electrical and Computer Engineering, Northeastern University, Boston, USA), Kunpeng Li (Department of Electrical and Computer Engineering, Northeastern University, Boston, USA), and Yun Fu (Department of Electrical and Computer Engineering, Northeastern University, Boston, USA; Khoury College of Computer Science, Northeastern University, Boston, USA)

Conditional Gaussian Distribution Learning for Open Set Recognition .13477.....
Xin Sun (Nanyang Technological University, Singapore), Zhenning Yang (Nanyang Technological University, Singapore), Chi Zhang (Nanyang Technological University, Singapore), Keck-Voon Ling (Nanyang Technological University, Singapore), and Guohao Peng (Nanyang Technological University, Singapore)

Connect-and-Slice: An Hybrid Approach for Reconstructing 3D Objects .13487.....
Hao Fang (Université Côte d'Azur, Inria) and Florent Lafarge (Université Côte d'Azur, Inria)

Attentive Weights Generation for Few Shot Learning via Information Maximization .13496..
Yiluan Guo (Singapore University of Technology and Design) and Ngai-Man Cheung (Singapore University of Technology and Design)

Assessing Eye Aesthetics for Automatic Multi-Reference Eye In-Painting .13506.....
Bo Yan (Shanghai Key Laboratory of Intelligent Information Processing, School of Computer Science, Fudan University), Qing Lin (Shanghai Key Laboratory of Intelligent Information Processing, School of Computer Science, Fudan University), Weimin Tan (Shanghai Key Laboratory of Intelligent Information Processing, School of Computer Science, Fudan University), and Shili Zhou (Shanghai Key Laboratory of Intelligent Information Processing, School of Computer Science, Fudan University)

PuppeteerGAN: Arbitrary Portrait Animation With Semantic-Aware Appearance Transformation … 13515
Zhuo Chen (Shenzhen International Graduate School, Tsinghua University; UBTECH Sydney AI Centre, School of Computer Science, Faculty of Engineering, The University of Sydney, Australia), Chaoyue Wang (UBTECH Sydney AI Centre, School of Computer Science, Faculty of Engineering, The University of Sydney, Australia), Bo Yuan (Shenzhen International Graduate School, Tsinghua University), and Dacheng Tao (UBTECH Sydney AI Centre, School of Computer Science, Faculty of Engineering, The University of Sydney, Australia)

SEED: Semantics Enhanced Encoder-Decoder Framework for Scene Text Recognition .13525
Zhi Qiao (Institute of Information Engineering, Chinese Academy of Sciences, Beijing, China; School of Cyber Security, University of Chinese Academy of Sciences, Beijing, China), Yu Zhou (Institute of Information Engineering, Chinese Academy of Sciences, Beijing, China), Dongbao Yang (Institute of Information Engineering, Chinese Academy of Sciences, Beijing, China), Yucan Zhou (Institute of Information Engineering, Chinese Academy of Sciences, Beijing, China), and Weiping Wang (Institute of Information Engineering, Chinese Academy of Sciences, Beijing, China)

Texture and Shape Biased Two-Stream Networks for Clothing Classification and Attribute Recognition .13535.....
Yuwei Zhang (Department of Computer Science and Technology, Tsinghua University), Peng Zhang (Department of Computer Science and Technology, Tsinghua University), Chun Yuan (Tsinghua Shenzhen International Graduate School; Peng Cheng Laboratory), and Zhi Wang (Tsinghua Shenzhen International Graduate School; Peng Cheng Laboratory)

Distortion Agnostic Deep Watermarking .13545.....
Xiyang Luo (Google Research), Ruohan Zhan (Stanford University), Huiwen Chang (Google Research), Feng Yang (Google Research), and Peyman Milanfar (Google Research)

RMP-SNN: Residual Membrane Potential Neuron for Enabling Deeper High-Accuracy and Low-Latency Spiking Neural Network .13555.....
Bing Han (School of Electrical and Computer Engineering, Purdue University), Gopalakrishnan Srinivasan (School of Electrical and Computer Engineering, Purdue University), and Kaushik Roy (School of Electrical and Computer Engineering, Purdue University)

BFBox: Searching Face-Appropriate Backbone and Feature Pyramid Network for Face Detector …. 13565
Yang Liu (North China Electic Power University, Beijing) and Xu Tang (Baidu Inc., Beijing)

PFCNN: Convolutional Neural Networks on 3D Surfaces Using Parallel Frames .13575.....
Yuqi Yang (Tsinghua University; Microsoft Research Asia), Shilin Liu (University of Science and Technology of China; Microsoft Research Asia), Hao Pan (Microsoft Research Asia), Yang Liu (Microsoft Research Asia), and Xin Tong (Microsoft Research Asia)

iTAML: An Incremental Task-Agnostic Meta-learning Approach .13585.....
Jathushan Rajasegaran (Inception Institute of Artificial Intelligence, UAE), Salman Khan (Inception Institute of Artificial Intelligence, UAE), Munawar Hayat (Inception Institute of Artificial Intelligence, UAE), Fahad Shahbaz Khan (Inception Institute of Artificial Intelligence, UAE; CVL, Linköping University, Sweden), and Mubarak Shah (University of Central Florida, USA)

Optimal least-squares solution to the hand-eye calibration problem .13595.....
Amit Dekel (Univrses), Linus Härenstam-Nielsen (Univrses), and Sergio Caccamo (Univrses)

MnasFPN: Learning Latency-Aware Pyramid Architecture for Object Detection on Mobile Devices .13604.....
Bo Chen (Google Research), Golnaz Ghiasi (Google Research), Hanxiao Liu (Google Research), Tsung-Yi Lin (Google Research), Dmitry Kalenichenko (Google Research), Hartwig Adam (Google Research), and Quoc V. Le (Google Research)

VSGNet: Spatial Attention Network for Detecting Human Object Interactions Using Graph Convolutions .13614.....
Oytun Ulutan (Department of Electrical and Computer Engineering, University of California, Santa Barbara, CA), A S M Iftekhar (Department of Electrical and Computer Engineering, University of California, Santa Barbara, CA), and B. S. Manjunath (Department of Electrical and Computer Engineering, University of California, Santa Barbara, CA)

End-to-End Camera Calibration for Broadcast Videos .13624.....
Long Sha (Stats Perform), Jennifer Hobbs (Stats Perform), Panna Felsen (Stats Perform), Xinyu Wei (Stats Perform), Patrick Lucey (Stats Perform), and Sujoy Ganguly (Stats Perform)

Regularizing CNN Transfer Learning With Randomised Regression .13634.....
Yang Zhong (Division of Robotics, Perception, and Learning, KTH Royal Institute of Technology, Sweden) and Atsuto Maki (Division of Robotics, Perception, and Learning, KTH Royal Institute of Technology, Sweden)

KeypointNet: A Large-Scale 3D Keypoint Dataset Aggregated From Numerous Human Annotations .13644.....
Yang You (Shanghai Jiao Tong University, China), Yujing Lou (Shanghai Jiao Tong University, China), Chengkun Li (Shanghai Jiao Tong University, China), Zhoujun Cheng (Shanghai Jiao Tong University, China), Liangwei Li (Shanghai Jiao Tong University, China), Lizhuang Ma (Shanghai Jiao Tong University, China), Cewu Lu (Shanghai Jiao Tong University, China), and Weiming Wang (Shanghai Jiao Tong University, China)

Hierarchical Clustering With Hard-Batch Triplet Loss for Person Re-Identification .13654.....
Kaiwei Zeng (National University of Defense Technology, Changsha, China), Munan Ning (National University of Defense Technology, Changsha, China), Yaohua Wang (National University of Defense Technology, Changsha, China), and Yang Guo (National University of Defense Technology, Changsha, China)

Joint Semantic Segmentation and Boundary Detection Using Iterative Pyramid Contexts .13663
Mingmin Zhen (Hong Kong University of Science and Technology), Jinglu Wang (Microsoft Rresearch Asia), Lei Zhou (Hong Kong University of Science and Technology), Shiwei Li (Everest Innovation Technology), Tianwei Shen (Hong Kong University of Science and Technology), Jiaxiang Shang (Hong Kong University of Science and Technology), Tian Fang (Everest Innovation Technology), and Long Quan (Hong Kong University of Science and Technology)

Attention-Guided Hierarchical Structure Aggregation for Image Matting .13673.....
Yu Qiao (Dalian University of Technology), Yuhao Liu (Dalian University of Technology), Xin Yang (Dalian University of Technology; Beijing Technology and Business University), Dongsheng Zhou (Dalian University), Mingliang Xu (Zhengzhou University), Qiang Zhang (Dalian University), and Xiaopeng Wei (Dalian University of Technology)

MetaFuse: A Pre-trained Fusion Model for Human Pose Estimation .13683.....
Rongchang Xie (Center for Data Science, Peking University; Deepwise AI Lab), Chunyu Wang (Microsoft Research Asia), and Yizhou Wang (Adv. Inst. of Info. Tech., Peking University; Center on Frontiers of Computing Studies, Peking University; CS Dept., Peking University)

Prior Guided GAN Based Semantic Inpainting .13693.....
Avisek Lahiri (Indian Institute of Technology Kharagpur), Arnav Kumar Jain (Microsoft), Sanskar Agrawal (Indian Institute of Technology Kharagpur), Pabitra Mitra (Indian Institute of Technology Kharagpur), and Prabir Kumar Biswas (Indian Institute of Technology Kharagpur)

Weakly Supervised Semantic Point Cloud Segmentation: Towards 10× Fewer Labels .13703.
Xun Xu (Department of Computer Science, National University of Singapore) and Gim Hee Lee (Department of Computer Science, National University of Singapore)

Physically Realizable Adversarial Examples for LiDAR Object Detection .13713.....
James Tu (Uber ATG), Mengye Ren (Uber ATG; University of Toronto), Sivabalan Manivasagam (Uber ATG; University of Toronto), Ming Liang (Uber ATG), Bin Yang (Uber ATG; University of Toronto), Richard Du (Princeton University), Frank Cheng (Uber ATG; University of Toronto), and Raquel Urtasun (Uber ATG; University of Toronto)

Combating Noisy Labels by Agreement: A Joint Training Method with Co-Regularization .13723
Hongxin Wei (School of Computer Science and Engineering, Nanyang Technological University, Singapore), Lei Feng (School of Computer Science and Engineering, Nanyang Technological University, Singapore), Xiangyu Chen (Open FIESTA Center, Tsinghua University, China), and Bo An (School of Computer Science and Engineering, Nanyang Technological University, Singapore)

Light-weight Calibrator: A Separable Component for Unsupervised Domain Adaptation .13733
Shaokai Ye (Institute for Interdisciplinary Information Core Technology (IIISCT), China), Kailu Wu (Tsinghua University, China), Mu Zhou (University of Tsukuba, Japan), Yunfei Yang (Tsinghua University, China), Sia Huat Tan (Tsinghua University, China), Kaidi Xu (Northeastern University, USA), Jiebo Song (Institute for Interdisciplinary Information Core Technology (IIISCT), China), Chenglong Bao (Tsinghua University, China), and Kaisheng Ma (Tsinghua University, China)

Learn to Augment: Joint Data Augmentation and Network Optimization for Text Recognition 13743
Canjie Luo (South China University of Technology), Yuanzhi Zhu (South China University of Technology), Lianwen Jin (South China University of Technology), and Yongpan Wang (Alibaba Group)

Learning Selective Self-Mutual Attention for RGB-D Saliency Detection .13753.....
Nian Liu (Northwestern Polytechincal University; Mohamed bin Zayed University of Artificial Intelligence), Ni Zhang (Northwestern Polytechincal University), and Junwei Han (Northwestern Polytechincal University)

Cross-domain Object Detection through Coarse-to-Fine Feature Adaptation .13763.....
Yangtao Zheng (Beijing Advanced Innovation Center for Big Data and Brain Computing, Beihang University; State Key Laboratory of Software Development Environment, Beihang University; School of Computer Science and Engineering, Beihang University, Beijing, China), Di Huang (Beijing Advanced Innovation Center for Big Data and Brain Computing, Beihang University; State Key Laboratory of Software Development Environment, Beihang University; School of Computer Science and Engineering, Beihang University, Beijing, China), Songtao Liu (Beijing Advanced Innovation Center for Big Data and Brain Computing, Beihang University; State Key Laboratory of Software Development Environment, Beihang University; School of Computer Science and Engineering, Beihang University, Beijing, China), and Yunhong Wang (Beijing Advanced Innovation Center for Big Data and Brain Computing, Beihang University; School of Computer Science and Engineering, Beihang University, Beijing, China)

Estimating Low-Rank Region Likelihood Maps .13773.....
Gabriela Csurka (NAVER LABS Europe, France), Zoltan Kato (University of Szeged, Institute of Informatics, Hungary; J. Selye University, Komarno, Slovakia), Andor Juhasz (University of Szeged, Institute of Informatics, Hungary), and Martin Humenberger (NAVER LABS Europe, France)

Neural Head Reenactment with Latent Pose Descriptors .13783.....
Egor Burkov (Samsung AI Center, Moscow; Skolkovo Institute of Science and Technology), Igor Pasechnik (Samsung AI Center, Moscow), Artur Grigorev (Samsung AI Center, Moscow), and Victor Lempitsky (Samsung AI Center, Moscow; Skolkovo Institute of Science and Technology)

Learning Individual Speaking Styles for Accurate Lip to Speech Synthesis .13793.....
K R Prajwal (IIIT, Hyderabad), Rudrabha Mukhopadhyay (IIIT, Hyderabad), Vinay P. Namboodiri (IIT, Kanpur), and C.V. Jawahar (IIIT, Hyderabad)

Self-Supervised Learning of Video-Induced Visual Invariances .13803.....
Michael Tschannen (Google Research, Brain Team), Josip Djolonga (Google Research, Brain Team), Marvin Ritter (Google Research, Brain Team), Aravindh Mahendran (Google Research, Brain Team), Neil Houlsby (Google Research, Brain Team), Sylvain Gelly (Google Research, Brain Team), and Mario Lucic (Google Research, Brain Team)

Two-Stage Peer-Regularized Feature Recombination for Arbitrary Image Style Transfer .13813
Jan Svoboda (NNAISENSE, Switzerland; Universita della Svizzera italiana, Switzerland), Asha Anoosheh (NNAISENSE, Switzerland), Christian Osendorfer (NNAISENSE, Switzerland), and Jonathan Masci (NNAISENSE, Switzerland)

MINA: Convex Mixed-Integer Programming for Non-Rigid Shape Alignment .13823.....
Florian Bernard (MPI Informatics), Zeeshan Khan Suri (Saarland Informatics Campus), and Christian Theobalt (Saarland Informatics Campus)

Improving One-Shot NAS by Suppressing the Posterior Fading .13833.....
Xiang Li (Brown University), Chen Lin (SenseTime Group Limited), Chuming Li (SenseTime Group Limited), Ming Sun (SenseTime Group Limited), Wei Wu (SenseTime Group Limited), Junjie Yan (SenseTime Group Limited), and Wanli Ouyang (The University of Sydney)

Incremental Few-Shot Object Detection .13843.....
Juan-Manuel Pérez-Rúa (Samsung AI Centre, Cambridge, United Kingdom), Xiatian Zhu (Samsung AI Centre, Cambridge, United Kingdom), Timothy M. Hospedales (Samsung AI Centre, Cambridge, United Kingdom; University of Edinburgh, United Kingdom), and Tao Xiang (Samsung AI Centre, Cambridge, United Kingdom; University of Surrey, United Kingdom)

Synthetic Learning: Learn From Distributed Asynchronized Discriminator GAN Without Sharing Medical Image Data .13853.....
Qi Chang (Rutgers University), Hui Qu (Rutgers University), Yikai Zhang (Rutgers University), Mert Sabuncu (Cornell University), Chao Chen (Stony Brook University), Tong Zhang (Hong Kong University of Science and Technology), and Dimitris N. Metaxas (Cornell University)

Exploring Category-Agnostic Clusters for Open-Set Domain Adaptation .13864.....
Yingwei Pan (JD AI Research, Beijing, China), Ting Yao (JD AI Research, Beijing, China), Yehao Li (JD AI Research, Beijing, China), Chong-Wah Ngo (City University of Hong Kong, Kowloon, Hong Kong), and Tao Mei (JD AI Research, Beijing, China)

Regularizing Class-Wise Predictions via Self-Knowledge Distillation .13873.....
Sukmin Yun (Korea Advanced Institute of Science and Technology, South Korea), Jongjin Park (Korea Advanced Institute of Science and Technology, South Korea), Kimin Lee (University of California, USA), and Jinwoo Shin (Korea Advanced Institute of Science and Technology, South Korea)

Hierarchical Graph Attention Network for Visual Relationship Detection .13883.....
Li Mi (School of Remote Sensing and Information Engineering, Wuhan University, China) and Zhenzhong Chen (School of Remote Sensing and Information Engineering, Wuhan University, China)

M2m: Imbalanced Classification via Major-to-Minor Translation .13893
Jaehyung Kim (Korea Advanced Institute of Science and Technology (KAIST)), Jongheon Jeong (Korea Advanced Institute of Science and Technology (KAIST)), and Jinwoo Shin (Korea Advanced Institute of Science and Technology (KAIST))

CenterMask: Real-Time Anchor-Free Instance Segmentation .13903
Youngwan Lee (Electronics and Telecommunications Research Institute (ETRI), South Korea) and Jongyoul Park (Electronics and Telecommunications Research Institute (ETRI), South Korea)

Multi-Path Learning for Object Pose Estimation Across Domains .13913
Martin Sundermeyer (German Aerospace Center (DLR); Technical University of Munich (TUM)), Maximilian Durner (German Aerospace Center (DLR); Technical University of Munich (TUM)), En Yen Puang (German Aerospace Center (DLR)), Zoltan-Csaba Marton (German Aerospace Center (DLR)), Narunas Vaskevicius (Robert Bosch GmbH), Kai O. Arras (Robert Bosch GmbH), and Rudolph Triebel (German Aerospace Center (DLR); Technical University of Munich (TUM))

Incremental Learning in Online Scenario .13923
Jiangpeng He (School of Electrical and Computer Engineering, Purdue University, USA), Runyu Mao (School of Electrical and Computer Engineering, Purdue University, USA), Zeman Shao (School of Electrical and Computer Engineering, Purdue University, USA), and Fengqing Zhu (School of Electrical and Computer Engineering, Purdue University, USA)

Enhanced Transport Distance for Unsupervised Domain Adaptation .13933
Mengxue Li (School of Mathematics, Sun Yat-Sen University, China), Yi-Ming Zhai (School of Mathematics, Sun Yat-Sen University, China), You-Wei Luo (School of Mathematics, Sun Yat-Sen University, China), Peng-Fei Ge (School of Mathematics, Sun Yat-Sen University, China), and Chuan-Xian Ren (School of Mathematics, Sun Yat-Sen University, China)

TESA: Tensor Element Self-Attention via Matricization .13942
Francesca Babiloni (Huawei Noah's Ark Lab), Ioannis Marras (Huawei Noah's Ark Lab), Gregory Slabaugh (Huawei Noah's Ark Lab), and Stefanos Zafeiriou (Imperial College London)

Training a Steerable CNN for Guidewire Detection .13952
Donghang Li (Florida State University, USA) and Adrian Barbu (Florida State University, USA)

Superpixel Segmentation With Fully Convolutional Networks .13961
Fengting Yang (The Pennsylvania State University), Qian Sun (The Pennsylvania State University), Hailin Jin (Adobe Research), and Zihan Zhou (The Pennsylvania State University)

SharinGAN: Combining Synthetic and Real Data for Unsupervised Geometry Estimation .13971
Koutilya PNVR (University of Maryland, USA), Hao Zhou (University of Maryland, USA), and David Jacobs (University of Maryland, USA)

Label Distribution Learning on Auxiliary Label Space Graphs for Facial Expression Recognition .13981
Shikai Chen (Southeast University), Jianfeng Wang (University of Oxford), Yuedong Chen (Nanyang Technological University), Zhongchao Shi (AI Lab, Lenovo Research), Xin Geng (Southeast University), and Yong Rui (AI Lab, Lenovo Research)

Deep Residual Flow for Out of Distribution Detection .13991
Ev Zisselman (Department of Electrical Engineering Technion) and Aviv Tamar (Department of Electrical Engineering Technion)

FeatureFlow: Robust Video Interpolation via Structure-to-Texture Generation .14001
Shurui Gui (UBTECH Sydney AI Centre, School of Computer Science, Faculty of Engineering, The University of Sydney, Australia; Department of Computer Science and Technology, University of Science and Technology of China), Chaoyue Wang (UBTECH Sydney AI Centre, School of Computer Science, Faculty of Engineering, The University of Sydney, Australia), Qihua Chen (UBTECH Sydney AI Centre, School of Computer Science, Faculty of Engineering, The University of Sydney, Australia; School of Information Science and Technology, University of Science and Technology of China), and Dacheng Tao (UBTECH Sydney AI Centre, School of Computer Science, Faculty of Engineering, The University of Sydney, Australia)

Learning Nanoscale Motion Patterns of Vesicles in Living Cells .14011
Arif Ahmed Sekh (UiT The Arctic University of Norway, Tromsø, Norway), Ida Sundvor Opstad (UiT The Arctic University of Norway, Tromsø, Norway), Åsa Birna Birgisdottir (UiT The Arctic University of Norway, Tromsø, Norway; University Hospital of North Norway, Tromsø, Norway), Truls Myrmel (UiT The Arctic University of Norway, Tromsø, Norway; University Hospital of North Norway, Tromsø, Norway), Balpreet Singh Ahluwalia (UiT The Arctic University of Norway, Tromsø, Norway), Krishna Agarwal (UiT The Arctic University of Norway, Tromsø, Norway), and Dilip K. Prasad (UiT The Arctic University of Norway, Tromsø, Norway)

Improving Action Segmentation via Graph-Based Temporal Reasoning .14021
Yifei Huang (Institute of Industrial Science, The University of Tokyo), Yusuke Sugano (Institute of Industrial Science, The University of Tokyo), and Yoichi Sato (Institute of Industrial Science, The University of Tokyo)

Episode-Based Prototype Generating Network for Zero-Shot Learning .14032
Yunlong Yu (College of Information Science & Electronic Engineering, Zhejiang University, China), Zhong Ji (Tianjin Key BIIT Lab, School of Electrical & Information Engineering, Tianjin University, China), Jungong Han (WMG Data Science, University of Warwick, UK), and Zhongfei Zhang (Department of Computer Science, Binghamton University, USA)

Learning to Segment the Tail .14042
Xinting Hu (Nanyang Technological University), Yi Jiang (Alibaba Group), Kaihua Tang (Nanyang Technological University), Jingyuan Chen (Damo Academy, Alibaba Group), Chunyan Miao (Nanyang Technological University), and Hanwang Zhang (Nanyang Technological University)

Learning to Evaluate Perception Models Using Planner-Centric Metrics .14052.....
Jonah Philion (NVIDIA), Amlan Kar (University of Toronto), and Sanja Fidler (Vector Institute)

CoverNet: Multimodal Behavior Prediction Using Trajectory Sets .14062.....
Tung Phan-Minh (Caltech), Elena Corina Grigore (nuTonomy, An APTIV Company), Freddy A. Boulton (nuTonomy, An APTIV Company), Oscar Beijbom (nuTonomy, An APTIV Company), and Eric M. Wolff (nuTonomy, An APTIV Company)

Real-World Person Re-Identification via Degradation Invariance Learning .14072.....
Yukun Huang (University of Science and Technology of China, China), Zheng-Jun Zha (University of Science and Technology of China, China), Xueyang Fu (University of Science and Technology of China, China), Richang Hong (Hefei University of Technology, China), and Liang Li (Institute of Computing Technology, Chinese Academy of Sciences, China)

Defending and Harnessing the Bit-Flip Based Adversarial Weight Attack .14083.....
Zhezhi He (School of Electrical, Computer and Energy Engineering, Arizona State University, USA), Adnan Siraj Rakin (School of Electrical, Computer and Energy Engineering, Arizona State University, USA), Jingtao Li (School of Electrical, Computer and Energy Engineering, Arizona State University, USA), Chaitali Chakrabarti (School of Electrical, Computer and Energy Engineering, Arizona State University, USA), and Deliang Fan (School of Electrical, Computer and Energy Engineering, Arizona State University, USA)

Adversarial Latent Autoencoders .14092.....
Stanislav Pidhorskyi (Lane Department of Computer Science and Electrical Engineering, West Virginia University, USA), Donald A. Adjeroh (Lane Department of Computer Science and Electrical Engineering, West Virginia University, USA), and Gianfranco Doretto (Lane Department of Computer Science and Electrical Engineering, West Virginia University, USA)

Adaptive Fractional Dilated Convolution Network for Image Aesthetics Assessment .14102..
Qiuyu Chen (Department of Computer Science, UNC Charlotte), Wei Zhang (Shanghai Key Laboratory of Intelligent Information Processing, School of Computer Science, Fudan University), Ning Zhou (Amazon Lab126), Peng Lei (Amazon Lab126), Yi Xu (Shanghai Key Laboratory of Intelligent Information Processing, School of Computer Science, Fudan University), Yu Zheng (School of Cyber Engineering, Xidian University), and Jianping Fan (Department of Computer Science, UNC Charlotte)

Deep Generative Model for Robust Imbalance Classification .14112.....
Xinyue Wang (Beijing Key Lab of Traffic Data Analysis and Mining, Beijing Jiaotong University, Beijing, China), Yilin Lyu (Beijing Key Lab of Traffic Data Analysis and Mining, Beijing Jiaotong University, Beijing, China), and Liping Jing (Beijing Key Lab of Traffic Data Analysis and Mining, Beijing Jiaotong University, Beijing, China)

Learning Deep Network for Detecting 3D Object Keypoints and 6D Poses .14122.....
Wanqing Zhao (Northwest University, Xi'an, China), Shaobo Zhang (Northwest University, Xi'an, China), Ziyu Guan (Northwest University, Xi'an, China), Wei Zhao (Xidian University, Xi'an, China), Jinye Peng (Northwest University, Xi'an, China), and Jianping Fan (UNC-Charlotte, NC, USA)

MetaIQA: Deep Meta-Learning for No-Reference Image Quality Assessment .14131.....
Hancheng Zhu (School of Artificial Intelligence, Xidian University; School of Information and Control Engineering, China University of Mining and Technology), Leida Li (School of Artificial Intelligence, Xidian University), Jinjian Wu (School of Artificial Intelligence, Xidian University), Weisheng Dong (School of Artificial Intelligence, Xidian University), and Guangming Shi (School of Artificial Intelligence, Xidian University)

Sketchformer: Transformer-Based Representation for Sketched Structure .14141.....
Leo Sampaio Ferraz Ribeiro (ICMC, Universidade de Séo Paulo – Séo Carlos/SP, Brazil), Tu Bui (CVSSP, University of Surrey – Guildford, Surrey, UK), John Collomosse (CVSSP, University of Surrey – Guildford, Surrey, UK; Adobe Research, Creative Intelligence Lab – San Jose, CA, USA), and Moacir Ponti (ICMC, Universidade de Séo Paulo – Séo Carlos/SP, Brazil)

Cylindrical Convolutional Networks for Joint Object Detection and Viewpoint Estimation .14151
Sunghun Joung (Yonsei University), Seungryong Kim (École Polytechnique Fédérale de Lausanne (EPFL); Korea University), Hanjae Kim (Yonsei University), Minsu Kim (Yonsei University), Ig-Jae Kim (Korea Institute of Science and Technology (KIST)), Junghyun Cho (Korea Institute of Science and Technology (KIST)), and Kwanghoon Sohn (Yonsei University)

Learning a Unified Sample Weighting Network for Object Detection .14161.....
Qi Cai (University of Science and Technology of China, Hefei, China), Yingwei Pan (JD AI Research, Beijing, China), Yu Wang (JD AI Research, Beijing, China), Jingen Liu (JD AI Research, USA), Ting Yao (JD AI Research, Beijing, China), and Tao Mei (JD AI Research, Beijing, China)

Old Is Gold: Redefining the Adversarially Learned One-Class Classifier Training Paradigm .14171
Muhammad Zaigham Zaheer (University of Science and Technology; Electronics and Telecommunications Research Institute, Daejeon, South Korea), Jin-Ha Lee (University of Science and Technology; Electronics and Telecommunications Research Institute, Daejeon, South Korea), Marcella Astrid (University of Science and Technology; Electronics and Telecommunications Research Institute, Daejeon, South Korea), and Seung-Ik Lee (University of Science and Technology; Electronics and Telecommunications Research Institute, Daejeon, South Korea)

An Adaptive Neural Network for Unsupervised Mosaic Consistency Analysis in Image Forensics.....
14182
Quentin Bammey (CMLA, CNRS, ENS Paris-Saclay, Université Paris-Saclay), Rafael Grompone von Gioi (CMLA, CNRS, ENS Paris-Saclay, Université Paris-Saclay), and Jean-Michel Morel (CMLA, CNRS, ENS Paris-Saclay, Université Paris-Saclay)

McFlow: Monte Carlo Flow Models for Data Imputation .14193.....
Trevor W. Richardson (Rochester Data Science Consortium, University of Rochester), Wencheng Wu (Rochester Data Science Consortium, University of Rochester), Lei Lin (Rochester Data Science Consortium, University of Rochester), Beilei Xu (Rochester Data Science Consortium, University of Rochester), and Edgar A. Bernal (Rochester Data Science Consortium, University of Rochester)

Learning to See Through Obstructions .14203.....
Yu-Lun Liu (National Taiwan University; MediaTek Inc.), Wei-Sheng Lai (Google), Ming-Hsuan Yang (Google; UC Merced), Yung-Yu Chuang (National Taiwan University), and Jia-Bin Huang (Virginia Tech)

GaitPart: Temporal Part-Based Model for Gait Recognition .14213.....
Chao Fan (University of Science and Technology Beijing; WATRIX.AI), Yunjie Peng (Beihang University; WATRIX.AI), Chunshui Cao (WATRIX.AI), Xu Liu (WATRIX.AI), Saihui Hou (WATRIX.AI), Jiannan Chi (University of Science and Technology Beijing), Yongzhen Huang (WATRIX.AI), Qing Li (University of Science and Technology Beijing), and Zhiqiang He (Lenovo Ltd; Beihang University)

EmotiCon: Context-Aware Multimodal Emotion Recognition Using Frege's Principle .14222..
Trisha Mittal (Department of Computer Science, University of Maryland, USA), Pooja Guhan (Department of Computer Science, University of Maryland, USA), Uttaran Bhattacharya (Department of Computer Science, University of Maryland, USA), Rohan Chandra (Department of Computer Science, University of Maryland, USA), Aniket Bera (Department of Computer Science, University of Maryland, USA), and Dinesh Manocha (Department of Computer Science, University of Maryland, USA; Department of Electrical and Computer Engineering, University of Maryland, USA)

Can Deep Learning Recognize Subtle Human Activities? .14232.....
Vincent Jacquot (École Polytechnique, Fédérale de Lausanne), Zhuofan Ying (University of Science and Technology of China), and Gabriel Kreiman (Center for Brains, Minds and Machines, Boston, MA)

PhysGAN: Generating Physical-World-Resilient Adversarial Examples for Autonomous Driving 14242
Zelun Kong (The University of Texas at Dallas), Junfeng Guo (The University of Texas at Dallas), Ang Li (The University of Maryland, College Park), and Cong Liu (The University of Texas at Dallas)

ILFO: Adversarial Attack on Adaptive Neural Networks .14252.....
Mirazul Haque (The University of Texas at Dallas), Anki Chauhan (The University of Texas at Dallas), Cong Liu (The University of Texas at Dallas), and Wei Yang (The University of Texas at Dallas)

On Translation Invariance in CNNs: Convolutional Layers Can Exploit Absolute Spatial Location .14262.....
Osman Semih Kayhan (Computer Vision Lab, Delft University of Technology) and Jan C. van Gemert (Computer Vision Lab, Delft University of Technology)

Diverse Image Generation via Self-Conditioned GANs .14274.....
Steven Liu (MIT CSAIL), Tongzhou Wang (MIT CSAIL), David Bau (MIT CSAIL), Jun-Yan Zhu (Adobe Research), and Antonio Torralba (MIT CSAIL)

Inducing Hierarchical Compositional Model by Sparsifying Generator Network .14284.....
Xianglei Xing (College of Automation, Harbin Engineering University, China), Tianfu Wu (Department of Electrical and Computer Engineering, NC State University), Song-Chun Zhu (Department of Statistics, University of California, Los Angeles), and Ying Nian Wu (Department of Statistics, University of California, Los Angeles)

CARP: Compression Through Adaptive Recursive Partitioning for Multi-Dimensional Images 14294
Rongjie Liu (Rice University), Meng Li (Rice University), and Li Ma (Duke University)

GrappaNet: Combining Parallel Imaging With Deep Learning for Multi-Coil MRI Reconstruction..... 14303
Anuroop Sriram (Facebook AI Research (FAIR)), Jure Zbontar (Facebook AI Research (FAIR)), Tullie Murrell (Facebook AI Research (FAIR)), C. Lawrence Zitnick (Facebook AI Research (FAIR)), Aaron Defazio (Facebook AI Research (FAIR)), and Daniel K. Sodickson (NYU School of Medicine)

Can Weight Sharing Outperform Random Architecture Search? An Investigation With TuNAS 14311
Gabriel Bender (Google Research, Contributed Equally), Hanxiao Liu (Google Research, Contributed Equally), Bo Chen (Google Research), Grace Chu (Google Research), Shuyang Cheng (Waymo), Pieter-Jan Kindermans (Google Research), and Quoc V. Le (Google Research)

Context Aware Graph Convolution for Skeleton-Based Action Recognition .14321.....
Xikun Zhang (UBTECH Sydney AI Centre, School of Computer Science, Faculty of Engineering, The University of Sydney, Australia), Chang Xu (UBTECH Sydney AI Centre, School of Computer Science, Faculty of Engineering, The University of Sydney, Australia), and Dacheng Tao (UBTECH Sydney AI Centre, School of Computer Science, Faculty of Engineering, The University of Sydney, Australia)

Fast(er) Reconstruction of Shredded Text Documents via Self-Supervised Deep Asymmetric Metric Learning .14331.....
Thiago M. Paixão (Federal Institute of Espírito Santo (IFES), Serra, Brazil; Federal University of Espírito Santo (UFES), Vit ória, Brazil), Rodrigo F. Berriel (Federal University of Espírito Santo (UFES), Vit ória, Brazil), Maria C. S. Boeres (Federal University of Espírito Santo (UFES), Vit ória, Brazil), Alessandro L. Koerich (École de Technologie Supérieure (ÉTS), Montreal, Canada), Claudine Badue (Federal University of Espírito Santo (UFES), Vit ória, Brazil), Alberto F. De Souza (Federal University of Espírito Santo (UFES), Vit ória, Brazil), and Thiago Oliveira-Santos (Federal University of Espírito Santo (UFES), Vit ória, Brazil)

Revisiting Pose-Normalization for Fine-Grained Few-Shot Recognition .14340.....
Luming Tang (Cornell University), Davis Wertheimer (Cornell University), and Bharath Hariharan (Cornell University)

RankMI: A Mutual Information Maximizing Ranking Loss .14350.....
Mete Kemertas (Samsung AI Centre Toronto), Leila Pishdad (Samsung AI Centre Toronto), Konstantinos G. Derpanis (Samsung AI Centre Toronto), and Afsaneh Fazly (Samsung AI Centre Toronto)

Learning Memory-Guided Normality for Anomaly Detection .14360.....
Hyunjong Park (School of Electrical and Electronic Engineering, Yonsei University), Jongyoun Noh (School of Electrical and Electronic Engineering, Yonsei University), and Bumsub Ham (School of Electrical and Electronic Engineering, Yonsei University)

Appearance Shock Grammar for Fast Medial Axis Extraction From Real Images .14370.....
Charles-Olivier Dufresne Camaro (University of Toronto), Morteza Rezanejad (School of Computer Science and Centre for Intelligent Machines, McGill University), Stavros Tsogkas (University of Toronto; Samsung Toronto AI Research Center), Kaleem Siddiqi (School of Computer Science and Centre for Intelligent Machines, McGill University), and Sven Dickinson (University of Toronto; Samsung Toronto AI Research Center; Vector Institute for Artificial Intelligence)

Generalizing Hand Segmentation in Egocentric Videos With Uncertainty-Guided Model Adaptation .14380.....
Minjie Cai (Hunan University), Feng Lu (State Key Lab. of VR Technology and Systems, Beihang University; Beijing Advanced Innovation Center for Big Data-Based Precision Medicine, Beihang University; Peng Cheng Laboratory), and Yoichi Sato (The University of Tokyo)

DeFeat-Net: General Monocular Depth via Simultaneous Unsupervised Representation Learning . 14390
Jaime Spencer (Centre for Vision, Speech and Signal Processing (CVSSP), University of Surrey), Richard Bowden (Centre for Vision, Speech and Signal Processing (CVSSP), University of Surrey), and Simon Hadfield (Centre for Vision, Speech and Signal Processing (CVSSP), University of Surrey)

Learning Visual Motion Segmentation Using Event Surfaces .14402.....
Anton Mitrokhin (University of Maryland,), Zhiyuan Hua (University of Maryland,), Cornelia Fermüller (University of Maryland,), and Yiannis Aloimonos (University of Maryland,)

Social-STGCNN: A Social Spatio-Temporal Graph Convolutional Neural Network for Human Trajectory Prediction .14412.....
Abduallah Mohamed (The University of Texas at Austin), Kun Qian (The University of Texas at Austin), Mohamed Elhoseiny (KAUST; Stanford University), and Christian Claudel (The University of Texas at Austin)

Discriminative Multi-Modality Speech Recognition .14421.....
Bo Xu (Xpeng Motors), Cheng Lu (Xpeng Motors), Yandong Guo (Xpeng Motors), and Jacob Wang (Xpeng Motors)

Clean-Label Backdoor Attacks on Video Recognition Models .14431.....
Shihao Zhao (Shanghai Key Lab of Intelligent Information Processing, School of Computer Science, Fudan University), Xingjun Ma (School of Computing and Information Systems, The University of Melbourne), Xiang Zheng (School of Computing and Information Systems, The University of Melbourne), James Bailey (School of Computing and Information Systems, The University of Melbourne), Jingjing Chen (Shanghai Key Lab of Intelligent Information Processing, School of Computer Science, Fudan University), and Yu-Gang Jiang (Shanghai Key Lab of Intelligent Information Processing, School of Computer Science, Fudan University)

Detecting Adversarial Samples Using Influence Functions and Nearest Neighbors .14441....
Gilad Cohen (Tel Aviv University, Tel Aviv), Guillermo Sapiro (Duke University, North Carolina), and Raja Giryes (Tel Aviv University, Tel Aviv)

Unsupervised Model Personalization While Preserving Privacy and Scalability: An Open Problem .14451.....
Matthias De Lange (KU Leuven), Xu Jia (Huawei, Noah's Ark Lab), Sarah Parisot (Huawei, Noah's Ark Lab; Mila), Aleš Leonardis (Huawei, Noah's Ark Lab), Gregory Slabaugh (Huawei, Noah's Ark Lab), and Tinne Tuytelaars (KU Leuven)

GIFnets: Differentiable GIF Encoding Framework .14461.....
Innfarn Yoo (Google Research - California), Xiyang Luo (Google Research - California), Yilin Wang (Google Research - California), Feng Yang (Google Research - California), and Peyman Milanfar (Google Research - California)

Learning Invariant Representation for Unsupervised Image Restoration .14471.....
Wenchao Du (College of Computer Science, Sichuan University, China), Hu Chen (College of Computer Science, Sichuan University, China), and Hongyu Yang (College of Computer Science, Sichuan University, China)

Improved Few-Shot Visual Classification .14481.....
Peyman Bateni (University of British Columbia), Raghav Goyal (University of British Columbia; Vector Institute), Vaden Masrani (University of British Columbia), Frank Wood (University of British Columbia; MILA; CIFAR AI Chair), and Leonid Sigal (University of British Columbia; Vector Institute; CIFAR AI Chair)

Learning Weighted Submanifolds With Variational Autoencoders and Riemannian Variational Autoencoders .14491.....
Nina Miolane (Stanford University) and Susan Holmes (Stanford University)

Learning Geocentric Object Pose in Oblique Monocular Images .14500.....
Gordon Christie (The Johns Hopkins University Applied Physics Laboratory), Rodrigo Rene Rai Munoz Abujder (The Johns Hopkins University Applied Physics Laboratory), Kevin Foster (The Johns Hopkins University Applied Physics Laboratory), Shea Hagstrom (The Johns Hopkins University Applied Physics Laboratory), Gregory D. Hager (The Johns Hopkins University), and Myron Z. Brown (The Johns Hopkins University Applied Physics Laboratory)

Understanding Adversarial Examples From the Mutual Influence of Images and Perturbations 14509
Chaoning Zhang (Robotics and Computer Vision (RCV) Laboratory, Korea Advanced Institute of Science and Technology (KAIST), Korea), Philipp Benz (Robotics and Computer Vision (RCV) Laboratory, Korea Advanced Institute of Science and Technology (KAIST), Korea), Tooba Imtiaz (Robotics and Computer Vision (RCV) Laboratory, Korea Advanced Institute of Science and Technology (KAIST), Korea), and In So Kweon (Robotics and Computer Vision (RCV) Laboratory, Korea Advanced Institute of Science and Technology (KAIST), Korea)

Your Local GAN: Designing Two Dimensional Local Attention Mechanisms for Generative Models.. 14519
Giannis Daras (National Technical University of Athens), Augustus Odena (Google Brain), Han Zhang (Google Brain), and Alexandros G. Dimakis (UT Austin)

MoreFusion: Multi-object Reasoning for 6D Pose Estimation from Volumetric Fusion .14528
Kentaro Wada (Dyson Robotics Laboratory, Imperial College London), Edgar Sucar (Dyson Robotics Laboratory, Imperial College London), Stephen James (Dyson Robotics Laboratory, Imperial College London), Daniel Lenton (Dyson Robotics Laboratory, Imperial College London), and Andrew J. Davison (Dyson Robotics Laboratory, Imperial College London)

HCNAF: Hyper-Conditioned Neural Autoregressive Flow and its Application for Probabilistic Occupancy Map Forecasting .14538.....
Geunseob Oh (University of Michigan) and Jean-Sébastien Valois (Uber ATG)

Detail-recovery Image Deraining via Context Aggregation Networks .14548.....
Sen Deng (Nanjing University of Aeronautics and Astronautics; MIIT Key Laboratory of Pattern Analysis and Machine Intelligence), Mingqiang Wei (Nanjing University of Aeronautics and Astronautics; MIIT Key Laboratory of Pattern Analysis and Machine Intelligence), Jun Wang (Nanjing University of Aeronautics and Astronautics; MIIT Key Laboratory of Pattern Analysis and Machine Intelligence), Yidan Feng (Nanjing University of Aeronautics and Astronautics; MIIT Key Laboratory of Pattern Analysis and Machine Intelligence), Luming Liang (Microsoft Applied Sciences Group), Haoran Xie (Lingnan University), Fu Lee Wang (The Open University of Hong Kong), and Meng Wang (Hefei University of Technology)

MCEN: Bridging Cross-Modal Gap between Cooking Recipes and Dish Images with Latent Variable Model .14558.....
Han Fu (Zhejiang University, Hangzhou, China; Alibaba-Zhejiang University Joint Institute of Frontier Technologies, China), Rui Wu (Zhejiang University, Hangzhou, China), Chenghao Liu (Singapore Management University, Singapore), and Jianling Sun (Zhejiang University, Hangzhou, China; Alibaba-Zhejiang University Joint Institute of Frontier Technologies, China)

Hypergraph Attention Networks for Multimodal Learning .14569.....
Eun-Sol Kim (Kakao Brain), Woo Young Kang (Kakao Brain), Kyoung-Woon On (Department of Computer Science and Engineering, Seoul National University), Yu-Jung Heo (Department of Computer Science and Engineering, Seoul National University), and Byoung-Tak Zhang (Department of Computer Science and Engineering, Seoul National University; AI Institute (AIIS), Seoul National University)

Moving in the Right Direction: A Regularization for Deep Metric Learning .14579.....
Deen Dayal Mohan (Department of Computer Science and Engineering, University at Buffalo, USA), Nishant Sankaran (Department of Computer Science and Engineering, University at Buffalo, USA), Dennis Fedorishin (Department of Computer Science and Engineering, University at Buffalo, USA), Srirangaraj Setlur (Department of Computer Science and Engineering, University at Buffalo, USA), and Venu Govindaraju (Department of Computer Science and Engineering, University at Buffalo, USA)

Rethinking Depthwise Separable Convolutions: How Intra-Kernel Correlations Lead to Improved MobileNets .14588.....
Daniel Haase (ZEISS Microscopy) and Manuel Amthor (ZEISS Microscopy)

Seeing without Looking: Contextual Rescoring of Object Detections for AP Maximization .14598
Lourenço V. Pato (Institute for Systems and Robotics / IST, ULisboa), Renato Negrinho (Carnegie Mellon University), and Pedro M. Q. Aguiar (Institute for Systems and Robotics / IST, ULisboa)

End-to-End Adversarial-Attention Network for Multi-Modal Clustering .14607.....
Runwu Zhou (State Key Laboratory of Computer Science, Institute of Software, Chinese Academy of Sciences, China; University of Chinese Academy of Sciences, Beijing, China) and Yi-Dong Shen (State Key Laboratory of Computer Science, Institute of Software, Chinese Academy of Sciences, China)

Fast Sparse ConvNets .14617.....
Erich Elsen (DeepMind, London, UK), Marat Dukhan (Google, CA), Trevor Gale (Google, CA), and Karen Simonyan (DeepMind, London, UK)

Few Sample Knowledge Distillation for Efficient Network Compression .14627.....
Tianhong Li (MIT), Jianguo Li (Intel Labs), Zhuang Liu (UC Berkeley), and Changshui Zhang (Dept. Automation, Tsinghua University)

Predicting Sharp and Accurate Occlusion Boundaries in Monocular Depth Estimation Using Displacement Fields .14636.....
Michaël Ramamonjisoa (LIGM, IMAGINE, Ecole des Ponts, Univ Gustave Eiffel, CNRS, Marne-la-Vallée, France), Yuming Du (LIGM, IMAGINE, Ecole des Ponts, Univ Gustave Eiffel, CNRS, Marne-la-Vallée, France), and Vincent Lepetit (LIGM, IMAGINE, Ecole des Ponts, Univ Gustave Eiffel, CNRS, Marne-la-Vallée, France)

Shape correspondence using anisotropic Chebyshev spectral CNNs 14646
Qinsong Li (Institute of Engineering Modeling and Scientific Computing, Central South University), Shengjun Liu (Institute of Engineering Modeling and Scientific Computing, Central South University; State Key Laboratory of High Performance Manufacturing Complex, Central South University), Ling Hu (School of Mathematics and Computational Science, Hunan First Normal University), and Xinru Liu (Institute of Engineering Modeling and Scientific Computing, Central South University)

RetinaTrack: Online Single Stage Joint Detection and Tracking 14656
Zhichao Lu (Google), Vivek Rathod (Google), Ronny Votel (Google), and Jonathan Huang (Google)

Multimodal Categorization of Crisis Events in Social Media 14667
Mahdi Abavisani (Dataminr Inc., New York, NY), Liwei Wu (Department of Statistics University of California, Davis, CA), Shengli Hu (Dataminr Inc., New York, NY), Joel Tetreault (Dataminr Inc., New York, NY), and Alejandro Jaimes (Dataminr Inc., New York, NY)

SPARE3D: A Dataset for SPAtial REasoning on Three-View Line Drawings 14678
Wenyu Han (New York University Tandon School of Engineering), Siyuan Xiang (New York University Tandon School of Engineering), Chenhui Liu (New York University Tandon School of Engineering), Ruoyu Wang (New York University Tandon School of Engineering), and Chen Feng (New York University Tandon School of Engineering)

SwapText: Image Based Texts Transfer in Scenes 14688
Qiangpeng Yang (Alibaba Group), Jun Huang (Alibaba Group), and Wei Lin (Alibaba Group)

OrigamiNet: Weakly-Supervised, Segmentation-Free, One-Step, Full Page Text Recognition by learning to unfold 14698
Mohamed Yousef (Intuition Machines, Inc.) and Tom E. Bishop (Intuition Machines, Inc.)

FroDO: From Detections to 3D Objects 14708
Martin Rünz (Facebook Reality Labs; Department of Computer Science, University College London), Kejie Li (Facebook Reality Labs; School of Computer Science, The University of Adelaide), Meng Tang (Facebook Reality Labs), Lingni Ma (Facebook Reality Labs), Chen Kong (Facebook Reality Labs), Tanner Schmidt (Facebook Reality Labs), Ian Reid (School of Computer Science, The University of Adelaide), Lourdes Agapito (Department of Computer Science, University College London), Julian Straub (Facebook Reality Labs), Steven Lovegrove (Facebook Reality Labs), and Richard Newcombe (Facebook Reality Labs)

Author Index