

# **2019 IEEE 4th International Conference on Image, Vision and Computing (ICIVC 2019)**

**Xiamen, China  
5-7 July 2019**



**IEEE Catalog Number: CFP19G62-POD  
ISBN: 978-1-7281-2326-4**

**Copyright © 2019 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:	CFP19G62-POD
ISBN (Print-On-Demand):	978-1-7281-2326-4
ISBN (Online):	978-1-7281-2325-7

**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](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

# 2019 IEEE 4th International Conference on Image, Vision and Computing (ICIVC 2019)

## Table of Contents

Preface .....	xiii
Conference Committee.....	xiv

---

---

### ❖ Computer Vision

Research on the Visual Simulation Platform of Acupoint Massage Based on Unity 3D.....	1
<i>Hu Xiaomei, Bo Wen, Chai Jianfei</i>	
Research on Operation State Assessment of Electric Power Composite Insulator Based on Visual Deep Learning and 3D E-field Simulation Technology.....	6
<i>Zhang Shiling, Xie Gangwen, Yao Qiang</i>	
A Research of Feature Matching Algorithm Based on Monocular Vision SLAM .....	12
<i>Wen Tian, Zhiqiang Wang, Qing Zhu</i>	
Visual Terrain Classification Methods for Mobile Robots Using Hybrid Coding Architecture.....	17
<i>Hang Wu, Wenchang Zhang, Boyang Li, Yucuo Sun, Deguang Duan, Ping Chen</i>	
Kernelized Target Representation for Visual Tracking with Sparse Constraint .....	23
<i>Yuanyun Wang, Jun Wang, Zhaoming Wu, Wei Tian, Chengzhi Deng, Shengqian Wang</i>	
A Novel Framework for Building Extraction with Dual-path Convolution Network .....	28
<i>Daoji Li, Chuan Zhao, Donghang Yu, Junfeng Xu, Baoming Zhang, Zhou Yuan</i>	
Automatic Pointer Meter Reading Based on Machine Vision.....	32
<i>Mao-Hsiung Hung, Chaur-Heh Hsieh</i>	
A Method for Generating Spray Trajectory of a Shoe Sole Based on Laser Vision .....	36
<i>Taishen Wang, Jingyi Zhang, Jinhua Dong, Shuwan Pan, Lixin Zheng</i>	
Grain Truck Loading Status Detection Based on Machine Vision .....	40
<i>Dan Liu, Zhuo Wang, Xiaoping Bai, Yongjia Zhao</i>	
Computer Vision Measurement System for Measuring Elasticity Modulus of Straws .....	45
<i>Yindong Fan, Jingqian Wen, Yaoguang Hu</i>	
Improved Grab Cut with Human Visual Perception.....	50
<i>Ben Feng, Kun He</i>	
Dual-Supervised Instance Segmentation Network Combined with Prior Corner Information .....	55
<i>Haoyu Zhou, Lei Lei, Ying Xu, Chengbin Peng, Luhong Wen, Zhenzhi Shi</i>	
Robust Visual Tracking with Channel Weighted Color Ratio Feature .....	61
<i>Shan Jiang, Shuxiao Li, Chengfei Zhu, Xiaosong Lan</i>	

Large-Scale 3D Semantic Mapping Using Monocular Vision.....	71
<i>Cheng Zhang, Zhi Liu, Guangwen Liu, Dandan Huang</i>	
Stereo Visual Odometry with Light and Adaptive Feature Tracking.....	77
<i>Xin Huang, Shuming Tang, Lifu Zhang, Haibing Zhu, Qingxiu Du</i>	
Design and Implementation of IIR Multi-path Filter for SSVEP Based on MATLAB .....	83
<i>Xiaotong Li, Wen Tan</i>	
Eye Centre Localisation with Convolutional Neural Network Based Regression.....	88
<i>Wenhao Zhang, Melvyn Smith</i>	
<b>❖ Image Processing</b>	
Research of Image Sharpness Assessment Algorithm for Autofocus .....	93
<i>Lilin Her, Xiaojun Yang</i>	
Arbitrary-Oriented Ship Detection Based on Rotation Region Locating Networks in Large Scale Remote Sensing Images .....	99
<i>Xipeng Liu, Jianxin Chen, Bin Kang, Xuguang Zhang</i>	
X-Ray Mammary Image Segmentation Based on Convolutional Neural Network .....	105
<i>Shuwan Pan, Jingyi Zhang, Taishen Wang, Lingke Kong</i>	
Integrated Approach for Calculating the Mineral Assemblages and Oxide Percentage of Crystalline Rock based on Object-Based Image Analysis and Electron Probe Microscopic Analyzer .....	109
<i>Zhouxuan Xiao, Ran Wang, Yuanxiu Hui, Jingyu Lin, Lu Li</i>	
Feature Extraction and Analysis of Zircon Cathodoluminescence Images Based on Multiscale Segmentation .....	114
<i>Yuanxiu Hui, Zhouxuan Xiao, Ran Wang, Jingyu Lin, Lu Li</i>	
Image Denoising Using Graph-Based Frequency Domain Low-pass Filtering.....	118
<i>Meijuan Liu, Ying Wei</i>	
Accurate Camera Synchronization Using Deep-Shallow Mixed Models.....	123
<i>Shuya Zhou, Hanxi Li, Haiqiang Jin, Jianyi Wan, Jihua Ye</i>	
Application of SSR for Bridge Deflection Measurement by Using of Digital Image Correlation .....	129
<i>Youfa Cai, Xing Fu, Fei Li, Huiyong Li, Lulu Zhang</i>	
A Remote Sensing Image Registration Method Based on Multi-features .....	134
<i>Kun Xie, Jinlong Chen, Minghao Yang</i>	
A Real-time Destructive Method to Counter Information Hiding .....	139
<i>Feng Liu, Xuehu Yan, Yuliang Lu</i>	

Multi-sensor Image Registration for Precisely Locating Time-sensitive Objects.....	144
<i>Shubin Zhao</i>	
Automatic Matching Method for Calibration Points Based on an Angular Ordered Sequence.....	149
<i>Lijun Zhong, Qifeng Yu, Jiexin Zhou, Yang Shang, Xiaohu Zhang, Tao Wang</i>	
Deep Residual Learning for Burst Denoising.....	156
<i>Hanlin Tan, Huaxin Xiao, Shiming Lai, Yu Liu, Maojun Zhang</i>	
Image Compression Algorithms Based on Super-Resolution Reconstruction Technology.....	162
<i>Yaning Tan, Juanjuan Cai, Shengqian Zhang, Wei Zhong, Long Ye</i>	
Image Colorization Based on Texture by Using of CNN.....	167
<i>Jingbei Li, Huaxin Xiao, Diaoyin Tan, Maojun Zhang, Yu Liu</i>	
Snowflakes Removal for Single Image Based on Model Pruning and Generative Adversarial Network .....	172
<i>Li He, Jie Zhang</i>	
A New Image Segmentation Method Based on Support Vector Machine .....	177
<i>Yinlong Wang, Yao Lu, Yan Li</i>	
A Two Stage Convolutional Neural Network for Single Pixel Camera Image Reconstruction.....	182
<i>Yang Peng, Chen Chen, Pengfei Zhang, Maojun Zhang</i>	
A Novel Bit-level Image Encryption Algorithm Based on Coarse-grained Chaotic Signals.....	187
<i>Yujie Sun, Pengfei Yan, Hao Zhang, Yong Zhang</i>	
Arbitrary Oriented Outcrop Section Measurement Using 3D Point Cloud.....	193
<i>Lu Li, Ran Wang, Jingyu Lin, Zhouxuan Xiao, Yuanxiu Hui, Wei Zeng</i>	
Highway Visibility Detection Method Based on Surveillance Video .....	197
<i>Ying Meng, Hongtao Wu</i>	
Integration Network for Fast Pedestrian Detection in Crowd Scenarios.....	203
<i>Chen Chen, Huaxin Xiao, Yang Peng, Yu Liu, Maojun Zhang</i>	
Single Image Dehazing Using Sky Adaptive Fusion.....	208
<i>Qiaoyu Ma, Tianyou Pei, Xiaoqing Wang, Qingling Tang, Qingsen Zhou, Teng Yu</i>	
An Image Super-resolution Reconstruction Method by Using of Deep Learning.....	213
<i>Defu Qiu, Lixin Zheng, Shengxiang Zhang, Ying Liu</i>	
Nighttime Haze Removal Using Bilateral Filtering and Adaptive Dark Channel Prior.....	218
<i>Tianyou Pei, Qiaoyu Ma, Pengfei Xue, Yuan Ding, Lixin Hao, Teng Yu</i>	
An Improved SURF in Image Mosaic Based on Deep Learning .....	223
<i>Hao Lv, Haiyang Zhang, Changming Zhao, Chun Liu, Faguo Qi, Zilong Zhang</i>	
Building Extraction from Remote Sensing Images Using SegNet.....	227
<i>Hongshun Chen, Shilin Lu</i>	

Classification of Flammulina Velutipes Heads via Convolution Neural Network.....	231
<i>Yiyao Zheng, Weifang Xie, Lixin Zheng, Wenqiao Yang</i>	
LSTM Multi-modal UNet for Brain Tumor Segmentation.....	236
<i>Fan Xu, Haoyu Ma, Junxiao Sun, Rui Wu, Xu Liu, Youyong Kong</i>	
Image Super-Resolution Reconstruction Algorithm Based on FSRCNN and Residual Network .....	241
<i>Jian Zhang, Detian Huang</i>	
A Large Benchmark for Fabric Image Retrieval.....	247
<i>Fei Shen, Luxin Lin, Mengwan Wei, Jiajun Liu, Jianqing Zhu, Huanqiang Zeng, Canhui Cai, Lixin Zheng</i>	
Auto Image Comment via Deep Attention.....	252
<i>Jiahang Shi, Hanxi Li, Shuixiu Wu, Mingwen Wang</i>	
Hyperspectral Anomaly Detection Based on Adaptive Subspace Detector .....	257
<i>Fuxiang Wang, Jinyong Chen, Kang Sun</i>	
Image Super-resolution Reconstruction Based on Bionic Intelligence .....	261
<i>Xin Wang, Qiong Wang, Guofang Lv</i>	
Effective Heterogeneous Image Matching by Multiple Cues Integration .....	266
<i>Xin Wang, Huaqiong Zhai, Chen Ning, Zhenli Ma</i>	
Light Field Imaging Distance Measurement Method Based on BP Neural Network.....	271
<i>Muzeng Xing, Yunfeng Yu, Binbin Yan, Pei Dai, Shuangxi Liu</i>	
Towards Content Independent No-reference Image Quality Assessment Using Deep Learning.....	276
<i>Tan Lu, Ann Dooms</i>	
Ghosting Elimination Method Based on Target Location Information.....	281
<i>Dou Jian, Lu Jizhe, Zhang Hailong, Qie Shuang, Ji Xiaoyue</i>	
A Leaf Recognition Method Based on Integration of Multi-migration Model.....	286
<i>Jipeng Zhao, Zhaobin Wang</i>	
Automatic Contrast Enhancement Using Reversible Data Hiding with Distortion Minimization.....	291
<i>Suah Kim, Hyoung Joong Kim</i>	
Building Extraction of Multi-source Data Based on Deep Learning.....	296
<i>Le Yang, Hui Wang, Ke Yan, Xiangzhou Yu, Jing Li, Dan Man</i>	
Study on Vision Measurement for Levitation Gap of Magnetic Levitation Ball Based on Convolutional Neural Network.....	301
<i>Jie Kong, Yongzhi Jing, Chenhao Zhang, Jianhua Hao, Cheng Qian, Qianwen Gong</i>	
Comparison of Super-resolution Reconstruction Algorithms Based on Texture Feature Classification.....	306
<i>Rui Yang, Wenxi Wang</i>	

An Automatic Extraction Architecture of Urban Green Space Based on DeepLabv3plus Semantic Segmentation Model .....	311
<i>Wenya Liu, Anzhi Yue, Weihua Shi, Jue Ji, Ruru Deng</i>	
Aerial Image Semantic Segmentation Using Spatial and Channel Attention.....	316
<i>Zhu Lan, Qingqing Huang, Fen Chen, Yu Meng</i>	
A Hybrid Deep Neural Network for Urdu Text Recognition in Natural Images.....	321
<i>Asghar Ali, Mark Pickering</i>	
The Design and Implementation of an Image Processing Framework with a Graphical Programming Interface for Low-Ended FPGAs.....	326
<i>Nuntipat Narkthong, Santitham Prom-on</i>	
Generating Diverse and Accurate Captions Based on Generative Adversarial Network.....	331
<i>Zhenfei Sun, Yong Wang, Weimin Zhou</i>	
Multi-task Enhanced Dam Crack Image Detection Based on Faster R-CNN .....	336
<i>Jianghong Tang, Yingchi Mao, Jing Wang, Longbao Wang</i>	
Image Super-Resolution Reconstruction Method Based on Global and Local Residual Learning.....	341
<i>Jingru Hou, Yajuan Si, Liangliang Li</i>	
<b>❖ Machine Learning Applications</b>	
Spatiotemporal Analysis and Prediction of Crime Events in Atlanta Using Deep Learning.....	346
<i>Shihuai Wang, Kunxiaojuan Yuan</i>	
Design of Agaricus Bisporus Smart Farm.....	351
<i>Hu Xiaomei, Lv Shunke, Chai Jianfei</i>	
A High Performance of Single Cell Imaging Detection with Deep Learning .....	356
<i>S. B. Luo, K. T. Nguyen, X. D. Jiang, J. F. Wu, B. H. Wen, Y. Zhang, G. Chierchia, H. Talbot, T. Bourouina, D. L. Kwong, A. Q. Liu</i>	
Hardware Architecture for Real-time License Plate Location on FPGA .....	361
<i>Zhao Li, Xiaodong Jiang, Yuanxin Wang, Qixiao Zhang, Jingjing Wang</i>	
Multi Object Tracking Based on Detection with Deep Learning and Hierarchical Clustering .....	367
<i>SiFeng Wu, XueBin Zhao, Hao Zhou, Jun Lu</i>	
Mask-FgS: Feature Global Networks and Supsampling for Instance Segmentation.....	371
<i>Lei Lei, Haoyu Zhou, Chuanhong Zhou, Ying Xu, Minjie Wang, Chengbin Peng</i>	
A Novel Multi-vehicle Tracking Method Based on Linked List of Associated Vehicles .....	376
<i>Hongtao Wu, Ying Meng</i>	
Improvement of Light Field Feature.....	382
<i>Xi Chen, Murat Tahtali, Matthew Garratt, Mark Pickering</i>	

## ❖ **Pattern Recognition and Classification**

Intelligent Work Order Recognition System Based on End-to-End Deep Neural Network.....	387
<i>Lufeng Yuan, Guannan Wang, Shifeng Fan, Xin Fu, Yang Guo, Sining Wang</i>	
Small Scale Feature Propagation Using Deep Residual Learning for Diabetic Retinopathy Classification .....	392
<i>Ali Can Metan, Andrew Lambert, Mark Pickering</i>	
Moving Target Detection Algorithm on Dynamic Water Surface Based on Sparse Model.....	397
<i>Huasheng Zhu, Kaiyan Xie, Chenguang Xu, Fan Li</i>	
Face Recognition Based on Two-stage CNN Combined with Transfer Learning .....	401
<i>Anqi Zhou, Jianxin Chen, Jie Ding, Zhaolai Pan</i>	
Fatigue Driving Detection Based on Multi Feature Fusion.....	407
<i>Wanghua Deng, Yi Yu, Zeyan Zhan, Weizeng Wang</i>	
Model Compression for Image Classification Based on Low-Rank Sparse Quantization .....	412
<i>Zongcheng Ben, Xin Long, Xiangrong Zeng, Jie Liu</i>	
An Improved Scene Learning Method for Cloud Detection Based on Normalized-Linear Detector.....	416
<i>Zhenyu An, Shuo Liu, Zhiqiang Guan, Wei Pan, Ziran Shen</i>	
Effective Privacy-Preserving Iris Recognition.....	421
<i>Wiraj Udara Wickramaarachchi, Yousif A. Alhaj, Asela Gunesekera</i>	
Traffic Lights Detection and Recognition Algorithm Based on Multi-feature Fusion.....	427
<i>Yuan Wu, Keke Geng, Peiling Xue, Guodong Yin, Ning Zhang, Yiheng Lin</i>	
Cow Body Condition Score Estimation with Convolutional Neural Networks .....	433
<i>Xinru Li, Zelin Hu, Xiaoping Huang, Tao Feng, Xuanjiang Yang, Miao Li</i>	
A Feature Pair Based Method for Online Moving Object Detection from High-Resolution Airborne Videos.....	438
<i>Xiaosong Lan, Chengfei Zhu, Shuxiao Li, Hongxing Chang</i>	
Transfer Spectral Clustering Algorithm Based on Manifold Distance.....	446
<i>Li Du, Xiaoxuan Qi, Zhenqi Hong</i>	
Quality Classification of Enoki Mushroom Caps Based on CNN.....	450
<i>Jinhua Dong, Lixin Zheng</i>	
Cable Number Detection and Recognition Based on MSER and CNN .....	455
<i>Mouliang Fang, Xiaowei Tu, Zhi Chen, Qinghua Yang</i>	
Person Re-Identification Using Color Features and CNN Features.....	460
<i>Mengke Jiang, Zhijie Li, Jinlong Chen</i>	
DL-RANSAC: An Improved RANSAC with Modified Sampling Strategy Based on the Likelihood .....	463
<i>Miftahur Rahman, Xueyuan Li, Xufeng Yin</i>	



A Co-saliency Detection Method Based on Attention Model.....	469
<i>Jin Gu, Hongxu Jiang</i>	
Multi-feature Fusion for Ultrasound Breast Image Classification of Benign and Malignant.....	474
<i>Mengwan Wei, Xiuming Wu, Jianqing Zhu, Peizhong Liu, Yanmin Luo, Lixin Zheng, Yongzhao Du</i>	
A Large-Scale Benchmark for Vehicle Logo Recognition .....	479
<i>Jiajun Liu, Fei Shen, Mengwan Wei, Yuzhao Zhang, Huanqiang Zeng, Jianqing Zhu, Canhui Cai</i>	
Chinese Character Recognition by Pseudo-Zernike Moments .....	484
<i>Shiyong Li, Simon Liao</i>	
Image Feature Point Matching Based on Improved SIFT Algorithm .....	489
<i>Bing Zhong, Yubai Li</i>	
A Method for Authenticity Identification of Fritillaria Cirrhosa D.Don Based on Deep Learning.....	494
<i>Ke Hu, Pan Hu, Dong Cao, Xin Yan, Xi Yu, Chang Liu</i>	
Kernel Joint Sparse Representation Based SAR Automatic Target Recognition.....	499
<i>Chen Ning, Wenbo Liu, Gong Zhang, Xin Wang</i>	
An Improved Vehicle-license Plate Recognition Based on Color Clues and Coding Rules.....	504
<i>Sen Zhang, Shuai Chen, Jie Li, Huichen Zhang</i>	
Acoustic Scene Classification Based on Additive Margin Softmax.....	509
<i>Kun Yao, Jibin Yang, Xiongwei Zhang, Changyan Zheng, Xin Zeng</i>	
A Multi-sensor Image Matching Method Based on KAZE-HOG Features .....	514
<i>Xin Wang, Lin Duan, Yue Fan, Chen Ning</i>	
Design of License Plate Recognition System Based on Machine Learning.....	518
<i>Mingjun Zhang, Wenjing Yu, Jinsheng Su, Weibin Li</i>	
Face Spoofing Detection Based on Combining Different Color Space Models.....	523
<i>Junqin He, Jun Luo</i>	
Salient Object Detection via Quaternionic Local Ranking Binary Pattern and High-Level Priors.....	529
<i>Wang Fan, Peng Guohua</i>	
<b>❖ Video Processing</b>	
Research on Massive Video Image Processing based on Cloud Server.....	534
<i>Yang Haigen, Ding Qian, Huang Yusheng, Yu Longyan, Xu Wenting, Han Longbao, Fu Xiao, Guo Feng</i>	
Video Flame Detection Using Convolutional Neural Networks.....	539
<i>Xiong Hao, Cong Linhu, He Weixin</i>	
Research and Design of Digital Library Based on Virtual Reality .....	544
<i>Fu Xiao, Yang Haigen, Ding Qian, Huang Yusheng, Yu Hongyan, Xu Wenting, Ma Jun, Guo Feng</i>	

Unsupervised Anomaly Event Detection in Video Based on Autoencoders and Motion Features.....	550
<i>Jiangpeng Fu, Yu Zhang, Guofeng Lin, Wentao Fan</i>	
Is Seeing Believing? Video Forgery through Object-based Editing Techniques.....	555
<i>Justin Shen, Edwin Shen, Tsorng-Lin Chia</i>	
Video Text Processing Method Based on Image Stitching.....	561
<i>Tianxiang Zhou, Ke Wang, Jun Wu, Ruifeng Li</i>	
Research on the Location of Citrus Picking Point Based on Structured Light Camera .....	567
<i>Hu Xiaomei, Ni Bowen, Chai Jianfei</i>	
Moving Object Distance Estimation Method Based on Target Extraction with a Stereo Camera.....	572
<i>Jingyi Zhang, Jianxin Chen, Qingyu Lin, Liming Cheng</i>	
Simple Roads Extraction Algorithm Based on Edge Detection Using Satellite Images.....	578
<i>Muna Darweesh, Saeed Al Mansoori, Hussain AlAhmad</i>	
A Visualization System of Ship Navigation Environment Based on OSG.....	583
<i>Chengcheng Zhang, Jianxin Chen, Wei Guo</i>	
<b>❖ Data Mining</b>	
Research on a Method of Airport Runway Detection Algorithm .....	587
<i>Kun Xie, Jinlong Chen, Minghao Yang</i>	
Spatial Distribution of Rural Residential Building Types in Shandong Province Based on Spatial Interpolation .....	592
<i>Shan Bao-yan, Liu Yang-yang, Wang Jun-ning, Wang Li-e</i>	
Research on False Alarm Removal Method for Aircraft Target Detection under Small Sample Conditions .....	597
<i>Qinghao Zeng, Jinlong Chen, Minghao Yang</i>	
Super-pixel Semantic Segmentation Method for Urban Complex Scenes .....	601
<i>Linjue Lv, Xingwei Li</i>	
Feature Selection Method Based on Maximum Conditional and Joint Mutual Information.....	607
<i>Jun Qian, Yingchi Mao, Jianghong Tang, Longbao Wang</i>	
Saliency Detection Based on Local and Global Information Fusion.....	612
<i>Mengyue Ge, Ruirui Ji, Yi Wu</i>	
Morphing Aircraft Control Method Based on T-S Fuzzy Control.....	617
<i>Shuangxi Liu, Binbin Yan, Pei Dai, Muzeng Xing</i>	
Bibliometric Analysis of Monte Carlo Based on Citespace.....	622
<i>Songping Yang, Fan Yang, Ranni Zhang, Landian Zhang</i>	
High Utility Co-location Patterns Mining from Spatial Dataset with Time Interval .....	628
<i>Xin Zeng, Zhenpeng Li, Jianming Wang, Xiaowei Li</i>	

Research on Requirement Prediction of Equipment Maintenance Supporting Resources Based on Data Mining .....	637
<i>Yu Fengzhu, Yang Ruiping, Zhao Bing, Wang Cong</i>	
HMApriori–An Improved Association Analysis Algorithm and Its Application Research.....	641
<i>Pan Huang, Hairong Wang, Xiaolin Xu, Weiwei Bai</i>	
Application Research of Parallel Frequent Itemset Mining Algorithm in Book Recommendation.....	647
<i>Yang Qing, Zhang Qin, Zhang Yawen, Du Feiyang</i>	
An Algorithm of Generalized Knight’s Tour Problem Based on Path Joint.....	653
<i>Zhou Long-fu, Wang Ying-long, Bai Sen, Gong Qu</i>	
Beyond Wisdom of Crowds: Deep Uncertainty Coding for Apparent Age Estimation .....	658
<i>Yanlin Qian, Ke Chen, Dan Yang, Joni-Kristian Kämäräinen</i>	
Association Rules-Based Rapid Design Life Cycle Assessment for Green Conceptual Designs.....	663
<i>Chenglei Zhang, Hu Han, Xiangke Tian, Jiajia Liu, Qibing Lu, Lei Wang</i>	
<b>❖ Electronic Device Science</b>	
TDLAS Signal Denoising with the EEMD and Monkey King Evaluation Method .....	669
<i>Hongyan Chen, Shi Liu</i>	
An Improved Kernel Correlation Filter for Occlusion Target Tracking.....	674
<i>Chenyang Ma, Gang Yu</i>	
Multisegment Optimization Method for the Design of Even-Order Variable Fractional Delay Filters.....	679
<i>Xin Jin, Yuyao Shen, Shaozhong Lu, Yongqing Wang</i>	
3D Modeling of the Rotationally Symmetric Objects Using Kinect.....	685
<i>Jie Ding, Jianxin Chen, Anqi Zhou, Zhimin Chen</i>	
Research on Adaptive Time-Frequency Distribution Characteristics of Buried Target Echoes.....	690
<i>Jun Wang, Junsheng Jiao</i>	
Geometry Based LM of Robot to Imitate Human Motion with Kinect.....	695
<i>Wei Guo, Jianxin Chen, Ming Zhang, Zhaolai Pan</i>	
Coarse Alignment of Strapdown Inertial Navigation System Based on LMS Adaptive Filtering .....	701
<i>Yuxuan Zhu, Pengchao Qiao</i>	
A Reliable Hand Tracking Method Using Kinect.....	706
<i>Qinyu Lin, Jianxin Chen, Jiangyi Zhang, Ling Yao</i>	
A Workflow of SfM-Based Digital Outcrop Reconstruction Using Agisoft PhotoScan.....	711
<i>Jingyu Lin, Ran Wang, Lu Li, Zhouxuan Xiao</i>	
A Design of Communication Radar Integrated Signal of MCPC Based on Costas Coding.....	716
<i>Zhi Wang, Yanyong Su, Zhuofu Cui, Xing Su</i>	

A Method of Constructing Developable H-Bézier Surfaces with Shape Parameter .....	721
<i>Gang Hu, Huinan Li, Yu Qiao</i>	
A Topological Relation Model between Strip Objects .....	726
<i>Liang Leng, Guoqiang Feng</i>	
Subdivision Algorithm of Quartic $\lambda$ -Bézier Curves with Shape Parameters .....	731
<i>Xin Sun, Yu Qiao, Huinan Li</i>	
Radar Waveform Design Based on Phase Coded Signal .....	737
<i>Wen Zhong, Dong Xia, Qiang Chen</i>	
Verified Background-Aware Filters and Re-detection Tracking Algorithms .....	742
<i>Liu Jiacheng, Bai Peirui, Liu Qingyi, Cui Xin, Zhang Huahai, Zhu Lulu</i>	
From State Estimation for Dogs to the Internet of Dogs .....	748
<i>Youwen Wang, Qian Huang, Sisi Chen, Chaozheng Zhu</i>	

**Author Index**