

# **2022 Data Compression Conference (DCC 2022)**

**Snowbird, Utah, USA  
22 – 25 March 2022**



**IEEE Catalog Number: CFP22DCC-POD  
ISBN: 978-1-6654-7894-6**

**Copyright © 2022 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:	CFP22DCC-POD
ISBN (Print-On-Demand):	978-1-6654-7894-6
ISBN (Online):	978-1-6654-7893-9
ISSN:	1068-0314

**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

# 2022 Data Compression Conference (DCC) **DCC 2022**

## Table of Contents

Program Committee .....	v
The Capocelli Prize .....	vi
Reviewers .....	viii

## Technical Sessions

### Session 1

Synergies Between in-Loop and out-of-Loop Mapping for HDR-PQ Content .....	3
<i>Edouard Francois (InterDigital), Milos Radosavljevic (InterDigital), and Alan Stein (InterDigital)</i>	
Beyond Keypoint Coding: Temporal Evolution Inference with Compact Feature Representation for Talking Face Video Compression .....	13
<i>Bolin Chen (City University of Hong Kong, China), Zhao Wang (Alibaba Group, China), Binzhe Li (City University of Hong Kong, China), Rongqun Lin (City University of Hong Kong, China), Shiqi Wang (City University of Hong Kong, China), and Yan Ye (Alibaba Group, China)</i>	
Improved Deep Image Compression with Joint Optimization of Cross Channel Context Model And Generalized Loop Filter .....	23
<i>Changyue Ma (Alibaba Group), Zhao Wang (Alibaba Group), Ru-Ling Liao (Alibaba Group), and Yan Ye (Alibaba Group)</i>	
A Smart Reference Picture Resampling Approach for VVC .....	33
<i>Tianliang Fu (Peking University, China), Kai Zhang (Bytedance Inc., USA), Yue Li (Bytedance Inc., USA), Li Zhang (Bytedance Inc., USA), Shanshe Wang (Peking University, China), and Siwei Ma (Peking University, China)</i>	
Learning-Based Fast Depth Inter Coding for 3D-HEVC via XGBoost .....	43
<i>Zixiang Zhang (Huazhong University of Science and Technology, China), Li Yu (Huazhong University of Science and Technology, China), Jian Qian (Huazhong University of Science and Technology, China), and Hongkui Wang (Huazhong University of Science and Technology, China)</i>	

## Session 2

Linear-Time Minimization of Wheeler DFAs .....	53
<i>Jarno Alanko (University of Helsinki, Finland; Dalhousie University, Canada), Nicola Cotumaccio (Gran Sasso Science Institute, Italy), and Nicola Prezza (Ca' Foscari University, Italy)</i>	
FM-Indexing Grammars Induced by Suffix Sorting for Long Patterns .....	63
<i>Jin-Jie Deng (Tsing Hua University, Taiwan), Wing-Kai Hon (Tsing Hua University, Taiwan), Dominik Köppl (TMDU, Japan), and Kunihiko Sadakane (The University of Tokyo, Japan)</i>	
Computing Matching Statistics on Repetitive Texts .....	73
<i>Younan Gao (Dalhousie University, Canada)</i>	

## Session 3

HOLZ: High-Order Entropy Encoding of Lempel-Ziv Factor Distances .....	83
<i>Dominik Köppl (TMDU, Japan), Gonzalo Navarro (University of Chile, Chile), and Nicola Prezza (Ca' Foscari University, Italy)</i>	
CSTs for Terabyte-Sized Data .....	93
<i>Marco Oliva (University of Florida), Davide Cenzato (University of Verona, Italy), Massimiliano Rossi (University of Florida), Zsuzsanna Lipták (University of Verona, Italy), Travis Gagie (Dalhousie University, Canada), and Christina Boucher (University of Florida)</i>	
Compact Representation of Interval Graphs of Bounded Degree and Chromatic Number .....	103
<i>Sankardeep Chakraborty (The University of Tokyo, South Korea) and Seungbum Jo (Chungnam National University, South Korea)</i>	

## Session 4

Privacy-Assured and Multi-Prior Recovered Compressed Sensing for Image Compression-Encryption Applications .....	113
<i>Hui Huang (Chongqing University, China), Di Xiao (Chongqing University, China), and Min Li (Chongqing University, China)</i>	
Compressing Cipher Images by Using Semi-Tensor Product Compressed Sensing and Pre-Mapping ...	123
<i>Bo Zhang (Army Engineering University, China), Di Xiao (Chongqing University, China), Hui Huang (Chongqing University, China), and Jia Liang (Chongqing University, China)</i>	
A Huffman Code Based Crypto-System .....	133
<i>Yoav Gross (Ariel University, Israel), Shmuel T. Klein (Bar Ilan University, Israel), Elina Opalinsky (Ariel University, Israel), Rivka Revivo (Ariel University, Israel), and Dana Shapira (Ariel University, Israel)</i>	

## Session 5

An Edge Aware Motion Modeling Technique Leveraging on the Discrete Cosine Basis Oriented Motion Model and Frame Super Resolution .....	143
<i>Ashek Ahmmed (University of New South Wales, Australia; Charles Sturt University, Australia), Manoranjan Paul (Charles Sturt University, Australia), Mark Pickering (University of New South Wales, Australia), and Andrew Lambert (University of New South Wales, Australia)</i>	
Stochastic Model of Block Segmentation Based on Improper Quadtree and Optimal Code Under the Bayes Criterion .....	153
<i>Yuta Nakahara (Waseda University, Japan) and Toshiyasu Matsushima (Waseda University, Japan)</i>	
Entropy Modeling via Gaussian Process Regression for Learned Image Compression .....	163
<i>Maida Cao (Shanghai Jiao Tong University, China), Wenrui Dai (Shanghai Jiao Tong University, China), Shaohui Li (Shanghai Jiao Tong University, China), Chenglin Li (Shanghai Jiao Tong University, China), Junni Zou (Shanghai Jiao Tong University, China), Ying Chen (Alibaba Group, China), and Hongkai Xiong (Shanghai Jiao Tong University, China)</i>	
Optimal Strategic Quantizer Design via Dynamic Programming .....	173
<i>Anju Anand (SUNY-Binghamton, USA) and Emrah Akyol (SUNY-Binghamton, USA)</i>	

## Session 6

Neural Distributed Image Compression Using Common Information .....	182
<i>Nitish Mital (Imperial College London), Ezgi Ozyilkan (New York University), Ali Garjani (Section of Mathematics, EPFL), and Deniz Gunduz (Imperial College London)</i>	
Deep Correlated Image Set Compression Based on Distributed Source Coding and Multi-Scale Fusion .....	192
<i>Jin Wang (Beijing University of Technology, China), Yunhui Shi (Beijing University of Technology, China), Yinsen Xing (Beijing University of Technology, China), Nam Ling (Santa Clara University, U. S.), and Baocai Yin (Beijing University of Technology, China)</i>	
Rate Distortion Characteristic Modeling for Neural Image Compression .....	202
<i>Chuanmin Jia (Peking University, China), Ziqing Ge (University of Chinese Academic of Sciences, China; Institute of Computing Technology, Chinese Academy of Sciences, China), Shanshe Wang (Peking University, China; Peng Cheng Laboratory, China), Siwei Ma (Peking University, China; Peng Cheng Laboratory, China; Information Technology R&amp;D Innovation Center of Peking University, China), and Wen Gao (Peking University, China; Peng Cheng Laboratory, China)</i>	
Graph-Based Transform Based on 3D Convolutional Neural Network for Intra-Prediction of Imaging Data .....	212
<i>Debaleena Roy (University of Warwick, UK), Tanaya Guha (University of Glasgow, UK), and Victor Sanchez (University of Warwick, UK)</i>	

Fast Partition Mode Decision via a Plug-in Fully Connected Network for Video Coding .....	222
<i>Jiaqi Zhang (Institute of Computing Technology, Chinese Academy of Sciences, China; University of Chinese Academy of Sciences, China), Meng Wang (City University of Hong Kong, China), Chuanmin Jia (Peking University, China), Qi Wang (MIGU Co., Ltd, China), Shanshe Wang (Peking University, China), Siwei Ma (Peking University, China), and Wen Gao (Peking University, China)</i>	

## Session 7

Computing Lexicographic Parsings .....	232
<i>Dominik Köppl (Tokyo Medical and Dental University, Japan)</i>	
Converting RLBWT to LZ77 in Smaller Space .....	242
<i>Masaki Shigekuni (Kyushu Institute of Technology, Japan) and Tomohiro I (Kyushu Institute of Technology, Japan)</i>	
On Dynamic Bitvector Implementations .....	252
<i>Saska Dönges (University of Helsinki, Finland), Simon Puglisi (University of Helsinki, Finland), and Rajeev Raman (University of Leicester, Finland)</i>	

## Session 8

Succinct Data Structure for Path Graphs .....	262
<i>Girish Balakrishnan (Indian Institute of Technology Madras, India), Sankardeep Chakraborty (University of Tokyo, Japan), Narayanaswamy N S (Indian Institute of Technology Madras, India), and Kunihiko Sadakane (University of Tokyo, Japan)</i>	
Graphs can be Succinctly Indexed for Pattern Matching in $O( E ^2 +  V ^{\frac{5}{2}})$ time .....	272
<i>Nicola Cotumaccio (Gran Sasso Science Institute, Italy)</i>	
Speeding up Compact Planar Graphs by Using Shallower Trees .....	282
<i>Alexander Irribarra-Cortés (Universidad de Concepción, Chile; Millennium Institute for Foundational Research on Data, Chile), José Fuentes-Sepúlveda (Universidad de Concepción, Chile), Diego Seco (Universidad de Concepción, Chile; Millennium Institute for Foundational Research on Data, Chile), and Roberto Asín (Universidad de Concepción, Chile)</i>	

## Session 9

High-Fidelity 3D Model Compression Based on Key Spheres .....	292
<i>Yuanzhan Li (Donghua University, China), Yuqi Liu (Donghua University, China), Yujie Lu (Donghua University, China), Siyu Zhang (Donghua University, China), Shen Cai (Donghua University, China), and Yanting Zhang (Donghua University, China)</i>	

Attribute-Decomposable Motion Compression Network for 3D MoCap Data .....	302
<i>Zengming Chen (Beihang University, China), Junxuan Bai (Peng Cheng Laboratory, China; Beihang University, China), and Ju Dai (Peng Cheng Laboratory, China)</i>	
A Physics-Informed Vector Quantized Autoencoder for Data Compression of Turbulent Flow .....	312
<i>Mohammadreza Momenifar (Duke University, USA), Enmao Diao (Duke University, USA), Vahid Tarokh (Duke University, USA), and Andrew Bragg (Duke University, USA)</i>	
Compressing Multisets with Large Alphabets .....	322
<i>Daniel Severo (Meta AI; University of Toronto; Vector Institute for AI), James Townsend (University College London), Ashish Khisti (University of Toronto), Alireza Makhzani (University of Toronto; Vector Institute for AI), and Karen Ullrich (Meta AI)</i>	
Learning Tucker Compression for Deep CNN .....	332
<i>Pengyi Hao (Zhejiang University of Technology, China), Xiaojuan Li (Zhejiang University of Technology, China), and Fuli Wu (Zhejiang University of Technology, China)</i>	

## Session 10

Adaptive Bilateral Matching for Decoder-Side Motion Vector Refinement in Video Coding .....	342
<i>Han Huang (Qualcomm Inc., USA), Zhi Zhang (Qualcomm Inc., USA), Vadim Seregin (Qualcomm Inc., USA), Wei-Jung Chien (Qualcomm Inc., USA), Chun-Chi Chen (Qualcomm Inc., USA), and Marta Karczewicz (Qualcomm Inc., USA)</i>	
High-Order Intra Prediction for Future Video Coding .....	349
<i>Kai Lin (Peking University, China), Jiaqi Zhang (University of Chinese Academy of Sciences, China), Junru Li (Peking University, China), Chuanmin Jia (Peking University, China), and Wen Gao (Peking University, China; Peng Cheng Laboratory, China; Information Technology R&amp;D Innovation Center of Peking University, China)</i>	
Cross-Component Sample Adaptive Offset .....	359
<i>Che-Wei Kuo (Kwai Inc., USA), Xiaoyu Xiu (Kwai Inc., USA), Yi-Wen Chen (Kwai Inc., USA), Hong-Jheng Jhu (Kwai Inc., USA), Wei Chen (Kwai Inc., USA), Ning Yan (Kwai Inc., USA), and Xianglin Wang (Kwai Inc., USA)</i>	

## Session 11

Fractional Motion Estimation for Point Cloud Compression .....	369
<i>Haoran Hong (University of Southern California, USA), Eduardo Pavez (University of Southern California, USA), Antonio Ortega (University of Southern California, USA), Ryosuke Watanabe (KDDI Research, Inc., Japan), and Keisuke Nonaka (KDDI Research, Inc., Japan)</i>	

SortComp (Sort-and-Compress) - Towards a Universal Lossless Compression Scheme for Matrix and Tabular Data .....	379
<i>Xizhe Cheng (Theory Lab, Hong Kong R&amp;D Center, Huawei Technologies Co. Ltd., China), Sian-Jheng Lin (Theory Lab, Hong Kong R&amp;D Center, Huawei Technologies Co. Ltd., China), and Jie Sun (Theory Lab, Hong Kong R&amp;D Center, Huawei Technologies Co. Ltd., China)</i>	
Analysis of Lossless Compressors Applied to Integer and Floating-Point Astronomical Data .....	389
<i>Òscar Maireles-González (Universitat Autònoma de Barcelona, Spain), Joan Bartrina-Rapesta (Universitat Autònoma de Barcelona, Spain), Miguel Hernández-Cabronero (Universitat Autònoma de Barcelona, Spain), and Joan Serra-Sagristà (Universitat Autònoma de Barcelona, Spain)</i>	

## Session 12

Contact Matrix Compressor .....	399
<i>Yeremia Gunawan Adhisantoso (Institute fuer Informationsverarbeitung, Leibniz Universität Hannover, Germany) and Jörn Ostermann (Institute fuer Informationsverarbeitung, Leibniz Universität Hannover, Germany)</i>	
Counting with Prediction: Rank and Select Queries with Adjusted Anchoring .....	409
<i>Muhammed Oguzhan Kulekci (Indiana University Bloomington, USA; Istanbul Technical University, Turkey)</i>	
Binary-Coded Ternary Number Representation in Natural Language Text Compression .....	419
<i>Igor Zavadskyi (Taras Shevchenko National University of Kyiv, Ukraine)</i>	
A High-Performance FPGA-Based Accelerator for Gradient Compression .....	429
<i>Qingqing Ren (Institute of Computing Technology, Chinese Academy of Sciences, China; University of Chinese Academy of Sciences, China), Shuyong Zhu (Institute of Computing Technology, Chinese Academy of Sciences, China), Xuying Meng (Institute of Computing Technology, Chinese Academy of Sciences, China; Purple Mountain Laboratories, China), and Yujun Zhang (Institute of Computing Technology, Chinese Academy of Sciences, China; University of Chinese Academy of Sciences, China; University of Chinese Academy of Sciences Nanjing College, China)</i>	

## Poster Session

x3: Lossless Data Compressor .....	441
<i>David Barina (Brno University of Technology, Czech Republic) and Ondrej Klima (Brno University of Technology, Czech Republic)</i>	
Orthonormal Matrix Codebook Design for Adaptive Transform Coding .....	442
<i>Rashmi Boragolla (University of Manitoba, Canada) and Pradeepa Yahampath (University of Manitoba, Canada)</i>	



Learning True Rate-Distortion-Optimization for End-To-End Image Compression .....	443
<i>Fabian Brand (Multimedia Communications and Signal Processing, Friedrich-Alexander University Erlangen-Nuremberg, Germany), Kristian Fischer (Multimedia Communications and Signal Processing, Friedrich-Alexander University Erlangen-Nuremberg, Germany), Alexander Kopte (Multimedia Communications and Signal Processing, Friedrich-Alexander University Erlangen-Nuremberg, Germany), and André Kaup (Multimedia Communications and Signal Processing, Friedrich-Alexander University Erlangen-Nuremberg, Germany)</i>	
RLBWT Tricks .....	444
<i>Nathaniel Brown (Dalhousie University, Canada), Travis Gagie (Dalhousie University, Canada), and Massimiliano Rossi (University of Florida, USA)</i>	
Evaluating the Throughput of Video Transcoding in Cloud Services .....	445
<i>Yangang Cai (Peking University, China), Xufeng Li (Peking University, China), Zhenyu Wang (Peking University, China), and Ronggang Wang (Peking University, China)</i>	
Jointly Training of Binary 3D CNN Features for Action Recognition .....	446
<i>Yangang Cai (Peking University, China; Peng Cheng Laboratory, China), Peiyin Xing (Peking University, China), Zhenyu Wang (Peking University, China), and Ronggang Wang (Peking University, China)</i>	
A Benchmark of Entropy Coders for the Compression of Genome Sequencing Data .....	447
<i>Simone Casale-Brunet (École Polytechnique Fédérale de Lausanne (EPFL), SCI-STI-MM, Switzerland), Paolo Ribeca (Biomathematics and Statistics Scotland (BioSS), United Kingdom), Claudio Alberti (GenomSys SA, Switzerland), Unsal Ozturk (École Polytechnique Fédérale de Lausanne (EPFL), SCI-STI-MM, Switzerland), and Marco Mattavelli (École Polytechnique Fédérale de Lausanne (EPFL), SCI-STI-MM, Switzerland)</i>	
On Different Variants of the Burrows-Wheeler-Transform of String Collections .....	448
<i>Davide Cenzato (University of Verona, Italy) and Zsuzsanna Liptak (University of Verona, Italy)</i>	
Lower Bounds for Lexicographical DFS Data Structures .....	449
<i>Sankardeep Chakraborty (University of Tokyo, Japan) and Christian Engels (National Institute of Informatics, Japan)</i>	
Compressing the Tree of Canonical Huffman Coding .....	450
<i>Qi Cheng (University of Science and Technology of China, CAS Key Laboratory of Electromagnetic Space Information, China), Wei Yan (University of Science and Technology of China, CAS Key Laboratory of Electromagnetic Space Information, China), Sian-Jheng Lin (Theory Lab, Cenrtal Research Institute, China), and Nenghai Yu (University of Science and Technology of China, CAS Key Laboratory of Electromagnetic Space Information, China)</i>	
DNN-Based Multi-Channel Speech Coding Employing Sound Localization .....	451
<i>Shuhao Deng (Beijing University of Technology, China) and Changchun Bao (Beijing University of Technology, China)</i>	

Burrows-Wheeler Transform on Purely Morphic Words .....	452
<i>Andrea Frosini (Università di Firenze, Italy), Iliaria Mancini (Università di Siena, Italy), Simone Rinaldi (Università di Siena, Italy), Giuseppe Romana (Università di Palermo, Italy), and Marinella Sciortino (Università di Palermo, Italy)</i>	
Simple Worst-Case Optimal Adaptive Prefix-Free Coding .....	453
<i>Travis Gagie (Dalhousie University, Canada)</i>	
Selective Weighted Adaptive Coding .....	454
<i>Yoav Gross (Ariel University, Israel), Shmuel T. Klein (Bar Ilan University, Israel), Elina Opalinsky (Ariel University, Israel), and Dana Shapira (Ariel University, Israel)</i>	
RNNSC: Recurrent Neural Network-Based Stereo Compression Using Image and State Warping ..	455
<i>Muhammad Shahzeb Khan Gul (Fraunhofer Institute for Integrated Circuits IIS, Germany), Hamid Suleman (Fraunhofer Institute for Integrated Circuits IIS, Germany), Michel Bätz (Fraunhofer Institute for Integrated Circuits IIS, Germany), and Joachim Keinert (Fraunhofer Institute for Integrated Circuits IIS, Germany)</i>	
Semantic Neural Rendering-Based Video Coding: Towards Ultra-Low Bitrate Video Conferencing.	456
<i>Yujie Hu (Peking University Shenzhen Graduate School, China; Peng Cheng Laboratory, China), Youmin Xu (Peking University Shenzhen Graduate School, China), Jianhui Chang (Peking University Shenzhen Graduate School, China), and Jian Zhang (Peking University Shenzhen Graduate School, China; Peng Cheng Laboratory, China)</i>	
Video Compression via Inter-Frame Chroma Prediction .....	457
<i>Rulin Huang (Shanghai Jiao Tong University, China), Shaohui Li (Shanghai Jiao Tong University, China), Wenrui Dai (Shanghai Jiao Tong University, China), Jixiang Luo (Shanghai Jiao Tong University, China), Chenglin Li (Shanghai Jiao Tong University, China), Junni Zou (Shanghai Jiao Tong University, China), and Hongkai Xiong (Shanghai Jiao Tong University, China)</i>	
Pathology Image Compression Based on JPEG2000, Multi-Resolutional Human Perception and the Region of Interest Predictions .....	458
<i>Yinghai Jiang (Nankai University, China), Feng Liu (Nankai University, China), Rongsheng Cui (Nankai University, China), Xinzhao Zhang (Nankai University, China), and Xianyuan Zhang (Nankai University, China)</i>	
Concurrent Encryption and Lossless Compression Using Inversion Ranks .....	459
<i>Basar Koc (Stetson University, USA), Ziya Arnavut (State University of New York at Fredonia, USA), and Huseyin Kocak (University of Miami, USA)</i>	
Coarse-to-Fine Prediction with Local and Nonlocal Correlations for Intra Coding .....	460
<i>Meng Lei (Peking University, China), Xuewei Meng (Peking University, China), Chuanmin Jia (Peking University, China), Shanshe Wang (Peking University, China), Zhipeng Cheng (MIGU Video Co., Ltd, China), and Siwei Ma (Peking University, China; Peng Cheng Laboratory, China; Information Technology R&amp;D Innovation Center of Peking University, China)</i>	

Towards Ultra Low Bit-Rate Digital Human Character Communication via Compact 3D Face Descriptors .....	461
<i>Binzhe Li (City university of hong kong, China), Bolin Chen (City university of hong kong, China), Zhao Wang (Alibaba Group), Shiqi Wang (City university of hong kong, China), and Yan Ye (Alibaba Group)</i>	
Joint Rate Distortion Optimization with CNN-Based In-Loop Filter For Hybrid Video Coding .....	462
<i>Junru Li (Bytedace Inc., USA), Yue Li (Bytedance Inc., USA), Kai Zhang (Bytedance Inc., USA), and Li Zhang (Bytedance Inc., USA)</i>	
Graph Dictionary Learning for 3-D Point Cloud Compression .....	463
<i>Xin Li (Shanghai Jiao Tong University, China), Wenrui Dai (Shanghai Jiao Tong University, China), Shaohui Li (Shanghai Jiao Tong University, China), Chenglin Li (Shanghai Jiao Tong University, China), Junni Zou (Shanghai Jiao Tong University, China), and Hongkai Xiong (Shanghai Jiao Tong University, China)</i>	
Efficient Decoder for Learned Image Compression via Structured Pruning .....	464
<i>Liewen Liao (Shanghai Jiao Tong University, China), Shaohui Li (Shanghai Jiao Tong University, China), Jixiang Luo (Shanghai Jiao Tong University, China), Wenrui Dai (Shanghai Jiao Tong University, China), Chenglin Li (Shanghai Jiao Tong University, China), Junni Zou (Shanghai Jiao Tong University, China), and Hongkai Xiong (Shanghai Jiao Tong University, China)</i>	
Non-Linear Mapping for Image Enhancement .....	465
<i>Shouxin Liu (Sichuan University, China), Lei He (Sichuan University, China), Yanyan Li (Sichuan University, China), and Wei Long (Sichuan University, China)</i>	
A Low-Complexity Neural Network for Compressed Video Post-Processing in HEVC .....	466
<i>Zheng Liu (University of Chinese Academy of Sciences, China), Honggang Qi (University of Chinese Academy of Sciences, China), Yu Han (University of Chinese Academy of Sciences, China), Guoqin Cui (State key Laboratory of Digital Multimedia Chip Technology, Chongqing Vimicro AI Chip Technology Co., Ltd), and Yundong Zhang (State key Laboratory of Digital Multimedia Chip Technology, Chongqing Vimicro AI Chip Technology Co., Ltd)</i>	
An Improved Multi-Reference Frame Loop Filter Algorithm Based on Transformer for VVC .....	467
<i>Zhi Liu (North China University of Technology, China), Yunpeng Duan (North China University of Technology, China), and Mengmeng Zhang (North China University of Technology, China)</i>	
A Fast Multi-Tree Partition Algorithm Based on Spatial-Temporal Correlation for VVC .....	468
<i>Zhi Liu (North China University of Technology, China), Houyu Qian (North China University of Technology, China), and Mengmeng Zhang (North China University of Technology, China)</i>	
Transformer-Based Image Compression .....	469
<i>Ming Lu (Nanjing University), Peiyao Guo (Nanjing University), Huiqing Shi (Jiangsu Longyuan Zhenhua Marine Engineering Co.), Chuntong Cao (Jiangsu Longyuan Zhenhua Marine Engineering Co.), and Zhan Ma (Nanjing University)</i>	

Less is More: Compression of Deep Neural Networks for Adaptation in Photonic FPGA Circuits...	470
<i>Eftychia Makri (Centre for Research and Technology Hellas, Greece), Georgios Agraftiotis (Centre for Research and Technology Hellas, Greece), Ilias Kalamaras (Centre for Research and Technology Hellas, Greece), Antonios Lalas (Centre for Research and Technology Hellas, Greece), Konstantinos Votis (Centre for Research and Technology Hellas, Greece), and Dimitrios Tzovaras (Centre for Research and Technology Hellas, Greece)</i>	
Neural JPEG: End-to-End Image Compression Leveraging a Standard JPEG Encoder-Decoder .....	471
<i>Ankur Mali (The Pennsylvania State University, USA), Alexander Ororbia (Rochester Institute of Technology, USA), Daniel Kifer (The Pennsylvania State University, USA), and Lee Giles (The Pennsylvania State University, USA)</i>	
Keyframe Insertion for Random Access and Packet-Loss Repair in H.264/AVC, H.265/HEVC, and H.266/VVC .....	472
<i>Hannes Mareen (Ghent University, Belgium), Martijn Courteaux (Ghent University, Belgium), Johan Vounckx (THEO Technologies, Belgium), Peter Lambert (Ghent University, Belgium), and Glenn Van Wallendael (Ghent University, Belgium)</i>	
Applying Practical Parallel Grammar Compression to Large-Scale Data .....	473
<i>Masaki Matsushita (Japan Advanced Institute of Science and Technology, Japan) and Yasushi Inoguchi (Japan Advanced Institute of Science and Technology, Japan)</i>	
Parametric Non-Local In-Loop Filter for Future Video Coding .....	474
<i>Xuewei Meng (Institute of Digital Media, Peking University, China), Chuanmin Jia (Institute of Digital Media, Peking University, China), Xinfeng Zhang (University of Chinese Academy of Sciences, China), Meng Lei (Institute of Digital Media, Peking University, China), Shanshe Wang (Institute of Digital Media, Peking University, China; Peng Cheng Laboratory, China), Lin Li (MIGU Co., Ltd, China), and Siwei Ma (Institute of Digital Media, Peking University, China; Peng Cheng Laboratory, China)</i>	
CODA: Content-Aware Frame Dropping Algorithm for High Frame-Rate Video Streaming .....	475
<i>Vignesh V Menon (Christian Doppler Laboratory ATHENA, Institute of Information Technology (ITEC), University of Klagenfurt, Austria), Hadi Amirpour (Christian Doppler Laboratory ATHENA, Institute of Information Technology (ITEC), University of Klagenfurt, Austria), Mohammad Ghanbari (Christian Doppler Laboratory ATHENA, Institute of Information Technology (ITEC), University of Klagenfurt, Austria; University of Essex, UK), and Christian Timmerer (Christian Doppler Laboratory ATHENA, Institute of Information Technology (ITEC), University of Klagenfurt, Austria)</i>	
Hyperspectral Remote Sensing Data Compression with Neural Networks .....	476
<i>Sebastià Mijares i Verdú (Universitat Autònoma de Barcelona, Spain), Johannes Ballé (Google Research, USA), Valero Laparra (Universitat de València, Spain), Joan Bartrina Rapesta (Universitat Autònoma de Barcelona, Spain), Miguel Hernández-Cabronero (Universitat Autònoma de Barcelona, Spain), and Joan Serra-Sagristà (Universitat Autònoma de Barcelona, Spain)</i>	

Information Preserving Dimensionality Reduction for Mutual Information Analysis of Deep Learning .....	477
<i>Shizuma Namekawa (University of Tsukuba) and Taro Tezuka (University of Tsukuba)</i>	
MPEG-G Reference-Based Compression of Unaligned Reads Through Ultra-Fast Alignments .....	478
<i>Unsal Ozturk (École Polytechnique Fédérale de Lausanne (EPFL), SCI-STI-MM, Switzerland), Simone Casale-Brunet (École Polytechnique Fédérale de Lausanne (EPFL), SCI-STI-MM, Switzerland), Paolo Ribeca (Biomathematics and Statistics Scotland (BioSS), United Kingdom), and Marco Mattavelli (École Polytechnique Fédérale de Lausanne (EPFL), SCI-STI-MM, Switzerland)</i>	
Robust and Efficient Optimization Scheme Leading to KL Transform .....	479
<i>Oleksandr Pankiv (Institute of Information Technology, Lodz University of Technology, Poland), Dariusz Puchala (Institute of Information Technology, Lodz University of Technology, Poland), and Kamil Stokfiszewski (Institute of Information Technology, Lodz University of Technology, Poland)</i>	
Cube-Based Video Coding Framework for Block-Based Compressive Imaging .....	480
<i>Jirayu Peetakul (Hosei University, Japan), Yibo Fan (Fudan University, China), and Jinjia Zhou (Hosei University, Japan; JST, PRESTO, Japan Science and Technology Agency, Japan)</i>	
Comparison and Extension of Autoencoder Models for uni- and Multivariate Signal Compression in IIoT .....	481
<i>Julia Rosenberger (Bosch Rexroth AG, Germany), Alexander Kübel (CODE University of Applied Science, Germany), and Fabian Rothfuß (CODE University of Applied Science, Germany)</i>	
On The Energy Statistics of Feature Maps in Pruning of Neural Networks with Skip-Connections .....	482
<i>Mohammadreza Soltani (Duke University), Suyu Wu (Duke University), Yuerong Li (Duke University), Jie Ding (University of Minnesota), and Vahid Tarokh (Duke University)</i>	
Mixed Huffman Codes for on-Line and off-Line Applications .....	483
<i>Ryszard Stasinski (Poznan University of Technology, Poland) and Grzegorz Ulacha (West Pomeranian University of Technology, Poland)</i>	
Iterative Enhancement Scheme of Synthesized Color and Depth Images for Immersive Video System .....	484
<i>Yongquan Su (Huazhong University of Science and Technology, China; Wuhan National Laboratory for Optoelectronics, China), Qiong Liu (Huazhong University of Science and Technology, China; Wuhan National Laboratory for Optoelectronics, China), Kejun Wu (Huazhong University of Science and Technology, China; Wuhan National Laboratory for Optoelectronics, China), Gangyi Jiang (Ningbo University, China), and You Yang (Huazhong University of Science and Technology, China; Wuhan National Laboratory for Optoelectronics, China)</i>	
SAQENet: A Quality Enhancement Network for Compressed Video with Self-Attention .....	485
<i>Xuan Sun (Beijing University of Technology, China), Pengyu Liu (Beijing University of Technology, China), Kebin Jia (Beijing University of Technology, China), and Shanji Chen (Qinghai Nationalities University, China)</i>	

A low-Complexity Destriping Method for Lossless Compression of Remote-Sensing Data .....	486
<i>Zhaoyi Sun (Theory Lab, Hong Kong R&amp;D Center, Huawei Technologies Co. Ltd., China), Yuliang Huang (Theory Lab, Chengdu R&amp;D Center, Huawei Technologies Ltd., China), Roberto Leonarduzzi (Theory Lab, Hong Kong R&amp;D Center, Huawei Technologies Co. Ltd., China), and Jie Sun (Theory Lab, Hong Kong R&amp;D Center, Huawei Technologies Co. Ltd., China)</i>	
Fast Coding of Haar Wavelet Trees .....	487
<i>Dylan Tarter (Texas Tech University, United States) and Brian Nutter (Texas Tech University, United States)</i>	
An Entropy Coding Based on Binary Encoding for Mixed-Radix Digits .....	488
<i>Na Wang (University of Shanghai for Science and Technology, China), Wei Yan (University of Science and Technology of China, China), Sian-Jheng Lin (Theory Lab, Cenrtal Research Institute), and Yuliang Huang (Theory Lab, Cenrtal Research Institute)</i>	
End-to-end Lossless Compression of high Precision Depth maps Guided by Pseudo-Residual .....	489
<i>Yuyang Wu (Peking University, China; Peng Cheng Laboratory, China) and Wei Gao (Peking University, China; Peng Cheng Laboratory, China)</i>	
An Improvement to Intra Block Copy in VVC with Reference Area Redefinition .....	490
<i>Jizheng Xu (ByteDance Inc., USA)</i>	
Medical Image Retrieval Based on Deep Hashing .....	491
<i>Longquan Yan (Ningxia University, China) and Wei Shi (Ningxia University, China)</i>	
Chunk Content is not Enough: Chunk-Context Aware Resemblance Detection for Deduplication Delta Compression .....	492
<i>Xuming Ye (University of South China, China), Xiaoye Xue (University of South China, China), Wenlong Tian (University of South China, China; Hunan provincial base for scientific and technological innovation cooperation China), Ruixuan Li (Huazhong University of Science and Technology, China), Weijun Xiao (Virginia Commonwealth University, USA), Zhiyong Xu (Suffolk University, USA), and Yaping Wan (University of South China, China; Hunan provincial base for scientific and technological innovation cooperation China)</i>	
A Fast Geometric Prediction Merge Mode Decision Algorithm Based on CU Gradient for VVC .....	493
<i>Mengmeng Zhang (North China University of Technology Beijing, China), Siqi Deng (North China University of Technology Beijing, China), and Zhi Liu (North China University of Technology Beijing, China)</i>	
Analysis on Compressed Domain: A Multi-Task Learning Approach .....	494
<i>Yuefeng Zhang (Peking University, China), Chuanmin Jia (Peking University, China), Jianhui Chang (Peking University, China), and Siwei Ma (Peking University, China; Peng Cheng Laboratory, China; Information Technology R&amp;D Innovation Center of Peking University, China)</i>	

Interpretable Learned Image Compression: A Frequency Transform Decomposition Perspective ...	495
<i>Yuefeng Zhang (Peking University, China; Peng Cheng Laboratory, China; Information Technology R&amp;D Innovation Center of Peking University, China), Kai Lin (Peking University, China; Peng Cheng Laboratory, China; Information Technology R&amp;D Innovation Center of Peking University, China), Chuanmin Jia (Peking University, China; Peng Cheng Laboratory, China; Information Technology R&amp;D Innovation Center of Peking University, China), and Siwei Ma (Peking University, China; Peng Cheng Laboratory, China; Information Technology R&amp;D Innovation Center of Peking University, China)</i>	
End-to-end Distributed Video Coding .....	496
<i>Junwei Zhou (Wuhan University of Technology, China), Ting Lv (Wuhan University of Technology, China), and XiangBo Yi (Wuhan University of Technology, China)</i>	
A New Parametric Coding Method Combined Linear Microphone Array Topology .....	497
<i>Yao Zhou (Beijing University of Technology, China) and Changchun Bao (Beijing University of Technology, China)</i>	
Lossy Compression of Gaussian Source Using Low Density Generator Matrix Codes .....	498
<i>Tingting Zhu (Sun Yat-sen University, China), Jifan Liang (Sun Yat-sen University, China), and Xiao Ma (Sun Yat-sen University, China)</i>	
Iterative Machine-Learning-Based Method of Selecting Encoder Parameters for Speed-Bitrate Tradeoff .....	499
<i>Sergey Zvezdakov (Lomonosov Moscow State University, Russia), Alexey Solovyov (Lomonosov Moscow State University, Russia), and Dmitriy Vatolin (Lomonosov Moscow State University, Russia)</i>	
<b>Author Index</b> .....	<b>501</b>