

# **2022 IEEE International Symposium on Broadband Multimedia Systems and Broadcasting (BMSB 2022)**

**Bilbao, Spain  
15 – 17 June 2022**



**IEEE Catalog Number: CFP22BRO-POD  
ISBN: 978-1-6654-6902-9**

**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:	CFP22BRO-POD
ISBN (Print-On-Demand):	978-1-6654-6902-9
ISBN (Online):	978-1-6654-6901-2
ISSN:	2155-5044

**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

## Table of Contents

---

<b>PARALLEL SESSIONS 1A - ATSC</b>	
ATSC 3.0 as a Use Case for Public Safety Communications.....	1
<i>Fred Engel, Red Grasso and Chris Lamb</i>	
Core-Layer Performance Comparison of ATSC 3.0 LDM-MIMO System in Mobile Environment.....	7
<i>Hoiyoon Jung, Sung-Ik Park, Bo-mi Lim, Haechan Kwon, Namho Hur, Sungho Jeon, Hyeongseok Kim and Jeongchang Kim</i>	
Improvement of L1 Signaling Protection Based on ATSC 3.0 LDPC Codes.....	10
<i>Seok-Ki Ahn and Sung-Ik Park</i>	
Signal Isolation in Full-Duplex Inter-Tower Communication Networks: Field Trials.....	13
<i>Eneko Iradier, Iñigo Bilbao, Marta Fernandez, Jon Montalban, Zhihong Hong, Liang Zhang, Wei Li and Yiyang Wu</i>	
Laboratory tests for ATSC 3.0-centric combination of cross-polarized MIMO and LDM with varying XPDs.....	18
<i>Haechan Kwon, Bo-mi Lim, Hoiyoon Jung, Namho Hur and Sung-Ik Park</i>	
<hr/>	
<b>PARALLEL SESSIONS 1B - MULTIMEDIA I</b>	
An Elastic DASH-based Bitrate Adaptation Scheme for Smooth On-Demand Video Streaming.....	21
<i>Mohammed Amine Togou and Gabriel-Miro Muntean</i>	
Flexible Tiles in Adaptive Viewing Window: Enabling Bandwidth-Efficient and Quality-Oriented 360° VR Video Streaming.....	27
<i>Abid Yaqoob, Cristina Muntean and Gabriel-Miro Muntean</i>	
Targeted Advertisement in HbbTV Multimedia Content.....	35
<i>Matteo Anedda, Mauro Fadda, Vlad Popescu, Massimo Farina, Gabriel-Miro Muntean and Daniele Giusto</i>	
Adaptive Video Streaming Based on Learning Intrinsic Reward.....	41
<i>Yining Feng, Ying Wang, Hongyang Liu, Lin Cong and Yan Liu</i>	
Temporally Dependent Rate-Distortion Optimization for AV1 Encoder.....	46
<i>Han Qin, Zeyu Jiang, Yonghua Wang, Hongwei Guo, Ce Zhu, Dandan Ding and Zoe Liu</i>	
<hr/>	
<b>PARALLEL SESSIONS 1C - FUTURE DTT I</b>	
Opportunistic PLP: Maximizing the Spectrum Usage in DTT.....	51
<i>Rufino Cabrera, Jon Montalban, Orlando Landrove, Eneko Iradier, Pablo Angueira, Sung-Ik Park, Sunhyoung Kwon and Namho Hur</i>	
Blind RF Self-Interference Cancellation for In-Band Distribution Link in ATSC 3.0.....	56
<i>Zhihong Hong, Liang Zhang, Wei Li, Yiyang Wu, Zhiwen Zhu, Sung-Ik Park, Sungjun Ahn, Sunhyoung Kwon, Namho Hur, Eneko Iradier, Jon Montalban and Pablo Angueira</i>	

Verification of Low-Latency Channel for Advanced ISDB-T .....	62
<i>Kotoko Furuya, Shingo Asakura, Kohei Kambara, Masahiro Okano and Kyoichi Saito</i>	
Applying ATSC 3.0 NUC-2D constellations to DVB-T2: an improved performance case study .....	68
<i>Scholastique Aïzo, Anne-Carole Honfoga, Véronique Moeyaert and Michel Dossou</i>	
Minimizing Age of Synchronization in No-buffer Wireless Networks with Random Arrivals	74
<i>Guozhi Chen, Yuchao Chen, Jintao Wang and Jian Song</i>	

---

## PARALLEL SESSIONS 2A - FUTURE DTT II

---

Designing Non-Uniform Constellations using an Artificial Immune System .....	79
<i>Fadi Jerji, Cristiano Akamine and Leandro Nunes de Castro</i>	
Performance Analysis of TV 3.0 Over-the-Air Physical Layer Protocols .....	83
<i>Julio Omi, Natalia Silva Santiago, George Henrique Maranhão Garcia de Oliveira, Eduardo Fluhmman Filho, Matheus Andrade Santana, Luciano Neves Dos Santos Jr, Wesley Henrique Silva De Souza, Gustavo de Melo Valeira, Paulo Batista Lopes, Guido Stolfi, Edson Tafeli Carneiro dos Santos, Luís Geraldo Pedroso Meloni and Cristiano Akamine</i>	
Combining LDM and MIMO for Mixed Broadcast-Broadband Service Delivery in 5G .....	88
<i>Yu Xue, Yuxiao Zhai, Elvino Sousa, Wei Li, Liang Zhang, Zhihong Hong and Yiyang Wu</i>	
Analysis of the Transport Layer Candidate Technologies for the TV 3.0 Project .....	94
<i>Allan Chaubet, George Oliveira, Gustavo Valeira, Leonardo Chaves and Cristiano Akamine</i>	
Channel Coding for the Control Plane in Broadcast Networks .....	100
<i>Lorenzo Fanari, Iñigo Bilbao, Rufino Cabrera, Eneko Iradier, Jon Montalban and Pablo Angueira</i>	

---

## PARALLEL SESSIONS 2B - FIELD TRIALS

---

Empirical Analysis of Time Variability of Electromagnetic Exposure due to Mobile Communications .....	105
<i>Marta Fernández, Ivan Pena, Unai Gil, Unai Jurado and David Guerra Pereda</i>	
Empirical Modeling of UHF Wireless Channel in HPHT SFNs: Based on Seoul Metropolitan Case .....	111
<i>Sungjun Ahn, Jeongchang Kim, Seok-Ki Ahn, Sunhyoung Kwon, Sungho Jeon, David Gomez Barquero, Pablo Angueira, Dazhi He, Cristiano Akamine, Mats Ek, Sesh Simha, Mark Aitken, Zhihong Hunter Hong, Yiyang Wu and Sung-Ik Park</i>	
Nationwide Integrated 24/7 Monitoring System for ATSC 3.0 Single Frequency Broadcast Networks .....	115
<i>Sungho Jeon, Seongman Min, Dawoon Chung, Doowon Kim, Sung-Ik Park and Byung-Ho Lee</i>	
Cost efficient spectrum monitoring platform for advanced management and optimization of wireless systems .....	119
<i>Dreyelian Morejón, Yosmany Hernández, Rufino Cabrera and Miguel Alejandro Blanco</i>	

Latency Analysis and Field Trial for 5G NR.....	125
<i>Yong Zhao, Weiliang Xie, Mingshuo Wei and Chunlei Hu</i>	

---

### PARALLEL SESSIONS 2C - MULTIMEDIA II

---

Assessment of the effects of 5G MEC cache on DASH adaptation algorithms.....	130
<i>Roberto Viola, Danilo Amendola, Zalao Fernandez, Alvaro Gabilondo, Mikel Joseba Zorrilla, Mikel Casals, Pablo Angueira and Jon Montalban</i>	
EVB360: Efficient 360-Degree Video Broadcast in Next-Generation Cellular Networks ...	136
<i>Chetna Singhal and Jacob Chakareski</i>	
Subjective quality assessment of one-to-one videotelephony services.....	142
<i>Mengying Liu, Jose Joskowicz, Rafael Sotelo, Yaosi Hu, Zhenzhong Chen and Lei Yang</i>	
Elastic Frame Protocol - an open-source alternative to MPEG-2 TS.....	148
<i>Torbjörn Einarsson, Mikael Wångren and Anders Cedronius</i>	
Efficient Network Removing Feature Redundancy for Single Image Super-Resolution.....	153
<i>Yun Zhou, Tao Liang, Zhuqing Jiang and Aidong Men</i>	

---

### PARALLEL SESSIONS 4A - QoS/QoE

---

Backhaul Traffic and QoE Joint Optimization Approach for Adaptive Video Streaming in MEC-Enabled Wireless Networks.....	159
<i>Yashar Farzaneh Yeznabad, Markus Helfert and Gabriel-Miro Muntean</i>	
An open source satellite network simulator for quality based multimedia broadband traffic management.....	165
<i>Roberto Puddu, Vlad Popescu and Maurizio Murrioni</i>	
Augmented Reality Image Quality Assessment Based on Visual Confusion Theory.....	172
<i>Huiyu Duan, Lantu Guo, Wei Sun, Xionghuo Min, Li Chen and Guangtao Zhai</i>	
An Evaluation of 360° Video and Audio Quality in an Artistic-Oriented Platform.....	178
<i>Anderson Simiscuka, Mohammed Amine Togou, Rohit Verma, Mikel Zorrilla, Noel E. O'Connor and Gabriel-Miro Muntean</i>	
Adaptive QoS of WebRTC for Vehicular Media Communications.....	183
<i>Angel Martin, Daniel Mejías, Zalao Fernandez, Roberto Viola, Josu Perez, Mikel Garcia, Gorka Velez, Jon Montalban and Pablo Angueira</i>	

---

### PARALLEL SESSIONS 4B - 5G

---

5G System Level Simulation Calibration Using MATLAB 5G Toolbox.....	189
<i>Yu Xue, Yuxiao Zhai, Elvino Sousa, Wei Li, Liang Zhang, Zhihong Hong and Yiyan Wu</i>	
5G Broadcast SDR Open Source Platforms.....	195
<i>Álvaro Ibanez Latorre, Jaime Sanchez Roldan, David Gomez-Barquero, Johann Mika, Stefan Babel and Klaus Kuehnhammer</i>	
Dynamic Multicast Access Technique in SC-PTM 5G Networks: Subgrouping with OM/NOM.....	201
<i>Ernesto Fontes Pupo, Claudia Carballo Gonzalez, Luigi Atzori and Maurizio Murrioni</i>	

A Machine Learning Solution to Mitigate Co-Tier Interference and Improve QoE for Video Delivery in 5G HetNets .....	207
<i>Devanshu Anand, Mohammed Amine Togou and Gabriel-Miro Muntean</i>	
A PBCH Reception Algorithm in 5G Broadcasting .....	212
<i>Chunyi Li, Haoyang Li, Ning Yang and Dazhi He</i>	

---

#### PARALLEL SESSIONS 4C - VIDEO PROCESSING

---

LFDENET: Light Field Depth Estimation Network Based on Hybrid Data Representation	218
<i>Vinh Van Duong, Thuc Nguyen Huu, Jonghoon Yim and Byeungwoo Jeon</i>	
Sign language image dataset with a hand pose type attribute .....	222
<i>Takeshi Kajiyama, Rei Endo, Hiroyuki Kaneko, Masanori Sano and Yoshiaki Shishikui</i>	
Novel Extended Kalman Filter Using Matrix-Based Levenberg-Marquardt Algorithm and Its Application for Variable Bit-Rate Video Frame-Size Prediction .....	226
<i>Shih Yu Chang, Hsiao-Chun Wu, Kun Yan and Yiyen Wu</i>	
Automatic Human Posture Recognition Using Kinect Sensors by Advanced Graph Convolutional Network .....	232
<i>Guannan Liu, Rende Xie, Hsiao-Chun Wu, Shih-Hau Fang, Kuan Yan, Yiyen Wu and Shih Yu Chang</i>	
Facial Expression Recognition Based on A Lightweight CNN Model .....	239
<i>Qianqian Chen, Xiaojun Jing, Fangpei Zhang and Junsheng Mu</i>	

---

#### PARALLEL SESSIONS 5A - BEYOND 5G

---

Impact of Satellite Mobility on the Delivery of Multimedia Services over LEO-based NTN	244
<i>Federica Rinaldi, Sara Pizzi, Antonella Molinaro and Giuseppe Araniti</i>	
A Trust-Based Selection Mechanism for the Support of 6G eHealth Multimedia Services ..	249
<i>Chiara Suraci, Sara Pizzi, Antonella Molinaro and Giuseppe Araniti</i>	
Impact of Multiple Transmissions using Incremental Redundancy for 5G-MBS .....	255
<i>Jungsun Um, Hoiyoon Jung, Sung-Ik Park and Namho Hur</i>	
A Fast and Effective Graph-Based Resource Allocation and Power Control Scheme in Vehicular Network Slicing .....	258
<i>Mohammad Fardad, Elham Mohammadzadeh Mianji, Gabriel-Miro Muntean and Irina Tal</i>	
Toward Native Artificial Intelligence in 6G .....	264
<i>Yuqin Liu, Yufeng He, Yilin Lin and Ling Tang</i>	

---

#### PARALLEL SESSIONS 5B - AI & NETWORKS

---

Deep Reinforcement Learning for Dynamic Radio Access Selection over Future Wireless Networks .....	270
<i>Claudia Carballo Gonzalez, Ernesto Fontes Pupo, Dariel Pereira Ruisanchez, Luigi Atzori and Maurizio Murrioni</i>	

A Machine Learning-based Approach for Vehicular Tracking in Low Power Wide Area Networks.....	276
<i>Matteo Anedda, Mauro Fadda, Roberto Girau, Massimo Farina, Marco Bertolusso, Michele Spanu, Giovanni Pettorru and Daniele Giusto</i>	
Deep reinforcement learning based dynamic power allocation for uplink device-to-device enabled cell-free network.....	282
<i>Guoqing Xia, Yue Zhang, Lu Ge and Huiyu Zhou</i>	
Radio Environment Map of an LTE Deployment Based on Machine Learning Estimation of Signal Levels.....	288
<i>Yosvany Hervis Santana, David Plets, Rodney Martinez Alonso, Glauco Guillen Nieto, Luc Martens and Wout Joseph</i>	
Federated Reinforcement Learning-Based Radio Resources Scheduling for Short Video Applications.....	294
<i>Liang Qiang, Zhao Hui and Hou Lu</i>	

---

#### PARALLEL SESSIONS 5C - SIGNAL PROCESSING

---

Channel phase calibration based on Savitzky-Golay filter in time-domain for OFDM systems.....	299
<i>Guillermo Díaz, Iker Sobrón, Iñaki Eizmendi, Iratxe Landa and Manuel Vélez</i>	
MIMO Integration for Wireless Backhaul and Inter-Tower Communications in ATSC 3.0..	303
<i>Zhihong Hong, Liang Zhang, Yiyang Wu, Wei Li, Sung-Ik Park, Sungjun Ahn, Sunhyoung Kwon, Namho Hur, Eneko Iradier, Jon Montalban and Pablo Angueira</i>	
Analysis of High Rate Punctured Trellis Coded M-APSK for Multimedia Data Transmissions.....	309
<i>Junghwan Kim and Miraj Mainali</i>	
Novel OAM-Based MIMO System Using Fractional Mode.....	313
<i>Guoyu Hao and Jintao Wang</i>	
A Novel Blind Compensation Scheme for I/Q Imbalance of Wideband Zero-IF Transmitter	318
<i>Laiwei Luo, Jun Wang and Jian Song</i>	

---

#### PARALLEL SESSIONS 7A - PRODUCTION

---

A Disaggregated 5G Testbed for Professional Live Audio Production.....	323
<i>Jan Dürre, Norbert Werner, Panagiotis Matzakos, Raymond Knopp, Antonio Garcia and Cristina Avellan</i>	
A Multiple Camera 5G Wireless Studio for Professional Content Production Scenarios ...	329
<i>Adrián Rodrigo, Paola Sunna, Thorsten Lohmar, Manuel Fuentes, Mohamed Nabil Ibrahim, Pedro Ferreira, Peter Brightwell, Baruch Altman, Davide Desirello and Giulio Stante</i>	
Experimenting with distributed participatory performing art experiences.....	335
<i>Mikel Zorrilla, Ana Dominguez, Hector Rivas, Stefano Masneri, Sergio Cabrero, Alina Striner and Pablo Cesar</i>	

VOD2Live: Exploring the technical challenges in the adaptive generation of linear FAST channels from existing on-demand and live contents and personalised ad selection.....	341
<i>Eduardo Saiz, Karen Troiano, Torbjörn Einarsson and Pablo Curiel</i>	
Digital TV based sign language avatar .....	347
<i>Rodrigo Ribeiro de Oliveira, Marcelo de Castro Loebens, Almir Soares Firmo Filho and Marcos Vinicius Bandeira Andrade Bezerra</i>	

---

### PARALLEL SESSIONS 7B - AI & SIGNAL PROCESSING

---

AI-based Inter-Tower Communication Networks: First approach.....	354
<i>Iñigo Bilbao, Eneko Iradier, Jon Montalban, Zhihong Hong, Liang Zhang, Wei Li and Yiyang Wu</i>	
A DNN-Based Channel Estimation Scheme for PMCH in LTE-Based 5G Terrestrial Broadcast System.....	359
<i>Hyeongseok Kim, Kwon Seol, Jeongchang Kim, Sung-Ik Park and Namho Hur</i>	
Joint Optimization of IRS-assisted MU-MIMO Communication Systems through a DRL-based Twin Delayed DDPG Approach .....	364
<i>Daniel Pereira-Ruisánchez, Óscar Fresnedo, Darian Pérez-Adán and Luis Castedo</i>	
Alternating Minimization Algorithm for Multiuser RIS-assisted MIMO Systems .....	370
<i>Darian Pérez-Adán, Óscar Fresnedo, José P. González-Coma and Luis Castedo</i>	
Parameters Optimization for Impulse Noise Suppressing: A Deep Learning Based Approach.....	376
<i>Yue He, Cong Zou, Dejian Li, Ruilong Yao, Fang Yang and Jian Song</i>	

---

### PARALLEL SESSIONS 7C - SECURITY & PRIVACY IN MULTIMEDIA

---

AlexNet-based Visible light communication devices fingerprint extraction and authentication in broadcast systems.....	381
<i>Ziqi Liu, Dayu Shi, Samia Oukemeni and Xun Zhang</i>	
Novel Multiwavelet-based LPC Random Forest Classifier for Bluetooth RF-Fingerprint Identification.....	386
<i>Qian Wang, Wenyu Tan, Pengwei Li, Xiao Yan, Hsiao-Chun Wu and Yiyang Wu</i>	
Blockchain-Based Recommendation and Advertisement System for the TV Ecosystem ....	392
<i>Vlad Popescu, Cristinel Gavrilă, George Alex Stelea, Angel Cataron, Maurizio Murroni and Daniele Giusto</i>	
Machine Learning-based Malicious Users Detection in Blockchain-Enabled CR-IoT Network for Secured Spectrum Access.....	398
<i>Md. Sipon Miah, Md Shamim Hossain and Ana Garcia Armada</i>	
Customized 5G Private Network Solution of High Flexibility, Security and Controllability.	404
<i>Jun Yin, Sihan Li, Guorong Liu, Jie Chen, Jun Shen and Qingyang Wang</i>	



---

**POSTER SESSIONS 3D**


---

Multi independent logical cells under 5G Radio Access Network Sharing of mobile operators .....	410
<i>Xiaoyin Zhao, Guiqing Liu, Chunlei Hu, Weiliang Xie, Peng Li and Zhijun Li</i>	
Hiding Among Your Neighbors: Face Image Privacy Protection with Differential Private k-anonymity .....	415
<i>Jingyi Cao, Bo Liu, Yunqian Wen, Yunhui Zhu, Rong Xie, Li Song, Lin Li and Yaoyao Yin</i>	
Research on 5G Shared Network Access Residency Strategy .....	421
<i>Xiao Li, Chunlei Hu and Weiliang Xie</i>	
Cost and QoS Balanced Service Function Graph Scaling Algorithm for Cloud-Edge Collaborative Multimedia IoT .....	426
<i>Chenghao Lei, Siya Xu, Feng Qi, Peng Yu, Xuesong Qiu, Yao Sun and Diwen Zhu</i>	
Risk-Aware Computation Offloading and Resource Allocation in FiWi HetNets .....	432
<i>Shi Wang, Siya Xu, Shaoyong Guo, Peng Yu, HuiPing Meng and JiZhao Lu</i>	
Network Traffic Classification Based on Domain Adaptive Migration for Multimedia Services in Smart City Networks .....	438
<i>Bowen Gao, Yang Yang, Zhipeng Gao, Longjun Zhao, Zhen Wang and Dandan Cui</i>	
Wideband Sparse Spectrum Sensing With the Virtual Grid Model .....	444
<i>Xiaohao Mo, Lin Gui and Xichao Sang</i>	
An Intelligent Mining Method of Alarm Knowledge Based on Multimedia Software-defined Network .....	449
<i>Xinyue Zhao, Peng Yu, Zhengyuan Liu and Honglin Fang</i>	
Information Directed Learning Algorithm for Minimizing the Queue Length Regret .....	454
<i>Xinyu Hou, Haoyue Tang, Jintao Wang and Jian Song</i>	
Scheduling Algorithms for Minimizing the Age of Synchronization in Wireless Networks with Random Updates under Throughput Constraints .....	459
<i>Yuqiao He, Guozhi Chen, Yuchao Chen, Jintao Wang and Jian Song</i>	
On Bit Mapping for Golden Angle Modulation in the Presence of Strong Phase Noise .....	465
<i>Peiyi Zhao, Hanjiang Hong, Yin Xu, Yihang Huang, Dazhi He and Wenjun Zhang</i>	
Blind Quality Assessment for in-the-Wild Images via Hierarchical Feature Fusion Strategy	471
<i>Wei Sun, Huiyu Duan, Xiongkuo Min, Li Chen and Guangtao Zhai</i>	
An Optimal Block-Scheduling Algorithm for Pipelined Block-Parallel LDPC Decoder .....	477
<i>Fengshuang Li, Chao Zhang and Kewu Peng</i>	
Failure Prediction Based VNF Migration Mechanism for Multimedia Services in Power Grid Substation Monitoring .....	483
<i>Mingshi Wen, Junqin Li, Tianxiang Hai, Pingping Wang, Kang Yin, Jiakai Hao, Diwen Zhu, Riming Tong and Yang Yang</i>	
On Energy Cyclic Replenishment of Combined UAV for Live Broadcast .....	489
<i>You Zhou, Jian Xiong, Baichang Sun, Baowen Chen and Peng Yu</i>	

Wireless Channel Recognition by CNN .....	495
<i>Shenyang Zhu, Jian Xiong, Can Yang, Peng Yu, Wencheng Ren and Yong Li</i>	
Real-Time Metal-Surface-Defect Detection and Classification Using Advanced Machine Learning Technique .....	500
<i>Wei Liu, Kun Yan, Hsiao-Chun Wu, Xiangli Zhang, Shih Yu Chang and Yiyan Wu</i>	
Wireless Self-Energy Recycling for Unmanned Aerial Vehicle-based Terrestrial Broadcasting.....	505
<i>Jinkyu Kang, Sungjun Ahn, Jaemin Jung, Sunhyoung Kwon and Sung-Ik Park</i>	
High Power Amplifier Nonlinearity Models and Digital Predistortion Techniques in DVB-S2X.....	510
<i>Yuri Batov, Danila Puzko, Aleksandr Gelgor, Dmitry Tkachenko, Jon Montalban and Pablo Angueira</i>	
Trustworthiness Measurement for Multimedia Domain Knowledge Graph.....	516
<i>Yujie Yan, Peng Yu, Honglin Fang and Zihao Wu</i>	
Active Cell Outage Detection Algorithm for Broadband Services in 5G Cloud Radio Access Networks .....	521
<i>Peng Yu, Haoyu Wang and Zhengwei Chen</i>	
Analysis and Implementation of MIMO Antenna Miniaturization.....	526
<i>Mingshuo Wei, Yuetian Zhou, Han Guo, Chunlei Hu and Weiliang Xie</i>	
Design and Implementation of Traffic Scheduling Algorithm for Time-Sensitive Network ..	531
<i>Ye Wang, Fushen Wang, Wei Wang, Xiaowen Tan, Jiachen Wen, Ying Wang and Peng Lin</i>	
Joint Parameterized Resource Allocation for IAB Networks with Deep Reinforcement Learning.....	537
<i>Xinwu Hou, Yihang Huang, Yin Xu, Dazhi He and Wenjun Zhang</i>	
Coverage Requirements Analysis of 5G Voice Services .....	543
<i>Jia Hou, Chunlei Hu, Pingping Lin, Yuetian Zhou, Xiaohang Xu and Weiliang Xie</i>	
Dynamic Traffic Anomaly Detection for Broadband Smart Grid Services in Software Defined Networks .....	548
<i>Xiaobo Li, Run Ma, Guoli Feng, Xinnan Ha, Shuang Wu, Shengjie Wang, Peng Lin, Manjun Zhang and Peng Yu</i>	
Research on Coverage and Capacity of 5G VoNR.....	553
<i>Jinyang Yu, Chunlei Hu, Weiliang Xie, Pingping Lin, Jia Hou and Xiaohang Xu</i>	
Interleaved Floor MIMO Solution in 5G Indoor System .....	558
<i>Xiaohang Xu, Yuetian Zhou, Xiao Li, Pingping Lin, Chunlei Hu and Weiliang Xie</i>	
Deep Reinforcement Learning based Mode Selection and Power Allocation Scheme for Convergent Power-Efficient Network.....	561
<i>Fan Hong, Yihang Huang, Yin Xu, Dazhi He and Wenjun Zhang</i>	

Research on Handover Technology in 5G NSA and SA Hybrid Network .....	567
<i>Han Guo, Xiaoyin Zhao, Bowen Cai, Jia Hou, Mingshuo Wei and Xiaohang Xu</i>	
<hr/> <b>POSTER SESSIONS 6D</b> <hr/>	
Intelligent Energy Saving Technology and Strategy of 5G RAN .....	572
<i>Zhirong Zhang, Mingshuo Wei, Xiaohang Xu, Chunlei Hu and Weiliang Xie</i>	
Sparse Factor Graph-Based Expanded Iterative Detection and Decoding Scheme for Uplink Polar Coded SCMA System.....	578
<i>Zhiyan Chen, Hui Zhao and Lu Hou</i>	
Physical Layer Key Generation Scheme for Wideband Large Antenna Array Systems .....	584
<i>Nannan Li, Yu Han, Ning Gao and Shi Jin</i>	
Mapping Design based on Diversity Effect for Polar Coded Modulation .....	589
<i>Xiangpin Jiang and Hui Zhao</i>	
Research on Carrier Aggregation of 5G NR.....	595
<i>Pingping Lin, Chunlei Hu, Xiao Li, Jinyang Yu and Weiliang Xie</i>	
Q-learning based spectral hole detection with adaptive sampling point and sensing threshold for broadcasting services .....	600
<i>Yuebo Li, Fangpei Zhang, Jiawu Miao and Xiaojun Jing</i>	
CNN-based idle spectrum detection for 5G broadcasting services .....	605
<i>Jiawu Miao, Fangpei Zhang, Yuebo Li and Xiaojun Jing</i>	
Signal Interference Elimination Based on Autoencoder for Integrated Sensing and Communication .....	610
<i>Zexuan Jing, Junsheng Mu and Xiaojun Jing</i>	
SNR estimation based on CNN and LSTM in broadcasting channel.....	615
<i>Hongjun Ye, Zhiqiang Tan, Fangpei Zhang and Junsheng Mu</i>	
Fine-grained object tracking system infrastructure based on cloud-edge collaboration .....	620
<i>Yutong Wang, Peng Ding, Yun Shen, Xiaohou Shi and Hengrui Zhou</i>	
Slice Deployment Method for Deterministic Latency Broadband Services for Virtual Power Plant.....	625
<i>Bingyang Han, Jiawei Wu, Xinyu Shu, Baozhu Zhao, Xuanzhong Wang, Qinghai Ou and Peng Yu</i>	
5G and F5G Converged Network Architecture for Fusion System of Video and 3D Model in Intelligent Park.....	629
<i>Qihong Zheng, Peng Ding, Yun Shen and Dan Liu</i>	
MARL-Based Joint computation offloading and UAV deployment in MEC systems .....	634
<i>Zhiqiang Xu, Fanqin Zhou, Lei Feng and Zihao Wu</i>	
Resource Reservation for Graph-structured Multimedia Services in Computing Power Network .....	640
<i>Shuo Yang, Fanqin Zhou, Lei Feng and Wenjing Li</i>	
A QoE-driven Adaptive Transmission Scheme for Streaming Media Service .....	645
<i>Yun Shen, Peng Ding, Yuying Xue and Yaqi Song</i>	

Edge-to-Cloud Intelligent Vehicle-Infrastructure Based on 5G Time-Sensitive Network Integration .....	650
<i>Peng Ding, Dan Liu, Yun Shen, Huibin Duan and Qihong Zheng</i>	
MEC Application Slice and Its collaboration with 5G network slice .....	655
<i>Hongmei Zhu, Yilin Lin, Jie Liu and Qingyang Wang</i>	
Performance Evaluation of ATSC 3.0 Preamble for TxID Signal-Injected Use Cases .....	661
<i>Bo-mi Lim, Seok-Ki Ahn, Sungjun Ahn, Sunhyoung Kwon and Sung-Ik Park</i>	
Blockchain-Based Distributed Addressing for Initial Authentication in Future Network ...	666
<i>Yuwei Shan, Yilin Lin and Qingyang Wang</i>	
An Algorithm of Emotion Recognition And Valence of Drivers on Multimodal Data .....	672
<i>Lu Guo, Yun Shen and Peng Ding</i>	
Multimedia Analytics on Air-assisted Vehicle Network in Smart City .....	677
<i>Yaqi Song, Yun Shen and Peng Ding</i>	
Intelligent fusion scheme of broadcasting signal and sensing signal .....	682
<i>Yanxi Xie, Junsheng Mu, Fangpei Zhang, Quan Zhou and Xiaojun Jing</i>	
Application of MOPSO Algorithm to Optimization of Energy Efficiency and Spectral Efficiency Trade-off in Massive MIMO System .....	687
<i>Zhou Yuetian, Qiaoqiao Zhang, Xu Xia and Mingshuo Wei</i>	
Practical Batch Quality Trend Analysis Based on Regression Algorithms .....	692
<i>Ming Wu, Long Ye, Huijie Han, Jun Tong and Zhenguo Wang</i>	
Design of Smart Production Scheduling Using Computational Heuristic Intelligence .....	696
<i>Zhaozhen Zeng, Yongfeng Wang, Jifu Wang, Xianjie Lu and Yong Sun</i>	
Reinforcement Learning Based Cross-Layer Congestion Control for Real-Time Communication .....	701
<i>Haoyong Li, Bingcong Lu, Jun Xu, Li Song, Wenjun Zhang, Lin Li and Yaoyao Yin</i>	
A fast Multi-Type-Tree split decision algorithm of intra Coding Unit in VVC .....	707
<i>Shasha Zhang, Ronghui Zhang and Xiaojun Jing</i>	
DQL-based Wide-area path scheduling for deterministic time-delay broadband services in power communication data networks .....	712
<i>Run Ma, Xiaobo Li, Guoli Feng, Shuang Wu, Shengjie Wang, Xinnan Ha, Yifan Jia and Peng Lin</i>	