

# **2021 IEEE International Conference on Communications Workshops (ICC Workshops 2021)**

**Virtual Conference  
14 – 23 June 2021**

**Pages 1-704**



**IEEE Catalog Number: CFP2101E-POD  
ISBN: 978-1-7281-9442-4**

**Copyright © 2021 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:	CFP2101E-POD
ISBN (Print-On-Demand):	978-1-7281-9442-4
ISBN (Online):	978-1-7281-9441-7
ISSN:	2164-7038

**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

## **IEEE ICC 2021 WORKSHOP - COVI-COM**

NEEDLES IN A HAYSTACK: HOW POOLING CAN CONTROL ERROR RATES IN NOISY TESTS .....	1
<i>Arockia David Roy Kulandai, J Stella, John Rose, Thomas Schwarz</i>	
ROBUST FACE MASK DETECTION USING DEEP LEARNING ON IOT DEVICES .....	8
<i>Sheikh Rufsana Reza, Xishuang Dong, Lijun Qian</i>	
LIGHTHOUSES: A WARNING SYSTEM FOR SUPER-SPREADER EVENTS .....	14
<i>Leonie Reichert, Samuel Brack, Björn Scheuermann</i>	
BLOCKCHAIN AND AI-INTEGRATED VEHICLE-BASED DYNAMIC PARKING PRICING SCHEME .....	20
<i>Dakshita Reebadiya, Rajesh Gupta, Aparna Kumari, Sudeep Tanwar</i>	
ANALYZING THE SPREAD OF INFECTIOUS DISEASE USING A PROBABILISTIC MODEL .....	26
<i>Shrikant Saxena, Shivang Khare, Sujata Pal, Vidushi Agarwal</i>	
PREDICTION OF COVID-19 CASES BASED ON HUMAN BEHAVIOR USING DNN REGRESSOR FOR CANADA .....	32
<i>Dharitri Tripathy, Sergio G. Camorlinga</i>	
MINING TRAJECTORY PATTERNS WITH POINT-OF-INTEREST AND BEHAVIOR-OF-INTEREST .....	38
<i>Sissi Xiaoxiao Wu, Zixian Wu, Weilin Zhu, Xiaokui Yang, Yong Li</i>	
USING CONTROL THEORY AND BAYESIAN REINFORCEMENT LEARNING FOR POLICY MANAGEMENT IN PANDEMIC SITUATIONS .....	44
<i>Heena Rathore, Abhay Samant</i>	
PIRS <sup>3</sup> A: A LOW COMPLEXITY MULTI-KNAPSACK-BASED APPROACH FOR USER ASSOCIATION AND RESOURCE ALLOCATION IN HETNETS .....	50
<i>Bharat Agarwal, Mohammed Amine Togou, Marco Ruffini, Gabriel-Miro Muntean</i>	
PASSIVE WIFI CSI SENSING BASED MACHINE LEARNING FRAMEWORK FOR COVID-SAFE OCCUPANCY MONITORING .....	56
<i>Aryan Sharma, Junye Li, Deepak Mishra, Gustavo Batista, Aruna Seneviratne</i>	
ULTRASOUND-BASED CONTROL OF MICRO-BUBBLES FOR EXOSOME DELIVERY IN TREATING COVID-19 LUNG DAMAGE .....	62
<i>Bruna Fonseca, Caio Fonseca, Michael Barros, Mark White, Vinay Abhyankar, David A. Borkholder, Sasitharan Balasubramaniam</i>	
EVALUATION OF HYBRID UNSUPERVISED AND SUPERVISED MACHINE LEARNING APPROACH TO DETECT SELF-REPORTING OF COVID-19 SYMPTOMS ON TWITTER .....	68
<i>Mingxiang Cai, Jiawei Li, Matthew Nali, Tim K. Mackey</i>	
SIMULATION-BASED ANALYSIS OF COVID-19 SPREAD THROUGH CLASSROOM TRANSMISSION ON A UNIVERSITY CAMPUS .....	74
<i>Arvin Hekmati, Mitul Luhar, Bhaskar Krishnamachari, Maja Mataric</i>	

DECENTRALIZED PEDESTRIAN DENSITY MAPS BASED ON SIDELINK COMMUNICATION .....	80
<i>Stefan Schuhbäck, Lars Wischhof</i>	

FEDERATED LEARNING TOWARD DATA PREPROCESSING: COVID-19 CONTEXT .....	86
<i>Lamia Chaari Fourati, Samiha Ayed</i>	

### **IEEE ICC 2021 WORKSHOP - TSDN**

ON THE SECURITY OF IEEE 802.1 TIME-SENSITIVE NETWORKING .....	92
<i>Doganalp Ergenç, Cornelia Brühlhart, Jens Neumann, Leo Krüger, Mathias Fischer</i>	

TRAFFIC SHAPING AT THE EDGE: ENABLING BOUNDED LATENCY FOR LARGE-SCALE DETERMINISTIC NETWORKS .....	98
<i>Guoyu Peng, Shuo Wang, Yudong Huang, Ru Huo, Tao Huang, Yunjie Liu</i>	

CRITICAL EVENT-TRIGGERED FLOWS TOLERANCE IN TIME-SENSITIVE NETWORKS .....	104
<i>Shuwen Yin, Shuo Wang, Yudong Huang, Ru Huo, Tao Huang, Yunjie Liu</i>	

IMPLEMENTATION AND ORCHESTRATION OF IEEE 802.1CB FRER IN OMNET++ .....	110
<i>Doganalp Ergenç, Mathias Fischer</i>	

JOINT ROUTING AND SCHEDULING FOR DYNAMIC APPLICATIONS IN MULTICAST TIME-SENSITIVE NETWORKS.....	116
<i>Cong Li, Chenyu Zhang, Wei Zheng, Xiangming Wen, Zhaoming Lu, Jiawen Zhao</i>	

DETERMINISTIC VIDEO STREAMING WITH DEEP LEARNING ENABLED BASE STATION INTERVENTION FOR STABLE REMOTE DRIVING SYSTEM .....	122
<i>Kohei Kato, Katsuya Suto, Koya Sato</i>	

LOW-DELAY PROPORTIONAL FAIR RATE ALLOCATION FOR 802.11AC WLAN DOWNLINK .....	128
<i>Francesco Gringoli, Douglas J. Leith</i>	

MULTIPLE CASCADED PRECONFIGURED CYCLES FOR THE FRER MECHANISM IN TIME-SENSITIVE NETWORKING .....	134
<i>Zongchen Yao, Yueping Cai, Tianchi Li</i>	

ANALYSIS AND IMPLEMENTATION OF MULTI-PROTOCOL GIGABIT ETHERNET SWITCH FOR REAL-TIME CONTROL SYSTEMS .....	139
<i>Thomas Leyrer, Pekka Varis, William Wallace, Pratheesh Gangadar, Manmohan Mandhana, Prajith Jayarajan, Sanjeev Karaiyan</i>	

NEURAL NETWORK BASED PARTIAL TOMOGRAPHY FOR IN-VEHICLE NETWORK MONITORING .....	145
<i>Amani Ibraheem, Zhengguo Sheng, George Parisi, Daxin Tian</i>	

TIME-SENSITIVE OVERLAY ROUTING VIA SEGMENT ROUTING WITH FAILURE CORRECTION .....	151
<i>Zengwei Zheng, Chenwei Zhao, Jianwei Zhang</i>	

DYNAMIC SCHEDULING AND ROUTING FOR TSN BASED IN-VEHICLE NETWORKS .....	157
<i>Ammad Ali Syed, Serkan Ayaz, Tim Leinmüller, Madhu Chandra</i>	

DISTRIBUTED IMPLEMENTATION OF DETERMINISTIC NETWORKING IN EXISTING NON-TSN ETHERNET SWITCHES .....	163
<i>Alexej Grigorjew, Christian Baier, Florian Metzger, Tobias Hoßfeld</i>	
A FRAMEWORK FOR PROVIDING STOCHASTIC DELAY GUARANTEES IN COMMUNICATION NETWORKS .....	169
<i>Massieh Kordi Boroujeny, Brian L. Mark</i>	
MULTI-STREAM GATE CONTROL OF TIME AWARE SHAPER FOR HIGH LINK UTILIZATION.....	175
<i>Yu Nakayama, Daisuke Hisano</i>	
MIX-FLOW SCHEDULING FOR CONCURRENT MULTIPATH TRANSMISSION IN TIME- SENSITIVE NETWORKING.....	181
<i>Yao Zheng, Shuo Wang, Shuwen Yin, Binwei Wu, Yunjie Liu</i>	
OPTIMIZED SURVIVAL MODE TO GUARANTEE QOS FOR TIME-CRITICAL SERVICES .....	187
<i>Olav Tirkkonen, Saeed R. Khosravirad, Paolo Baracca, Liang Zhou, Ulo Parts, Dani Korpi, Mikko A. Uusitalo</i>	
PERFORMANCE ANALYSIS OF VERTICAL HANDOVER USING PREDICTABLE LGD EVENT BASED ON IEEE 802.21.....	193
<i>Muhammad Shadi Hajar, Mohamed Khaled Chahine, Raouf Hamdan, Mohammad Sharf Qdah</i>	
HIGHLY RELIABLE CLOCK SYNCHRONIZATION BASED ON PORT REDUNDANCY IN TIME-SENSITIVE NETWORKING.....	199
<i>Kun Liu, Hailong Zhu, Yuanyuan Yan, Huayu Zhang</i>	
ENABLING QOS FOR COLLABORATIVE ROBOTICS APPLICATIONS WITH WIRELESS TSN .....	205
<i>Susruth Sudhakaran, Vincent Mageshkumar, Amit Baxi, Dave Cavalcanti</i>	
GENETIC ALGORITHM BASED ARINC 664 MIXED CRITICALITY OPTIMIZATION USING NETWORK CALCULUS.....	211
<i>Eyüp Can Akpolat, Ömer Faruk Gemici, M. Selim Demir, Ibrahim Hökelek, Sinem Coleri, Hakan Ali Çirpan</i>	
 <b><u>IEEE ICC 2021 WORKSHOP - IOT-HEALTH</u></b>	
EVALUATING A LOW-COST STRAIN GAUGE BREATHING SENSOR FOR SLEEP APNEA DETECTION AT HOME.....	217
<i>Stein Kristiansen, Morten Hamborg Andersen, Vera Goebel, Thomas Plagemann, Gunn Marit Traaen, Britt Øverland, Harriet Akre, Lars Gullestad</i>	
EDGE-ENABLED SECURE HEALTHCARE SYSTEM .....	223
<i>Deepti Saraswat, Manik Lal Das</i>	
ELIMINATING BATTERY REPLACEMENT THROUGHOUT THE USEFUL LIFE OF IOT DEVICES WITH LIMITED-CAPACITY BATTERIES: ANALYSIS AND DESIGN OF A ZERO ENERGY AIR INTERFACE.....	229
<i>Abdelrahman Taha, Hussain Elkotby, Tanbir Haque, Ravikumar Pragada, Douglas Castor</i>	
CONTENT-BASED MEDICAL IMAGE TRANSMISSION AGAINST RANDOMLY- DISTRIBUTED PASSIVE EAVESDROPPERS .....	235
<i>Mehdi Letafati, Hamid Behroozi, Babak Hossein Khalaj, Eduard A. Jorswieck</i>	

SEMI-EMPIRICAL MODEL OF GLOBAL EXPOSURE USING STOCHASTIC GEOMETRY .....	242
<i>Quentin Gontier, Luca Petrillo, François Rottenberg, François Horlin, Joe Wiart, Claude Oestges, Philippe De Doncker</i>	
HETEROGENEOUS SYSTEM MODEL FOR SECURITY IN E-HEALTH APPLICATIONS.....	247
<i>Isabel Jellen, Joseph Callenes-Sloan, Dongfeng Fang</i>	
MEC-BASED ENERGY-AWARE DISTRIBUTED FEATURE EXTRACTION FOR MHEALTH APPLICATIONS WITH STRICT LATENCY REQUIREMENTS .....	253
<i>Omar Hashash, Sanaa Sharafeddine, Zaher Dawy</i>	
IN-BODY PROPAGATION AT ISM AND UWB FREQUENCIES FOR ABDOMINAL MONITORING APPLICATIONS .....	259
<i>Mariella Särestöniemi, Carlos Pomalaza-Raez, Kamran Sayrafian, Jari Inatti</i>	
<b><u>IEEE ICC 2021 WORKSHOP - UAV-5G</u></b>	
ENERGY EFFICIENT RESOURCE ALLOCATION AND TRAJECTORY DESIGN FOR MULTI-UAV-ENABLED WIRELESS NETWORKS .....	264
<i>Chenyu Wu, Shuo Shi, Shushi Gu, Ning Zhang, Xuemai Gu</i>	
UAV-ASSISTED RELAYING AND MEC NETWORKS: RESOURCE ALLOCATION AND 3D DEPLOYMENT .....	270
<i>Yu Xu, Tiankui Zhang, Dingcheng Yang, Lin Xiao</i>	
AERODYNAMIC-AWARE ENERGY SAVING FOR FIXED-WING UAV UNDER DATA COLLECTION REQUIREMENTS .....	276
<i>Shiyu Wang, Xiaoqi Qin, Wenjun Xu, Zhi Zhang, Hang Li, Nan Ma</i>	
ENERGY-EFFECTIVE OFFLOADING SCHEME IN UAV-ASSISTED C-RAN SYSTEM .....	282
<i>Xingquan Li, Chiya Zhang, Chunlong He</i>	
DQN-BASED RELAY DEPLOYMENT AND TRAJECTORY PLANNING IN CONSENSUS-BASED MULTI-UAVS TRACKING NETWORK.....	288
<i>Zhihan Huang, Xiaodong Xu</i>	
ENERGY-EFFICIENT DEPLOYMENT OF A NON-ORTHOGONAL MULTIPLE ACCESS UNMANNED AERIAL SYSTEM .....	295
<i>Nithin Babu, Constantinos B. Papadias, Petar Popovski</i>	
AIR-TO-GROUND DIRECTIONAL CHANNEL SOUNDER WITH DRONE AND 64-ANTENNA DUAL-POLARIZED CYLINDRICAL ARRAY .....	301
<i>Jorge Gomez-Ponce, Thomas Choi, Naveed A. Abbasi, Aldo Adame, Alexander Alvarado, Colton Bullard, Ruiyi Shen, Fred Daneshgaran, Harpreet S. Dhillon, Andreas F. Molisch</i>	
ENERGY-EFFICIENCY FRAMEWORK FOR FIXED-WING UAV COMMUNICATIONS WITH VARIABLE ALTITUDE.....	307
<i>Jared Miller, Suleyman Uludag</i>	
QOS-AWARE AUTONOMOUS IAB-NODE ACTIVATION AND ACCESS CONTROL.....	313
<i>Ahmet Serdar Tan, Elham Dehghan Biyar</i>	
PEAK AGE OF INFORMATION MINIMIZATION FOR UAV-AIDED WIRELESS SENSING AND COMMUNICATIONS .....	319
<i>Wenwen Jiang, Chao Shen, Bo Ai, Hang Li</i>	

ENERGY EFFICIENT OPTIMIZATION FOR SOLAR-POWERED UAV COMMUNICATIONS SYSTEM.....	325
<i>Xu Song, Zheng Chang, Xijuan Guo, Peiliang Wu, Timo Hämäläinen</i>	
JOINT DESIGN OF UAV TRAJECTORY AND DIRECTIONAL ANTENNA ORIENTATION IN UAV-ENABLED WPT NETWORKS.....	331
<i>Xiaopeng Yuan, Yulin Hu, Anke Schmeink</i>	
FAIRNESS-AWARE OPTIMIZATION FOR UAV-IRS SYMBIOTIC RADIO SYSTEMS.....	337
<i>Meng Hua, Qingqing Wu</i>	
EXPERIMENTAL EVALUATION OF A UAV USER QOS FROM A TWO-TIER 3.6GHZ SPECTRUM NETWORK.....	343
<i>Boris Galkin, Erika Fonseca, Gavin Lee, Conor Duff, Marvin Kelly, Edward Emmanuel, Ivana Dusparic</i>	
ENERGY MANAGEMENT STRATEGY BASED ON DEEP Q-NETWORK IN THE SOLAR-POWERED UAV COMMUNICATIONS SYSTEM.....	349
<i>Jiayi Cong, Bin Li, Xianzhen Guo, Ruonan Zhang</i>	
TRAJECTORY DESIGN FOR UAV COMMUNICATIONS WITH NO-FLY ZONES BY DEEP REINFORCEMENT LEARNING .....	355
<i>Zhenrong Liu, Yuan Zeng, Wei Zhang, Yi Gong</i>	
DYNAMIC TRAJECTORY AND OFFLOADING CONTROL OF UAV-ENABLED MEC UNDER USER MOBILITY.....	360
<i>Zheyuan Yang, Suzhi Bi, Ying-Jun Angela Zhang</i>	
LINE OF SIGHT PROBABILITY PREDICTION FOR UAV COMMUNICATION .....	366
<i>Imran Mohammed, Iain B. Collings, Stephen V. Hanly</i>	
AN EXHAUSTIVE STUDY OF USING COMMERCIAL LTE NETWORK FOR UAV COMMUNICATION IN RURAL AREAS.....	372
<i>Mohammed Gharib, Shashidhar Nandadapu, Fatemeh Afghah</i>	
JAMMING-RESILIENT PATH PLANNING FOR MULTIPLE UAVS VIA DEEP REINFORCEMENT LEARNING .....	378
<i>Xueyuan Wang, M. Cenk Gursoy, Tugba Erpek, Yalin E. Sagduyu</i>	
JOINT USER GROUPING AND POWER ALLOCATION FOR NOMA-BASED UAV RELAYING NETWORKS .....	384
<i>Bing Li, Rongqing Zhang, Liuqing Yang</i>	
 <b><u>IEEE ICC 2021 WORKSHOP - TERACOM</u></b>	
3D BEAM TRAINING IN TERAHERTZ COMMUNICATION: A QUADRUPLE-UPA ARCHITECTURE.....	389
<i>Zhongbao Tian, Zhi Chen, Boyu Ning</i>	
INTELLIGENT REFLECTING SURFACES AT TERAHERTZ BANDS: CHANNEL MODELING AND ANALYSIS .....	395
<i>Konstantinos Dovelos, Stylianos D. Assimonis, Hien Quoc Ngo, Boris Bellalta, Michail Matthaiou</i>	

FRACTIONALLY SPACED EQUALIZER FOR NEXT GENERATION TERAHERTZ WIRELESS COMMUNICATION SYSTEMS .....	401
<i>Qiaoyang Ye, Joonyoung Cho, Jeongho Jeon, Shadi Abu-Surra, Kitaek Bae, Jianzhong Charlie Zhang</i>	
ANGLE-RESOLVED THZ CHANNEL MEASUREMENTS AT 300 GHZ IN AN OUTDOOR ENVIRONMENT .....	408
<i>Fabian Undi, Alper Schultze, Wilhelm Keusgen, Michael Peter, Taro Eichler</i>	
EFFECT OF STANDING WAVE ON TERAHERTZ CHANNEL MODEL .....	415
<i>Ha Tran, Thanh Le, Suresh Singh</i>	
END-TO-END 140 GHZ WIRELESS LINK DEMONSTRATION WITH FULLY-DIGITAL BEAMFORMED SYSTEM .....	421
<i>Shadi Abu-Surra, Wonsuk Choi, Sungtae Choi, Eunyoung Seok, Dongjoo Kim, Navneet Sharma, Siddharth Advani, Vitali Loseu, Kitaek Bae, Ilju Na, Ali A. Farid, Mark J. W. Rodwell, Gary Xu, Jianzhong Charlie Zhang</i>	
CHANNEL MEASUREMENT AND PATH-LOSS CHARACTERIZATION FOR LOW-TERAHERTZ INDOOR SCENARIOS .....	427
<i>Jia He, Yi Chen, Yiqin Wang, Ziming Yu, Chong Han</i>	
HIERARCHICAL BEAM ALIGNMENT IN SINGLE-USER MIMO SINGLE-CARRIER FREQUENCY DIVISION MULTIPLE ACCESS TERAHERTZ COMMUNICATION SYSTEMS .....	433
<i>Yifei Wu, Johannes Koch, Martin Vossiek, Wolfgang Gerstacker</i>	
SUB-TERAHERTZ AND MMWAVE PENETRATION LOSS MEASUREMENTS FOR INDOOR ENVIRONMENTS .....	440
<i>Kairui Du, Ozgur Ozdemir, Fatih Erden, Ismail Guvenc</i>	
DOUBLE-DIRECTIONAL CHANNEL MEASUREMENTS FOR URBAN THZ COMMUNICATIONS ON A LINEAR ROUTE .....	446
<i>Naveed A. Abbasi, Jorge Gomez-Ponce, Daoud Burghal, Revanth Kondaveti, Shadi Abu-Surra, Gary Xu, Charlie Zhang, Andreas F. Molisch</i>	
PROPAGATION MODELING AND ANALYSIS FOR TERAHERTZ INTER-SATELLITE COMMUNICATIONS USING FDTD METHODS .....	452
<i>Yuanbo Li, Yi Chen</i>	

### **IEEE ICC 2021 WORKSHOP - AFFECTIVESENSE**

EFFECT OF THE COLOR TEMPERATURE OF LED LIGHTING ON THE SENSING ABILITY OF VISIBLE LIGHT COMMUNICATIONS .....	458
<i>Alexis A. Dowhuszko, Mehmet C. Ilter, Paulo Pinho, Risto Wichman, Jyri Hämäläinen</i>	
PRIVACY ENHANCED SPEECH EMOTION COMMUNICATION USING DEEP LEARNING AIDED EDGE COMPUTING .....	464
<i>Hafiz Shehbaz Ali, Fakhar Ul Hassan, Siddique Latif, Habib Ullah Manzoor, Junaid Qadir</i>	
ROBUST ML MODEL FOR HUMAN COUNTING USING AMBIENT WIFI TRAFFIC FROM MULTIPLE SOURCES .....	469
<i>Aryan Sharma, Junye Li, Deepak Mishra, Aruna Seneviratne</i>	
UAV PATH PLANNING USING ON-BOARD ULTRASOUND TRANSDUCER ARRAYS AND EDGE SUPPORT .....	475
<i>Emanuel Figetakis, Ahmed Refaey</i>	



A DEEP NEURAL NETWORK BASED ENVIRONMENT SENSING IN THE PRESENCE OF JAMMERS .....	481
<i>Atul Kumar, Ivo Bizon Franco De Almeida, Norman Franchi, Gerhard Fettweis</i>	

BENCHMARKING CLASSICAL AND AI-BASED CACHING STRATEGIES IN INTERNET OF VEHICLES.....	488
<i>Soufiane Oualil, Rachid Oucheikh, Mohamed El Kamili, Ismail Berrada</i>	

### **IEEE ICC 2021 WORKSHOP - ORBIT-TRANS**

SIGNAL PROCESSING OF MULTI-MODE-MULTI-SPATIAL (MOMS) IN LINE-OF-SIGHT CHANNELS.....	494
<i>Yi Lv, Rui Ni, Qian Zhu, Merouane Debbah</i>	

A FAN RING RESONATOR ANTENNA FOR GENERATING HIGH GAIN PSOAM MODE-GROUP WITH ULTRAHIGH EQUIVALENT ORDER .....	500
<i>Zelin Zhu, Xiaowen Xiong, Yuqi Chen, Shilie Zheng, Xianmin Zhang</i>	

CAPACITY ANALYSIS OF OAM-MIMO WIRELESS CHANNEL IN AN CORRIDOR MULTIPATH ENVIRONMENT .....	505
<i>Changwen He, Xi Liao, Yang Wang, Jihua Zhou, Jie Zhang</i>	

MODAL PURITY AND LG COUPLING OF AN OAM BEAM REFLECTED BY A ROUGH SURFACE FOR NLOS THZ LINKS .....	510
<i>Xinzhou Su, Nanzhe Hu, Amir Minoofar, Hao Song, Huibin Zhou, Zhe Zhao, Runzhou Zhang, Kai Pang, Cong Liu, Kaiheng Zou, Haoqian Song, Brittany Lynn, Shlomo Zach, Moshe Tur, Andreas F. Molisch, Hirofumi Sasaki, Doohwan Lee, Alan E. Willner</i>	

MULTIPLE OAM SIGNAL RECOVERY USING PSEUDO- DOPPLER TECHNIQUE WITH TWO MM-WAVE RECEIVERS .....	516
<i>Marek Klemes, Andrei Buliga, Greg Bowles, Michael Schwartzman, Soulideth Thirakoune, Tan Huy Ho, David Wessel, Wen Tong</i>	

AN OAM MODE MEASUREMENT METHOD BY ROTATION ANGLE ESTIMATION.....	523
<i>Quanqing Qiao, Shengmei Zhao, Le Wang</i>	

FIELD EXPERIMENT OF 117 GBIT/S WIRELESS TRANSMISSION USING OAM MULTIPLEXING AT A DISTANCE OF 200 M ON 40 GHZ BAND.....	528
<i>Yasunori Yagi, Hirofumi Sasaki, Tomoki Semoto, Tomoya Kageyama, Takayuki Yamada, Jun Mashino, Doohwan Lee</i>	

ULTRA NARROW BAND TRANSMISSION SYSTEM WITH ORBITAL ANGULAR MOMENTUM.....	533
<i>Qiuli Wu, Chao Zhang</i>	

EFFICIENT INTER-MODE INTERFERENCE CANCELLATION METHOD FOR OAM MULTIPLEXING IN THE PRESENCE OF BEAM AXIS MISALIGNMENT .....	538
<i>Shuhei Saito, Yuki Ito, Hirofumi Saganuma, Kayo Ogawa, Fumiaki Maehara</i>	

IMPROVING MULTIPLE-USER CAPACITY THROUGH DOWNLINK NOMA IN OAM SYSTEMS .....	544
<i>Mengnan Jian, Yijian Chen, Guanghui Yu</i>	

HIGHER-ORDER SPATIAL MODES IN TURBULENCE: ALTERNATIVES TO ORBITAL ANGULAR MOMENTUM .....	550
<i>Mitchell A. Cox, Abderrahmen Trichili, Boon S. Ooi, Mohamed-Slim Alouini</i>	

## **IEEE ICC 2021 WORKSHOP - EMERGING6G-COM**

COOPERATIVE SCHEME FOR CELL-FREE MASSIVE MIMO WITH RADIO STRIPES.....	556
<i>Yihua Ma, Zhifeng Yuan, Guanghui Yu, Yijian Chen</i>	
TWO-STEP MACHINE LEARNING APPROACH FOR CHANNEL ESTIMATION WITH MIXED RESOLUTION RF CHAINS .....	562
<i>Brenda Vilas Boas, Wolfgang Zirwas, Martin Haardt</i>	
PERFORMANCE ANALYSIS AND OPTIMIZATION FOR VISIBLE LIGHT COMMUNICATION WITH SPATIAL MODULATION.....	568
<i>Yihan Cang, Ming Chen, Jingwen Zhao, Zhaohui Yang, Binghao Cao, Fang Huang, Yanglin Ben</i>	
ENABLING ADVANCED DUPLEX IN 6G.....	574
<i>Hyounghu Ji, Younsun Kim, Taehyoung Kim, Khurram Muhammad, Chance Tarver, Matthew Tonnemacher, Jinyoung Oh, Bin Yu, Gary Xu</i>	
TIME DOMAIN PROPAGATION CHARACTERISTICS WITH CAUSAL CHANNEL MODEL FOR TERAHERTZ BAND.....	580
<i>Zhaona Wu, Hiroto Ebisawa, Kenta Umebayashi, Janne Lehtomäki, Nizar Zorba</i>	
TRIMMING THE FAT FROM OFDM: PILOT- AND CP-LESS COMMUNICATION WITH END-TO-END LEARNING .....	586
<i>Fayçal Ait Aoudia, Jakob Hoydis</i>	
BLOCKCHAIN-BASED COLLABORATIVE TASK OFFLOADING IN MEC: A HYPERLEDGER FABRIC FRAMEWORK .....	592
<i>Angelo Vera-Rivera, Ahmed Refaey, Ekram Hossain</i>	
RIS-AIDED CELL-FREE MASSIVE MIMO: PERFORMANCE ANALYSIS AND COMPETITIVENESS.....	598
<i>Bayan Al-Nahas, Mohanad Obeed, Anas Chaaban, Md. Jahangir Hossain</i>	
CONSTRUCTIVE INTERFERENCE BASED JOINT COMBINER AND PRECODER DESIGN IN MULTIUSER MIMO SYSTEMS.....	604
<i>Zhongxiang Wei, Christos Masouros, Tongyang Xu</i>	
ON THE COVERAGE OF BROADCAST NETWORKS WITH MULTIPLE TRANSMITTERS AND HETEROGENEOUS USERS.....	610
<i>Kanchan K. Chaurasia, Reena Sahu, Abhishek K. Gupta</i>	
B5G: PREDICTIVE CONTAINER AUTO-SCALING FOR CELLULAR EVOLVED PACKET CORE .....	616
<i>Yahuza Bello, Mhd Saria Allahham, Ahmed Refaey, Aiman Erbad, Amr Mohamed, Nabil Abdennadher</i>	
6G CONNECTIVITY IN DENSE INDOOR ENVIRONMENTS USING BEAMFORMING AND FREQUENCY ALLOCATION OVER IEEE 802.11AD .....	623
<i>Elias Yaacoub</i>	
ON THE USE OF QUANTUM COMMUNICATIONS FOR SECURING IOT DEVICES IN THE 6G ERA.....	628
<i>Hasan Abbas Al-Mohammed, Elias Yaacoub</i>	

PRECODED FASTER-THAN-NYQUIST SIGNALING WITH OPTIMAL POWER ALLOCATION IN FREQUENCY-SELECTIVE CHANNEL.....	634
<i>Takumi Ishihara, Shinya Sugiura</i>	
ON SECRECY SUM-RATE OF ARTIFICIAL-NOISE-AIDED MULTI-USER VISIBLE LIGHT COMMUNICATION SYSTEMS .....	640
<i>Yanglin Ben, Ming Chen, Binghao Cao, Zhaohui Yang, Zhiyang Li, Yihan Cang, Zheng Xu</i>	
WAVEFORM SHAPING FOR WIRELESS INFORMATION AND ENERGY PROVISION WITH CARRIER FREQUENCY OFFSET .....	646
<i>Yaping Hou, Jie Hu, Kun Yang</i>	
WIRELESS LINK SCHEDULING VIA INTERFERENCE-AWARE SYMMETRIC POSITIVE DEFINITE CONNECTIVITY MANIFOLDS .....	652
<i>Ahmed S. Ibrahim</i>	
ENVIRONMENT-AWARE AND TRAINING-FREE BEAM ALIGNMENT FOR MMWAVE MASSIVE MIMO VIA CHANNEL KNOWLEDGE MAP .....	657
<i>Di Wu, Yong Zeng, Shi Jin, Rui Zhang</i>	
META-VITERBINET: ONLINE META-LEARNED VITERBI EQUALIZATION FOR NON- STATIONARY CHANNELS .....	664
<i>Tomer Raviv, Sangwoo Park, Nir Shlezinger, Osvaldo Simeone, Yonina C. Eldar, Joonhyuk Kang</i>	
VISION-AIDED DYNAMIC BLOCKAGE PREDICTION FOR 6G WIRELESS COMMUNICATION NETWORKS .....	670
<i>Gouranga Charan, Muhammad Alrabeiah, Ahmed Alkhateeb</i>	
AFDM: A FULL DIVERSITY NEXT GENERATION WAVEFORM FOR HIGH MOBILITY COMMUNICATIONS .....	676
<i>Ali Bemani, Nassar Ksairi, Marios Kountouris</i>	
MULTI-TAP HYBRID BEAMFORMING IN WIDEBAND MMWAVE SYSTEMS: A NON- ITERATIVE APPROACH.....	682
<i>Seongbae Jun, Girim Kwon, Hyuncheol Park</i>	
ON SINGLE-USER INTERACTIVE BEAM ALIGNMENT IN NEXT GENERATION SYSTEMS: A DEEP LEARNING VIEWPOINT .....	687
<i>Abbas Khalili, Sundeep Rangan, Elza Erkip</i>	
USER-CENTRIC MULTI-DIMENSIONAL MULTIPLE ACCESS IN 6G COMMUNICATIONS.....	693
<i>Wudan Han, Jie Mei, Xianbin Wang</i>	
JOINT OPTIMIZATION OF PREAMBLE SELECTION AND ACCESS BARRING FOR MTC WITH CORRELATED DEVICE ACTIVITIES .....	699
<i>Wang Liu, Ying Cui, Lianghai Ding, Jun Sun, Yangyang Liu, Yang Li, Li Zhang</i>	
<b><u>IEEE ICC 2021 WORKSHOP - AGEWELLSENSE</u></b>	
NON-CONTACT BLOOD PRESSURE ESTIMATION WITH PULSE WAVE EMPLOYING MICROWAVE REFLECTION.....	705
<i>Hinako Ochi, Shigeru Shimamoto, Jiang Liu, Yukino Yamaoka</i>	

GAN BASED NOISE GENERATION TO AID ACTIVITY RECOGNITION WHEN AUGMENTING MEASURED WIFI RADAR DATA WITH SIMULATIONS .....	711
<i>Shelly Vishwakarma, Chong Tang, Wenda Li, Karl Woodbridge, Raviraj Adve, Kevin Chetty</i>	

FEDERATION OF AAL & AHA SYSTEMS THROUGH SEMANTICALLY INTEROPERABLE FRAMEWORK .....	717
<i>Regel Gonzalez-Usach, Matilde Julian, Manuel Esteve, Carlos Palau</i>	

BANDPASS: A BLUETOOTH-ENABLED REMOTE MONITORING DEVICE FOR SARCOPENIA .....	723
<i>Suehayla Mohieldin, Colin M. Minor, Curtis L. Petersen, John A. Batsis, Ryan J. Halter</i>	

### **IEEE ICC 2021 WORKSHOP - INTELLI-SURFACES**

SPECTRAL EFFICIENCY OPTIMIZATION FOR HYBRID RELAY-REFLECTING INTELLIGENT SURFACE .....	729
<i>Nhan Thanh Nguyen, Quang-Doanh Vu, Kyungchun Lee, Markku Juntti</i>	

ENERGY EFFICIENT INTELLIGENT REFLECTING SURFACE ASSISTED TERAHERTZ COMMUNICATIONS .....	735
<i>Qirui Wu, Yirun Zhang, Chongwen Huang, Yuen Chau, Zhaohui Yang, Mohammad Shikh-Bahaei</i>	

TRAINING SIGNAL DESIGN FOR SPARSE CHANNEL ESTIMATION IN MILLIMETER-WAVE COMMUNICATION WITH INTELLIGENT REFLECTING SURFACES .....	741
<i>Song Noh, Heejung Yu, Youngchul Sung</i>	

AVERAGE RATE ANALYSIS OF RIS-AIDED SHORT PACKET COMMUNICATION IN URLLC SYSTEMS .....	747
<i>Ramin Hashemi, Samad Ali, Nurul Huda Mahmood, Matti Latva-Aho</i>	

RIS-ASSISTED BROAD COVERAGE FOR MMWAVE MASSIVE MIMO SYSTEM .....	753
<i>Muxin He, Wei Xu, Chunming Zhao</i>	

RELAY-RECONFIGURABLE INTELLIGENT SURFACE COOPERATION FOR ENERGY-EFFICIENT MULTIUSER SYSTEMS .....	759
<i>Mohanad Obeed, Anas Chaaban</i>	

INTELLIGENT REFLECTING SURFACE AIDED MISO UPLINK WIRELESS NETWORK: FEASIBILITY AND POWER CONTROL .....	765
<i>Yang Liu, Jun Zhao, Ming Li, Qingqing Wu</i>	

JOINT ADMISSION CONTROL AND BEAMFORMING FOR INTELLIGENT REFLECTING SURFACE AIDED WIRELESS NETWORKS .....	771
<i>Ding Li, Kunlun Wang, Hongbin Zhu, Yong Zhou, Yuanming Shi</i>	

CHANNEL MODELING AND ANALYSIS OF RECONFIGURABLE INTELLIGENT SURFACES ASSISTED VEHICULAR NETWORKS .....	777
<i>Long Kong, Jiguang He, Yun Ai, Symeon Chatzinotas, Björn Ottersten</i>	

RECONFIGURABLE INTELLIGENT SURFACE CONFIGURATION AND DEPLOYMENT IN THREE-DIMENSIONAL SCENARIOS .....	783
<i>Bilian Xu, Ting Zhou, Tianheng Xu, Yuzhen Wang</i>	

TWO-USER SINR REGION FOR RECONFIGURABLE INTELLIGENT SURFACE AIDED DOWNLINK CHANNEL .....	789
<i>Xian Liu, Cong Sun, Eduard A. Jorswieck</i>	
IRS-ASSISTED MASSIVE MIMO-NOMA NETWORKS WITH POLARIZATION DIVERSITY .....	795
<i>Arthur S. De Sena, Pedro H. J. Nardelli, Daniel B. Da Costa, F. Rafael M. Lima, Liang Yang, Petar Popovski, Zhiguo Ding, Constantinos B. Papadias</i>	
MULTI-IRS-ASSISTED MULTI-CELL UPLINK MIMO COMMUNICATIONS UNDER IMPERFECT CSI: A DEEP REINFORCEMENT LEARNING APPROACH .....	801
<i>Junghoon Kim, Seyyedali Hosseinalipour, Taejoon Kim, David J. Love, Christopher G. Brinton</i>	
NEAR-FIELD BEAMFORMING AT INTELLIGENT RE-CONFIGURABLE SURFACE IN UPLINK TRANSMISSION .....	808
<i>Visa Tapio, Markku Juntti, Ibrahim Hemadeh, Alain Mourad</i>	
RESOURCE ALLOCATION FOR IRS-ASSISTED SENSING-ENHANCED WIDEBAND CR NETWORKS .....	813
<i>Yuhang Wu, Fuhui Zhou, Qihui Wu, Yang Huang, Rose Qingyang Hu</i>	
RECONFIGURABLE INTELLIGENT SURFACE FOR INTERFERENCE ALIGNMENT IN MIMO DEVICE-TO-DEVICE NETWORKS .....	819
<i>Min Fu, Yong Zhou, Yuanming Shi</i>	
HYBRID BEAMFORMING AND PASSIVE REFLECTION DESIGN FOR RIS-ASSISTED MMWAVE MIMO SYSTEMS .....	825
<i>Qi Zhu, Hongyu Li, Rang Liu, Ming Li, Qian Liu</i>	
SECRECYPERFORMANCE ANALYSIS FOR RECONFIGURABLE INTELLIGENT SURFACE AIDED NOMA NETWORK .....	831
<i>Zhiqing Tang, Tianwei Hou, Yuanwei Liu, Jiankang Zhang</i>	
SPECTRAL EFFICIENCY VS COMPLEXITY IN DOWNLINK ALGORITHMS FOR RECONFIGURABLE INTELLIGENT SURFACES .....	837
<i>Pooja Nuti, Brian L. Evans</i>	
ENERGY-EFFICIENT JOINT BEAMFORMING DESIGN FOR IRS-ASSISTED MISO SYSTEM .....	844
<i>Gen Li, Ming Zeng, Deepak Mishra, Li Hao, Zheng Ma, Octavia A. Dobre</i>	
OPTIMIZATION OF RECONFIGURABLE INTELLIGENT SURFACES THROUGH TRACE MAXIMIZATION .....	850
<i>Akbar M. Sayeed</i>	
RECONFIGURABLE INTELLIGENT SURFACE-ASSISTED AMBIENT BACKSCATTER COMMUNICATIONS – EXPERIMENTAL ASSESSMENT .....	856
<i>R. Fara, D.-T. Phan-Huy, P. Ratajczak, A. Ourir, M. Di Renzo, J. De Rosny</i>	
DEEP LEARNING FOR THZ DRONES WITH FLYING INTELLIGENT SURFACES: BEAM AND HANDOFF PREDICTION .....	863
<i>Nof Abuzainab, Muhammad Alrabeiah, Ahmed Alkhateeb, Yalin E. Sagduyu</i>	
SECURE INTELLIGENT REFLECTING SURFACE ASSISTED UAV COMMUNICATION NETWORKS .....	869
<i>Junhao Fang, Zhaohui Yang, Nasreen Anjum, Ye Hu, Hamid Asgari, Mohammad Shikh- Bahaei</i>	

## **IEEE ICC 2021 WORKSHOP - DAWN**

COOPERATIVE EDGE CACHING VIA FEDERATED DEEP REINFORCEMENT LEARNING IN FOG-RANS.....	875
<i>Min Zhang, Yanxiang Jiang, Fu-Chun Zheng, Mehdi Bennis, Xiaohu You</i>	
ENERGY EFFICIENT EDGE COMPUTING: WHEN LYAPUNOV MEETS DISTRIBUTED REINFORCEMENT LEARNING.....	881
<i>Mohamed Sana, Mattia Merluzzi, Nicola Di Pietro, Emilio Calvanese Strinati</i>	
DECENTRALIZED FEDERATED LEARNING FOR ROAD USER CLASSIFICATION IN ENHANCED V2X NETWORKS.....	887
<i>Luca Barbieri, Stefano Savazzi, Monica Nicoli</i>	
ON CASCADED FEDERATED LEARNING FOR MULTI-TIER PREDICTIVE MODELS.....	893
<i>Abdulrahman Alabbasi, Milad Ganjalizadeh, Konstantinos Vandikas, Marina Petrova</i>	
ENERGY-EFFICIENT MMWAVE UDN USING DISTRIBUTED MULTI-AGENT DEEP REINFORCEMENT LEARNING.....	900
<i>Jihoon Moon, Hyungyu Ju, Seungnyun Kim, Byonghyo Shim</i>	

## **IEEE ICC 2021 WORKSHOP - 6GRATESPLIT**

6G DOWNLINK TRANSMISSION VIA RATE SPLITTING SPACE DIVISION MULTIPLE ACCESS BASED ON GROUPED CODE INDEX MODULATION.....	906
<i>Wenchao Zhai, Yishan Wu, Jun Zhao, Huimei Han</i>	
RESOURCE ALLOCATION DESIGN FOR IRS-AIDED DOWNLINK MU-MISO RSMA SYSTEMS.....	912
<i>Hao Fu, Suili Feng, Derrick Wing Kwan Ng</i>	
OUTAGE-CONSTRAINED ROBUST AND SECURE DESIGN FOR DOWNLINK RATE- SPLITTING UAV NETWORKS.....	918
<i>Hamed Bastami, Majid Moradikia, Mehdi Letafati, Ahmed Abdelhadi, Hamid Behroozi</i>	
SUCCESSIVE NULL-SPACE PRECODER DESIGN FOR DOWNLINK MU-MIMO WITH RATE SPLITTING AND SINGLE-STAGE SIC.....	925
<i>Aravindh Krishnamoorthy, Robert Schober</i>	
LOW COMPLEXITY RATE SPLITTING USING HIERARCHICAL USER GROUPING.....	931
<i>Elaheh Sadeghabadi, Steven Blostein</i>	
RATE-SPLITTING MULTIPLE ACCESS FOR JOINT RADAR-COMMUNICATIONS WITH LOW-RESOLUTION DACS.....	937
<i>Onur Dizdar, Aryan Kaushik, Bruno Clerckx, Christos Masouros</i>	
RATE-SPLITTING MULTIPLE ACCESS FOR MULTIGROUP MULTICAST CELLULAR AND SATELLITE COMMUNICATIONS: PHY LAYER DESIGN AND LINK-LEVEL SIMULATIONS.....	943
<i>Longfei Yin, Onur Dizdar, Bruno Clerckx</i>	
RESOURCE ALLOCATION FOR SECURE RATE-SPLITTING MULTIPLE ACCESS WITH ADAPTIVE BEAMFORMING.....	949
<i>Tenghao Cai, Jia Zhang, Shihao Yan, Lili Meng, Jiande Sun, Naofal Al-Dhahir</i>	

RATE-SPLITTING FOR THE WEIGHTED SUM RATE MAXIMIZATION UNDER MINIMUM RATE CONSTRAINTS IN THE MIMO BC..... 955  
*Christoph Kaulich, Michael Joham, Wolfgang Utschick*

BEAMFORMING DESIGN FOR RATE SPLITTING MIMO ..... 961  
*Ticao Zhang, Shiwen Mao*

### **IEEE ICC 2021 WORKSHOP - IOMT**

ENERGY AND DELAY MINIMIZATION BASED ON GAME THEORY IN MEC-ASSISTED VEHICULAR NETWORKS ..... 967  
*Haipeng Wang, Zhipeng Lin, Kun Guo, Tiejun Lv*

A REINFORCEMENT LEARNING ALGORITHM FOR DATA COLLECTION IN UAV-AIDED IOT NETWORKS WITH UNCERTAIN TIME WINDOWS..... 973  
*Cihan Tugrul Cicek*

A MOBILE DEVICES ASSISTED ADAPTIVE CONTENT DELIVERY STRATEGY IN URBAN PUBLIC TRANSPORTATION SYSTEM..... 979  
*Hang Wang, Xi Li, Hong Ji, Heli Zhang*

EFFICIENT ONLINE VEHICLE RECRUITMENT BASED ON DETERMINISTIC TRAJECTORY IN MOBILE CROWD SENSING..... 985  
*Guoqing Lu, Luning Liu, Luhan Wang, Zhaoming Lu, Xiangming Wen, Meiling Li*

WAND: WORMHOLE ATTACK ANALYSIS USING THE NEIGHBOR DISCOVERY FOR SOFTWARE-DEFINED HETEROGENEOUS INTERNET OF THINGS ..... 992  
*Faheed A. F. Alenezi, Sejun Song, Baek-Young Choi*

COMPUTATION RESOURCE CONFIGURATION FOR VEHICULAR EDGE COMPUTING: A FLUID-MODEL BASED APPROACH..... 998  
*Yue Zhou, Changyan Yi, Kun Zhu*

OVER-THE-AIR COMPUTATION VIA CLOUD RADIO ACCESS NETWORKS..... 1004  
*Lukuan Xing, Yong Zhou, Yuanming Shi*

ANALYSIS OF CHANNEL MODELS FOR LORA-BASED DIRECT-TO-SATELLITE IOT NETWORKS SERVED BY LEO NANOSATELLITES..... 1010  
*Tomás Núñez González, Julián López Salamanca, Samuel Montejo Sánchez, Cesar Azurdia Meza, Sandra Céspedes*

THROUGHPUT MAXIMIZATION FOR ENERGY HARVESTING BASED RELAY COOPERATIVE BACKSCATTERING TRANSMISSION ..... 1016  
*Wen-Jing Wang, Kangjun Xu, Li Zhen, Keping Yu, Ali Kashif Bashir, Sahil Garg*

PATH DESIGN FOR NOMA-ENHANCED ROBOTS: A MACHINE LEARNING APPROACH WITH RADIO MAP ..... 1021  
*Ruikang Zhong, Xiao Liu, Yuanwei Liu, Di Zhang, Yue Chen*

DUDE, ARE YOU APPROACHING ME? DETECTING CLOSE PHYSICAL CONTACT VIA UNLICENSED LPWAN SIGNALS ..... 1027  
*Chenglong Shao, Osamu Muta*

JOINT LOCALIZATION AND RADIO MAP GENERATION USING TRANSFORMER NETWORKS WITH LIMITED RSS SAMPLES ..... 1033  
*Ankur Pandey, Ryan Sequeira, Sudhir Kumar*

SYNCHRONIZED SCUBA: D2D COMMUNICATION FOR OUT-OF-SYNC DEVICES .....	1039
<i>Vishnu Rajendran Chandrika, Gautham Prasad, Lutz Lampe, Gus Vos</i>	

**IEEE ICC 2021 WORKSHOP - EDGELEARN5G**

FEDERATED LEARNING IN MULTI-ANTENNA WIRELESS NETWORKS.....	1046
<i>Zhendong Song, Hongguang Sun, Howard H. Yang, Xijun Wang, Tony Q. S. Quek</i>	

OPTIMAL DESIGN OF HYBRID FEDERATED AND CENTRALIZED LEARNING IN THE MOBILE EDGE COMPUTING SYSTEMS.....	1052
<i>Wei Hong, Xueting Luo, Zhongyuan Zhao, Mugen Peng, Tony Q. S. Quek</i>	

OVER-THE-AIR LEARNING RATE OPTIMIZATION FOR FEDERATED LEARNING.....	1058
<i>Chunmei Xu, Shengheng Liu, Yongming Huang, Chongwen Huang, Zhaoyang Zhang</i>	

RECONFIGURABLE INTELLIGENT SURFACE ASSISTED FEDERATED LEARNING WITH PRIVACY GUARANTEE .....	1065
<i>Yuhan Yang, Yong Zhou, Ting Wang, Yuanming Shi</i>	

AN EDGE FEDERATED MARL APPROACH FOR TIMELINESS MAINTENANCE IN MEC COLLABORATION .....	1071
<i>Zheqi Zhu, Shuo Wan, Pingyi Fan, Khaled B. Letaief</i>	

COORDINATED HYPER-PARAMETER SEARCH FOR EDGE MACHINE LEARNING IN BEYOND-5G NETWORKS .....	1077
<i>Hasan Farooq, Julien Forgeat, Shruti Bothe, Maxime Bouton, Meral Shirazipour, Per Karlsson</i>	

RADIO ENVIRONMENT MAP ENHANCED INTELLIGENT REFLECTING SURFACE SYSTEMS BEYOND 5G.....	1084
<i>Kai Zhang, Jian Zhao, Pei Liu, Changchuan Yin</i>	

BYZANTINE-RESILIENT FEDERATED MACHINE LEARNING VIA OVER-THE-AIR COMPUTATION .....	1090
<i>Shaoming Huang, Yong Zhou, Ting Wang, Yuanming Shi</i>	

DEEP REINFORCEMENT LEARNING FOR OFFLOADING AND SHUNTING IN HYBRID EDGE COMPUTING NETWORK.....	1096
<i>Jiadong Zhang, Wenxiao Shi, Ruidong Zhang, Sicheng Liu</i>	

DEEPRAT: A DRL-BASED FRAMEWORK FOR MULTI-RAT ASSIGNMENT AND POWER ALLOCATION IN HETNETS .....	1102
<i>Abdulmalik Alwarafy, Bekir Sait Ciftler, Mohamed Abdallah, Mounir Hamdi</i>	

ON THE CONVERGENCE TIME OF FEDERATED LEARNING OVER WIRELESS NETWORKS UNDER IMPERFECT CSI.....	1108
<i>Francesco Pase, Marco Giordani, Michele Zorzi</i>	

COMMUNICATION-EFFICIENT FEDERATED LEARNING THROUGH 1-BIT COMPRESSIVE SENSING AND ANALOG AGGREGATION.....	1115
<i>Xin Fan, Yue Wang, Yan Huo, Zhi Tian</i>	

JOINT RESOURCE ALLOCATION FOR EFFICIENT FEDERATED LEARNING IN INTERNET OF THINGS SUPPORTED BY EDGE COMPUTING .....	1121
<i>Jiayang Ren, Junshuai Sun, Hui Tian, Wanli Ni, Gaofeng Nie, Yingying Wang</i>	



GENERATIVE MACHINE LEARNING FOR RESOURCE-AWARE 5G AND IOT SYSTEMS.....	1127
<i>Nico Piatkowski, Johannes S. Mueller-Roemer, Peter Hasse, Adam Bachorek, Tim Werner, Pascal Birnstill, Andreas Morgenstern, Lutz Stobbe</i>	

**IEEE ICC 2021 WORKSHOP - OTFS-6G**

LOW-COMPLEXITY LINEAR EQUALIZATION FOR OTFS SYSTEMS WITH RECTANGULAR WAVEFORMS.....	1133
<i>Tingting Zou, Wenjun Xu, Hui Gao, Zhisong Bie, Zhiyong Feng, Zhiguo Ding</i>	

COMPRESSED OTFS TRANSMISSION OVER MILLIMETER-WAVE AND TERAHERTZ SPECTRUM.....	1139
<i>Hyoungju Ji, Younsun Kim, Taehyoung Kim, Jinyoung Oh</i>	

CHANNEL ESTIMATION AND EQUALIZATION FOR CP-OFDM-BASED OTFS IN FRACTIONAL DOPPLER CHANNELS.....	1145
<i>Noriyuki Hashimoto, Noboru Osawa, Kosuke Yamazaki, Shinsuke Ibi</i>	

PERFORMANCE ANALYSIS OF OTFS-BASED UPLINK MASSIVE MIMO WITH ZF RECEIVERS.....	1152
<i>Junjuan Feng, Hien Quoc Ngo, Mark F. Flanagan, Michail Matthaiou</i>	

ON ACHIEVABLE RATE OF OFDM AND OTFS IN THE PRESENCE OF SPARSITY.....	1159
<i>Lorenzo Gaudio, Giuseppe Caire, Giulio Colavolpe</i>	

CHANNEL ESTIMATION FOR MIMO SPACE TIME CODED OTFS UNDER DOUBLY SELECTIVE CHANNELS.....	1165
<i>Roberto Bomfin, Marwa Chafii, Ahmad Nimr, Gerhard Fettweis</i>	

ITERATIVE CHANNEL ESTIMATION AND DATA DETECTION IN OTFS USING SUPERIMPOSED PILOTS.....	1171
<i>Himanshu B. Mishra, Prem Singh, Abhishek K. Prasad, Rohit Budhiraja</i>	

LOW-COMPLEXITY LINEAR MIMO-OTFS RECEIVERS.....	1177
<i>Prem Singh, Himanshu B. Mishra, Rohit Budhiraja</i>	

ON THE PERFORMANCE OF CODED OTFS MODULATION OVER HIGH-MOBILITY CHANNELS.....	1183
<i>Shuangyang Li, Jinhong Yuan, Weijie Yuan, Zhiqiang Wei, Baoming Bai, Derrick Wing Kwan Ng</i>	

MODULATION SYMBOL CANCELLATION FOR OTFS-BASED JOINT RADAR AND COMMUNICATION.....	1189
<i>Haojian Zhang, Tingting Zhang, Yuan Shen</i>	

PULSE-SHAPED OTFS OVER DOUBLY-DISPERSIVE CHANNELS: ONE-TAP VS. FULL LMMSE EQUALIZERS.....	1195
<i>Andreas Pfadler, Peter Jung, Tom Szollmann, Slawomir Stanczak</i>	

RADAR SENSING WITH OTFS: EMBRACING ISI AND ICI TO SURPASS THE AMBIGUITY BARRIER.....	1201
<i>Musa Furkan Keskin, Henk Wymeersch, Alex Alvarado</i>	

AN ORTHOGONAL TIME FREQUENCY SPACE DIRECT SEQUENCE MODULATION SCHEME.....	1207
<i>Jinjing Sun, Zulin Wang, Qin Huang</i>	

## **IEEE ICC 2021 WORKSHOP - SPECTRUMSHARE**

MEASUREMENT STUDY OF DENSE NETWORKS WITH HETEROGENEOUS IEEE 802.11AC WI-FI DEVICES.....	1213
<i>Andra M. Voicu, Pheobe Agbo, Ljiljana Simic, Petri Mähönen, Marina Petrova</i>	
REDUCED-FEEDBACK SCHEDULING POLICIES FOR ENERGY-EFFICIENT MAC .....	1219
<i>Priyadarshi Mukherjee, Swades De</i>	
A DEEP REINFORCEMENT LEARNING BASED SPECTRUM ACCESS SCHEME IN UNLICENSED BANDS .....	1225
<i>Errong Pei, Yige Huang, Yun Li</i>	
HIDDEN-NODES IN COEXISTING LAA & WI-FI: A MEASUREMENT STUDY OF REAL DEPLOYMENTS.....	1231
<i>Vanlin Sathya, Muhammad Iqbal Rochman, Monisha Ghosh</i>	
ENERGY-EFFICIENT DEVICE-TO-DEVICE PRIVACY CONTENT TRANSMISSION IN UPLINK RELAY NETWORKS .....	1238
<i>Qiang Li, Pinyi Ren, Dongyang Xu, Yuncong Xie</i>	
HOW TO DEFINE UTILITY FOR USE IN PRACTICAL WIRELESS NETWORK RESOURCE TRADING PLATFORMS.....	1244
<i>Ramtin Ranji, Elena Sitnikova, Frank Den Hartog</i>	
FAIR LICENSED SPECTRUM SHARING BETWEEN TWO MNOS USING RESOURCE OPTIMIZATION .....	1250
<i>Tianchen Wang, Raviraj Adve</i>	
OPTIMIZING RESOURCE CONSTRAINED DISTRIBUTED COLLABORATIVE SENSING .....	1256
<i>Michael Stecklein, Hasan Burhan Beytur, Gustavo De Veciana, Haris Vikalo</i>	
AN OPTIMAL SENSOR DEPLOYMENT TECHNIQUE FOR SPECTRUM MONITORING APPLICATIONS.....	1262
<i>Yifeng Zhou</i>	
SPECTRUM SHARING BETWEEN RLANS AND TERRESTRIAL LINKS IN THE 6 GHZ BAND.....	1268
<i>Nadia Yoza-Mitsuishi, Peter Mathys</i>	
A CONFIGURABLE 60GHZ PHASED ARRAY PLATFORM FOR MULTI-LINK MMWAVE CHANNEL CHARACTERIZATION.....	1275
<i>Anton Shkel, Alireza Mehrabani, Julius Kusuma</i>	
ADJACENT CHANNEL INTERFERENCE SUPPRESSION TO ENHANCE SPECTRUM SHARING FOR CO-LOCATED DEVICES .....	1281
<i>Xiaolei Huo, Wei Zhang, Wenbo Guo, Chenxing Li, Hongzhi Zhao, Ying Liu</i>	
BLIND RECEIVER DESIGN FOR DOWNLINK COGNITIVE-RADIO NOMA NETWORKS.....	1287
<i>Hamad Yahya, Emad Alsusa, Arafat Al-Dweik</i>	
DEEPAIR: PREDICTING RADIO SPECTRUM USAGE AT SCALE WITH DEEP TEMPORAL CONVOLUTIONAL NETWORKS.....	1293
<i>Amir Ghasemi, Janaki Parekh</i>	

CONVOLUTIONAL NEURAL NETWORK FOR ASYNCHRONOUS PACKET PARAMETER IDENTIFICATION IN DENSE WI-FI ..... 1300  
*Muhammad Harry Bintang Pratama, Dody Ichwana Putra, Leonardo Lanante, Hiroshi Och*

COGNITIVE OVERLAY FOR INTER-SYSTEM CELLULAR DYNAMIC SPECTRUM SHARING IN THE DOWNLINK ..... 1306  
*Jared S. Everett, Brian L. Mark*

COOPERATIVE SPECTRUM SENSING: A NEW APPROACH FOR MINIMUM INTERFERENCE AND MAXIMUM UTILISATION ..... 1312  
*Ogeen H. Toma, Miguel López-Benítez*

### **IEEE ICC 2021 WORKSHOP - CCN-CPS**

COMPUTATION OFFLOADING BASED ON GAME THEORY IN MEC-ASSISTED V2X NETWORKS ..... 1318  
*Haipeng Wang, Zhipeng Lin, Kun Guo, Tiejun Lv*

A VERIFIED PROTOCOL FOR SECURE AUTONOMOUS AND COOPERATIVE PUBLIC TRANSPORTATION IN SMART CITIES ..... 1324  
*Hussam Al-Hamadi, Nida Nasir, Chan Yeob Yeun, Ernesto Damiani*

LOCALIZED DATA TRANSFER SYSTEM BY VEHICLES AND CELLULAR BASE STATION IN LOCAL AREA ..... 1330  
*Hiroshi Miyata, Kazutami Arimoto*

FOCUSED TERMINOLOGY EXTRACTION FOR CPSS THE CASE OF "IMPLANT TERMS" IN ELECTRONIC MEDICAL RECORDS ..... 1336  
*Oskar Jerdhaf, Marina Santini, Peter Lundberg, Anette Karlsson, Arne Jönsson*

MULTI-HOP WIFI DIRECT IMPLEMENTATION VIA EFFICIENT COMMUNICATION BACKBONE CONSTRUCTION ..... 1342  
*Utku Demir, Cristiano Tapparello, Wendi Heinzelman*

CYBER-PHYSICAL SYSTEM SECURITY OF SURFACE SHIPS USING INTELLIGENT CONSTRAINTS ..... 1348  
*Daniel Butchko, Brien Croteau, Kiriakos Kiriakidis*

DIMA: DISTRIBUTED IOT MODELING ARCHITECTURE ..... 1354  
*Scott Pudlewski, Katherine Landers*

EXPERIMENTAL TRANSMISSION POWER CONTROL POLICY FOR REMOTE STATE ESTIMATION IN INDUSTRIAL WSN ..... 1360  
*Samuele Zoppi, Ivan Smolin, Wolfgang Kellerer*

IDENTIFICATION AND MITIGATION OF FALSE DATA INJECTION USING MULTI STATE IMPLICATIVE INTERDEPENDENCY MODEL (MSIIM) FOR SMART GRID ..... 1366  
*Sohini Roy, Arunabha Sen*

AN INVESTIGATIVE STUDY INTO AN AUTONOMOUS UAS TRAFFIC MANAGEMENT SYSTEM FOR CONGESTED AIRSPACE SAFETY ..... 1372  
*Lanier Watkins, Nick Sarfaraz, Sebastian Zanlongo, Joshua Silbermann, Tyler Young, Randall Sleight*

DPNCT: A DIFFERENTIAL PRIVATE NOISE CANCELLATION SCHEME FOR LOAD MONITORING AND BILLING FOR SMART METERS.....	1378
<i>Khadija Hafeez, Mubashir Husain Rehmani, Donna O'Shea</i>	
COST-AWARE DYNAMIC BAYESIAN COALITIONAL GAME FOR ENERGY TRADING AMONG MICROGRIDS.....	1384
<i>Mohammad Sadeghi, Shahram Mollahasani, Melike Erol-Kantarci</i>	
ABSTRACTION-BASED MULTI-OBJECT ACOUSTIC ANOMALY DETECTION FOR LOW-COMPLEXITY BIG DATA ANALYSIS.....	1390
<i>Huanzhuo Wu, Jia He, Máté Tömösközi, Frank H. P. Fitzek</i>	
CONTAINER PLACEMENT FOR RESOURCE UTILIZATION IN CYBER PHYSICAL CLOUD SYSTEMS.....	1396
<i>Yanal Alahmad, Anjali Agarwal, Marzia Zaman, Nishith Goel</i>	
NEURAL NETWORK BASED REGRESSION MODEL FOR VIRTUAL MACHINES MIGRATION METHOD SELECTION.....	1402
<i>Mohammad A. Altafat, Anjali Agarwal, Nishith Goel, Marzia Zaman</i>	
TIME SERIES FORECASTING USING FACEBOOK PROPHET FOR CLOUD RESOURCE MANAGEMENT.....	1408
<i>Mustafa Daraghmech, Anjali Agarwal, Ricardo Manzano, Marzia Zaman</i>	
MONITORING OPERATING CONDITIONS OF WIRELESS POWER TRANSFER SYSTEMS USING DISTRIBUTED ESTIMATION PROCESS.....	1414
<i>Md Masud Rana, Ahmed Abdelhadi, Wajiha Shireen</i>	
CODING SCHEMES AND RESOURCE ALLOCATIONS FOR THE MULTI-TASK CODED DISTRIBUTED COMPUTATION.....	1418
<i>Lihui Yi, Shu-Jie Cao, Youlong Wu</i>	
IMPACT AND ANALYSIS OF SPATIAL CORRELATION ON SLOTTED BASED MAC IN UANS.....	1424
<i>Yan Wang, Fei Ji, Quansheng Guan</i>	
 <b><u>IEEE ICC 2021 WORKSHOP - E-URLLC</u></b>	
SECURITY AND RELIABILITY PERFORMANCE ANALYSIS FOR URLLC WITH RANDOMLY DISTRIBUTED EAVESDROPPERS.....	1430
<i>Yuncong Xie, Pinyi Ren, Dongyang Xu, Qiang Li</i>	
DELAY AND DEPLOYMENT COST OPTIMIZATION OF EDGE COMPUTING BASED ON C-RAN IN INTELLIGENT PLANT.....	1436
<i>Ye Xiao, Fucai Luo, Chenglin Zhao, Fangmin Xu, Tao Chen</i>	
BEAM SELECTION FOR ULTRA-RELIABLE LOW-LATENCY COMMUNICATION IN INDUSTRIAL ENVIRONMENT WITH BEAMFORMING REPEATERS.....	1442
<i>Mohamed Salah Ibrahim, Saeed R. Khosravirad, Jakub Mazgula, Harish Viswanathan, Nicholas D. Sidiropoulos</i>	
ANALYSIS AND OPTIMIZATION OF SPINAL CODES OVER THE BSC: FROM THE AOI PERSPECTIVE.....	1448
<i>Siqi Meng, Shaohua Wu, Aimin Li, Jian Jiao, Ning Zhang, Qinyu Zhang</i>	

POWER ADAPTIVE HARQ FOR ULTRARELIABILITY VIA A NOVEL OUTAGE PROBABILITY BOUND .....	1454
<i>Kaiming Shen, Xihan Chen, Wei Yu, Saeed R. Khosravirad</i>	

### **IEEE ICC 2021 WORKSHOP - 5G SEC**

INTELLIGENT MISBEHAVIOR DETECTION SYSTEM FOR DETECTING FALSE POSITION ATTACKS IN VEHICULAR NETWORKS .....	1460
<i>Faisal Hawlader, Abdelwahab Boualouache, Sébastien Faye, Thomas Engel</i>	

BLOCKCHAIN BASED UNIFIED AUTHENTICATION WITH ZERO-KNOWLEDGE PROOF IN HETEROGENEOUS MEC .....	1466
<i>Wanxue Lin, Xuefei Zhang, Qimei Cui, Zhiwei Zhang</i>	

BLOCK-D2D: BLOCKCHAIN-ENABLED COOPERATIVE D2D-ASSISTED FOG COMPUTING SCHEME UNDER IMPERFECT CSI .....	1472
<i>Rajesh Gupta, Tejal Rathod, Sudeep Tanwar</i>	

PRS-P2P: A PROSUMER RECOMMENDER SYSTEM FOR SECURE P2P ENERGY TRADING USING Q-LEARNING TOWARDS 6G .....	1478
<i>Aparna Kumari, Rajesh Gupta, Sudeep Tanwar</i>	

ACTIVE EAVESDROPPING IN SHORT PACKET COMMUNICATION: AVERAGE SECRECY THROUGHPUT ANALYSIS .....	1484
<i>Nihan Ari, Nikolaos Thomos, Leila Musavian</i>	

ADVERSARIAL MACHINE LEARNING FOR FLOODING ATTACKS ON 5G RADIO ACCESS NETWORK SLICING .....	1490
<i>Yi Shi, Yalin E. Sagduyu</i>	

NETWORK AUGMENTATION BY DYNAMICALLY SPLITTING THE SWITCHING FUNCTION IN SDN.....	1496
<i>Bharat S Rawal, Gunasekaran Manogaran, Raman Singh, Poongodi M, Mounir Hamdi</i>	

THE DEGRADATION OF COOPERATIVE JAMMING SUPPRESSION FOR FREQUENCY MISMATCH IN FH SECURE SYSTEMS .....	1502
<i>Changqing Song, Hongzhi Zhao, Lizhi Qin, Wenbo Guo, Shihai Shao, Youxi Tang</i>	

QUEUE ALLOCATION-BASED DDOS MITIGATION AT EDGE SWITCH.....	1507
<i>Ryo Yaegashi, Daisuke Hisano, Yu Nakayama</i>	

CHAOS-BASED PHYSICAL LAYER SECURITY IN NOMA NETWORKS OVER RICIAN FADING CHANNELS.....	1513
<i>Israa Al-Musawi, Walid Al-Hussaibi, Falah Ali</i>	

T-AUTH: A NOVEL AUTHENTICATION MECHANISM FOR THE IOT BASED ON SMART CONTRACTS AND PUFs .....	1519
<i>Wun-Cing Liou, Tsungnan Lin</i>	

COOPERATIVE JAMMING CANCELLATION ANALYSIS BASED ON RC SHAPING FILTER IN PHYSICAL LAYER SECURITY .....	1525
<i>Yun Zhong, Wenbo Guo, Hongzhi Zhao, Youxi Tang</i>	

ENHANCING SECRECY CAPACITY IN ALTERNATE AF RELAYING NETWORKS WITH INTER-RELAY INTERFERENCE .....	1530
<i>Mohammed Al-Haj-Ali Abuyaghi, Jacek Ilow</i>	

ROBUST MAX-MIN FAIR BEAMFORMING OF SECRECY SWIPT IOT SYSTEMS UNDER A NON-LINEAR EH MODEL .....	1536
<i>Zhengyu Zhu, Zixuan Wang, Yu Lin, Peijia Liu, Wanming Hao, Zhongyong Wang, Inkyu Lee</i>	
HYBRID UPLINK-DOWNLINK NOMA FOR SECURE COORDINATED MULTI-POINT NETWORKS .....	1542
<i>Xin Fan, Yue Wang, Guangkai Li, Yan Huo, Zhi Tian</i>	
RELAY-ASSISTED SECURE SHORT-PACKET COMMUNICATIONS IN COGNITIVE INTERNET OF THINGS .....	1548
<i>Yong Chen, Tao Zhang, Yu Zhang, Baoquan Yu, Yueming Cai</i>	
COOPERATIVE JAMMING CANCELLATION UNDER NONLINEARITY AND IMPERFECT TIME-FREQUENCY ALIGNMENTS FOR PHYSICAL-LAYER SECURITY .....	1554
<i>Chenxing Li, Xiangjie Xia, Chengzhe Shi, Linsong Du, Jianhui Ma, Ying Liu, Youxi Tang</i>	
CELL-FREE MASSIVE MIMO SYSTEMS UNDER JAMMING ATTACK .....	1560
<i>Ramiz Sabbagh, Huiling Zhu, Jiangzhou Wang</i>	
SECURE TRANSMISSION BASED ON MARGINAL UTILITY IN UAV-ASSISTED COGNITIVE RADIO NETWORK .....	1566
<i>Xufeng He, Xi Li, Hong Ji, Heli Zhang</i>	
UPLINK CHANNEL ESTIMATION AND SIGNAL EXTRACTION AGAINST MALICIOUS IRS IN MASSIVE MIMO SYSTEM .....	1572
<i>Xiaofeng Zheng, Ruohan Cao, Lidong Ma</i>	
DEEP-LEARNING BASED AUCTION RESOURCE ALLOCATION IN CODED COMPUTATION OFFLOADING FOR INTERNET-OF-THINGS .....	1578
<i>Jer Shyuan Ng, Wei Yang Bryan Lim, Zehui Xiong, Sahil Garg, Dusit Niyato, Cyril Leung</i>	

### **IEEE ICC 2021 WORKSHOP - FINP**

SLARM: SIMULTANEOUS LOCALIZATION AND RADIO MAPPING FOR COMMUNICATION-AWARE CONNECTED ROBOT .....	1583
<i>Xinyu Gao, Yuanwei Liu, Xidong Mu</i>	
TOWARDS A URLLC-AWARE PROGRAMMABLE DATA PATH WITH P4 FOR INDUSTRIAL 5G NETWORKS .....	1589
<i>Kerim Gökarslan, Yagmur Sabucu Sandal, Tuna Tugcu</i>	
DIGITAL TWINS IN INDUSTRIAL IOT: A SURVEY OF THE STATE OF THE ART AND OF RELEVANT STANDARDS .....	1595
<i>Marko Vukovic, Daniele Mazzei, Stefano Chessa, Gualtiero Fantoni</i>	
INDUSTRIAL WLAN SYSTEM WITH ACCURATE TIME SYNCHRONIZATION ON SOFTWARE DEFINED RADIO .....	1601
<i>Tran Thi Thao Nguyen, Mizuki Toyofuku, Yoshiki Ito, Chiharu Ishimitsu, Yuhei Nagao, Masayuki Kurosaki, Hiroshi Ochi</i>	

### **IEEE ICC 2021 WORKSHOP - INNOVATEEDGE**

JOINT COMMUNICATION-LEARNING DESIGN FOR RIS-ASSISTED FEDERATED LEARNING .....	1607
<i>Hang Liu, Xiaojun Yuan, Ying-Jun Angela Zhang</i>	

MEC-BASED EVACUATION PLANNING USING VARIANCE FRACTAL DIMENSION TRAJECTORY FOR SPEECH CLASSIFICATION.....	1613
<i>Christopher Desantis, Ahmed Refaey</i>	
THRESHOLD-BASED DATA EXCLUSION APPROACH FOR ENERGY-EFFICIENT FEDERATED EDGE LEARNING.....	1619
<i>Abdullatif Albaseer, Mohamed Abdallah, Ala Al-Fuqaha, Aiman Erbad</i>	
A DECOUPLED LEARNING STRATEGY FOR MEC-ENABLED WIRELESS VIRTUAL REALITY (VR) NETWORK.....	1625
<i>Xiaonan Liu, Yansha Deng</i>	
UBLS: USER-BASED LOCATION SELECTION SCHEME FOR PRESERVING LOCATION PRIVACY .....	1631
<i>Muneera Alotaibi, Mohamed I. Ibrahim, Waleed Alasmary, Dawood Al-Abri, Mohamed Mahmoud</i>	
EFFICIENT AND PRIVACY-PRESERVING CONTACT TRACING SYSTEM FOR COVID-19 USING BLOCKCHAIN.....	1637
<i>Seham A. Alansari, Mahmoud M. Badr, Mohamed Mahmoud, Waleed Alasmary</i>	
FEDERATED DOUBLE DEEP Q-LEARNING FOR JOINT DELAY AND ENERGY MINIMIZATION IN IOT NETWORKS .....	1643
<i>Sheyda Zarandi, Hina Tabassum</i>	
DISTRIBUTED MULTI-AGENT LEARNING FOR SERVICE FUNCTION CHAIN PARTIAL OFFLOADING AT THE EDGE.....	1649
<i>Fahime Khoramnejad, Roghayeh Joda, Melike Erol-Kantarci</i>	
DEEP REINFORCEMENT LEARNING FOR INTELLIGENT COMPUTING AND CONTENT EDGE SERVICE IN ICN-BASED IOV .....	1655
<i>Jingsong Li, Junhua Tang, Jianhua Li, Futai Zou</i>	
RE-CONFIGURATION OF UAV RELAYS IN 6G NETWORKS.....	1662
<i>Mohammad Javad-Kalbasi, Shahrokh Valaee</i>	
<b><u>IEEE ICC 2021 WORKSHOP - DDINS</u></b>	
CHAIANGE: A BLOCKCHAIN SOLUTION TO AUTOMATE PAYMENT DETAIL UPDATES TO SUBSCRIPTION SERVICES.....	1668
<i>David Buckley, Gueltoum Bendiab, Stavros Shiaeles, Nick Savage, Nicholas Kolokotronis</i>	
A FRAMEWORK FOR INTELLIGENT DDOS ATTACK DETECTION AND RESPONSE USING SIEM AND ONTOLOGY.....	1674
<i>Salva Daneshgadeh Çakmakçi, Helmar Hutschenreuter, Christian Maeder, Thomas Kemmerich</i>	
RAN INFORMATION-ASSISTED TCP CONGESTION CONTROL VIA DRL WITH REWARD REDISTRIBUTION .....	1680
<i>Minghao Chen, Rongpeng Li, Zhifeng Zhao, Honggang Zhang</i>	
MOBILE APPLICATION ENCRYPTION TRAFFIC CLASSIFICATION BASED ON TLS FLOW SEQUENCE NETWORK.....	1687
<i>Hua Wu, Lu Wang, Guang Cheng, Xiaoyan Hu</i>	

AUTOMATED CONFIGURATION OF ROUTER PORT QUEUES VIA MODEL-BASED REINFORCEMENT LEARNING .....	1693
<i>Ajay Kattapur, Sushanth David, Swarup Mohalik</i>	
OPPORTUNISTIC NETWORK ROUTING STRATEGY BASED ON NODE INDIVIDUAL COMMUNITY .....	1699
<i>Lin Yu, Gang Xu, Na Zhang, Fengqi Wei</i>	
ACCURACY AND GENERALIZATION OF DEEP LEARNING APPLIED TO LARGE SCALE ATTACKS .....	1705
<i>Christopher B. Freas, Dhara Shah, Robert W. Harrison</i>	
AN EMD- AND GRU-BASED HYBRID NETWORK TRAFFIC PREDICTION MODEL WITH DATA RECONSTRUCTION .....	1711
<i>Shuang Du, Zhanqi Xu, Jianxin Lv</i>	
DEEP REINFORCEMENT LEARNING BASED DYNAMIC ROUTE PLANNING FOR MINIMIZING TRAVEL TIME .....	1718
<i>Yuanzhe Geng, Erwu Liu, Rui Wang, Yiming Liu, Weixiong Rao, Shaojun Feng, Zhao Dong, Zhiren Fu, Yanfen Chen</i>	
A NOVEL HYBRID MODEL FOR TASK DEPENDENT SCHEDULING IN CONTAINER-BASED EDGE COMPUTING.....	1724
<i>Tingting Lu, Fanping Zeng, Guozhu Chen, Wenjuan Shu, Jingfei Shen, Weikang Zhang</i>	
A TERMINAL CLASSIFICATION SCHEME WITH IMBALANCED DATASET BASED ON LOW-COMPLEXITY TIME-LSTM .....	1731
<i>Rui Yang, Xuannan Liu, Wenbo Xu, Jie Wu, Yang Zhang</i>	
MODEL-DRIVEN DEEP LEARNING-BASED SIGNAL DETECTOR FOR CP-FREE MIMO-OFDM SYSTEMS .....	1737
<i>Xingyu Zhou, Jing Zhang, Chao-Kai Wen, Jun Zhang, Shi Jin</i>	
DEEP LEARNING BASED APPROACH FOR SECURE WEB OF THINGS (WOT) .....	1743
<i>Akshat Gaurav, B. B. Gupta, Ching-Hsien Hsu, Dragan Perakovic, Francisco José García Peñalvo</i>	
FILTERING OF DISTRIBUTED DENIAL OF SERVICES (DDOS) ATTACKS IN CLOUD COMPUTING ENVIRONMENT .....	1749
<i>Akshat Gaurav, B. B. Gupta, Ching-Hsien Hsu, Dragan Perakovic, Francisco José García Peñalvo</i>	
DEEP REINFORCEMENT BASED OPTIMIZATION OF FUNCTION SPLITTING IN VIRTUALIZED RADIO ACCESS NETWORKS.....	1755
<i>Fahri Wisnu Murti, Samad Ali, Matti Latva-Aho</i>	
SECURING UAV-TO-VEHICLE COMMUNICATIONS: A CURIOSITY-DRIVEN DEEP Q-LEARNING NETWORK (C-DQN) APPROACH .....	1761
<i>Fang Fu, Qi Jiao, F. Richard Yu, Zhicai Zhang, Jianbo Du</i>	
BML: AN EFFICIENT AND VERSATILE TOOL FOR BGP DATASET COLLECTION .....	1767
<i>Kevin Hoarau, Pierre Ugo Tournoux, Tahiry Razafindralambo</i>	
PACKET DROP PROBABILITY-OPTIMAL CROSS-LAYER SCHEDULING: DEALING WITH CURSE OF SPARSITY USING PRIORITIZED EXPERIENCE REPLAY .....	1773
<i>Mohit K. Sharma, Tan Peng Hui, Ernest Kurniawan, Sun Sumei</i>	



BIG-DATA-DRIVEN INTELLIGENT WIRELESS NETWORK AND USE CASES.....	1779
<i>Lanlan Li, Xiaosi Tan</i>	
INDIVIDUAL-INITIATED AUDITABLE ACCESS CONTROL FOR PRIVACY-PRESERVED IOT DATA SHARING WITH BLOCKCHAIN .....	1785
<i>Ruichen Cong, Yixiao Liu, Kiichi Tago, Ruidong Li, Hitoshi Asaeda, Qun Jin</i>	
USER SATISFACTION PREDICTION FRAMEWORK FOR PERSONALIZED WIRELESS NETWORKS: A DNN APPROACH.....	1791
<i>Rawan Alkurd, Ibrahim Abualhaol, Halim Yanikomeroglu</i>	
MODULATION CLASSIFICATION OF ACTIVE ATTACK SIGNALS FOR INTERNET OF THINGS USING GP-CNN NETWORK.....	1797
<i>Kejia Ji, Shuo Chang, Sai Huang, Hao Chen, Shao Jia, Hua Lu</i>	
DEEP LEARNING-BASED SUB-6GHZ/MMWAVE PARTITIONING FOR SHORT-PACKET COMMUNICATIONS .....	1803
<i>Sacha Leblanc, Megumi Kaneko</i>	
COARSE ESTIMATION OF BOTTLENECK ROUTER'S BUFFER SIZE FOR HETEROGENEOUS TCP SOURCES .....	1809
<i>Christian Vega Caicedo, Jorge E. Pezoa, Elie F. Kfoury, Jorge Crichigno</i>	
DEEP REINFORCEMENT LEARNING-BASED SPECTRUM ALLOCATION AND POWER MANAGEMENT FOR IAB NETWORKS.....	1815
<i>Qingqing Cheng, Zhiqiang Wei, Jinhong Yuan</i>	
DEEP UNSUPERVISED LEARNING FOR GENERALIZED ASSIGNMENT PROBLEMS: A CASE-STUDY OF USER-ASSOCIATION IN WIRELESS NETWORKS.....	1821
<i>Arjun Kaushik, Mehrazin Alizadeh, Omer Waqar, Hina Tabassum</i>	
SPECTRUM AND COMPUTING RESOURCE MANAGEMENT FOR FEDERATED LEARNING IN DISTRIBUTED INDUSTRIAL IOT.....	1827
<i>Weiting Zhang, Dong Yang, Wen Wu, Haixia Peng, Hongke Zhang, Xuemin Sherman Shen</i>	
PERFORMANCE EVALUATION OF FEATURE SELECTION AND TREE-BASED ALGORITHMS FOR TRAFFIC CLASSIFICATION.....	1833
<i>Ons Aouedi, Kandaraj Piamrat, Benoît Parrein</i>	
SYSTEM FAILURE PREDICTION WITHIN SOFTWARE 5G CORE NETWORKS USING TIME SERIES FORECASTING.....	1839
<i>Pousali Chakraborty, Marius Corici, Thomas Magedanz</i>	
DATA-DRIVEN SHORTEST ANYPATH IN WIRELESS NETWORK VIRTUALIZATION FOR MOBILE CYBER PHYSICAL SYSTEMS .....	1846
<i>Vijay Chaudhary, Danda B. Rawat</i>	
MACHINE LEARNING-BASED MODULE FOR MONITORING LTE/WIFI COEXISTENCE NETWORKS DYNAMICS.....	1852
<i>Ahmed M. El-Shal, Badiia Gabr, Laila H. Afify, Amr El-Sherif, Karim G. Seddik, Mustafa Elattar</i>	
WIRELESS TRAFFIC PREDICTION WITH SERIES FLUCTUATION PATTERN CLUSTERING .....	1858
<i>Xudong Xing, Yuanjie Lin, Hui Gao, Yueming Lu</i>	

## **IEEE ICC 2021 WORKSHOP - AB-SIOT**

LDBT: A LIGHTWEIGHT DDOS ATTACK TRACING SCHEME BASED ON BLOCKCHAIN.....	1864
<i>Wei Guo, Jin Xu, Yukui Pei, Liuguo Yin, Chunxiao Jiang</i>	
EVALUATION OF LOW COST INDOOR POSITIONING FOR NEXT GENERATION IOT INDUSTRIAL APPLICATIONS.....	1870
<i>Mohamed S. El-Gendy, Marley M. Fayez, Omar A. Abdel-Wahab, Nada H. Sayed, Youstina H. Samir, Samy El-Hennawey</i>	
DATANET: ENABLING SEAMLESS, METERED AND TRUSTED INTERNET CONNECTIVITY WITHOUT SUBSCRIPTIONS .....	1876
<i>Madhumitha Harishankar, Jinhang Zuo, Sriram Venkateswaran Iyer, Patrick Tague, Carlee Joe-Wong</i>	
BOOSTING IOT DATA VALORIZATION THROUGH THE ADOPTION OF DLT .....	1882
<i>Laura Rodríguez De Lope, Johnny Choque, Andrés Sánchez Sandaza, Jorge Fernández Valdes, Sofia Terzi, Konstantinos Votis, Har Preet Singh, Luis Muñoz</i>	
DISTC: DISTRIBUTED QUANTUM-SAFE CONSENSUS FOR SECURE IOT DATA PROCESSING.....	1887
<i>Dilip Krishnaswamy, Nitish Bhardwaj, Shobhit Srivastava</i>	

## **IEEE ICC 2021 WORKSHOP - ULMC6GN**

MULTI-DIMENSION RESOURCE ALLOCATION FOR NOMA-EDGE COMPUTING-BASED 6G POWER IOT .....	1893
<i>Zehan Jia, Haijun Liao, Zhenyu Zhou, Xiongwen Zhao, Lei Zhang, Shahid Mumtaz</i>	
A PROBABILISTIC CODEBOOK TECHNIQUE FOR FAST INITIAL ACCESS IN 6G VEHICLE-TO-VEHICLE COMMUNICATIONS .....	1899
<i>Filippo Morandi, Francesco Linsalata, Mattia Brambilla, Marouan Mizmizi, Maurizio Magarini, Umberto Spagnolini</i>	
5G ENABLED VANET: ENHANCING THE CAPABILITIES OF VEHICULAR COMMUNICATION NETWORK .....	1905
<i>Rohit Singh, Deepak Saluja, Suman Kumar</i>	
REINFORCEMENT LEARNING BASED ADAPTIVE ACCESS CLASS BARRING FOR RAN SLICING .....	1910
<i>Ali Turan, Mehmet Koseoglu, Ebru Akcapinar Sezer</i>	
DEALING WITH CSI COMPRESSION TO REDUCE LOSSES AND OVERHEAD: AN ARTIFICIAL INTELLIGENCE APPROACH.....	1916
<i>Muhammad Karam Shehzad, Luca Rose, Mohamad Assaad</i>	
FASTER URLLC: DEEP LEARNING WAVEFORM FINGERPRINTING.....	1922
<i>Tongyang Xu, Izzat Darwazeh</i>	
INTERFERENCE ANALYSIS IN MULTI-NUMEROLOGY OFDM SYSTEMS: A CONTINUOUS-TIME APPROACH.....	1928
<i>Juquan Mao, Arman Farhang, Lei Zhang, Zheng Chu, Pei Xiao, Sai Gu</i>	

ONLINE SCHEDULING AND OPTIMALITY ANALYSIS FOR NOMA-BASED MEC SYSTEMS.....	1934
<i>Meihui Hua, Hui Tian, Wanli Ni</i>	
PERFORMANCE OF STBC COOPERATIVE NOMA WITH IMPERFECT SUCCESSIVE INTERFERENCE CANCELLATION.....	1940
<i>Danish Ilyas, Syed Ali Hassan, Aamir Mahmood, Mikael Gidlund</i>	
ITERATIVE RESOLUTION AND OPTIMAL SCHEDULING OF BLIND RETRANSMISSIONS FOR MULTI-USER URLLC.....	1946
<i>Guodong Sun, Stefano Paris, Yulin Hu, Klaus Pedersen</i>	
AN OPTIMAL NETWORKED LIFI ACCESS POINT SLICING SCHEME FOR INTERNET-OF-THINGS .....	1952
<i>Hamada Alshaer, Harald Haas, Oluwatayo Y. Kolawole</i>	
CONFLICT-AWARE MULTI-NUMEROLOGY RADIO RESOURCE ALLOCATION FOR HETEROGENEOUS SERVICES.....	1958
<i>Nasim Ferdosian, Sotiris Skaperas, Arsenia Chorti, Lefteris Mamatras</i>	
NODE-RESOURCE- AND USER-DEMAND-AWARE RESOURCE ALLOCATION IN NFV-ENABLED ELASTIC OPTICAL NETWORKS .....	1964
<i>Yihan Liu, Zhanqi Xu, Fan Yang, Liwei Kuang</i>	

### **IEEE ICC 2021 WORKSHOP - I-CPSAAS**

A SECURE SCALABLE AUTHENTICATION PROTOCOL FOR ACCESS NETWORK COMMUNICATIONS USING ECC.....	1970
<i>Suyash Patel, Amit Dua, Neeraj Kumar</i>	
ROBUST ELECTRONIC NOISE IN INDUSTRIAL CYBER PHYSICAL SYSTEMS BASED ON DOMAIN ADAPTIVE SUBSPACE TRANSFER MODEL .....	1976
<i>Tan Guo, Keping Yu, Xiaochun Cheng, Ali Kashif Bashir</i>	
A HYBRID APPROACH FOR SCENE MATCHING USED FOR AUTONOMOUS VEHICLES .....	1982
<i>Baljit Kaur, Jhilik Bhattacharya</i>	
AV-CPS: AUDIO VISUAL COGNITIVE PROCESSING SYSTEM FOR CRITICAL INTERVENTION IN AUTONOMOUS VEHICLES .....	1988
<i>Gumasekaran Raja, Senbagapriya Senthilkumar, Sivaseelan Ganesan, Rithika Edhayachandran, Geetha Vijayaraghavan, Ali Kashif Bashir</i>	
ON THE SECURITY OF CYBER-PHYSICAL ROBOTIC SYSTEMS USING DYNAMIC MODELING AND SIMULATION .....	1994
<i>Joshua B. Hector, Pantelis Katsiaris, Nicole E. Carey, Nick Cote, Danda B. Rawat</i>	
ANALYTICAL MODELING AND PREDICTION OF CLOUD WORKLOAD .....	2000
<i>Tariq Daradkeh, Anjali Agarwal, Marzia Zaman, Ricardo Manzano S</i>	
ON THE PERFORMANCE OF ALAMOUTI-CODED COOPERATIVE NOMA WITH IMPERFECT CHANNEL STATE INFORMATION.....	2006
<i>Muhammad Waseem Akhtar, Syed Ali Hassan, Haejoon Jung, Haris Pervaiz</i>	

PERFORMANCE ANALYSIS OF CLOUD COMPUTING FOR DISTRIBUTED DATA CENTER USING CLOUD-SIM ..... 2011  
*Sheher Bano Syed, Aqsa Rasul, Talha Javed, Muhammad Rizwan, Amoldeep Singh, Kapal Dev, Maurizio Magarini*

A VARIATIONAL AUTOENCODER-BASED DIMENSIONALITY REDUCTION TECHNIQUE FOR GENERATION FORECASTING IN CYBER-PHYSICAL SMART GRIDS..... 2017  
*Devinder Kaur, Shama Naz Islam, Md. Apel Mahmud*

AN EFFICIENT AND RELIABLE LIGHTWEIGHT PUF FOR IOT-BASED APPLICATIONS..... 2023  
*Fathi Amsaad, Abdul Razaque, Mohamed Baza, Seluck Kose, Sajal Bhatia, Gautam Srivastava*

### **IEEE ICC 2021 WORKSHOP - SATMEGACONST**

MINIATURIZED OPTICAL INTERSATELLITE COMMUNICATION TERMINAL – CUBEISL ..... 2029  
*Benjamin Rödiger, Christian Fuchs, Jorge Rosano Nonay, Wolfgang Jung, Christopher Schmidt*

BROADBAND NON-GEOSTATIONARY SATELLITE COMMUNICATION SYSTEMS: RESEARCH CHALLENGES AND KEY OPPORTUNITIES..... 2034  
*Hayder Al-Hraishawi, Symeon Chatzinotas, Björn Ottersten*

MEC-BASED QOE OPTIMIZATION FOR ADAPTIVE VIDEO STREAMING VIA SATELLITE BACKHAUL..... 2040  
*Haoyuan Cai, Wenpeng Jing, Xiangming Wen, Zhaoming Lu, Zhifei Wang*

A NOVEL HIGHLY-EFFICIENT AMPLIFICATION SCHEME FOR SATELLITE COMMUNICATIONS ..... 2047  
*Pedro Viegas, João Guerreiro, Hugo Serra, Ricardo Madeira, Pedro Morgado, Ricardo Laires, Rui Dinis, Paulo Montezuma, João Pedro Oliveira*

AN UPDATED COMPARISON OF FOUR LOW EARTH ORBIT SATELLITE CONSTELLATION SYSTEMS TO PROVIDE GLOBAL BROADBAND..... 2053  
*Nils Pachler, Inigo Del Portillo, Edward F. Crawley, Bruce G. Cameron*

HYBRID A/D PRECODING FOR DOWNLINK MASSIVE MIMO IN LEO SATELLITE COMMUNICATIONS..... 2060  
*Xiaoyu Qiang, Li You, Ke-Xin Li, Christos G. Tsinos, Wenjin Wang, Xiqi Gao, Björn Ottersten*

COOPERATIVE BEAM HOPPING FOR ACCURATE POSITIONING IN ULTRA-DENSE LEO SATELLITE NETWORKS..... 2066  
*Yu Wang, Ying Chen, Yunfei Qiao, Hejia Luo, Xiaolu Wang, Rong Li, Jun Wang*

RESOURCE EFFICIENCY OPTIMIZATION FOR ROBUST MULTIGROUP MULTICAST SATELLITE COMMUNICATIONS ..... 2072  
*Linna Gao, Wenjin Wang, Rui Ding, Li You, Xiqi Gao*

ON THE USE OF HAPS TO INCREASE SECRECY PERFORMANCE IN SATELLITE NETWORKS..... 2078  
*Olfa Ben Yahia, Eylem Erdogan, Günes Karabulut Kurt*

FAILURE-BASED MULTI-CONTROLLER PLACEMENT IN SOFTWARE DEFINED SATELLITE NETWORKING..... 2084  
*Chen Chang, Yu Liu, Yumei Wang*

PRECODING AND SCHEDULING IN MULTIBEAM MULTICAST NOMA BASED SATELLITE COMMUNICATION SYSTEMS .....	2090
<i>Sareh Majidi Ivary, Marius Caus, Miguel Angel Vazquez, M. Reza Soleymani, Yousef R. Shayan, Ana I. Perez-Neira</i>	
FUTURE ULTRA-DENSE LEO SATELLITE NETWORKS: A CELL-FREE MASSIVE MIMO APPROACH.....	2096
<i>Mohammed Y. Abdelsadek, Halim Yanikomeroglu, Gunes Karabulut Kurt</i>	
GALILEO SECOND GENERATION: TWO-WAY MESSAGING FOR IOT .....	2102
<i>Matteo Conti, Alessandro Vanelli-Coralli</i>	
SATELLITE DIVERSITY TO MITIGATE JAMMING IN LEO SATELLITE MEGA- CONSTELLATIONS.....	2108
<i>Vijitha Weerackody</i>	
6G INTEGRATED NON-TERRESTRIAL NETWORKS: EMERGING TECHNOLOGIES AND CHALLENGES.....	2114
<i>Sastri Kota, Giovanni Giambene</i>	
<b><u>IEEE ICC 2021 WORKSHOP - SAGE</u></b>	
CLUSTERING-ASSISTED 3D BEAMFORMING FOR THROUGHPUT MAXIMIZATION IN MMWAVE NETWORKS.....	2120
<i>Shraddha Tripathi, Surender Redhu, Rajesh M Hegde</i>	
DEEP LEARNING BASED INTEGRATED INFORMATION AND ENERGY RELAYING IN RF POWERED COMMUNICATION .....	2126
<i>Ganesh Prasad, Deepak Mishra</i>	
OPTIMIZATION OF TRAJECTORY SCHEDULING AND TIME ALLOCATION IN UAV- ASSISTED BACKSCATTER COMMUNICATION .....	2132
<i>Guoqiang Tang, Xi Li, Hong Ji, Heli Zhang</i>	
ENERGY-OPTIMAL SAMPLING OF EDGE-BASED FEEDBACK SYSTEMS.....	2138
<i>Vishnu Narayanan Moothedath, Jaya Prakash Champati, James Gross</i>	
ENERGY-EFFICIENT FRIENDLY JAMMING FOR PHYSICAL LAYER SECURITY IN VISIBLE LIGHT COMMUNICATION .....	2144
<i>Thanh V. Pham, Anh T. Pham</i>	
LORA PERFORMANCE ENHANCEMENT THROUGH LIST DECODING TECHNIQUE .....	2150
<i>Sondos Elzeiny, Phoebe Edward, Tallal Elshabrawy</i>	

**Author Index**