

2020 IEEE 91st Vehicular Technology Conference (VTC2020-Spring)

**Antwerp, Belgium
25 – 28 May 2020**

Pages 1-706



**IEEE Catalog Number: CFP20VTC-POD
ISBN: 978-1-7281-4053-7**

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

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

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

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

IEEE Catalog Number:	CFP20VTC-POD
ISBN (Print-On-Demand):	978-1-7281-4053-7
ISBN (Online):	978-1-7281-5207-3
ISSN:	1090-3038

Additional Copies of This Publication Are Available From:

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

CURRAN ASSOCIATES INC.
proceedings
.com

TABLE OF CONTENTS

5G NETWORKS AND SYSTEMS

A LOW COMPLEXITY BASEBAND SIGNAL COMPRESSION FOR DATA TRANSPORT IN LTE-A AND NR SYSTEMS	1
<i>Sungyoon Cho, Joohyun Do, Inhyoung Kim, Min Goo Kim</i>	
FREQUENCY AND TIME SPREADING FOR UPLINK URLLC TRANSMISSION	6
<i>Shang-Ho Tsai, Chia-Hsin Lai, Xiu-Sheng Li</i>	
INTERFERENCE DISTRIBUTION PREDICTION FOR LINK ADAPTATION IN ULTRA- RELIABLE LOW-LATENCY COMMUNICATIONS	11
<i>Alessandro Brighente, Jafar Mohammadi, Paolo Baracca</i>	
MODULATED SPUR INTERFERENCE CANCELLATION FOR LTE-A/5G TRANSCEIVERS: A SYSTEM LEVEL ANALYSIS	18
<i>Christian Motz, Thomas Paireder, Mario Huemer</i>	
PILOT SPACING ADAPTATION IN OFDM FOR A FLEXIBLE NEXT GENERATION WAVEFORM.....	24
<i>Zaid Khan, M. Danish Nisar</i>	

OFDM

CONSTANT-AMPLITUDE OFDM FOR WIRELESS COMMUNICATION SYSTEMS	28
<i>Yuyuan Chang, Yingqing Liu, Kazuhiko Fukawa</i>	
ITERATIVE CANCELLATION FOR INTER-BLOCK-INTERFERENCE ON LDPC CODED MIMO-OFDM SYSTEMS	33
<i>Masakazu Kizawa, Tetsushi Ikegami</i>	
PARALLELLY PROCESSED PEAK CANCELLATION SIGNAL-BASED PAPR REDUCTION METHOD USING NULL SPACE IN MIMO CHANNEL FOR MIMO-OFDM SIGNALS	38
<i>Taku Suzuki, Mikihiro Suzuki, Yoshihisa Kishiyama, Kenichi Higuchi</i>	
SPECTRAL ENCAPSULATION TO BLOCK THE OUT-OF-BAND EMISSION OF OFDM SIGNALS FOR FUTURE COMMUNICATIONS	43
<i>Myungsup Kim, Do Young Kwak, Jiwon Jung, Ki-Man Kim, Wan-Jin Kim</i>	

DETECTION AND CHANNEL ESTIMATION

EXPECTATION MAXIMIZATION (EM)-BASED JOINT CHANNEL ESTIMATION AND SYMBOL DETECTION IN DOUBLY SELECTIVE BLOCK TRANSMISSION SYSTEMS.....	48
<i>Manjeer Majumder, Amrita Mishra, Aditya K. Jagannatham</i>	
ITERATIVE REWEIGHED APPROACH FOR MULTIUSER DETECTION WITH MULTIPLE MEASUREMENT VECTOR IN MTC COMMUNICATIONS	53
<i>Xiaoxu Zhang, Li Hao, Pingzhi Fan, Jiaqi Liu, Linxiao Yang</i>	

LOOPBACK TRANSCEIVER SELF-CALIBRATION DESIGN FOR WIDEBAND RF IMPAIRMENTS	58
<i>Juinn-Horng Deng, Chia-Fang Lee</i>	

LDPC CODED NON-RECURSIVE GMSK SYSTEM WITH QUASI-COHERENT DEMULATION.....	63
<i>Mengmeng Liu, Zhongyang Yu, Qingya Lu, Baoming Bai, Min Zhu</i>	

SELF-INTERFERENCE CANCELLATION UTILIZING SUPERPOSITION MODULATION TECHNIQUE FOR SINGLE CARRIER FULL-DUPLEX SYSTEM.....	68
<i>Shuzhi Liu, Keiichi Mizutani, Takeshi Matsumura, Hiroshi Harada</i>	

MODULATION AND CODING

DIFFERENTIAL MODULATION FOR BUFFER-AIDED COOPERATIVE RELAYING USING PRIORITY-BASED LINK SELECTION	74
<i>Ashish Kant Shukla, Manav R. Bhatnagar</i>	

IMPLEMENTATION OF MCS INCORPORATING 1024-QAM AND BEAM-BASED TRANSMISSION IN 3D-BF	80
<i>Yuji Omura, Fumiya Kemmochi, Kento Fujisawa, Hiroyuki Otsuka</i>	

PRACTICAL POLAR CODE CONSTRUCTION OVER MEMORYLESS IMPULSE NOISE CHANNELS.....	84
<i>Der-Feng Tseng, Ying-Dai Lin, Shu-Ming Tseng</i>	

SPINAL CODES OVER BSC: ERROR PROBABILITY ANALYSIS AND THE PUNCTURING DESIGN	89
<i>Aimin Li, Shaohua Wu, Ying Wang, Jian Jiao, Qinyu Zhang</i>	

SOFT DECISION DECODING IN MUD PULSE TELEMETRY SYSTEM	94
<i>Andrey Ivanov, Dmitry Lakontsev, Alexey Fisenko, Alexander Ushakov</i>	

MIMO SYSTEMS I

A STATE-SPACE APPROACH FOR MIMO CHANNEL TRACKING IN SC-FDE TRANSMISSIONS	99
<i>P. Pedrosa, D. Castanheira, A. Silva, R. Dinis, A. Gameiro</i>	

NON-COHERENT RATE-SPLITTING FOR MULTIBEAM SATELLITE FORWARD LINK: PRACTICAL CODING AND DECODING ALGORITHMS	104
<i>N. Noels, M. Moeneclaey, T. Ramírez, C. Mosquera, M. Caus, A. Pastore</i>	

NONLINEARITIES IMPACT ON MASSIVE MIMO MILLIMETER WAVE HYBRID SYSTEMS.....	111
<i>Sara Teodoro, Adão Silva, Rui Dinis, Atílio Gameiro</i>	

ROBUST NON-COHERENT BEAMFORMING FOR FDD DOWNLINK MASSIVE MIMO	117
<i>François Rottenberg, Ming-Chun Lee, Thomas Choi, Jianzhong Zhang, Andreas F. Molisch</i>	

MIMO SYSTEMS II

DAMPING FACTOR LEARNING OF BP DETECTION WITH NODE SELECTION IN MASSIVE MIMO USING NEURAL NETWORK	122
<i>Junta Tachibana, Tomoaki Ohtsuki</i>	
SPATIAL INTERFERENCE ALIGNMENT RELYING ON LIMITED PRECODING MATRIX FEEDBACK INDICES	128
<i>Shixin Peng, Wei Lu, Liang Zhong, Zhengmin Kong</i>	
DOPPLER RESILIENT ORTHOGONAL TIME-FREQUENCY SPACE (OTFS) SYSTEMS BASED ON INDEX MODULATION.....	133
<i>Yu Liang, Lingjun Li, Pingzhi Fan, Yongliang Guan</i>	
MIMO FULL-DUPLEX TRANSCEIVER DESIGN IN THE PRESENCE OF PHASE NOISE.....	138
<i>Xin Quan, Ying Liu, Pingzhi Fan, Youxi Tang</i>	
TRANSCEIVER DESIGN FOR LARGE-SCALE DAS WITH NETWORK ASSISTED FULL DUPLEX	144
<i>Xinjiang Xia, Pengcheng Zhu, Jiamin Li, Dongming Wang, Yuanxue Xin, Xiaohu You</i>	

MIMO SYSTEMS III

DATA-AIDED LS CHANNEL ESTIMATION IN MASSIVE MIMO TURBO-RECEIVER	151
<i>Alexander Osinsky, Andrey Ivanov, Dmitry Lakontsev, Roman Bychkov, Dmitry Yarotsky</i>	
HIGH PERFORMANCE INTERFERENCE SUPPRESSION IN MULTI-USER MASSIVE MIMO DETECTOR	156
<i>Andrey Ivanov, Alexander Osinsky, Dmitry Lakontsev, Dmitry Yarotsky</i>	
HIGH RELIABILITY DOWNLINK MU-MIMO: NEW OSTBC APPROACH AND SUPERPOSITION MODULATED SIDE INFORMATION.....	161
<i>Nora Boulaïoune, Nandana Rajatheva, Matti Latva-Aho</i>	
MEMORY-ASSISTED STATISTICALLY-RANKED RF BEAM TRAINING ALGORITHMS FOR SPARSE MIMO	168
<i>Krishan K. Tiwari, Eckhard Grass, John S. Thompson</i>	
MIMO USER RATE BALANCING IN MULTICELL NETWORKS WITH PER CELL POWER CONSTRAINTS	175
<i>Imène Ghamnia, Dirk Slock, Yi Yuan-Wu</i>	
PRECODER DESIGN ALGORITHM USING SPATIAL SIGNAL SYNTHESIS WITH MULTIPLE ANTENNA SUBSET SELECTION FOR HYBRID MIMO SYSTEM.....	180
<i>Daichi Tamate, Yukitoshi Sanada</i>	

MMWAVE SYSTEMS I

A MULTI-USER HIGH ACCURACY BEAM TRAINING ALGORITHM FOR MMWAVE COMMUNICATION	185
<i>Quan Wan, Jun Wang, Zihan Tang</i>	

A NOVEL APPROACH TO EMULATE AND DETECT PACKET LOSS ON SURVEILLANCE RADAR CHANNELS.....	190
<i>Roman Raekow, Michael Kuhn, Bernd-Ludwig Wenning</i>	
HYBRID PRECODING AND COMBINING ALGORITHM FOR REDUCED COMPLEXITY AND POWER CONSUMPTION ARCHITECTURES IN MMWAVE COMMUNICATIONS	195
<i>João Pedro Pavia, Nuno Souto, Marco Ribeiro, João Silva, Rui Dinis</i>	
IMPACT OF WRONG BEAM SELECTION ON BEAM PAIR SCANNING METHOD FOR USER DISCOVERY IN MMWAVE SYSTEMS.....	200
<i>Edith Ghunney, Syed Ali Hassan, Mary Ann Weitnauer</i>	
PERFORMANCE ANALYSIS OF ADAPTIVE MODULATION FOR MILLIMETER WAVE CELLULAR SYSTEMS	205
<i>Khaled M. Humadi, Wei-Ping Zhu, Wessam Ajib</i>	

MMWAVE COMMUNICATIONS

A PLNC APPROACH FOR K-PAIR-USER EXCHANGING IN TWO-TIER HETNETS WITH MMWAVE WIRELESS BACKHAUL	210
<i>Sixuan Chen, Weixia Zou, Zheng Zhou</i>	
AN INITIAL ACCESS OPTIMIZATION ALGORITHM FOR MILLIMETER WAVE 5G NR NETWORKS.....	217
<i>A. Indika Perera, K. B. Shashika Manosha, Nandana Rajatheva, Matti Latva-Aho</i>	
CROSS-BEARING BASED POSITIONING AS A FEATURE OF 5G MILLIMETER WAVE BEAM ALIGNMENT.....	223
<i>Karsten Heimann, Janis Tiemann, Stefan Böcker, Christian Wietfeld</i>	
MMWAVE RADAR-BASED HAND GESTURE RECOGNITION USING RANGE-ANGLE IMAGE.....	228
<i>Jih-Tsun Yu, Li Yen, Po-Hsuan Tseng</i>	
TRANSMITTER IQ IMBALANCE PRE-COMPENSATION FOR MM-WAVE HYBRID BEAMFORMING SYSTEMS	233
<i>Rachit Mahendra, Saif Khan Mohammed, Ranjan K. Mallik</i>	

MULTICARRIER SYSTEMS

HIGHLY EFFICIENT TIBWB-OFDM WAVEFORM FOR BROADBAND WIRELESS COMMUNICATIONS	240
<i>Filipe Conceição, Marco Gomes, Vitor Silva, Rui Dinis</i>	
IMPACT OF INTERFERENCE ON OFDM BASED RADARS	245
<i>H. C. Yildirim, J. Louveaux, P. De Doncker, F. Horlin</i>	
MULTIPLE OBJECTIVE OPTIMIZATION OF OSBE AND ISI FOR CYCLIC PREFIX FREE DFT-S-OFDM SYSTEMS	250
<i>Shih-Sheng Wei, Jen-Ming Wu</i>	
PILOT ALLOCATION BASED ON SIMULATED ANNEALING FOR SPARSE CHANNEL ESTIMATION IN UWB OFDM SYSTEMS.....	255
<i>Taoyong Li, Nele Noels, Heidi Steendam</i>	

PRECODER DESIGN FOR TRANSMITTER PREPROCESSING AIDED SPATIAL MODULATED QPSK SYSTEMS USING ONE-BIT DACS AND QUANTIZED PHASE SHIFTERS	261
<i>Chiao-En Chen, Hsin-Ching Yang, Kelvin Kuang-Chi Lee, Yuan-Hao Huang</i>	

MULTI-SERVICE NETWORK OPTIMIZATION

OPTIMIZATION FOR MULTICARRIER MIMO SWIPT SYSTEMS UNDER MSE QOS CONSTRAINT.....	266
<i>Xingxiang Peng, Peiran Wu, Minghua Xia</i>	
OPTIMIZED LINEAR PRECODING FOR BIASED 2-ASK MODULATION IN MULTI-USER SWIPT WITH INTEGRATED RECEIVER	271
<i>Erica Debels, Marc Moeneclaey</i>	
PERFORMANCE OF HYBRID ARQ OVER POWER LINE COMMUNICATIONS CHANNELS	276
<i>Aashish Mathur, Yun Ai, Michael Cheffena, Manav R. Bhatnagar</i>	
PHASE RETRIEVAL VIA DIFFERENCE OF CONVEX PROGRAMMING	282
<i>Jinglian He, Min Fu, Kaiqiang Yu, Yuanming Shi</i>	
POWER ALLOCATION FOR BER MINIMIZATION IN AN UPLINK MUSA SCENARIO.....	287
<i>Wissal Ben Ameer, Philippe Mary, Marion Dumay, Jean-François Héland, Jean Schwoerer</i>	

NOMA SYSTEMS I

A FADING PREDICTION METHOD USING DL-OFDM SIGNALS FOR PRECISE TPC IN TDD-UL-NOMA SYSTEMS.....	292
<i>Masafumi Moriyama, Kenichi Takizawa, Hayato Tezuka, Fumihide Kojima</i>	
CAPACITY CHARACTERIZATION OF UPLINK NOMA IN MULTI-UAV NETWORKS	297
<i>Tan Zheng Hui Ernest, A S Madhukumar, Rajendra Prasad Sirigina, Anoop Kumar Krishna</i>	
COMPLEXITY REDUCTION OF MPA DETECTION USING JOINT IQ FACTOR GRAPH IN SCMA.....	302
<i>Hiroto Hirama, Takahiko Saba</i>	
IMPACT OF CELLULAR INTERFERENCE ON UPLINK UAV COMMUNICATIONS	307
<i>Tan Zheng Hui Ernest, A S Madhukumar, Rajendra Prasad Sirigina, Anoop Kumar Krishna</i>	
MU-MIMO NOMA WITH LINEAR PRECODING TECHNIQUES IN INDOOR DOWNLINK VLC SYSTEMS	312
<i>Virendra Singh Rajput, D. R. Ashok, A. Chockalingam</i>	

NOMA SYSTEMS II

AN ANTENNA SWITCHING BASED NOMA SCHEME FOR IEEE 802.15.4 CONCURRENT TRANSMISSION	318
<i>Xianjun Jiao, Muhammad Aslam, Wei Liu, Ingrid Moerman</i>	
MULTIUSER DETECTOR BASED ON FUSED AMENDED ORTHOGONAL MATCHING PURSUIT AND SUBSPACE PURSUIT ALGORITHMS FOR UPLINK GRANT-FREE NOMA WIRELESS COMMUNICATION SYSTEMS.....	323
<i>Olutayo Oyeyemi Oyerinde</i>	

ON THE RECEIVER DESIGN FOR NONLINEAR NOMA-OFDM SYSTEMS..... 329
João Guerreiro, Rui Dinis, Paulo Montezuma, Miguel Campos

OUTAGE ANALYSIS OF COOPERATIVE NOMA FOR MILLIMETER WAVE VEHICULAR NETWORKS AT INTERSECTIONS..... 335
Baha Eddine Youcef Belmekki, Abdelkrim Hamza, Benoît Escrig

A LOW-COMPLEXITY INTERFERENCE CANCELLATION APPROACH FOR NOMA 341
Prasanna Herath, Afshin Haghighat, Loic Canonne-Velasquez

NOMA SYSTEMS III

IMPROVEMENT OF EVM FOR DOWNLINK NOMA WITH BLIND NONLINEAR COMPENSATION SCHEME..... 346
Jun Nagai, Tomoki Abe, Yasushi Yamao

NON-ORTHOGONAL FREQUENCY DIVISION MULTIPLE ACCESS 350
Tongyang Xu, Izzat Darwazeh

ON OPTIMAL POWER CONTROL FOR SEQUENTIAL NOMA IN WIRELESS RELAY NETWORKS..... 355
Rung-Hung Gau, Hsiao-Ting Chiu

OPTIMAL PRECODER DESIGN AND POWER ALLOCATION FOR NOMA-BASED MMWAVE DOWNLINK..... 362
Kali Krishna Kota, P. Ubaidulla

PERFORMANCE ANALYSIS OF DOWNLINK NOMA SYSTEM OVER α - η - μ GENERALIZED FADING CHANNEL 367
Adel S. Alqahtani, Emad Alsusa

NOMA SYSTEMS IV

LINK-LEVEL PERFORMANCE EVALUATION OF AN ULNOMA SYSTEM WITH TDD CONSTRUCTED BY HARDWARE 372
Hayato Tezuka, Masafumi Moriyama, Kenichi Takizawa, Fumihide Kojima

MATCHING PREDICTION TO COMMUNICATION AND COMPUTING FOR PROACTIVE VR VIDEO STREAMING..... 377
Xing Wei, Chenyang Yang

MAXIMIZING CONNECTION DENSITY IN NB-IOT NETWORKS WITH NOMA 382
Shashwat Mishra, Lou Salaiin, Chung Shue Chen

NOMA-BASED INTER-BASE STATION COOPERATIVE SCHEDULING METHOD AMONG MULTIPLE SERVICE CHANNELS TO MAXIMIZE INTEGRATED SYSTEM THROUGHPUT 388
Teruaki Shikuma, Yasuaki Yuda, Kenichi Higuchi

SIGNAL PROCESSING I

ATOMIC NORM-BASED DOA ESTIMATION IN INCONSISTENT MIMO RADAR 393
Peng Chen, Zhimin Chen, Zhenxin Cao, Yi Jin

A WFRFT-BASED CYCLIC PREFIX-FREE HYBRID-CARRIER FDE SCHEME	399
<i>Lin Mei, Xiaojie Fang, Xu Lin, Zejia Shi, Jiaqi Wang</i>	
COLLABORATIVE LOCALIZATION WITH TRUTH DISCOVERY FOR HETEROGENEOUS AND DYNAMIC VEHICULAR NETWORKS	405
<i>Fuxi Wen, Tommy Svensson</i>	
COMPFI: PARTIALLY CONNECTED NEURAL NETWORK USING COMPLEX CSI DATA FOR INDOOR LOCALIZATION	410
<i>Minseuk Kim, Changjun Kim, Dongsoo Han, June-Koo Kevin Rhee</i>	
SUB-GHZ PHASE-BASED RANGING SYSTEM: IMPLEMENTATION AND EVALUATION.....	415
<i>Masayoshi Oshiro, Shoji Otaka, Takayuki Kato, Katsuya Nonin, Masaki Nishikawa, Yoshiharu Nito, Hideyuki Ishiwata, Hiroshi Yoshida</i>	

SIGNAL PROCESSING II

FAST SIMULATION OF ULTRA-RELIABLE CODED COMMUNICATION SYSTEM VIA ADAPTIVE SHAPING OF NOISE HISTOGRAM	422
<i>You-Zong Yu, David W. Lin</i>	
ON THE OUTAGE PROBABILITY OF VEHICULAR COMMUNICATIONS AT INTERSECTIONS OVER NAKAGAMI-M FADING CHANNELS	427
<i>Baha Eddine Youcef Belmekki, Abdelkrim Hamza, Benoît Escrig</i>	
OUTAGE PROBABILITY ANALYSIS OF THE RELAY NETWORK WITH CORRELATED RELAYING CHANNELS	432
<i>Trung-Hien Nguyen, Jérôme Louveaux, Philippe De Doncker, François Horlin</i>	
RATE MAXIMIZATION UNDER PARTIAL CSIT FOR MULTI-STAGE/HYBRID BF UNDER LIMITED DYNAMIC RANGE FOR OFDM FULL-DUPLEX SYSTEMS	437
<i>Christo Kurisummoottil Thomas, Dirk Slock</i>	
ROBUST CLIPPING NOISE CANCELLATION BASED ON LOCATION-AWARE COMPRESSED SENSING	443
<i>Xudong Zhang, Yu Zhang, Xiaohua Chang, Yichen Wu, Changyong Pan</i>	

SIGNAL PROCESSING III

THRESHOLDING QUANTIZER DESIGN FOR MUTUAL INFORMATION MAXIMIZATION UNDER OUTPUT CONSTRAINT	448
<i>Thuan Nguyen, Tinh Nguyen</i>	
ADAPTIVE DEMODULATION IN SYMMETRIC ALPHA-STABLE IMPULSE NOISE CHANNELS.....	453
<i>Kristoffer Hågglund, Erik Axell</i>	
IMPROVED PARALLEL SEQUENCE SPREAD SPECTRUM TRANSMISSION FOR HIGH BANDWIDTH EFFICIENCY	458
<i>Elias L. Peter, Wolfgang Endemann, Rüdiger Kays</i>	
MEMORY DECODING ALGORITHM FOR FSO TRANSMISSION	463
<i>Yu-Jung Chu, Tinh Nguyen</i>	

ON THRESHOLDING QUANTIZER DESIGN FOR MUTUAL INFORMATION MAXIMIZATION: OPTIMAL STRUCTURES AND ALGORITHMS	468
<i>Thuan Nguyen, Thinh Nguyen</i>	

SIGNAL PROCESSING IV

A NEW APPROACH FOR ACCURATE TIME SYNCHRONIZATION USING CHIRP SIGNALS	473
<i>Ana Belen Martinez, Atul Kumar, Marwa Chafii, Gerhard Fettweis</i>	

A NOVEL POWER WEIGHTED MULTIPATH COMPONENT CLUSTERING ALGORITHM BASED ON SPECTRAL CLUSTERING.....	478
<i>Mingtao Hu, Yuxin Ye, Ruisi He, Bo Ai, Chen Huang, Zhangdui Zhong</i>	

CARRIER FREQUENCY OFFSET ESTIMATION IN BURST-TYPE CPM VIA THE EM ALGORITHM.....	483
<i>Andreas Lang, Berthold Lankl</i>	

GENERALIZED FLIGHT DELAY PREDICTION METHOD USING GRADIENT BOOSTING DECISION TREE	489
<i>Fan Liu, Jinlong Sun, Miao Liu, Jie Yang, Guan Gui</i>	

SIGNAL RESTORATION FOR CLIPPED SPACE-FREQUENCY INDEX MODULATION SYSTEMS.....	494
<i>Rui Cao, Xia Lei, Yue Xiao</i>	

SLAM USING LTE MULTIPATH COMPONENT DELAYS	498
<i>Junshi Chen, Meifang Zhu, Fredrik Tufvesson</i>	

SPARSE DELAY-DOPPLER CHANNEL ESTIMATION IN RAPIDLY TIME-VARYING CHANNELS FOR MULTIUSER OTFS ON THE UPLINK.....	503
<i>O K. Rasheed, G. D. Surabhi, A. Chockalingam</i>	

LOCALIZATION TECHNIQUES I

INDOOR LOCALIZATION USING CHANNEL STATE INFORMATION WITH REGRESSION ARTIFICIAL NEURAL NETWORKS.....	508
<i>Seyed Mohsen Samadani, Yvon Savaria, Chahé Nerguizian</i>	

CSI-BASED POSITIONING IN MASSIVE MIMO SYSTEMS USING CONVOLUTIONAL NEURAL NETWORKS.....	512
<i>Sibren De Bast, Andrea P. Guevara, Sofie Pollin</i>	

BUILDING FLOOR IDENTIFICATION METHOD BASED ON DAE-LSTM IN CELLULAR NETWORK.....	517
<i>Yongliang Zhang, Lin Ma, Bin Wang, Danyang Qin</i>	

FEED-FORWARD NEURAL NETWORK FOR NETWORK INTRUSION DETECTION.....	522
<i>Arnaud Rosay, Florent Carlier, Pascal Leroux</i>	

A DEEP LEARNING FRAMEWORK FOR BLIND TIME-FREQUENCY LOCALIZATION IN WIDEBAND SYSTEMS	528
<i>K. N. R. Surya Vara Prasad, Kevin B. Dsouza, Vijay K Bhargava, Shankhanaad Mallick, Hamidreza Boostanimehr</i>	

LOCALIZATION TECHNIQUES II

A BENCHMARK OF DUAL CONSTELLATIONS GNSS SOLUTIONS FOR VEHICLE LOCALIZATION IN CONTAINER TERMINALS.....	534
<i>Carlos Rizzo, Juan Francisco Rascon, Jesus Pablo Gonzalez, Maarten Uijt De Haag, Daniel Serrano</i>	
A LOW COMPLEXITY GNSS SPOOFING DETECTION METHOD FOR VEHICULAR APPLICATIONS.....	541
<i>Barend Lubbers, Homayoun Nikookar</i>	
A SIMPLIFIED MESSAGE-PASSING STRATEGY FOR LOCALIZATION IN VEHICULAR NETWORKS.....	546
<i>Hong Ki Kim, Minji Kim, Sang Hyun Lee</i>	
MULTI-STAGE LOCALIZATION FOR MASSIVE MIMO 5G SYSTEMS.....	551
<i>Amal Sellami, Leila Nasraoui, Leila Najjar Atallah</i>	
RSS-BASED INDOOR PASSIVE LOCALIZATION USING CLUSTERING AND FILTERING IN A LTE NETWORK.....	557
<i>Huiwen Zheng, Xiaofeng Zhong, Peng Liu</i>	

MACHINE LEARNING BASED TECHNIQUES I

A MACHINE LEARNING APPROACH FOR BEAMFORMING IN UDN CONSIDERING SELFISH AND ALTRUISTIC BALANCE.....	563
<i>Changyin Sun, Xiaoxiao Wang, Fan Jiang, Hongfeng Qin, Sang Sun</i>	
DEEP LEARNING ASSISTED BEAM PREDICTION USING OUT-OF-BAND INFORMATION	569
<i>Ke Ma, Peiyao Zhao, Zhaocheng Wang</i>	
DEEP LEARNING FOR BEAM HOPPING IN MULTIBEAM SATELLITE SYSTEMS	574
<i>Lei Lei, Eva Lagunas, Yaxiong Yuan, Mirza Golam Kibria, Symeon Chatzinotas, Björn Ottersten</i>	
UNDERSTANDING THE POTENTIAL OF EDGE-BASED PARTICIPATORY SENSING: AN EXPERIMENTAL STUDY	579
<i>Breno Dantas Cruz, Junjie Cheng, Zheng Song, Eli Tilevich</i>	
SEMI-SUPERVISED DETECTION OF TARIFF LIMITS IN LTE NETWORK BENCHMARKS	584
<i>Lukas Eller, Philipp Svoboda, Markus Rupp</i>	

MACHINE LEARNING BASED TECHNIQUES II

IMPROVED DEEP LEARNING IN OFDM SYSTEMS WITH IMPERFECT TIMING SYNCHRONIZATION.....	591
<i>Ziming He, Xuan Huang</i>	
CLIPPING NOISE ESTIMATION BASED ON DEEP COMPLEX NEURAL NETWORK WITH SPARSITY CONSTRAINT	596
<i>Xudong Zhang, Yu Zhang, Xiaohua Chang, Yichen Wu, Changyong Pan</i>	

PAPR REDUCTION SCHEME FOR DEEP LEARNING-BASED COMMUNICATION SYSTEMS USING AUTOENCODERS	601
<i>Melika Vahdat, Koosha Pourtahmasi Roshandeh, Masoud Ardakani, Hai Jiang</i>	

SUPPORT VECTOR MACHINES FOR SELF-INTERFERENCE CANCELLATION IN MOBILE COMMUNICATION TRANSCEIVERS	606
<i>C. Auer, K. Kostoglou, T. Paireder, O. Ploder, M. Huemer</i>	

REINFORCEMENT LEARNING BASED ANTENNA SELECTION IN USER-CENTRIC MASSIVE MIMO	612
<i>Xinxin Chai, Hui Gao, Ji Sun, Xin Su, Tiejun Lv, Jie Zeng</i>	

MACHINE LEARNING BASED TECHNIQUES III

HIGH-PRECISION SNR ESTIMATION BY CNN USING PSD IMAGE FOR ADAPTIVE MODULATION AND CODING	618
<i>Shun Kojima, Kazuki Maruta, Chang-Jun Ahn</i>	

MODULATION CLASSIFICATION USING JOINT TIME AND FREQUENCY-DOMAIN DATA	623
<i>Diogo Figueiredo, Antonio Furtado, Rodolfo Oliveiray</i>	

RECURRENT NEURAL NETWORKS WITH LONG SHORT-TERM MEMORY FOR FADING CHANNEL PREDICTION	628
<i>Wei Jiang, Hans D. Schotten</i>	

INSTANTANEOUS SIGNAL COLLISION DETECTION USING IN-BAND FULL-DUPLEX: MACHINE LEARNING VS DOMAIN-SPECIFIC KNOWLEDGE	633
<i>Seyed Ali Hassani, Xianjun Jiao, Ingrid Moerman, Sofie Pollin</i>	

MILLIMETER WAVE BASE STATIONS WITH CAMERAS: VISION-AIDED BEAM AND BLOCKAGE PREDICTION	639
<i>Muhammad Alrabeiah, Andrew Hredzak, Ahmed Alkhateeb</i>	

MACHINE LEARNING BASED TECHNIQUES IV

A MACHINE LEARNING BASED MULTI-FLIPS SUCCESSIVE CANCELLATION DECODING SCHEME OF POLAR CODES	644
<i>Bi He, Shaohua Wu, Yajing Deng, Hao Yin, Jian Jiao, Qinyu Zhang</i>	

BLIND SIR ESTIMATION BY CONVOLUTIONAL NEURAL NETWORK USING VISUALIZED IQ CONSTELLATION	649
<i>Kazuki Maruta, Shun Kojima, Chang-Jun Ahn, Daisuke Hisano, Yu Nakayama</i>	

PATH LOSS PREDICTION IN SMART CAMPUS ENVIRONMENT: MACHINE LEARNING-BASED APPROACHES	651
<i>Harsh Singh, Shivam Gupta, Charchit Dhawan, Amrita Mishra</i>	

ROBUST AND FAST AUTOMATIC MODULATION CLASSIFICATION WITH CNN UNDER MULTIPATH FADING CHANNELS	656
<i>Kürsat Tekbiyik, Ali Riza Ekti, Ali Görçin, Günes Karabulut Kurt, Cihat Keçeci</i>	

MACHINE LEARNING BASED TECHNIQUES V

IDENTIFICATION OF VEHICLE OBSTRUCTION SCENARIO BASED ON MACHINE LEARNING IN VEHICLE-TO-VEHICLE COMMUNICATIONS.....	662
<i>Mi Yang, Bo Ai, Ruisi He, Chen Huang, Jianzhi Li, Zhangfeng Ma, Liang Chen, Xue Li, Zhangdui Zhong</i>	
INTRUSION DETECTION ON ROBOT CAMERAS USING SPATIO-TEMPORAL AUTOENCODERS: A SELF-DRIVING CAR APPLICATION	667
<i>Faouzi Amrouche, Sofiane Lagraa, Raphaël Frank, Radu State</i>	
QUALITY OF EXPERIENCE PREDICTION IN MOBILITY SCENARIOS BASED ON RECURRENT NEURAL NETWORKS	672
<i>G. J. Anaya-López, C. Cárdenas-Angelat, D. Jiménez-Soria, M. C. Aguayo-Torres, N. Guerra-Melgares, J. Baños-Polglase</i>	
TRAJECTORY PREDICTION OF TRAFFIC AGENTS: INCORPORATING CONTEXT INTO MACHINE LEARNING APPROACHES	677
<i>Vyshakh Palli-Thazha, David Filliat, Javier Ibañez-Guzmán</i>	

DEEP LEARNING I

A DEEP LEARNING METHOD TO PREDICT FADING CHANNEL IN MULTI-ANTENNA SYSTEMS.....	683
<i>Wei Jiang, Hans D. Schotten</i>	
APPROXIMATE SYMBOLIC EXPLANATION FOR NEURAL NETWORK ENABLED WATER-FILLING POWER ALLOCATION.....	688
<i>Schylar Chengyao Sun, Weisi Guo</i>	
DEEP LEARNING FOR OVER-THE-AIR NON-ORTHOGONAL SIGNAL CLASSIFICATION.....	692
<i>Tongyang Xu, Izzat Darwazeh</i>	
ENHANCING LEAST SQUARE CHANNEL ESTIMATION USING DEEP LEARNING	697
<i>Abdul Karim Gizzini, Marwa Chafii, Ahmad Nimr, Gerhard Fettweis</i>	
RADIO FREQUENCY INTERFERENCE DETECTION USING DEEP LEARNING.....	702
<i>Yosr Ghanney, Wessam Ajib</i>	

DEEP LEARNING II

AUTOENCODER BASED ROBUST TRANSCEIVERS FOR FADING CHANNELS USING DEEP NEURAL NETWORKS.....	707
<i>Sandesh Rao Mattu, T Lakshmi Narasimhan, A. Chockalingam</i>	
DL-AIDED NOMP: A DEEP LEARNING-BASED VITAL SIGN ESTIMATING SCHEME USING FMCW RADAR.....	712
<i>Hsin-Yuan Chang, Chia-Hung Lin, Yu-Chien Lin, Wei-Ho Chung, Ta-Sung Lee</i>	
LOW COMPLEXITY AUTOENCODER BASED END-TO-END LEARNING OF CODED COMMUNICATIONS SYSTEMS	719
<i>Nuwanthika Rajapaksha, Nandana Rajatheva, Matti Latva-Aho</i>	

UNCERTAINTY PROPAGATION IN NEURAL NETWORK ENABLED MULTI-CHANNEL OPTIMISATION.....	726
<i>Chen Li, Schyler C. Sun, Saba Al-Rubaye, Antonios Tsourdous, Weisi Guo</i>	

RESOURCE ALLOCATION AND MANAGEMENT

DEEP REINFORCEMENT LEARNING BASED POWER ALLOCATION FOR D2D NETWORK.....	730
<i>Zhengran Bi, Wenan Zhou</i>	

MACHINE LEARNING FOR QOS-AWARE FAIRNESS OF A D2D NETWORK	735
<i>Xian Liu, Changcheng Huang</i>	

MACHINE LEARNING ASSISTED HANDOVER AND RESOURCE MANAGEMENT FOR CELLULAR CONNECTED DRONES	740
<i>Amin Azari, Fayezeh Ghavimi, Mustafa Ozger, Riku Jantti, Cicek Cavdar</i>	

ENERGY CONSUMPTION OPTIMIZATION FOR CSMA/CA PROTOCOL EMPLOYING MACHINE LEARNING	747
<i>Paulo F. C. Barbosa, Bruna A. Da Silva, Cleber Zanchettin, Renato M. De Moraes</i>	

QMORA: A Q-LEARNING BASED MULTI-OBJECTIVE RESOURCE ALLOCATION SCHEME FOR NFV ORCHESTRATION	752
<i>Jing Chen, Jia Chen, Renkun Hu, Hongke Zhang</i>	

VEHICULAR NETWORKS

INCREASING SITUATIONAL AWARENESS IN VEHICULAR NETWORKS: PASSIVE TRAFFIC SENSING BASED ON MACHINE LEARNING	758
<i>Halit Bugra Tulay, Can Emre Koksul</i>	

QOS PREDICTABILITY IN V2X COMMUNICATION WITH MACHINE LEARNING.....	765
<i>Darlan C. Moreira, Igor M. Guerreiro, Wanlu Sun, Charles C. Cavalcante, Diego A. Sousa</i>	

INTELLIGENT TASK OFFLOADING ALGORITHM FOR MOBILE EDGE COMPUTING IN VEHICULAR NETWORKS.....	770
<i>Yaping Cui, Yingjie Liang, Ruyan Wang</i>	

A CNN-LSTM MODEL FOR TRAFFIC SPEED PREDICTION.....	775
<i>Miaomiao Cao, Victor O. K. Li, Vincent W. S. Chan</i>	

MACHINE LEARNING BASED NETWORK PLANNING IN DRONE AIDED EMERGENCY COMMUNICATIONS.....	780
<i>Jian He, Jiangzhou Wang, Huiling Zhu, Nathan J. Gomes, Wenchi Cheng, Peng Yue, Xiang Yi</i>	

WIRELESS NETWORKS IV

VIRTUAL DEVELOPMENT AND VALIDATION OF A FUNCTION FOR AN AUTOMATED LATERAL CONTROL USING ARTIFICIAL NEURAL NETWORKS AND GENETIC ALGORITHMS.....	785
<i>Xiaobo Liu-Henke, Or Aviv Yarom, Soeren Scherler</i>	

DYNAMIC SPECTRUM ACCESS WITH REINFORCEMENT LEARNING FOR UNLICENSED ACCESS IN 5G AND BEYOND.....	790
<i>Susanna Mosleh, Yao Ma, Jacob D. Rezac, Jason B. Coder</i>	
AN ACCESS CONTROL MECHANISM BASED ON RISK PREDICTION FOR THE IOV	797
<i>Yuanni Liu, Man Xiao, Yanyan Zhou, Di Zhang, Jianhui Zhang, Haris Gacanin, Jianli Pan</i>	
SLICE MANAGEMENT IN RADIO ACCESS NETWORK VIA DEEP REINFORCEMENT LEARNING.....	802
<i>Behnam Khodapanah, Ahmad Awada, Ingo Viering, Andre Noll Barreto, Meryem Simsek, Gerhard Fettweis</i>	
VIWI: A DEEP LEARNING DATASET FRAMEWORK FOR VISION-AIDED WIRELESS COMMUNICATIONS.....	808
<i>Muhammad Alrabeiah, Andrew Hredzak, Zhenhao Liu, Ahmed Alkhateeb</i>	

5G PROPAGATION & MEASUREMENT

A FAST STOCHASTIC RAY-TRACING METHOD FOR THE 5G VEHICLE-TO-VEHICLE COMMUNICATION	813
<i>Piotr Gorniak</i>	
A MMWAVE BRIDGE CONCEPT TO SOLVE THE CELLULAR OUTDOOR-TO-INDOOR CHALLENGE.....	818
<i>Adrian Schumacher, Ruben Merz, Andreas Burg</i>	
EXPERIMENTAL CHARACTERIZATION OF NON-STATIONARY V2I RADIO CHANNEL IN TUNNELS.....	824
<i>Marwan Yusuf, Emmeric Tanghe, Luc Martens, Wout Joseph, Frederic Challita, Pierre Laly, Davy P. Gaillot, Martine Liénard</i>	
MEASUREMENT BASED STATISTICAL CHANNEL CHARACTERIZATION OF AIR-TO-GROUND PATH LOSS MODEL AT 446MHZ FOR NARROW-BAND SIGNALS IN LOW ALTITUDE UAVS	829
<i>Burak Ede, Serhan Yarkan, Ali Riza Ekti, Tunçer Baykas, Hakan Ali Çirpan, Ali Görçin</i>	
NARROWBAND CHARACTERISTICS OF AIR-TO-GROUND PROPAGATION FOR UAV ASSISTED NETWORKS IN URBAN ENVIRONMENTS BY MEANS OF FAST RAY-LAUNCHING SIMULATIONS	834
<i>Maximilian James Arpaio, Enrico M. Vitucci, Marina Barbiroli, Vittorio Degli-Esposti, Diego Masotti, Franco Fuschini</i>	

CHANNEL MODELING & MEASUREMENTS

3D BEAMFORMING BASED DYNAMIC TDD INTERFERENCE MITIGATION SCHEME.....	839
<i>Jalal Rachad, Ridha Nasri, Laurent Decreusefond</i>	
AN EFFICIENT CALIBRATION OF A FULLY-SWITCHED MIMO CHANNEL SOUNDER WITH INTERNAL CROSSTALK	846
<i>Junseok Kim, Eun Ae Lee, Chung-Sup Kim, Young-Jun Chong, Joon Ho Cho</i>	
ANTENNA SELECTIONS FOR MULTI-TARGET DETECTION OF VEHICULAR MMWAVE RADAR WITH LARGE ANTENNA ARRAYS	851
<i>Kai-Rey Liu, Sau-Hsuan Wu, Lie-Liang Yang</i>	

BANDWIDTH EXPANSION OF THE IBFD COMMUNICATION SYSTEM USING BALANCED FEED NETWORKS	857
<i>Myunggi Kim, Heung-Gyoon Ryu</i>	

PERFORMANCE ANALYSIS OF WIRELESS COMMUNICATION SYSTEMS SUBJECT TO κ - μ EXTREME FADING	861
<i>Jules M. Moualeu, Daniel B. Da Costa, A. A. Rausley De Souza, Walaa Hamouda, Ugo S. Dias</i>	

CHANNEL MODELING & EMF

EXPOSURE MODELLING AND MINIMIZATION FOR MULTI-ANTENNA COMMUNICATION SYSTEMS	866
<i>Fabien Héliot, Muhammad Ali Jamshed, Tim W. C. Brown</i>	

IS IT SAFE LIVING IN THE VICINITY OF CELLULAR TOWERS? ANALYSIS OF LONG- TERM HUMAN EMF EXPOSURE AT POPULATION SCALE	872
<i>Luca Chiaraviglio, Cristian Di Paolo, Giuseppe Bianchi, Nicola Blefari-Melazzi</i>	

MEASUREMENT CAMPAIGN WITH SYNCHRONIZED DISTRIBUTED RECEIVERS AND MOBILE EMITTER AT 3.75 GHZ IN URBAN SCENARIOS	879
<i>Julia Bauer, Carsten Andrich, Michael Döbereiner, Steffen Schieler, James Myint, Alexander Ihlow, Christian Schneider, Reiner Thomä, Giovanni Del Galdo</i>	

THE MULTIPATH CHARACTERISTIC OF AN INTRA-VEHICLE CHANNEL UNDER THE NON-LINE-OF-SIGHT CONDITION	884
<i>Irfan Yusoff, Xiao-Hong Peng</i>	

WILL THE PROLIFERATION OF 5G BASE STATIONS INCREASE THE RADIO- FREQUENCY “POLLUTION”?	888
<i>Luca Chiaraviglio, Giuseppe Bianchi, Nicola Blefari-Melazzi, Marco Fiore</i>	

CELLULAR & COGNITIVE RADIO NETWORKS

ANTENNA SELECTION AND RESOURCE ALLOCATION IN DOWNLINK MISO OFDMA FEMTOCELL NETWORKS	895
<i>Jalal Jalali, Ata Khalili, Heidi Steendam</i>	

RELAYING TECHNIQUES BASED OUTAGE ANALYSIS FOR MOBILE USERS IN COGNITIVE RADIO NETWORKS.....	901
<i>Samuel D. Okegbile, B. T. Maharaj, Attahiru S. Alfa</i>	

SYMBOL ERROR RATE WITH RECEIVER NONLINEARITY	906
<i>Jennifer Dsouza, Hossein Mohammadi, Aditya V. Padaki, Vuk Marojevic, Jeffrey H. Reed</i>	

DEEP LEARNING MEETS COGNITIVE RADIO: PREDICTING FUTURE STEPS	911
<i>Alex Shenfield, Zaheer Khan, Hamed Ahmadi</i>	

SECONDARY USER EXPERIENCE-ORIENTED RESOURCE ALLOCATION IN AI- EMPOWERED COGNITIVE RADIO NETWORKS USING DEEP NEUROEVOLUTION	916
<i>M. C. Hlophe, B. T. Maharaj</i>	

SPECTRUM SENSING & SHARING

A RUIN THEORY-INSPIRED CO-PRIMARY SPECTRUM SHARING MECHANISM FOR 5G.....	921
<i>Zaw Htike, Fumihide Kojima</i>	
CAPACITY EVALUATION OF LTE NETWORK IN DYNAMIC SPECTRUM ACCESS AND INTERFERENCE ANALYSIS.....	927
<i>Raphael B. Evangelista, Carlos F. M. E Silva, Yuri C. B. Silva</i>	
DYNAMIC SPECTRUM MANAGEMENT FOR EUROPEAN-WIDE RESEARCH NETWORK	933
<i>Ilkka Harjula, Laura Panizo, Barbara Valera-Muros, Jarno Pinola, Mika Hoppari, Adam Flizikowski, Maria Safianowska</i>	
RADIO ENVIRONMENT MAPS FOR DYNAMIC FREQUENCY SELECTION IN V2X COMMUNICATIONS	939
<i>Pawel Sroka, Pawel Kryszkiewicz, Adrian Kliks</i>	
SPECTRUM PREDICTION FOR FREQUENCY BANDS WITH HIGH BURSTINESS: ANALYSIS AND METHOD.....	945
<i>Peiliang Zuo, Tao Peng, Xinyue Wang, Kangyong You, Hanbo Jing, Wenbin Guo, Wenbo Wang</i>	

BEAMFORMING AND HYBRID BEAMFORMING

BASEBAND CODEBOOK DESIGN WITH LONG-TERM INFORMATION FOR HYBRID BEAMFORMING SYSTEMS	952
<i>Gaozheng Liu, Li Chen, Weidong Wang, Xiaohui Chen</i>	
HYBRID PRECODING FOR MILLIMETER WAVE MULTIUSER MASSIVE MIMO SYSTEMS WITH LOW-RESOLUTION DACS.....	958
<i>Yajing Guo, Yunliang Zhang, Shuaipei Chen, Jiakang Zheng, Jiayi Zhang</i>	
LOW COMPLEXITY CHANNEL ESTIMATION FOR HYBRID BEAMFORMING SYSTEMS	963
<i>Yanru Tang, Hongbing Cheng, Kee-Bong Song</i>	
SIMULTANEOUS BEAMFORMING AND NULLFORMING FOR COVERT WIRELESS COMMUNICATIONS.....	968
<i>Justin Kong, Fikadu T. Dagefu, Brian M. Sadler</i>	
SUBCHANNEL GAIN PRODUCT BASED FREQUENCY SELECTIVE HYBRID BEAMFORMING WITH LIMITED FEEDBACK	974
<i>Hyunwoo Nam, Girim Kwon, Namshik Kim, Hyuncheol Park</i>	

ESTIMATION, ALLOCATION, AND PERFORMANCE ANALYSIS

BAYESIAN CRLB FOR JOINT AOA, AOD, AND CHANNEL ESTIMATION USING UPA IN MILLIMETER-WAVE COMMUNICATIONS	979
<i>Imtiaz Ahmed, Ramesh Annavajjala</i>	
LOW COMPLEXITY QUASI-MLM MODULATION CLASSIFICATION BASED OPTIMAL OVERLOADED MU-MIMO RECEIVER	985
<i>Sairaj Desai, K Giridhar</i>	

OPTIMUM RESOURCE ALLOCATION IN MU-MIMO OFDMA WIRELESS SYSTEMS	990
<i>Chandra S. Bontu, Jagadish Ghimire, Amr El-Keyi</i>	
PERFORMANCE ANALYSIS OF MATCHED-FILTER PRECODED MISO-OFDM SYSTEMS IN THE PRESENCE OF IMPERFECT CSI	995
<i>Trung-Hien Nguyen, Jérôme Louveaux, Philippe De Doncker, François Horlin</i>	
SUPERVISED LEARNING BASED SUPER-RESOLUTION DOA ESTIMATION UTILIZING ANTENNA ARRAY EXTRAPOLATION.....	1000
<i>Udaya Sampath K. P. Miriya Thanthrige, Aya Mostafa Ahmed, Aydin Sezgin</i>	

HETEROGENEOUS AND COOPERATIVE COMMUNICATION

PERFORMANCE ANALYSIS OF HAPS-BASED RELAYING FOR HYBRID FSO/RF DOWNLINK SATELLITE COMMUNICATION	1005
<i>R Swaminathan, Shubha Sharma, A. S. Madhukumar</i>	
PERFORMANCE COMPARISON OF ADAPTIVE TERMINAL SELECTION SCHEMES FOR TERMINAL-COLLABORATED MIMO RECEPTION USING ACTUAL RECEIVED SIGNALS	1010
<i>Mampeï Kasai, Hidekazu Murata</i>	
PERFORMANCE EVALUATION OF ADAPTIVE COOPERATIVE NOMA PROTOCOL AT ROAD JUNCTIONS	1015
<i>Baha Eddine Youcef Belmekki, Abdelkrim Hamza, Benoît Escrig</i>	
PERFORMANCE OF DUAL-HOP HYBRID FSO/RF SYSTEM WITH POINTING ERRORS OPTIMIZATION	1021
<i>Shubha Sharma, A. S. Madhukumar, Swaminathan Ramabadran</i>	

RELAYING

ADDRESSING RELIABILITY NEEDS OF INDUSTRIAL APPLICATIONS IN 5G NR WITH NETWORK CODING.....	1026
<i>Stefano Paris, Petteri Kela, Daniela Laselva, Qiyang Zhao</i>	
COOPERATIVE AF-BASED 3D MOBILE UAV RELAYING FOR HYBRID SATELLITE- TERRESTRIAL NETWORKS	1032
<i>Pankaj K. Sharma, Deepika Gupta, Dong In Kim</i>	
FULL-DUPLEX SPOOFING RELAYS FOR WIRELESS SURVEILLANCE WITH INTER- RELAY INTERFERENCE SUPPRESSION	1037
<i>Jihwan Moon, Hoon Lee, Changick Song, Seowoo Kang, Minseok Kim, Inkyu Lee</i>	
SECURE TRANSMISSION SCHEME DESIGN FOR SWIPT IN BUFFER-AIDED RELAY NETWORKS.....	1042
<i>Juanjuan Ren, Xianfu Lei, Panagiotis D. Diamantoulakis, Qingchun Chen, George K. Karagiannidis</i>	
X-DUPLEX DECODE-AND-FORWARD RELAYING WITH DIRECT LINK: A DPC-BASED TRANSMISSION SCHEME	1047
<i>Peixi Liu, Wei Jiang, Wu Luo, Tiansheng Zhang</i>	

MASSIVE MIMO

AN EFFICIENT SIGNAL EXTRACTION SCHEME IN UPLINK MASSIVE MIMO SYSTEMS	1053
<i>Guo Li, Xiao Zhang</i>	
DIGITAL BEAMFORMING WITH PAPR REDUCTION: AN APPROACH FOR ENERGY EFFICIENT MASSIVE MIMO	1058
<i>C. A. Schmidt, M. Crussière, J. F. Hélaré</i>	
MASSIVE MIMO INDOOR LOCALIZATION WITH 64-ANTENNA UNIFORM LINEAR ARRAY	1064
<i>Bin Liu, Andrea P. Guevara, Sibren De Bast, Qing Wang, Sofie Pollin</i>	
PARAMETER OPTIMIZATION FOR ENERGY EFFICIENT INDOOR MASSIVE MIMO SMALL CELL NETWORKS	1069
<i>Chen Chen, Yan Jiang, Jiliang Zhang, Xiaoli Chu, Jie Zhang</i>	
POWER ALLOCATION AND COOPERATION IN CELL-FREE MASSIVE MIMO SYSTEMS WITH ENERGY EXCHANGE CAPABILITIES	1074
<i>Rami Hamdi, Marwa Qaraqe</i>	

MMWAVE SYSTEMS II

A BLIND BEAM TRACKING SCHEME FOR MILLIMETER WAVE SYSTEMS	1079
<i>Steve Blandino, Thibault Bertrand, Claude Desset, André Bourdoux, Sofie Pollin, Jérôme Louveaux</i>	
ERGODIC ENERGY EFFICIENCY OF MMWAVE SYSTEM CONSIDERING INSERTION LOSS UNDER DYNAMIC SUBARRAY ARCHITECTURE	1085
<i>Ji-Chong Guo, Qi-Yue Yu, Wei-Xiao Meng, Wei Xiang</i>	
FIXED MMWAVE MULTI-USER MIMO: PERFORMANCE ANALYSIS AND PROOF-OF-CONCEPT ARCHITECTURE	1090
<i>Achiel Colpaert, Evgenii Vinogradov, Sofie Pollin</i>	
STS ADAPTATION FOR BEAMFORMING TRAINING OF ASYMMETRIC LINKS IN IEEE 802.11AY-BASED DENSE NETWORKS	1095
<i>Yena Kim, Sukyoung Lee, Tanguy Ropitault</i>	
SYSTEMATIC BEAM MANAGEMENT IN MMWAVE NETWORK: TRADEOFF AMONG USER MOBILITY, LINK OUTAGE, AND INTERFERENCE CONTROL	1101
<i>Honghao Ju, Yan Long, Xuming Fang, Rong He</i>	

VEHICULAR COMMUNICATIONS IV

A NOVEL DECENTRALIZED AND FLEXIBLE POLICY FOR FLOW MOBILITY MANAGEMENT	1106
<i>Edivaldo Pastori, Daniel L. Guidoni, Leandro Aparecido Villas, Robson E. De Grande, Rodolfo Meneguette</i>	
ADAPTIVE POWER CONTROL WITH VEHICULAR TRELLIS ARCHITECTURE FOR VEHICULAR COMMUNICATION SYSTEMS	1111
<i>Akinsola Akinsanya, Manish Nair, Huiling Zhu, Jiangzhou Wang</i>	

JOINT VEHICLE-BEAM ALLOCATION FOR RELIABILITY AND COVERAGE IN
VEHICULAR COMMUNICATION SYSTEMS 1116
Akinsola Akinsanya, Manish Nair, Huiling Zhu, Jiangzhou Wang

POWER-AND-INDEX BASED MULTIPLE ACCESS FOR V2X NETWORKS 1121
Sunyoung Lee, Mehrdad Dianati, Youngwook Ko, Alexandros Mouzakitis

SELF-INTERFERENCE CANCELLATION AND BEAMFORMING IN REPEATER-ASSISTED
FULL-DUPLEX VEHICULAR COMMUNICATION 1127
Ahmed S. Ibrahim

HETEROGENEOUS NETWORKS I

A UNIFIED ANALYTICAL APPROACH TO MULTI-CELL LBT-BASED SPECTRUM
SHARING SYSTEMS 1132
Yao Ma, Susanna Mosleh, Jason Coder

CACHE-AIDED DEVICE-TO-DEVICE NON-ORTHOGONAL MULTIPLE ACCESS..... 1138
Kevin Z. Shen, Turki E. A. Alharbi, Daniel K. C. So

CLOUD-BASED QUEUING MODEL FOR TACTILE INTERNET IN NEXT GENERATION OF
RAN 1144
*Narges Gholipoor, Saeedeh Parsaeefard, Mohammad Reza Javan, Nader Mokari, Hamid
Saeedi, Hossein Pishro-Nik*

COORDINATED SCHEDULING AND POWER CONTROL FOR NON-ORTHOGONAL
MULTIPLE ACCESS (NOMA) ENABLED H-CRAN..... 1150
Rupesh Rai, Huiling Zhu, Jiangzhou Wang

DESIGN OF PDMA PATTERN MATRIX IN 5G SCENARIOS 1155
Jiaying Sun, Chang Wang, Jie Zeng, Xin Su, Tiejun Lv

HETEROGENEOUS NETWORKS II

FLEXIBLE SOFT FREQUENCY REUSE FOR INTERFERENCE MANAGEMENT IN THE
NETWORKS WITH FLYING BASE STATIONS..... 1161
Md. Sakir Hossain, Zdenek Becvar

FULL COVERAGE WITH 3GPP TECHNOLOGIES ON THE FEASIBILITY OF PROVIDING
FULL RURAL CELLULAR COVERAGE 1168
N. Jaldén, J. Lun, P. Frenger, A. Furuskär, S. Venkatasubramanian, E. Trojer

HIERARCHICAL SCHEDULING WITH FPGA-BASED ACCELERATOR FOR FLEXIBLE 5G
MOBILE NETWORKS..... 1174
Yuki Arikawa, Takeshi Sakamoto, Satoshi Shigematsu

HOW TO ASSOCIATE USERS WITH ACCESS POINTS IN A SMALL CELL NETWORK?..... 1179
Hong Yang

IMPROVED FREQUENCY DOMAIN RESOURCE ALLOCATION INDICATION 1184
Kittipong Kittichokechai, Mattias Andersson, Robert Baldemair, Yufei Blankenship

HETEROGENEOUS NETWORKS III

INTEGRATION OF DIMMING INTO LIFI SYSTEMS.....	1189
<i>Trang Nguyen, Mohamed Sufyan Islim, Harald Hass</i>	
INTERFERENCE CONTROL OF LTE-LAA USING Q-LEARNING WITH HARQ.....	1194
<i>Kenshiro Wada, Tomoaki Ohtsuki</i>	
LIGHTWEIGHT COMPREHENSIVE EVALUATION METHOD FOR WIRELESS USER PERCEPTION BASED ON RANDOM FOREST.....	1199
<i>Kaixuan Zhang, Guanghui Fan, Jun Zeng, Guan Gui</i>	
MEASUREMENT BASED FHSS-TYPE DRONE CONTROLLER DETECTION AT 2.4GHZ: AN STFT APPROACH.....	1204
<i>Batuhan Kaplan, Ibrahim Kahraman, Ali Görçin, Hakan Ali Çirpan, Ali Rıza Ekti</i>	
MEMORY-AFFECTING NETWORK SELECTION IN NEXT GENERATION HETNETS	1210
<i>Shaohan Feng, Dusit Niyato, Xiao Lu, Ping Wang, Dong In Kim</i>	

HETEROGENEOUS NETWORKS IV

NEXT GENERATION WI-FI MESH FOR INDOOR RESIDENTIAL DEPLOYMENTS.....	1216
<i>Lester Ho, Adrian Garcia-Rodriguez, Lorenzo Galati Giordano, David López-Pérez</i>	
NEXT GENERATION WI-FI: DEPLOYMENT GUIDELINES AND BENEFITS OF MASSIVE MIMO FOR THE ENTERPRISE.....	1221
<i>Lorenzo Galati Giordano, Adrian Garcia-Rodriguez, Lester Ho, David López-Pérez</i>	
ON THE DESIGN OF B5G MULTI-BEAM LEO SATELLITE INTERNET OF THINGS	1226
<i>Jianhang Chu, Xiaoming Chen, Qiao Qi, Caijun Zhong, Hai Lin, Zhaoyang Zhang</i>	
PHYSICAL CELL ID DETECTION PROBABILITY USING SYNCHRONIZATION SIGNALS OF NB-IOT RADIO INTERFACE IN 28-GHZ BAND	1232
<i>Daisuke Inoue, Kyogo Ota, Mamoru Sawahashi, Satoshi Nagata</i>	
PREDICTION OF V2V CHANNEL QUALITY UNDER DOUBLE-RAYLEIGH FADING CHANNELS.....	1238
<i>Yifan Chen, Zheng Dou, Yun Lin, Ying Li</i>	

INTELLIGENT COMMUNICATIONS I

CELL-FREE MASSIVE MIMO WITH FEW-BIT ADCS/DACS: AQNM VERSUS BUSSGANG.....	1244
<i>Yao Zhang, Haotong Cao, Meng Zhou, Xu Qiao, Shengchen Wu, Longxiang Yang</i>	
CELLULAR NETWORK PERFORMANCE USING MACHINE LEARNING BASED QUANTITATIVE ASSOCIATION RULE MINING METHOD.....	1249
<i>Guanghui Fan, Juan Wang, Kaixuan Zhang, Jun Zeng, Guan Gui</i>	
CONVOLUTIONAL NEURAL NETWORK AIDED SIGNAL MODULATION RECOGNITION IN OFDM SYSTEMS	1254
<i>Sheng Hong, Yu Wang, Yuwen Pan, Hao Gu, Miao Liu, Jie Yang, Guan Gui</i>	

EN-ROUTE MULTILATERATION SYSTEM BASED ON ADS-B AND TDOA/AOA FOR FLIGHT SURVEILLANCE SYSTEMS	1259
<i>Dongxu Zhao, Jinlong Sun, Guan Gui</i>	

LARGE INTELLIGENT REFLECTING SURFACE ENHANCED MASSIVE ACCESS FOR B5G CELLULAR INTERNET OF THINGS	1265
<i>Guanghua Yu, Xiaoming Chen, Caijun Zhong, Hai Lin, Zhaoyang Zhang</i>	

INTELLIGENT COMMUNICATIONS II

MODULATION CLASSIFICATION METHOD BASED ON DEEP LEARNING UNDER NON-GAUSSIAN NOISE	1270
<i>Minghuan Ma, Zhigang Li, Yun Lin, Lei Chen, Sen Wang</i>	

REAL-TIME ROUTING FOR WIRELESS RELAY FRONTHAUL WITH VEHICLE-MOUNTED RADIO UNITS	1275
<i>Yu Nakayama, Yuko Hara-Azumi, Anh Hoang Ngoc Nguyen, Daisuke Hisano, Yoshiaki Inoue, Takayuki Nishio, Kazuki Maruta</i>	

RESEARCH ON RF FINGERPRINT FEATURE SELECTION METHOD	1281
<i>Ying Li, Yun Lin, Zheng Dou, Yifan Chen</i>	

USER ASSOCIATION TO OVERCOME HUMAN BLOCKAGE AT MMWAVE CELLULAR NETWORKS	1286
<i>S. Yuva Kumar, Tomoaki Ohtsuki</i>	

NETWORKS

AN ENERGY-EFFICIENT IEEE 802.11AD MESH NETWORK FOR SEISMIC ACQUISITION	1291
<i>Varun Amar Reddy, Gordon L. Stüber, Suhail Al-Dharrab, Ali Hussein Muqaibel, Wessam Mesbah</i>	

COOPERATIVE EDGE CACHING IN SMALL CELL NETWORKS WITH HETEROGENEOUS CHANNEL QUALITIES	1296
<i>Tao Nie, Jingjing Luo, Lin Gao, Fu-Chun Zheng, Li Yu</i>	

DYNAMIC MULTI-RAT ACCESS FOR ULTRA DENSE 5G AND BEYOND: A MEAN FIELD PERSPECTIVE	1302
<i>Sami Nadif, Essaid Sabir, Halima Elbiaze, Abdelkrim Haqiq</i>	

LOCI: A MOBILE Q&A SYSTEM WITH MULTIMODAL MOTIVATION SCHEME FOR LOCAL INTENT QUESTIONS IN DYNAMIC SOCIAL NETWORKS	1307
<i>Imad Ali, Ronald Y. Chang, Cheng-Hsin Hsu, Chi-Han Lee</i>	

SOCIO-CELLULAR NETWORK: A NOVEL SOCIAL ASSISTED CELLULAR COMMUNICATION PARADIGM	1313
<i>Swati Agarwal, Rahul Thakur, Utakarsh Yadav, Hemant Rathore</i>	

RADIO ACCESS I

5G AND LTE-TDD SYNCHRONIZED COEXISTENCE WITH BLIND RETRANSMISSION AND MINI-SLOT UPLINK	1318
<i>Abdelrahim Mohamed, Atta Quddus, Pei Xiao, Bernard Hunt, Rahim Tafazolli</i>	

ACHIEVABLE RATE OF MULTI-CELL DOWNLINK MASSIVE MIMO SYSTEMS WITH D2D UNDERLY	1323
<i>Ashraf Al-Rimawi, Laith Ibrahim, Wessam Ajib</i>	
ANTENNA-RESOURCE-BASED SCMA IN DOWNLINK MULTIUSER TRANSMISSION SYSTEMS.....	1328
<i>Yi-Peng Zhang, Qi-Yue Yu, Zi-Jing Liu, Yong-Kang Zhou, Wei-Xiao Meng</i>	
ASYNCHRONOUS SCRAMBLED CODED MULTIPLE ACCESS FOR 5G NON-ORTHOGONAL MULTIPLE ACCESS: SYSTEM LEVEL PERFORMANCE.....	1333
<i>Rohit Iyer Seshadri, Neal Becker, Mustafa Eroz, Lin-Nan Lee, Chin-Kuo Jao, Ting-Yu Yeh, Chun-Yen Wang</i>	
COORDINATED PASSIVE BEAMFORMING FOR DISTRIBUTED INTELLIGENT REFLECTING SURFACES NETWORK.....	1340
<i>Jinglian He, Kaiqiang Yu, Yuanming Shi</i>	
CORRELATED PLACEMENT OF SMALL CELL BASE STATIONS: A COVERAGE ENRICHED HETNET WITH MASSIVE MIMO	1345
<i>Bitan Banerjee, Robert C. Elliott, Witold A. Krzymien, Jordan Melzer</i>	

RADIO ACCESS II

FULL-DUPLEX COOPERATIVE NON-ORTHOGONAL MULTIPLE ACCESS SYSTEM WITH FEASIBLE SUCCESSIVE INTERFERENCE CANCELLATION.....	1351
<i>Turki E. A. Alharbi, Kevin Z. Shen, Daniel K. C. So</i>	
RECONFIGURABLE INTELLIGENT SURFACE ASSISTED NON-ORTHOGONAL UNICAST AND BROADCAST TRANSMISSION.....	1357
<i>Qiaochu An, Yuanming Shi, Yong Zhou</i>	
UPLINK SCMA WITH STBC IN FADING CHANNELS	1362
<i>Huan-Ying Li, Zi-Jing Liu, Qi-Yue Yu, Wei Xiang, Fumiyuki Adachi</i>	

WIFI

EXPERIMENTAL EVALUATION OF THE TWO-RAY MODEL FOR NEAR-SHORE WIFI-BASED NETWORK SYSTEMS DESIGN.....	1367
<i>Miguel Gutiérrez Gaitán, Pedro M. Santos, Luis R. Pinto, Luis Almeida</i>	
IEEE 802.11AX (WI-FI 6): DL AND UL MU-MIMO CHANNEL SOUNDING COMPRESSION SCHEMES IMPAIRED WITH IQ IMBALANCE AND CFO	1370
<i>Roger Pierre Fabris Hoefel</i>	
OPENWIFI: A FREE AND OPEN-SOURCE IEEE802.11 SDR IMPLEMENTATION ON SOC	1376
<i>Xianjun Jiao, Wei Liu, Michael Mehari, Muhammad Aslam, Ingrid Moerman</i>	
REINFORCEMENT LEARNING APPROACH FOR HYBRID WIFI-VLC NETWORKS	1378
<i>Abdulmajeed M. Alenezi, Khairi A. Hamdi</i>	
WIHAR: FROM WI-FI CHANNEL STATE INFORMATION TO UNOBTRUSIVE HUMAN ACTIVITY RECOGNITION.....	1383
<i>Muhammad Muaaz, Ali Chelli, Matthias Pätzold</i>	

RESOURCE ALLOCATION I

OPTIMAL RESOURCE ALLOCATION AND PLACEMENT FOR TERRESTRIAL AND AERIAL BASE STATIONS IN MIXED RF/FSO BACKHAUL NETWORKS	1390
<i>Ju-Hyung Lee, Ki-Hong Park, Mohamed-Slim Alouini, Young-Chai Ko</i>	
RESOURCE ALLOCATION FOR NON-ORTHOGONAL MULTIPLE ACCESS WITH COORDINATED MULTIPOINT SUPPORT	1395
<i>Zhi-Xuan Huang, Yen Chun Peng, Yi-Chia Lo, Jung-Chun Kao, Hsi-Hsun Su</i>	
RESOURCE-EFFICIENT DUAL CONNECTIVITY FOR ULTRA-RELIABLE LOW-LATENCY COMMUNICATION	1400
<i>Marco Centenaro, Daniela Laselva, Jens Steiner, Klaus Pedersen, Preben Mogensen</i>	
SECURITY PROVISION FOR VEHICULAR FOG COMPUTING	1405
<i>Jiaqi Huang, Yi Qian, Rose Qingyang Hu</i>	
SEQUENTIAL BARGAINING GAME FOR REUSE OF RADIO RESOURCES IN D2D COMMUNICATION IN DEDICATED MODE.....	1410
<i>Mehyar Najla, Zdenek Becvar, Pavel Mach</i>	

RESOURCE ALLOCATION II

AN INTERFERENCE-AWARE OPTIMAL DATA COLLECTION SCHEDULING FOR WISUN ADVANCED METERING INFRASTRUCTURE NETWORK	1416
<i>Amnart Boonkajay, Peng Hui Tan, Lee Kee Goh, Syed Naveen Altaf Ahmed, Sumei Sun</i>	
INTEGRATED AGENT-BASED MODEL FOR BROADBAND RESOURCE ALLOCATION ANALYSIS	1421
<i>Jennifer Legaspi, Casey I. Canfield, Kuldeep S. Gill, Alexander M. Wyglinski, Shamsnaz V. Bhadai</i>	
JOINT DOWNLINK CELL ASSOCIATION AND BANDWIDTH ALLOCATION WITH USER PRIORITIES IN TWO-TIER HETNETS	1426
<i>Hongju Lee, Junhee Park, Sang Hyun Lee, Inkyu Lee</i>	
RESOURCE ALLOCATION STRATEGY FOR MOBILE EDGE COMPUTING SYSTEM WITH HYBRID ENERGY HARVESTING	1431
<i>Jiafa Chen, Yisheng Zhao, Zhimeng Xu, Haifeng Zheng</i>	
SUBCARRIER AND POWER ALLOCATION FOR SPARSE CODE MULTIPLE ACCESS	1437
<i>Yanely Jimenez Licea, Kevin Shen, Daniel K. C. So</i>	

GREEN COMMUNICATIONS I

AN AUTONOMOUS ERROR-TOLERANT ARCHITECTURE FEATURING SELF-REPAIRATION FOR CONVOLUTIONAL NEURAL NETWORKS.....	1442
<i>Lizheng Liu, Yuxiang Huan, Zhuo Zou, Xiaoming Hu, Lirong Zheng</i>	
CONSTRUCTIONS OF FLEXIBLE-SIZE DETERMINISTIC MEASUREMENT MATRICES USING PROTOGRAPH LDPC CODES AND HADAMARD CODES	1448
<i>Kangjian Chen, Yi Fang, Guofa Cai, Jun Zhang, Guojun Han, Pingping Chen</i>	

ENERGY-EFFICIENT DISTRIBUTED ESTIMATION USING WIRELESS SENSOR WITH WAKE-UP RECEIVERS	1453
<i>Hitoshi Kawakita, Hiroyuki Yomo, Petar Popovski</i>	

LEARNING-BASED ENERGY-EFFICIENT CHANNEL SELECTION FOR EDGE COMPUTING-EMPOWERED COGNITIVE MACHINE-TO-MACHINE COMMUNICATIONS	1458
<i>Haijun Liao, Zhenyu Zhou, Bo Ai, Mohsen Guizani</i>	

NONCOOPERATIVE RESOURCE OPTIMIZATION FOR NOMA BASED FOG RADIO ACCESS NETWORK	1464
<i>Yu Qiu, Haijun Zhang, Keping Long, Victor C. M. Leung</i>	

GREEN COMMUNICATIONS II

CELL ASSOCIATION FOR ENERGY EFFICIENT RESOURCE ALLOCATION IN DECOUPLED 5G HETEROGENEOUS NETWORKS	1470
<i>Humayun Zubair Khan, Mudassar Ali, Imran Rashid, Abdul Ghafoor, Muhammad Naeem</i>	

ENERGY EFFICIENCY MAXIMIZATION IN GREEN ENERGY AIDED HETEROGENEOUS CLOUD RADIO ACCESS NETWORKS.....	1475
<i>Naveed Ahmad Chughtai, Mudassar Ali, Saad Qaisar, Muhammad Imran, Muhammad Naeem</i>	

PRIORITY-BASED ACCESS STRATEGY FOR MULTI-TRANSMITTER MULTI-RECEIVER AMBIENT BACKSCATTER COMMUNICATION SYSTEM.....	1481
<i>Qian Chen, Xing Zhang, Jing Li, Jizhe Zhou</i>	

RESOURCE ALLOCATION STRATEGY FOR MEC SYSTEM BASED ON VM MIGRATION AND RF ENERGY HARVESTING	1486
<i>Peng Fang, Yisheng Zhao, Zhichao Liu, Jincheng Gao, Zhonghui Chen</i>	

UAV-ASSISTED TIME DIVISION POWER ALLOCATION STRATEGY BASED ON RF ENERGY HARVESTING	1492
<i>Zhichao Liu, Yisheng Zhao, Peng Fang, Jincheng Gao, Zhonghui Chen</i>	

GREEN COMMUNICATIONS III

BEAM AND USER SELECTION TECHNIQUE IN MILLIMETER WAVE COMMUNICATIONS	1497
<i>Irem Cumali, Berna Özbek, Alexander Pyattaev</i>	

COMPRESSIVE SENSING BASED LOW COMPLEXITY USER SELECTION FOR MASSIVE MIMO SYSTEMS.....	1502
<i>Saadet Simay Yilmaz, Berna Özbek</i>	

JOINT OPTIMIZATION OF AGE OF INFORMATION AND ENERGY EFFICIENCY IN IOT NETWORKS.....	1507
<i>Qamar Abbas, Shah Zeb, Syed Ali Hassan, Rafia Mumtaz, Syed Ali Raza Zaidi</i>	

ON THE PERFORMANCE OF SPATIAL MODULATION SCHEMES IN LARGE-SCALE MIMO UNDER CORRELATED NAKAGAMI FADING.....	1512
<i>Ayesha Bint Saleem, Syed Ali Hassan</i>	

SUM OF AVERAGE THROUGHPUT MAXIMIZATION IN ENERGY HARVESTING COOPERATIVE WIRELESS COMMUNICATION	1517
<i>Mateen Ashraf, Luc Vandendorpe</i>	

GREEN COMMUNICATIONS IV

LOW LATENCY AMBIENT BACKSCATTER COMMUNICATIONS WITH DEEP Q-LEARNING FOR BEYOND 5G APPLICATIONS	1522
<i>Furqan Jameel, Muhammad Ali Jamshed, Zheng Chang, Riku Jäntti, Haris Pervaiz</i>	
PACKET SCHEDULING AND COMPUTATION OFFLOADING FOR ENERGY HARVESTING DEVICES WITHOUT CSIT	1528
<i>Ibrahim Fawaz, Mireille Sarkiss, Philippe Ciblat</i>	
PERFORMANCE EVALUATION OF NONLINEAR EFFECTS IN FREQUENCY-SPLITTING SWIPT SIGNALS	1533
<i>Akashkumar Rajaram, Rui Dinis, João Madeira, Dushantha Nalin K. Jayakody, Marko Beko</i>	
SLPOW: SECURE AND LOW LATENCY PROOF OF WORK PROTOCOL FOR BLOCKCHAIN IN GREEN IOT NETWORKS	1538
<i>Abbas Yazdinejad, Gautam Srivastava, Reza M. Parizi, Ali Dehghantanha, Hadis Karimipour, Somayeh Razaghi Karizno</i>	
SUM INVERSE ENERGY EFFICIENCY MINIMIZATION FOR MULTIPLE LINKS WITH TIME SHARING	1543
<i>Zijian Wang, Luc Vandendorpe</i>	

GREEN COMMUNICATIONS V

A LIGHT BLOCKCHAIN-POWERED PRIVACY-PRESERVING ORGANIZATION SCHEME FOR RIDE SHARING SERVICES	1548
<i>Mohamed Baza, Mohamed Mahmoud, Gautam Srivastava, Waleed Alasmay, Mohamed Younis</i>	
ASSOCIATION AND SCHEDULING IN ENERGY HARVESTING NETWORKS: AGE OF INFORMATION AND FAIRNESS TRADE-OFF	1554
<i>Zoubeir Mlika, Oussama Khalifeh, Wessam Ajib</i>	
ENERGY-EFFICIENT PRECODER DESIGN FOR URLLC-ENABLED DOWNLINK MULTI-USER MISO NETWORKS USING FINITE BLOCKLENGTH CODES	1559
<i>Keshav Singh, Meng-Lin Ku, Mark F. Flanagan</i>	

CELLULAR IOT

BURST ERROR ANALYSIS OF SCHEDULING ALGORITHMS FOR 5G NR URLLC PERIODIC DETERMINISTIC COMMUNICATION	1564
<i>Johannes Demel, Carsten Bockelmann, Armin Dekorsy</i>	
JITTER SUPPRESSION FOR VERY LOW LATENCY FEEDBACK CONTROL OVER NR	1570
<i>Torbjörn Wigren, Ying Sun, Ramón A. Delgado, Katrina Lau, Richard H. Middleton</i>	
MULTI-RAT RANDOM ACCESS SCHEME UTILISING COMBINED LICENSED AND UNLICENSED SPECTRUM FOR MASSIVE MACHINE-TYPE COMMUNICATIONS	1576
<i>Che-Wei Hsu, Kallol Das, Ljupco Jorguseski</i>	
NR-WLAN AGGREGATION: ARCHITECTURE FOR SUPPORTING URLLC IN 5G IOT NETWORKS	1583
<i>Yoshiaki Ohta, Ryuichi Takechi, Hiroki Takahashi, Ryu Atsuta</i>	

OPTIMIZED 3D DRONE PLACEMENT AND RESOURCE ALLOCATION FOR LTE-BASED M2M COMMUNICATIONS	1588
<i>Ahmed Fahim, Yasser Gadallah</i>	

SENSOR NETWORKS

A NOVEL CROSS-LAYER MOBILE DATA-GATHERING PROTOCOL FOR UNDERWATER SENSOR NETWORKS.....	1593
<i>Faisal Abdulaziz Alfouzan, Seyed Mohammad Ghoreyshi, Alireza Shahrabi, Mahsa Sadeghi Ghahroudi</i>	

COST-EFFICIENT UNDERWATER ACOUSTIC SENSOR NETWORKS FOR INTERNET OF UNDERWATER THINGS	1599
<i>Yujae Song, Hui Cheol Shin</i>	

EXPERIMENTAL DEMONSTRATION OF AOA ESTIMATION UNCERTAINTY FOR IOT SENSOR NETWORKS.....	1604
<i>Shaghayegh Monfared, Trung-Hien Nguyen, Thomas Van Der Vorst, Philippe De Doncker, François Horlin</i>	

STOCHASTIC ENCODING BASED DISTRIBUTED BLIND ESTIMATION FOR DETERMINISTIC VECTOR SIGNAL	1609
<i>Wentao Zhang, Li Chen, Weidong Wang</i>	

VORONOI-BASED COOPERATIVE NODE DEPLOYMENT ALGORITHM IN MOBILE SENSOR NETWORKS.....	1614
<i>Mahsa Sadeghi Ghahroudi, Alireza Shahrabi, Tuleen Boutaleb</i>	

ENERGY EFFICIENCY

A RELIABILITY-AWARE ADAPTIVE GREEDY-MULTICAST ROUTING PROTOCOL FOR 3D HIGHLY DYNAMIC NETWORKS.....	1619
<i>Su Wang, Wengang Li, Pincan Zhao, Yuchuan Fu, Changle Li</i>	

AGE-ENERGY TRADEOFF OF SHORT PACKET BASED TRANSMISSIONS IN MULTICAST NETWORKS WITH ARQ	1624
<i>Mangang Xie, Jie Gong, Xiao Ma</i>	

BUFFER-AWARE SCHEDULING FOR UAV RELAY NETWORKS WITH ENERGY FAIRNESS	1629
<i>Yousef Emami, Kai Li, Eduardo Tovar</i>	

ENERGY-EFFICIENT TASK OFFLOADING FOR VEHICULAR EDGE COMPUTING: JOINT OPTIMIZATION OF OFFLOADING AND BIT ALLOCATION	1634
<i>Youngsu Jang, Jinyeop Na, Seongah Jeong, Joonhyuk Kang</i>	

WIRELESSLY POWERED DATA AGGREGATION VIA INTELLIGENT REFLECTING SURFACE ASSISTED OVER-THE-AIR COMPUTATION.....	1639
<i>Zhibin Wang, Yuanming Shi, Yong Zhou</i>	

ESTIMATION AND LOCALIZATION

A PRE-PROCESSING ALGORITHM UTILIZING A PAIRED CRLB FOR TDOA BASED IOT POSITIONING.....	1644
<i>Ahmed Abdel Ghany, Bernard Uguen, Dominique Lemur</i>	
A PROBABILISTIC OCTREE FUSION MODEL FOR ANALYTICAL-BASED OBSERVER FAULT DETECTION IN LSAVS	1649
<i>Abdul N. Raouf, Osama Alluhaibi, Stewart Birrell, Matthew D. Higgins, Simon Brewerton</i>	
ANCHOR SELECTION IN ANGLE-OF-ARRIVAL ESTIMATION-BASED LOCALIZATION USING POLYNOMIAL CHAOS EXPANSIONS	1656
<i>Thomas Van Der Vorst, Trung-Hien Nguyen, Shaghayegh Monfared, Aziz Benlarbi-Delai, Julien Sarrazin, François Horlin, Philippe De Doncker</i>	
DESIGN OF BLE 2-STEP SEPARATE CHANNEL FINGERPRINTING	1661
<i>Takahiro Yamamoto, Shigemi Ishida, Ryota Kimoto, Shigeaki Tagashira, Akira Fukuda</i>	
KALMAN FILTERING-AIDED HYBRID INDOOR POSITIONING SYSTEM WITH FINGERPRINTING AND MULTILATERATION.....	1667
<i>Angela Cristina Eyng, Ohara Kerusauskas Rayel, Elder Oroski, João Luiz Rebelatto</i>	

MULTIPLE ACCESS I

A SCHEDULING SCHEME FOR CHANNEL HOPPING IN WI-SUN FAN SYSTEMS TOWARD DATA THROUGHPUT ENHANCEMENT	1672
<i>Robby Wayong, Ryota Okumura, Keiichi Mizutani, Hiroshi Harada</i>	
AN EFFICIENT NPUSCH RECEIVER DESIGN FOR NB-IOT SYSTEM.....	1677
<i>Aoxiang Qin, Ruibo Tang, Peiran Wu, Minghua Xia</i>	
EFFICIENT DECODING OF SYNCHRONIZED COLLIDING LORA SIGNALS	1682
<i>Samira Abboud, Nancy El Rachkidy, Alexandre Guitton</i>	
PERFORMANCE ANALYSIS FOR THE CMA/CA PROTOCOL IN UAV-BASED IOT NETWORK	1687
<i>Xianzhen Guo, Bin Li, Kebang Liu</i>	
STATION GROUPING METHOD FOR NON-UNIFORM STATION DISTRIBUTION IN IEEE 802.11AH BASED IOT NETWORKS.....	1693
<i>Maki Shimokawa, Kosuke Sanada, Hiroyuki Hatano, Kazuo Mori</i>	

MULTIPLE ACCESS II

ADAPTIVE PRIORITY-THRESHOLD SETTING STRATEGY FOR STATISTICAL PRIORITY-BASED MULTIPLE ACCESS NETWORK.....	1698
<i>Pai Liu, Chan Wang, Ming Lei, Min Li, Minjian Zhao</i>	
CCA THRESHOLD IMPACT ON THE MAC LAYER PERFORMANCE IN IOT NETWORKS	1703
<i>Abderrahman Ben Khalifa, Razvan Stanica</i>	
IOT VIA SATELLITE: ASYNCHRONOUS RANDOM ACCESS FOR THE MARITIME CHANNEL.....	1709
<i>Federico Clazzer, Andrea Munari</i>	

OPTIMIZING NON-ORTHOGONAL MULTIPLE ACCESS IN RANDOM ACCESS NETWORKS.....	1715
<i>Ziru Chen, Yong Liu, Sami Khairy, Lin X. Cai, Yu Cheng, Ran Zhang</i>	

RANDOM INTERLEAVING MULTIPLEXING BASED RANDOM ACCESS IN IOT-ORIENTED SATELLITE NETWORKS	1720
<i>Jingrui Su, Guangliang Ren, Huining Zhang</i>	

ADVANCES IN COMMUNICATIONS I

A DELAY-DRIVEN EARLY CACHING AND SHARING STRATEGY FOR D2D TRANSMISSION NETWORK.....	1725
<i>Zhangnan Wang, Yichen Wang, Lu Wang, Tao Wang, Dongyang Xu</i>	

HIGH-PERFORMANCE AND RESOURCE-EFFICIENT IOT-BASED SLEEP MONITORING SYSTEM	1730
<i>Nico Surantha, Oei Kurniawan Utomo, Sani Muhamad Isa</i>	

INITIAL EVALUATION OF TRANSMISSION TIMING CONTROL SCHEME USING WIRELESS LAN FOR SMART FACTORY	1735
<i>Tatsuya Yoshioka, Shinji Yamaguchi, Hiroshi Aoki, Akio Hasegawa</i>	

OPEN MONITORING PLATFORM FOR MOBILE BROADBAND.....	1740
<i>Wolfgang Hofer, Philipp Svoboda, Wolfgang Kastner, Vaclav Raida, Markus Rupp</i>	

RECENT ADVANCES IN INTENT-BASED NETWORKING: A SURVEY	1745
<i>Engin Zeydan, Yekta Turk</i>	

ADVANCES IN COMMUNICATIONS II

DOPPLER POWER CHARACTERISTICS OBTAINED FROM CALIBRATED CHANNEL STATE INFORMATION FOR HUMAN ACTIVITY RECOGNITION	1750
<i>Ahmed Abdelgawwad, Andreu Catala, Matthias Pätzold</i>	

INFLUENCE OF ACCESS POINT LOCATION ON DYNAMIC INDOOR RADIO CHANNEL AT 60 GHZ	1757
<i>Marwan El Hajj, Gheorghe Zaharia, Ghais El Zein, Hanna Farhat, Sawsan Sadek</i>	

STATISTICAL CHARACTERIZATION OF WIRELESS INTERFERENCE SIGNAL BASED ON UWB SPECTRUM SENSING	1762
<i>Ramoni Adeogun, Gilberto Berardinelli, Preben Elgaard Mogensen, Ignacio Rodriguez</i>	

TINY-YOLO OBJECT DETECTION SUPPLEMENTED WITH GEOMETRICAL DATA.....	1767
<i>Ivan Khokhlov, Egor Davydenko, Ilya Osokin, Ilya Ryakin, Azer Babaev, Vladimir Litvinenko, Roman Gorbachev</i>	

SECURITY

A PHYSICAL-LAYER SECURITY BASED ON WIRELESS STEGANOGRAPHY THROUGH OFDM AND DFT-PRECODED OFDM SIGNALS.....	1772
<i>Ryohei Yamaguchi, Hideki Ochiai, Junji Shikata</i>	

A SDN/NFV-BASED CORE NETWORK SLICING FOR SECURE MOBILE COMMUNICATION	1777
<i>Nan Ma, Xiaofeng Zhong, Peng Liu, Shidong Zhou</i>	
A SECURE TRANSMISSION SCHEME AT THE RECEIVER FOR EAVESDROPPING PREVENTION	1782
<i>Sinuk Choi, Sungmin Han, Ji-Woong Choi</i>	
OPTIMAL ENERGY ALLOCATION AGAINST DENIAL-OF-SERVICE ATTACK IN CACHE-ENABLED WIRELESS NETWORKS	1787
<i>Ruimeng Gan, Yue Xiao, Jinliang Shao, Xiaotian Zhou, Wei Xiang</i>	
REPORTING SPECTRUM MISBEHAVIOUR USING THE IEEE 1609 SECURITY CREDENTIAL MANAGEMENT SYSTEM.....	1791
<i>Hamed Noori, David G. Michelson, Kevin Henry</i>	

URLLC

ADAPTIVE REPETITION CONTROL USING TERMINAL MOBILITY FOR UPLINK GRANT-FREE URLLC	1797
<i>Shinichi Ozaku, Yukiko Shimbo, Hirofumi Sukanuma, Fumiaki Maehara</i>	
ADMISSION CONTROL IN 5G NETWORKS FOR THE COEXISTENCE OF EMBB-URLLC USERS	1802
<i>Nipuni Uthpala Ginige, K. B. Shashika Manosha, Nandana Rajatheva, Matti Latva-Aho</i>	
CHANNEL QUALITY FEEDBACK ENHANCEMENTS FOR ACCURATE URLLC LINK ADAPTATION IN 5G SYSTEMS	1808
<i>Guillermo Pocovi, Ali A. Esswie, Klaus I. Pedersen</i>	
ON URLLC DOWNLINK TRANSMISSION MODES FOR MEC TASK OFFLOADING	1814
<i>Jinfei Wang, Yi Ma, Na Yi, Rahim Tafazolli</i>	

WIRELESS NETWORKS I

A NOVEL PSEUDONYM LINKING SCHEME FOR PRIVACY INFERENCE IN VANETS	1819
<i>Rui Zhang, Xin Wang, Peng Cheng, Jiming Chen</i>	
ACHIEVE PRACTICAL SECRECY WITH VECTOR PERTURBATION PRECODING	1824
<i>Liutong Du, Lihua Li, Yaxian Li, Ji Wu</i>	
ANALYTIC STUDY OF PACKET DELAY FROM 4G AND 5G SYSTEM ARQS USING SIGNAL FLOW GRAPHS	1829
<i>Sebastian Lindner, Jon David Kroening, Phuong Nga Tran, Christoph Petersen, Andreas Timm-Giel</i>	
QUALITY OF SERVICE AWARE TRAFFIC MANAGEMENT FOR AIRCRAFT COMMUNICATIONS	1834
<i>David Tomic, Sandra Hofmann, Mustafa Ozger, Dominic Schupke, Cicek Cavdar</i>	
QUALITY OF SERVICE DRIVEN RESOURCE ALLOCATION IN NETWORK SLICING.....	1840
<i>S. Saibharath, Sudeepta Mishra, Chittaranjan Hota</i>	
SDN-BASED MISBEHAVIOR DETECTION SYSTEM FOR VEHICULAR NETWORKS	1845
<i>Abdelwahab Boualouache, Ridha Soua, Thomas Engel</i>	

WIRELESS NETWORKS II

HIGH DEFINITION VIDEO PACKET SCHEDULING ALGORITHMS FOR IEEE802.11AC NETWORKS TO ENHANCE QOE	1850
<i>Summera Nosheen, Jamil Y. Khan</i>	
IMPACT OF INTERFERENCE SUPPRESSION UNDER RAY TRACING AND 3GPP STREET CANYON MODEL.....	1855
<i>Muhammad Usman Sheikh, Riku Jäntti, Jyri Hämäläinen</i>	
ON THE INAPPROPRIATENESS OF STATIC MEASUREMENTS FOR BENCHMARKING IN WIRELESS NETWORKS	1861
<i>Vaclav Raida, Philipp Svoboda, Markus Rupp</i>	
PHYSICAL LAYER SECURITY IN VEHICULAR NETWORKS WITH RECONFIGURABLE INTELLIGENT SURFACES.....	1866
<i>Abubakar U. Makarfi, Khaled M. Rabie, Omprakash Kaiwartya, Xingwang Li, Rupak Kharel</i>	
QOS ENHANCEMENTS FOR V2X SERVICES IN 5G NETWORKS	1872
<i>Riccardo Trivisonno, Qing Wei, Clarissa Cassales Marquezan</i>	

WIRELESS NETWORKS III

ACHIEVABLE SECRECY RATE IN MMWAVE MULTIPLE-INPUT SINGLE-OUTPUT AD HOC NETWORKS	1877
<i>Ahmed F. Darwesh, Abraham O. Fapojuwo</i>	
CSAI: OPEN-SOURCE CELLULAR RADIO ACCESS NETWORK SECURITY ANALYSIS INSTRUMENT	1883
<i>Thomas Byrd, Vuk Marojevic, Roger Piqueras Jover</i>	
PHYSICAL LAYER SECURITY IN MULTI-USER WIRELESS NETWORKS: INTERFERENCE EFFECT ON LARGE SCALE ANALYSIS	1888
<i>Mehdi Sadeghzadeh, Masoud Salehi</i>	
SECRECY ANALYSIS OF UAV-AIDED RELAYING SYSTEMS	1894
<i>Liang Yang, Xiaoqiong Long, Jun Zhang</i>	
SUPPRESSION OF 802.11 TRANSMISSION IN 2.4GHZ ISM BAND: METHOD AND EXPERIMENTAL VERIFICATION.....	1899
<i>Peiliang Zuo, Tao Peng, Hao Wu, Kangyong You, Hanbo Jing, Wenbin Guo, Wenbo Wang</i>	
TOWARDS SEAMLESS PRODUCER MOBILITY IN INFORMATION CENTRIC VEHICULAR NETWORKS.....	1905
<i>Vignesh Sivaraman, Dibyajyoti Guha, Biplab Sikdar</i>	

POSITIONING AND NAVIGATION I

LARGE INTELLIGENT SURFACE FOR POSITIONING IN MILLIMETER WAVE MIMO SYSTEMS.....	1910
<i>Jiguang He, Henk Wymeersch, Long Kong, Olli Silvén, Markku Juntti</i>	
STATISTICAL BEAM INFORMATION FOR MMW POSITIONING.....	1915
<i>Ramón A. Delgado, Torbjörn Wigren, Katrina Lau, Richard H. Middleton, Iana Siomina</i>	

INTERSYMBOL INTERFERENCE CANCELLATION ON ULTRA-WIDEBAND IMPULSE RADIO POSITIONING	1920
<i>Xufang Wang, Feng Lin, Wen-Kang Jia</i>	

METROPOLITAN FIELD TRIAL OF FINGERPRINT-BASED LOCALIZATION UTILIZING RESIDUAL OF RECEIVED-SIGNAL-STRENGTH.....	1925
<i>Jun Sakai, Takafumi Yanaga, Kohta Sugaya, Shinya Kurumatani</i>	

FAST LOOP CLOSURES DETECTION METHOD FOR GEOMAGNETIC SIGNAL AND LIDAR FUSION	1930
<i>Beizhang Chen, Panwei Li, Huiyun Li</i>	

POSITIONING AND NAVIGATION II

PERFORMANCE OF HIGH-ACCURACY PHASE-BASED RANGING IN MULTIPATH ENVIRONMENTS	1936
<i>Pepijn Boer, Jac Romme, Jochem Govers, Guido Dolmans</i>	

PRACTICAL EVALUATION OF SMARTPHONE-BASED MULTI-FLOORS INDOOR POSITIONING SYSTEM USING ENHANCED PEDESTRIAN DEAD RECKONING AND MAP CALIBRATION	1941
<i>Jing-Wen Liu, Jun-Bang Jiang, Shao-Yung Huang, Kuan-Wu Su, Min-Chieh Yu, Jenq-Shiou Leu</i>	

BAG-OF-VISUAL WORDS BASED IMPROVED IMAGE RETRIEVAL ALGORITHM FOR VISION INDOOR POSITIONING.....	1946
<i>Shuang Jia, Lin Ma, Xuezhi Tan, Danyang Qin</i>	

A METHOD OF MONOCULAR VISUAL ODOMETRY COMBINING FEATURE POINTS AND PIXEL GRADIENT FOR DYNAMIC SCENE	1950
<i>Panwei Li, Huiyun Li, Beizhang Chen</i>	

VISIBLE LIGHT INDOOR POSITIONING ALGORITHM BASE ON THE FRUIT FLY MODIFIED DV-HOP METHOD	1955
<i>Yuexia Zhang, Shengwang Yin, Jiacheng Jin</i>	

POSITIONING AND NAVIGATION III

CLUTTER REMOVAL FOR WI-FI-BASED PASSIVE BISTATIC RADAR.....	1961
<i>Laurent Storrer, Hasan Can Yildirim, Claude Desset, Marc Bauduin, André Bourdoux, François Horlin</i>	

IP3/DR - A LOW-COST PRECISE AND ROBUST GNSS/INS INTEGRATED NAVIGATION SYSTEM FOR LAND VEHICLES	1966
<i>Hongzhou Yang, Haiyu Lan, Fei Liu, Yang Gao, Naser Elsheimy</i>	

ITERATIVE BAYESIAN-BASED LOCALIZATION MECHANISM FOR INDUSTRY VERTICALS	1971
<i>Henrique Hilleshein, H. M. Carlos De Lima, Hirley Alves, Matti Latva-Aho</i>	

RELATIVE POSITIONING OF AUTONOMOUS SYSTEMS USING SIGNALS OF OPPORTUNITY	1976
<i>Nicolas Souli, Panayiotis Kolios, Georgios Ellinas</i>	

SECTOR FITTING - A NOVEL POSITIONING ALGORITHM FOR SECTORIZED TRANSMITTERS.....	1982
<i>Simon Sundberg, Johan Garcia</i>	

SATELLITE NETWORKS AND HAPS

ON AD HOC ON-DEMAND DISTANCE VECTOR ROUTING IN LOW EARTH ORBIT NANOSATELLITE CONSTELLATIONS.....	1987
<i>Néstor J. Hernández Marcano, Jonas Gabs Fugl Nørby, Rune Hylsberg Jacobsen</i>	

AN OPTIMIZATION METHOD FOR THE GATEWAY STATION DEPLOYMENT IN LEO SATELLITE SYSTEMS	1993
<i>Chaoyi Zhu, Yitao Li, Manqing Zhang, Qi Wang, Wuyang Zhou</i>	

A STUDY ON SIGNAL BAND DIVISION INTERFERENCE CANCELLER FOR HAPS FEEDER LINKS WITH MULTI-GATEWAYS.....	2000
<i>Takafumi Fujii, Yoshichika Ohta, Teruya Fujii</i>	

KA-BAND BASED CHANNEL MODELING AND ANALYSIS IN HIGH ALTITUDE PLATFORM(HAP) SYSTEM	2007
<i>Jiarui Zhao, Qi Wang, Yitao Li, Jiayi Zhou, Wuyang Zhou</i>	

TEPLITS: A COMPREHENSIVE TEST PLATFORM FOR INTELLIGENT TRANSPORTATION SYSTEMS	2012
<i>Florian A. Schiegg, Shuo Li, Nikolay Mikhaylov</i>	

DRIVING ASSISTANCE I

A SCHEME ON PEDESTRIAN DETECTION USING MULTI-SENSOR DATA FUSION FOR SMART ROADS.....	2017
<i>Hui Wang, Changle Li, Yao Zhang, Zhao Liu, Yilong Hui, Guoqiang Mao</i>	

A STEREO PERCEPTION FRAMEWORK FOR AUTONOMOUS VEHICLES	2022
<i>Narsimlu Kemsaram, Anweshan Das, Gijs Dubbelman</i>	

GAN-CRT: A NOVEL RANGE-DOPPLER ESTIMATION METHOD IN AUTOMOTIVE RADAR SYSTEMS	2028
<i>Yun-Han Pan, Chia-Hung Lin, Ta-Sung Lee</i>	

MODEL PREDICTIVE MOTION PLANNING FOR AUTONOMOUS VEHICLE IN MID-HIGH OVERTAKING SCENE	2035
<i>Xiaoyu Yang, Huiyun Li</i>	

ON-ROAD OBJECT IDENTIFICATION WITH TIME SERIES AUTOMOTIVE MILLIMETER-WAVE RADAR INFORMATION	2040
<i>Takashi Nakamura, Kentaroh Toyoda, Tomoaki Ohtsuki</i>	

DRIVING ASSISTANCE II

A DIGITAL TWIN PARADIGM: VEHICLE-TO-CLOUD BASED ADVANCED DRIVER ASSISTANCE SYSTEMS	2045
<i>Ziran Wang, Xishun Liao, Xuanpeng Zhao, Kyungtae Han, Prashant Tiwari, Matthew J. Barth, Guoyuan Wu</i>	

CAMERA VS. COOPERATIVE VRU COLLISION AVOIDANCE	2051
<i>Marek Bachmann, Michel Morold, Sebastian Engel, Johann Götz, Klaus David</i>	
MODELING THE IMPACT OF TRAFFIC SIGNALS ON V2V INFORMATION FLOW	2056
<i>Jungyeol Kim, Rohan Saraogi, Saswati Sarkar, Santosh S. Venkatesh</i>	
ON THE APPLICATION OF MACHINE LEARNING FOR CUT-IN MANEUVER RECOGNITION IN PLATOONING SCENARIOS	2063
<i>Afaf Bouhoute, Mohamed Mosbah, Akka Zemmari, Ismail Berrada</i>	
PERFORMANCE ANALYSIS OF EMBEDDED PLATOON CONTROLLERS	2068
<i>Amr Ibrahim, Iñaki Martín Soroa, Hong Li, Dip Goswami, Twan Basten</i>	

ELECTRIC VEHICLES

DEVELOPMENT OF PLC BASED COMMUNICATION ARCHITECTURE FOR BATTERY MANAGEMENT SYSTEM.....	2075
<i>Muhammad Shamoon Saleem</i>	
ELECTRONIC DIFFERENTIAL SYSTEM FOR AN ELECTRIC VEHICLE WITH FOUR IN- WHEEL PMSM	2080
<i>Merve Yildirim, Hasan Kurum</i>	
ESTIMATING ENVIRONMENTAL PARAMETERS IN CONNECTED ELECTRIC POWERTRAINS USING SET-MEMBERSHIP FILTERING	2085
<i>Arian Ahmadi, Peter H. Bauer, Yih-Fang Huang</i>	
SIMULATION OF AN ELECTRIC VEHICLE TO STUDY THE IMPACT OF CABIN HEATING ON THE DRIVING RANGE	2090
<i>David Ramsey, Alain Bouscayrol, Loïc Boulon, Alexandre Vaudrey</i>	
SOC ESTIMATION OF LFP BATTERY BASED ON EKF OBSERVER AND A FULL POLYNOMIAL PARAMETERS-MODEL	2095
<i>Ines Baccouche, Bilal Manai, Najoua Essoukri Ben Amara</i>	

ELECTRIC VEHICLES AND INTELLIGENT TRANSPORTATION

A TIME-DELAY NEURAL NETWORK OF SIDESLIP ANGLE ESTIMATION FOR IN- WHEEL MOTOR DRIVE ELECTRIC VEHICLES	2100
<i>Jizheng Liu, Zhenpo Wang, Lei Zhang</i>	
BENCHMARKING ALTERNATIVE TECHNOLOGIES FOR PROVIDING VOICE SERVICES ONBOARD TRAINS.....	2105
<i>Herman Mikkelsen, Rikard Reinham, Mats Karlsson, Claes Beckman</i>	
ELECTRIC VEHICLES CHARGING SCHEDULING OPTIMIZATION FOR TOTAL ELAPSED TIME MINIMIZATION	2112
<i>Li Ping Qian, Xinyue Zhou, Ningning Yu, Yuan Wu</i>	
TRAFFIC SIMULATION OF CONNECTED AND AUTONOMOUS FREIGHT VEHICLES TO INCREASE TRAFFIC THROUGHPUT VIA ROAD TUNNEL NETWORKS	2117
<i>Kushagra Bhargava, Matthew D. Higgins, Kum Wah Choy, Paul A. Jennings</i>	
VEHICLE TRAJECTORY ESTIMATION BASED ON DYNAMIC BAYESIAN NETWORKS	2122
<i>Pedro Rio, Rodolfo Oliveira</i>	

ITS I

DARE: A REPORTS DATASET FOR GLOBAL MISBEHAVIOR AUTHORITY EVALUATION IN C-ITS	2127
<i>Farah Haidar, Joseph Kamel, Ines Ben Jemaa, Arnaud Kaiser, Brigitte Lonc, Pascal Urien</i>	
IMPACT OF IMPERFECT COMMUNICATION ON COOPERATIVE VEHICULAR MANEUVERING AT INTERSECTIONS	2133
<i>Daniel Bischoff, Florian Schiegg, Tobias Meuser, Ralf Steinmetz</i>	
LATENCY ASSESSMENT OF AN ITS SAFETY APPLICATION PROTOTYPE FOR PROTECTING CROSSING PEDESTRIANS	2138
<i>Guido A. Gavilanes Castillo, Edoardo Bonetto, Daniele Brevi, Francesco Scappatura, Anooq Sheikh, Riccardo Scopigno</i>	
MEC-BASED INFOTAINMENT SERVICES FOR SMART ROADS IN 5G ENVIRONMENTS	2143
<i>Dario Sabella, Daniele Brevi, Edoardo Bonetto, Anurag Ranjan, Antonio Manzalini, Dario Salerno</i>	
PLATOON-BASED COOPERATIVE INTERSECTION MANAGEMENT STRATEGIES	2149
<i>Neha Bisht, Rahi Avinash Shet</i>	

ITS II

NIGHT TIME VEHICLE DETECTION AND TRACKING BY FUSING SENSOR CUES FROM AUTONOMOUS VEHICLES	2155
<i>Xinxiang Zhang, Brett Story, Dinesh Rajan</i>	
ON URBAN TRAFFIC FLOW BENEFITS OF CONNECTED AND AUTOMATED VEHICLES	2162
<i>Ioannis Mavromatis, Andrea Tassi, Robert J. Piechocki, Mahesh Sooriyabandara</i>	
P2C2: PEER-TO-PEER CAR CHARGING	2169
<i>Prabuddha Chakraborty, Robert Parker, Tamzidul Hoque, Jonathan Cruz, Swarup Bhunia</i>	
PREDICTIVE QUALITY OF SERVICE: ADAPTATION OF PLATOON INTER-VEHICLE DISTANCE TO PACKET INTER-RECEPTION TIME	2174
<i>Andreas Pfadler, Guillaume Jornod, Ahmad El Assaad, Peter Jung</i>	
REPEATABLE SIMULATION FOR HIGHLY AUTOMATED DRIVING DEVELOPMENT AND TESTING	2179
<i>Wojciech Baron, Christoph Sippl, Kai-Steffen Hielscher, Reinhard German</i>	

SYSTEMS & SECURITY

A SIMULTANEOUS ATTACK SCENARIO GENERATION METHOD USING THE PARALLEL BEHAVIOR MODEL	2186
<i>Toshiyuki Fujikura, Ryo Kurachi</i>	
EXPERIMENTAL ASSESSMENT OF WHEEL-TERRAIN INTERACTION MODEL SUITABILITY AND APPLICABILITY	2193
<i>Yuewei He, Yongkun Zhao, Zi Wang, Wenjun Zhu, Lihang Feng</i>	

SECURE VIRTUAL RESOURCE ALLOCATION IN HETEROGENEOUS NETWORKS FOR INTELLIGENT TRANSPORTATION..... 2197
Haotong Cao, Shengchen Wu, Yue Hu, Feng Tian, Longxiang Yang

WIRELESS HEALTHCARE SYSTEM FOR LIFE DETECTION AND VITAL SIGN MONITORING 2202
Lili Xie, Jun Tian, Hongchun Li, Qian Zhao

UAV I

CONSTRUCTION OF A TEMPORARY MESSAGE COLLECTION SYSTEM USING A DRONE FOR REFUGEES IN A LARGE-SCALE DISASTER 2207
Azusa Danjo, Atsuki Murata, Shinsuke Hara, Takahiro Matsuda, Fumie Ono

ENERGY-EFFICIENT TRANSMIT POWER AND STRAIGHT TRAJECTORY OPTIMIZATION IN UAV-AIDED WIRELESS SENSOR NETWORKS 2212
Yue Ma, Yanqun Tang, Jia Tao, Di Zhang, Siyu Tao, Wei Li

EXTRACTING THE FUNDAMENTAL DIAGRAM FROM AERIAL FOOTAGE 2219
R. Makrigiorgis, P. Kolios, S. Timotheou, T. Theocharides, C. G. Panayiotou

RESOURCE AWARENESS IN UNMANNED AERIAL VEHICLE-ASSISTED MOBILE-EDGE COMPUTING SYSTEMS 2224
Xianfu Chen, Tao Chen, Zhifeng Zhao, Honggang Zhang, Mehdi Bennis, Yusheng Ji

UPFLIGHT: AN ENABLER FOR AVIONIC MEC IN A DRONE-EXTENDED 5G MOBILE NETWORK 2230
Umberto Fattore, Marco Liebsch, Carlos J. Bernardos

UAV II

MODELLING AND SIMULATION OF EGO-NOISE OF UNMANNED AERIAL VEHICLES 2237
Xabier Insausti, Bjørn O. Hogstad, Matthias Pätzold

ON THE DESIGN OF A HIGH-THROUGHPUT COMMUNICATION LINK FOR SHORT-RANGE UAVS OPERATING IN DENSE URBAN ENVIRONMENT 2242
Rafal Krenz, Michal Sybis, Pawel Sroka, Krzysztof Wesolowski

OPTIMIZED TOUR PLANNING FOR DRONE-BASED URBAN TRAFFIC MONITORING 2248
C. Christodoulou, P. Kolios

TOWARDS THE DEVELOPMENT OF A ROBUST PATH PLANNER FOR AUTONOMOUS DRONES 2253
Gopi Gagan, Anwar Haque

UNMANNED AERIAL VEHICLES FOR PACKAGE DELIVERY AND NETWORK COVERAGE 2259
Mohammadjavad Khosravi, Hossein Pishro-Nik

AERIAL COMMUNICATIONS

A STUDY OF CO-CHANNEL SPECTRUM-SHARING SYSTEM BETWEEN HAPS AND TERRESTRIAL MOBILE COMMUNICATION NETWORKS..... 2264
Mitsukuni Konishi, Takuya Nishimaki, Yohei Shibata, Sho Nabatame, Atsushi Nagate

DEVELOPMENT AND EXPERIMENTAL VERIFICATION OF AUTONOMOUS COLLISION RISK AVOIDANCE SYSTEM FOR UAV BASED ON DEVICE-TO-DEVICE COMMUNICATION	2269
<i>Fumie Ono, Toshinori Kagawa, Lin Shan, Ryu Miura, Fumihide Kojima, Katsuhiko Yokota</i>	
EFFICIENT AND COORDINATED VERTICAL TAKEOFF OF UAV SWARMS	2274
<i>Francisco Fabra, Jamie Wubben, Carlos T. Calafate, Juan Carlos Cano, Pietro Manzoni</i>	
OPTIMAL UAV POSITIONING FOR TERRESTRIAL USERS	2279
<i>Leïla Nasraoui, Sumit Roy</i>	
POSITIONING OF MULTIPLE UNMANNED AERIAL VEHICLE BASE STATIONS IN FUTURE WIRELESS NETWORK	2284
<i>Thushan Sivalingam, K. B. Shashika Manosha, Nandana Rajatheva, M. Latva-Aho, Maheshi B. Dissanayake</i>	

VEHICULAR AND AD-HOC NETWORKS I

A DIRECTIONAL CLUSTERING PROTOCOL FOR MILLIMETER WAVE VEHICULAR AD HOC NETWORKS	2290
<i>Mohammed S. Bahbahani, Emad Alsusa</i>	
AN EFFICIENT COORDINATOR SELECTION METHOD FOR GEO-ROUTING PROTOCOL IN VEHICULAR NETWORK.....	2296
<i>Farzana Shabnam, Abbas Jamalipour</i>	
DELAY-MINIMIZATION LINK SELECTION FOR HETEROGENEOUS VLC-DSRC VANETS	2301
<i>Kaixuan Ji, Yuhan Dong, Jiaxuan Chen, Tianqi Mao, Zhaocheng Wang</i>	
MULTI-HOP RELAYING IN MMWAVE BAND FOR NEXT GENERATION TRAIN RADIO.....	2306
<i>Qianrui Li, Nicolas Gresset</i>	
MULTIPLE CHANNEL ACCESS USING DEEP REINFORCEMENT LEARNING FOR CONGESTED VEHICULAR NETWORKS	2311
<i>Chungjae Choe, Junsung Choi, Jangyong Ahn, Dongryul Park, Seungyoung Ahn</i>	

VEHICULAR AND AD-HOC NETWORKS II

COMMUNICATION-EFFICIENT OPTIMAL CONTROL DESIGN FOR DISTRIBUTED CONTROL SYSTEMS IN COOPERATIVE VEHICULAR NETWORKS.....	2317
<i>Myung Cho, Abdallah S. Abdallah</i>	
COOPERATIVE AWARENESS MESSAGE DISSEMINATION IN EN 302 637-2: AN ADAPTATION FOR WINDING ROADS	2322
<i>Juan Aznar-Poveda, Esteban Egea-López, Antonio-Javier García-Sánchez</i>	
CVS: DESIGN, IMPLEMENTATION, VALIDATION AND IMPLICATIONS OF A REAL-WORLD V2I PROTOTYPE TESTBED.....	2327
<i>Alessandro Marchetto, Panagiotis Pantazopoulos, András Varádi, Silvia Capato, Angelos Amditis</i>	
EFFICIENT VEHICULAR CROWDSOURCING MODELS IN VANET FOR DISASTER MANAGEMENT	2332
<i>Marie-Ange Lebre, Frédéric Le Mouël, Eric Ménard</i>	

REDUNDANCY MITIGATION IN COOPERATIVE PERCEPTION FOR CONNECTED AND AUTOMATED VEHICLES.....	2337
<i>Gokulnath Thandavarayan, Miguel Sepulcre, Javier Gozalvez</i>	

VEHICULAR COMMUNICATIONS I

DYNAMIC CONTROL OF TRANSMISSION INTERVAL FOR EFFICIENT PEDESTRIAN-TO-VEHICLE COMMUNICATION BASED ON CHANNEL UTILIZATION RATE	2342
<i>Shun Ito, Suhua Tang, Sadao Obana</i>	

EXPLOITING LARGE VEHICLES WITH HIGH ANTENNA FOR EFFICIENT RELAY IN INTER-VEHICLE COMMUNICATION	2347
<i>Takuya Mori, Suhua Tang, Sadao Obana</i>	

FULL-DUPLEX STORE-CARRY-FORWARD SCHEME FOR INTERMITTENTLY CONNECTED VEHICULAR NETWORKS.....	2352
<i>Ali A. Siddig, Ahmed S. Ibrahim, Mahmoud H. Ismail</i>	

RELIABLE GRAPH-SLAM FRAMEWORK TO GENERATE 2D LIDAR INTENSITY MAPS FOR AUTONOMOUS VEHICLES.....	2358
<i>Mohammad Aldibaja, Noaki Sukanuma, Reo Yanase, Keisuke Yoneda</i>	

VIRTUAL SUBCARRIER AIDED CHANNEL ESTIMATION SCHEMES FOR TRACKING RAPID TIME VARIANT CHANNELS IN IEEE 802.11P SYSTEMS	2364
<i>Seungho Han, Jinsu Park, Changick Song</i>	

VEHICULAR COMMUNICATIONS II

5G V2X COMMUNICATION AT MILLIMETER WAVE: RATE MAPS AND USE CASES	2369
<i>W. Zheng, A. Ali, N. González-Prelcic, R. W. Heath, A. Klautau, E. Moradi Pari</i>	

A NEW MODE SELECTION AND RESOURCE REUSE STRATEGY FOR V2X IN FUTURE CELLULAR NETWORKS	2374
<i>Haider Daami R. Albonda, J. Pérez-Romero</i>	

CODEBOOK PERFORMANCE EVALUATION OF MMWAVE IN TRAIN COMMUNICATIONS	2380
<i>Stavros Typos, Vaia Kalokidou, Simon Armour, Angela Doufexi, Evangelos Mellios, Andrew Nix</i>	

CONCEPTION AND REALIZATION OF A MOBILE HIL TEST BENCH FOR V2X COMMUNICATION	2386
<i>Soeren Scherler, Xiaobo Liu-Henke</i>	

EMPIRICAL INVESTIGATION OF SDR-BASED DSRC COMMUNICATION.....	2391
<i>Steven Knowles Flanagan, Xiao-Hong Peng, Irfan Yusoff, Jianhua He</i>	

IMPACTS OF CHANNEL LOSS AND ELECTROMAGNETIC INTERFERENCE ON INTRA-VEHICLE WIRELESS COMMUNICATIONS.....	2396
<i>Irfan Yusoff, Xiao-Hong Peng</i>	

VEHICULAR COMMUNICATIONS III

LINK LEVEL PERFORMANCE COMPARISON OF C-V2X AND ITS-G5 FOR VEHICULAR CHANNEL MODELS.....	2401
<i>Raja Sattiraju, Donglin Wang, Andreas Weinand, Hans D. Schotten</i>	
NEURAL NETWORK EQUALISATION AND SYMBOL DETECTION FOR 802.11P V2V COMMUNICATION AT 5.9GHZ.....	2408
<i>Scott Stainton, Waseem Ozan, Martin Johnston, Satnam Dlay, Paul Anthony Haigh</i>	
PERFORMANCE COMPARISON BETWEEN LTE-V2X AND ITS-G5 UNDER REALISTIC URBAN SCENARIOS.....	2413
<i>Mouna Karoui, Antonio Freitas, Gerard Chalhoub</i>	
QOS EVALUATION AND PREDICTION FOR C-V2X COMMUNICATION IN COMMERCIALY-DEPLOYED LTE AND MOBILE EDGE NETWORKS.....	2420
<i>Luis Torres-Figueroa, Henning F. Schepker, Josef Jiru</i>	
VEHICLE TO INFRASTRUCTURE VLC CHANNEL MODELS	2427
<i>Xiaotong Shen, Harald Haas</i>	

VEHICULAR COMMUNICATIONS IV

C-ITS DATA COMPLETION TO IMPROVE UNSUPERVISED DRIVING PROFILE DETECTION.....	2432
<i>Brice Leblanc, Secil Ercan, Cyril De Runz</i>	
C-V2X RESOURCE DEPLOYMENT ARCHITECTURE BASED ON MOVING NETWORK CONVOYS.....	2437
<i>Venkatnarayanan Lakshminarasimhan, Alois Knoll</i>	
CVIN: CONNECTED VEHICLE INFORMATION NETWORK	2443
<i>Nikhil Prakash, David G. Michelson, Chen Feng</i>	
DENM REPETITIONS TO ENHANCE RELIABILITY OF THE AUTONOMOUS MODE IN NR V2X SIDELINK.....	2449
<i>Francesco Romeo, Claudia Campolo, Antonella Molinaro, Antoine O. Berthet</i>	
EXPERIMENTAL ANALYSIS OF SAFETY APPLICATION RELIABILITY IN V2V NETWORKS.....	2454
<i>Biplav Choudhury, Vijay K Shah, Avik Dayal, Jeffrey H. Reed</i>	

VEHICULAR COMMUNICATIONS V

ADAPTIVE SAMPLING FOR THE OPTIMAL SIGNAL RECONSTRUCTION OF VEHICLE TELEMATICS	2459
<i>Jie Ren, Yong Li, Kan Tang, Shuai Sun, Xuwei Wang, Chiaruei Liu</i>	
COLLABORATIVE AND DISTRIBUTED MECHANISMS FOR TRAFFIC JAMS DETECTION AND CONTROL USING VANETS.....	2464
<i>Bruno Cunha Farias, Carlos Alberto V. Campos</i>	

COMBINATORIAL OPTIMIZATION-BASED TASK ALLOCATION MECHANISM FOR VEHICULAR CLOUDS	2469
<i>Joahannes B. D. Da Costa, Rodolfo I. Meneguette, Denis Rosário, Leandro A. Villas</i>	
LEADER SELECTION IN VEHICULAR AD-HOC NETWORKS: A PROACTIVE APPROACH.....	2474
<i>Rusheng Zhang, Baptiste Jacquemot, Kagan Bakirci, Sacha Bartholme, Killian Kaempf, Baptiste Freydt, Loic Montandon, Shenqi Zhang, Ozan K. Tonguz</i>	
NDNIDS: AN INTRUSION DETECTION SYSTEM FOR NDN BASED VANET	2479
<i>Praveensankar Manimaran, Arun Raj Kumar P.</i>	

VEHICULAR COMMUNICATIONS VI

BLOCKCHAIN-BASED INFORMATION SHARING BETWEEN SMART VEHICLES FOR SAFE DRIVING	2484
<i>Keonhyeong Kim, Taehyoung Kim, Im Y. Jung</i>	
BUMBLEBEE-INSPIRED C-V2X DYNAMIC SPECTRUM ACCESS TESTBED USING OPENAIRINTERFACE.....	2486
<i>Kuldeep S. Gill, Kevin N. Heath, Sreeshti Chuke, Aneela Haider, Robert J. Gegeer, Elizabeth F. Ryder, Alexander M. Wyglinski</i>	
DEGREE CENTRALITY-BASED CACHING DISCOVERY PROTOCOL FOR VEHICULAR NAMED-DATA NETWORKS.....	2491
<i>Lucas B. Rondon, Joahannes B. D. Da Costa, Geraldo P. Rocha Filho, Denis Rosário, Leandro A. Villas</i>	
GUIDELINES FOR SIMULATING/EMULATING SOFTWARE-DEFINED NETWORKS IN CONNECTED VEHICLES.....	2496
<i>David Franco, Marina Aguado, Nerea Toledo, Marivi Higuero</i>	
IS PACKET DROPPING A SUITABLE CONGESTION CONTROL MECHANISM FOR VEHICULAR NETWORKS?.....	2502
<i>Miguel Sepulcre, Jorge Mira, Gokulnath Thandavarayan, Javier Gozalvez</i>	

W1: TERAHERTZ COMMUNICATION FOR FUTURE WIRELESS SYSTEMS

HYBRID PRECODING TECHNIQUES FOR THZ MASSIVE MIMO IN HOTSPOT NETWORK DEPLOYMENT	2507
<i>Sherif Adeshina Busari, Shahid Mumtaz, Jonathan Rodriguez</i>	
INDOOR-TO-OUTDOOR PATH LOSS MEASUREMENTS IN AN AIRCRAFT FOR TERAHERTZ COMMUNICATIONS.....	2513
<i>Johannes M. Eckhardt, Tobias Doeker, Thomas Kürner</i>	
SHINE (STRATEGIES FOR HIGH-FREQUENCY INDOOR ENVIRONMENTS) WITH EFFICIENT THZ-AP PLACEMENT	2518
<i>Rohit Singh, Douglas Sicker</i>	

W2: EMERGING BLOCKCHAIN TECHNOLOGY SOLUTIONS FOR REAL-WORLD APPLICATIONS (EBTSRA)

A BLOCKCHAIN-BASED TRUSTED SERVICE MECHANISM FOR CROWDSOURCING SYSTEM..... 2525
Liang Tan, Huan Xiao, Xinglin Shang, Yong Wang, Feng Ding, Wenjuan Li

A LIGHTWEIGHT DATA SHARING MECHANISM AND MULTIPARTY COMPUTATION FOR CPS..... 2531
Zhenpeng Xu, Jian Yang, Jinyong Yin

A TWO-TIER BLOCKCHAIN ARCHITECTURE FOR THE DIGITAL TRANSFORMATION OF MULTILATERALISM..... 2536
Clay Lin, Zhijun William Zhang

BLOCKCHAIN BASED POWER TRANSACTION ASYNCHRONOUS SETTLEMENT SYSTEM..... 2541
Songpu Ai, Diankai Hu, Tong Zhang, Yunpeng Jiang, Chunming Rong, Junwei Cao

BLOCKCHAIN-BASED CONTENT-ORIENTED SURVEILLANCE NETWORK..... 2547
Xin Qi, Keping Yu, Zheng Wen, San Hlaing Myint, Yutaka Katsuyama, Toshio Sato, Kiyohito Tokuda, Takuro Sato

W3: 1ST INTERNATIONAL WORKSHOP ON NEXT GENERATION ROAD WEATHER AND AIR POLLUTION SERVICES (NG-ROWS)

AIR QUALITY AND MOBILITY EXTENSIBLE SENSOR PLATFORM..... 2553
Laurent Morin, Francois Bodin, Benjamin Depardon, Yiannis Georgiou

INTELLIGENT TRANSPORT SYSTEMS – ROAD WEATHER INFORMATION AND FORECAST SYSTEM FOR VEHICLES..... 2558
Daria Stepanova, Timo Sukuvaara, Virve Karsisto

PMS CONCENTRATION FORECASTING USING ARIMA ALGORITHM..... 2563
Andreea Badicu, George Suciu, Mihaela Balanescu, Marius Dobrea, Andrei Birdici, Oana Orza, Adrian Pasat

THE SPATIAL ESTIMATION OF ROAD SURFACE CONDITION USING SPATIOTEMPORAL FEATURES..... 2568
Minwoo Lee, Yejong Ryu, Yongjoo Jun

TOWARDS DETECTION OF ROAD WEATHER CONDITIONS USING LARGE-SCALE VEHICLE FLEETS..... 2573
Siegfried Mercelis, Sylvain Watelet, Wim Casteels, Toon Bogaerts, Joris Van Den Bergh, Maarten Reyniers, Peter Hellinckx

TRUST: TRANSPORTATION AND ROAD MONITORING SYSTEM FOR UBIQUITOUS REAL-TIME INFORMATION SERVICES..... 2580
João Almeida, João Rufino, Francisco Cardoso, Miguel Gomes, Joaquim Ferreira

USING FLOATING CAR DATA FOR MORE PRECISE ROAD WEATHER FORECASTS..... 2587
Meike Hellweg, John-Walter Acevedo-Valencia, Zoi Paschalidi, Jens Nachtigall, Thomas Kratzsch, Christoph Stiller

W4: ARTIFICIAL INTELLIGENCE DRIVEN EMERGING SOLUTIONS, PROTOCOLS AND TECHNOLOGIES FOR RELIABLE, SCALABLE AND ENERGY-EFFICIENT FUTURE GENERATION NETWORKS

DEEP LEARNING BASED DIVERSITY COMBINING FOR GENERIC NOISE AND INTERFERENCE 2590
Imtiaz Ahmed, Evan J. Allen

OPTIMAL BEAM SEPARATION IN AUXILIARY BEAM PAIR-BASED INITIAL ACCESS IN MMWAVE D2D NETWORKS 2594
Sadaf Nawaz, Syed Ali Hassan

OPTIMAL RESOURCE ALLOCATION VIA MACHINE LEARNING IN COORDINATED DOWNLINK MULTI-CELL OFDM NETWORKS UNDER IMPERFECT CSI 2599
Yunan Guo, Fu-Chun Zheng, Jingjing Luo, Xiaoming Wang

RF FINGERPRINTING AND DEEP LEARNING ASSISTED UE POSITIONING IN 5G 2605
M. Majid Butt, Anil Rao, Daejung Yoon

SPECTRUM OCCUPANCY PREDICTION EXPLOITING TIME AND FREQUENCY CORRELATIONS THROUGH 2D-LSTM 2612
Mehmet Ali Aygül, Mahmoud Nazzal, Ali Riza Ekti, Ali Görçin, Daniel Benevides Da Costa, Hasan Fehmi Ates, Hüseyin Arslan

W5: TECHNOLOGY TRIALS AND PROOF-OF-CONCEPT ACTIVITIES FOR 5G EVOLUTION & BEYOND 5G 2020 (TPOC5GE 2020)

28 GHZ-BAND EXPERIMENTAL TRIAL AT 283 KM/H USING THE SHINKANSEN FOR 5G EVOLUTION 2617
Nobuhide Nonaka, Kazushi Muraoka, Tatsuki Okuyama, Satoshi Suyama, Yukihiko Okumura, Takahiro Asai, Yoshihiro Matsumura

ENHANCED INTERFERENCE COORDINATION AND RADIO RESOURCE MANAGEMENT FOR 5G ADVANCED ULTRA-DENSE RAN 2622
Fumiyuki Adachi, Ryo Takahashi, Hidenori Matsuo

FIELD EXPERIMENTAL EVALUATION ON LATENCY AND RELIABILITY PERFORMANCE OF 5G NR V2V DIRECT COMMUNICATION IN REAL EXPRESS HIGHWAY ENVIRONMENT 2627
Manabu Mikami, Koichi Serizawa, Yoshikazu Ishida, Hideya Nishiyori, Kohei Moto, Hitoshi Yoshino

FIELD EXPERIMENTAL TRIAL OF DYNAMIC MODE SWITCHING FOR 5G NR-V2X SIDELINK COMMUNICATIONS TOWARDS APPLICATION TO TRUCK PLATOONING 2632
Manabu Mikami, Yoshikazu Ishida, Koichi Serizawa, Hideya Nishiyori, Kohei Moto, Hitoshi Yoshino

LOW LATENCY INTERFERENCE CANCELLATION FOR UPLINK URLLC REPETITION TRANSMISSION 2637
Osamu Nakamura, Yasuhiro Hamaguchi, Takumi Takahashi, Seiichi Sampei

PERFORMANCE OF FDE USING PARTIAL LDPC CODING WITH DOUBLE GRAY MAPPING FOR SINGLE-CARRIER LOS-MIMO 2642
Kana Aono, Bin Zheng, Mamoru Sawahashi, Norifumi Kamiya

TWO MILLIMETER-WAVE BASE STATION COOPERATION TECHNOLOGIES IN HIGH-MOBILITY ENVIRONMENTS FOR 5G EVOLUTION.....	2648
<i>Tatsuki Okuyama, Satoshi Ssuyama, Nobuhide Nonaka, Yukihiko Okumura, Takahiro Asai</i>	

W7: ULTRA-DENSE HETEROGENEOUS WIRELESS NETWORKS FOR BEYOND 5G APPLICATIONS

END-TO-END ENERGY EFFICIENCY EVALUATION FOR B5G ULTRA DENSE NETWORKS.....	2653
<i>Yu Fu, Mohammad Dehghani Soltani, Hamada Alshaer, Cheng-Xiang Wang, Majid Safari, Stephen McLaughlin, Harald Haas</i>	

FREQUENCY ALLOCATION BASED ON ANGLE-OF-ARRIVAL FOR DOWNLINK USER SELECTION IN 5G MU-MIMO HETEROGENEOUS NETWORK.....	2659
<i>Ahmad Fadel, Bernard Cousin</i>	

LAYER DIVISION MULTIPLEXING FOR 5G DL TRANSMISSION WITHIN ULTRA-DENSE HETEROGENEOUS NETWORKS.....	2666
<i>Md Shantanu Islam, Mohammad Patwary, Roger Tait, Evtim Peytchev</i>	

LEARNING-BASED JOINT USER-AP ASSOCIATION AND RESOURCE ALLOCATION IN ULTRA DENSE NETWORK.....	2673
<i>Zhipeng Cheng, Minghui Liwang, Ning Chen, Hongyue Lin, Zhibin Gao, Lianfen Huang</i>	

NON-RECURSIVE CHANNEL PREDICTION FOR TDD MASSIVE MIMO SYSTEMS.....	2678
<i>Yasser Naguib Ahmed</i>	

PERFORMANCE ANALYSIS FOR NOMA WITH M-QAM MODULATION.....	2683
<i>Haowei Jia, Leila Musavian</i>	

PHY-MAC MIMO PRECODER DESIGN FOR SUB-6 GHZ BACKHAUL SMALL CELL.....	2688
<i>Abdellah Chehri, Hussein. T. Mouftah</i>	

VARIATIONAL AUTO-ENCODERS APPLICATION IN WIRELESS VEHICLE-TO-EVERYTHING COMMUNICATIONS.....	2693
<i>Mutasem Q. Hamdan, Khairi A. Hamdi</i>	

W8: THE 9TH INTERNATIONAL WORKSHOP ON HIGH MOBILITY WIRELESS COMMUNICATIONS (HMWC) 2020

A CLUSTER-BASED DATA OFFLOADING STRATEGY FOR HIGH DEFINITION MAP APPLICATION.....	2699
<i>Yunzhu Wu, Yan Shi, Zixuan Li, Shanzhi Chen</i>	

A COOPERATIVE RSU CACHING POLICY FOR VEHICULAR CONTENT DELIVERY NETWORKS IN TWO-WAY ROAD WITH A T-JUNCTION.....	2704
<i>Sangsha Fang, Zahid Khan, Pingzhi Fan</i>	

A DECENTRALIZED CAR-SHARING CONTROL SCHEME BASED ON SMART CONTRACT IN INTERNET-OF-VEHICLES.....	2709
<i>Qihao Zhou, Zhe Yang, Kuan Zhang, Kan Zheng, Jie Liu</i>	

A DISTRIBUTED DRIVING DECISION SCHEME BASED ON REINFORCEMENT LEARNING FOR AUTONOMOUS DRIVING VEHICLES.....	2714
<i>Jie Liu, Long Zhao, Kan Zheng, Qihao Zhou</i>	

A SEMI-DISTRIBUTION CONGESTION CONTROL ALGORITHM FOR EVENT-DRIVEN M2M COMMUNICATIONS	2719
<i>Liu Yang, Heng Liu, Pingzhi Fan, Li Hao, Cong Ouyang</i>	
A SEQUENCE-BASED AUTOMATIC GAIN CONTROL MECHANISM FOR THE PHYSICAL CHANNELS IN NR-V2X.....	2724
<i>Shilei Zheng, Rui Zhao, Li Zhao, Xiaotao Ren, Jinling Hu, Yan Shi</i>	
A VEHICLE DENSITY BASED TWO-STAGE RESOURCE MANAGEMENT SCHEME FOR 5G-V2X NETWORKS.....	2729
<i>Fakhar Abbas, Gang Liu, Pingzhi Fan, Zahid Khan, Muhammad Saleh Bute</i>	
ANALYSIS FOR RANK DISTRIBUTION OF BATS CODES UNDER TIME-VARIANT CHANNELS.....	2734
<i>Lin Tang, Heng Liu, Liu Yang, Zheng Ma, Ming Xiao</i>	
DESIGN AND EVALUATION OF SYNCHRONIZATION SIGNALS FOR NR-V2X SIDELINK.....	2739
<i>Jinling Hu, Xiaotao Ren, Rui Zhao, Li Zhao, Shilei Zheng, Yan Shi</i>	
DESIGN OF CONFORMANCE TESTING SYSTEM FOR C-V2X STANDARD PROTOCOL.....	2745
<i>Yuming Ge, Qinglong Xie, Rundong Yu, Jianchao Ma, Qingwen Han, Qian Zhang</i>	
DOUBLE-LAYER GAME BASED WIRELESS CHARGING SCHEDULING FOR ELECTRIC VEHICLES.....	2750
<i>Tian Wang, Bo Yang, Cailian Chen</i>	
ENERGY EFFICIENT RELAY IN UAV NETWORKS AGAINST JAMMING: A REINFORCEMENT LEARNING BASED APPROACH	2755
<i>Weihang Wang, Xiaozhen Lu, Sicong Liu, Liang Xiao, Bo Yang</i>	
EP-BASED DETECTION FOR UPLINK OFDM-IDMA WITH CARRIER FREQUENCY OFFSETS	2760
<i>Yun Chen, Yue Xiao</i>	
MULTI-ARMED BANDIT BASED TASK OFFLOADING BY PROBABILISTIC V2X COMMUNICATION IN VEHICLE EDGE CLOUD SYSTEM	2765
<i>Jiayou Xie, Qi Si, Yulian Tang</i>	
NETWORK SELECTION IN HETEROGENEOUS VEHICULAR NETWORK: A ONE-TO-MANY MATCHING APPROACH	2770
<i>Qi Si, Zhipeng Cheng, Yuhui Lin, Lianfen Huang, Yuliang Tang</i>	
REPAIR DELAY PERFORMANCE ANALYSIS OF MOBILE CACHING SYSTEMS USING ERASURE CODES.....	2775
<i>Wancheng Lu, Ye Wang, Shushi Gu, Liang Xiong, Qinyu Zhang</i>	
SENSOR AND MAP-AIDED COOPERATIVE BEAM TRACKING FOR OPTICAL V2V COMMUNICATIONS.....	2780
<i>Mattia Brambilla, Dario Tagliaferri, Monica Nicoli, Umberto Spagnolini</i>	
UAV-ASSISTED ONLINE VIDEO DOWNLOADING IN VEHICULAR NETWORKS: A REINFORCEMENT LEARNING APPROACH	2787
<i>Ke Zheng, Yanglong Sun, Zhiping Lin, Yuliang Tang</i>	
WIRELESS RESOURCE PRE-ALLOCATION FOR CELLULAR V2I LOW-LATENCY COMMUNICATIONS.....	2792
<i>Mingyu Zhang, Jianxin Zhang, Xing Tang, Yuliang Tang</i>	

W9: 6TH INTERNATIONAL WORKSHOP OF CORNER: COMMUNICATION FOR NETWORKED SMART CITIES

A COST EFFICIENT FAIR PRICING SCHEME FOR LOW ENERGY CONSUMERS OF NETWORKED SMART CITIES..... 2797
Syed Muhammad Mohsin, Nouman Ashraf, Sheraz Aslam, Hassaan Khaliq Qureshi, Iqra Mustafa, Muhammad Asaad Cheema, Muhammad Bilal Qureshi

AN ENERGY-AWARE DISTRIBUTED OPEN MARKET MODEL FOR UAV-ASSISTED COMMUNICATIONS 2802
Rafay Iqbal Ansari, Nouman Ashraf, Christos Politis

BUDGET FEASIBLE ROADSIDE UNIT ALLOCATION MECHANISM IN VEHICULAR AD-HOC NETWORKS 2808
Xiaohua Xu, Shuiping He, Meng Han, Reza M. Parizi, Gautam Srivastava

COMMUNITY-BASED “PIGGY-BACK NETWORK” UTILIZING LOCAL FIXED & MOBILE RESOURCES SUPPORTED BY HETEROGENEOUS WIRELESS & AI-BASED MOBILITY PREDICTION 2813
Yozo Shoji, Wei Liu, Yoshito Watanabe

COVERAGE IN MILLIMETER-WAVE NETWORKS WITH SNR-DEPENDENT BEAM ALIGNMENT ERRORS..... 2818
Muhammad Saad Zia, Douglas M. Blough, Mary Ann Weitnauer

QUATERNIONIC CHANNEL-BASED MODULATION FOR DUAL-POLARIZED ANTENNAS 2823
Sara Shakil Qureshi, Syed Ali Hassan, Sajid Ali

RESOURCE ALLOCATION AND THROUGHPUT MAXIMIZATION FOR IOT REAL-TIME APPLICATIONS..... 2828
Rabeea Basir, Saad Qaisar, Mudassar Ali, Haris Pervaiz, Muhammad Naeem, Muhammad Ali Imran

SMART FIR: SECURING E-FIR DATA THROUGH BLOCKCHAIN WITHIN SMART CITIES 2833
Nasir D. Khan, Chrysostomos Chrysostomou, Babar Nazir

OPTIMIZATION OF SPREADING FACTOR DISTRIBUTION IN HIGH DENSITY LORA NETWORKS 2838
Alston Lloyed Emmanuel, Xavier Fernando, Fatima Hussain, Wisam Farjow

W10: 1ST IEEE WORKSHOP ON SPECTRUM ACCESS IN AUTONOMOUS VEHICLE ECOSYSTEM (SAVE 2020)

AUTONOMOUS VEHICLES IN UNDERGROUND MINES, WHERE WE ARE, WHERE WE ARE GOING? 2843
Abdellah Chehri, Paul Fortier

CAPACITY AND COVERAGE ANALYSIS OF HIGH ALTITUDE PLATFORM (HAP) ANTENNA ARRAYS FOR RURAL VEHICULAR BROADBAND SERVICES..... 2848
Kayode Popoola, David Grace, Tim Clarke

DISTRIBUTED VEHICULAR DYNAMIC SPECTRUM ACCESS FOR PLATOONING ENVIRONMENTS	2853
<i>Pawel Sroka, Pawel Kryszkiewicz, Michal Sybis, Adrian Kliks, Kuldeep S. Gill, Alexander Wyglinski</i>	
EFFECTS OF INTERFERENCE ON BEAMFORMING-ENABLED VEHICULAR NETWORKS IN MULTIPATH PROPAGATION ENVIRONMENTS	2858
<i>Nivetha Kanthasamy, Alexander M. Wyglinski, Raghvendra Cowlagi</i>	
INFLUENCE OF SENSOR INACCURACIES AND ACCELERATION LIMITS ON IEEE 802.11P-BASED CACC CONTROLLED PLATOONS	2863
<i>Michal Sybis, Marcin Rodziewicz, Krzysztof Wesolowski</i>	
SPECTRUM SENSING BASED ON PARALLEL CNN-LSTM NETWORK	2869
<i>Mingdong Xu, Zhendong Yin, Mingyang Wu, Zhilu Wu, Yanlong Zhao, Zhenlei Gao</i>	

W11: STRIVE 2020: THIRD INTL. WORKSHOP ON SAFETY, SECURITY, AND PRIVACY IN AUTOMOTIVE SYSTEMS

A PHYSIOLOGY-BASED DRIVER READINESS ESTIMATION MODEL FOR TUNING ISO 26262 CONTROLLABILITY	2874
<i>Moses Mariajoseph, Barbara Gallina, Marco Carli, Daniele Bibbo</i>	
ANTARES - ANONYMOUS TRANSFER OF VEHICLE ACCESS RIGHTS FROM EXTERNAL CLOUD SERVICES	2879
<i>Adriana Berdich, Alfred Anistoraei, Bogdan Groza, Horatiu Gurban, Stefan Murvay, Daniel Iercan</i>	
EARLY ANALYSIS OF SECURITY THREATS BY MODELING AND SIMULATING POWER ATTACKS IN SYSTEMC	2884
<i>Josef Treus, Paula Herber</i>	
EVALUATION OF CYBER SECURITY IN DIGITAL AVIONIC SYSTEMS	2889
<i>Klaus Kainrath, Martin Fruhmann, Klaus Gebeshuber, Erich Leitgeb, Mario Gruber</i>	
MACHINE LEARNING FOR DRIVER DETECTION THROUGH CAN BUS	2894
<i>Fabio Martinelli, Francesco Mercaldo, Antonella Santone</i>	

W12: DECENTRALIZED TECHNOLOGIES AND APPLICATIONS FOR IOT (DIOT) 2020

DEGRADED READ CODING SCHEME IN HETEROGENEOUS DISTRIBUTED CLOUD STORAGE SYSTEM FOR INTERNET OF THINGS DATA	2899
<i>Xianfan Sun, Shushi Gu, Ye Wang, Kaiyu Liu, Ning Zhang, Qinyu Zhang</i>	
EXPLORING LATTICE-BASED POST-QUANTUM SIGNATURE FOR JWT AUTHENTICATION: REVIEW AND CASE STUDY	2904
<i>Abdolmaged Alkhulaifi, El-Sayed M. El-Alfy</i>	
LABVS: LIGHTWEIGHT AUTHENTICATION AND BATCH VERIFICATION SCHEME FOR UNIVERSAL INTERNET OF VEHICLES (UIOV)	2909
<i>Himani Sikarwar, Ankur Nahar, Debasis Das</i>	
MULTITHREAD OPTIMAL OFFLOADING STRATEGY BASED ON CLOUD AND EDGE COLLABORATION	2915
<i>Yifan Zhu, Zhaoyang Wang, Zhuo Han, Nana Li, Shouyi Yang</i>	

NON-COOPERATIVE SPECTRUM ALLOCATION BASED ON GAME THEORY IN IOT-ORIENTED NARROWBAND PLC NETWORKS..... 2920
Abdellah Chehri

OPTIMAL CLOUD RESOURCE SCHEDULING IN SMART GRID: A HIERARCHICAL GAME APPROACH..... 2925
Hang Gao, Weiwei Xia, Feng Yan, Lianfeng Shen

TOWARDS QOE OPTIMIZATION IN MEDICAL MULTIMEDIA SERVICES FOR DECENTRALIZED IOT-BASED APPLICATIONS 2932
Ali Hassan Sodhro, Noman Zahid, Sandeep Pirbhulal, Nuno M Garcia, Lei Wang

Author Index