# **2019 25th Asia-Pacific Conference** on Communications (APCC 2019)

## Ho Chi Minh City, Vietnam 6 – 8 November 2019



IEEE Catalog Number: CFP19790-POD **ISBN:** 

978-1-7281-3680-6

### **Copyright © 2019 by the Institute of Electrical and Electronics Engineers, Inc. All Rights Reserved**

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

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

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

IEEE Catalog Number:	
ISBN (Print-On-Demand):	
ISBN (Online):	
ISSN:	

CFP19790-POD 978-1-7281-3680-6 978-1-7281-3679-0 2163-0771

#### 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



## **Table of Contents**

We	elcome Messages	XV
Ex	ecutive Committeex	tix
Tee	chnical Program Committee	XX
Ad	ditional Reviewersxx	xi
Ke	ynote Speakers xxx	iii
En	nerging Technologies, Applications, and Services Track #1	
•	Improvement of Cyclic Performance Variation between TCP BBR and CUBIC Yeong-Jun Song (Kyungpook National University (KNU), Korea (South)), Geon-Hwan Kim (Kyungpook National University, Korea (South)), You-Ze Cho (Kyungpook National University, Korea (South))	1
•	Why Simple Models Perform Well in Predicting Popularity for Caching? Jiajun Wu (Beijing University of Aeronautics and Astronautics, China), Chenyang Yang (Beihang University, China)	7
•	A Study on Mobility Supporting System for the Mobility Handicapped in railway Station Jong Gyu Hwang (Korea Railroad Research Institute, Korea (South)), Tae-Ki Ahn (Korea Railroad Research Institute, Korea (South)), Kyeong-Hee Kim (Korea Railroad Research Institute, Korea (South)), Tae Hyung Lee (Korea Railroad Research Institute, Korea (South))	d N/A
•	Blockchain-Based Smart Contract Access Control System Weiqi Dai (HUST, China), Chenlong Wang (Huazhong University of Science and Technology, China), Changze Cui (Huazhong University of Science and Technology, China), Hai Jin (Huazhon University of Science and Technology, China), Xinqiao Lv (Huazhong University of Science and	
•	An Improved Weighted K-Nearest Neighbors Algorithm for High Accuracy in Indoor Localization Hoang-Anh Pham (Ho Chi Minh City University of Technology, VNU-HCM, Vietnam), Quang Thier Tri Nguyen (Ho Chi Minh City University of Technology, VNU-HCM, Vietnam), Thanh Van Le (Ho Chi Minh City University of Technology, Vietnam) gnal Processing for Communications #1	
•	Performance Analysis of Wideband Time Division Multiplexing for Low Power Broadcasting Transmission Ho Jae Kim (Pusan National University, Korea (South)), Hyoung-Nam Kim (Pusan National University, Korea (South)), JaeHwui Bae (Electronics and Telecommunications Research Institut Korea (South)), Namho Hur (Electronics and Telecommunications Research Institute, Korea	
•	(South)) Sensing Criteria of TV White Space Devices under Nakagami-Rice Fading	28
•	Yee Loo Foo (Multimedia University, Malaysia) Single Image Dehazing Based on Adaptive Histogram Equalization and Linearization of Gamma Correction	32

Le Thi Thanh (Ho Chi Minh city University of Transport, Vietnam), Dang N. H. Thanh (Hue College of Industry, Vietnam), Nguyen Minh Hue (Ho Chi Minh City University of Transport, Vietnam), V. B. Surya Prasath (Cincinnati Children's Hospital Medical Center & University of Cincinnati, USA)

36

•	Reducing Out-of-Band Radiation in GFDM Systems Using Pulse Shaping Filter Design Zee Ang Sim (Curtin University, Malaysia), Filbert H. Juwono (Curtin University Malaysia, Malaysia), Regina Reine (Curtin University Sarawak Campus, Malaysia), Zhuquan Zang (Curtin
W	University. Malaysia, Malaysia), Lenin Gopal (Curtin University Malaysia, Malaysia) 41 ireless Communications #1
•	<ul> <li>A High Data Rate Swing Enhanced CMOS Pulse Generator with an Overhead Reducing Technique</li> <li>Md. Tasnimul Hasan (Bangladesh University of Engineering and Technology Bangladesh,</li> <li>Bangladesh), Md. Tahmidul Alam (Bangladesh University of Engineering and Technology (BUET) &amp;</li> <li>Daffodil International University, Dhaka, Bangladesh), Shakil Mahmud Olee (BUET, Bangladesh),</li> <li>Md. Zahidul Islam (Bangladesh University of Engineering and Technology, Bangladesh,</li> <li>Bangladesh), Apratim Roy (BUET, Bangladesh)</li> </ul>
•	Outage Probability Analysis of MF Precoded Massive MIMO with Multi-antenna User Environment Koki Ito (Chiba University, Japan), Kazuki Maruta (Chiba University, Japan), Chang-Jun Ahn (Chiba University, Japan) 50
•	Physical Layer Security in MIMO/NOMA in the multiple UEH relaying network with TAS/MRCThi Anh Le (Ulsan University, Korea (South)), Van Phu Tuan (University of Ulsan, Korea (South)),Hyung-Yun Kong (University of Ulsan, Korea (South))55
W	ireless Communications #2
•	Bias Allocation and Precoding for Tricolor Visible Light Communications with Signal-dependent Noise Qian Gao (Texas A&M University, USA), Sabit Ekin (Oklahoma State University, USA), Khalid A. Qaraqe (Texas A&M University at Qatar, USA), Erchin Serpedin (Texas A&M University, USA) 61
•	Physical Cell ID Detection Probability Using Synchronization Signals for NR Radio Interface in 28- GHz Band Kyogo Ota (Tokyo City University, Japan), Mamoru Sawahashi (Tokyo City University, Japan),
	Satoshi Nagata (NTT DoCoMo, Inc., Japan) 67
•	A Study on UE Clustering and Antenna Selection for Distributed MIMO Cooperative Transmission using Multi-user MMSE-SVD
	Fumiyuki Adachi (Tohoku University, Japan), Yuta Seki (Panasonic Corporation & Core Element Technology Development Center, Japan), Tomoyuki Saito (Tohoku University, Japan) 73
•	Lossy Information Transmission Method based on Semantic Computing Architecture Chuyan Wang (Shanghai Jiao Tong University, China), Liang Qian (Shanghai Jiao Tong University, China), Yichong Wei (Shanghai Jiao Tong University, China), Lingzhi Liu (Shanghai Jiao Tong University, China) 78
•	<ul> <li>A Highly Linear CMOS Amplifier at 5.8 GHz Bolstered with Active Post-distortion for Wireless</li> <li>Applications</li> <li>Md. Tasnimul Hasan (Bangladesh University of Engineering and Technology Bangladesh, Bangladesh), Shakil Mahmud Olee (BUET, Bangladesh), Md. Zahidul Islam (Bangladesh University of Engineering and Technology, Bangladesh, Bangladesh), Md. Tahmidul Alam (Bangladesh</li> </ul>
	University of Engineering and Technology (BUET) & Daffodil International University, Dhaka,
	Bangladesh), Apratim Roy (BUET, Bangladesh) 83

## Emerging Technologies, Applications, and Services Track #2

• A Priority-Enhanced Slot Allocation MAC Protocol for Industrial Wireless Sensor Networks

	Leiyang Liu (Shanghai Jiao Tong University, China), Yuan Cao (Naval Research Acadamy, Chi Lianghui Ding (Shanghai Jiao Tong University, China), Feng Yang (Shanghai Jiaotong Univers China), Liang Qian (Shanghai Jiao Tong University, China), Cheng Zhi (Shanghai Jiao Tong	
		88
•	University, China) Ultrasound-based Obstacle Detection System for Vehicles under Interference Environment Donghee Yi (Pusan National University, Korea (South)), Jaehan Joo (Pusan National Universit Korea (South)), Zewen Piao (Pusan National University, Korea (South)), Heetae Jin (Pusan National University, Korea (South)), Suk Chan Kim (Pusan National University, Korea (South)	
•	Route Reconstruction at Failure in Navigation Control of UAV by Smart Meter Wireless Devices	
	Shintaro Natsui (Nihon University, Japan), Kiyoshi Ueda (Nihon University, Japan), Suzusa Ka (Nihon University, Japan)	aito 99
•	Research on redundancy strategy for power line and wireless converged networks	
	Chunyan AN (Global Energy Internet Research Institute, China), Yong Zhao (Global Energy	
	Internet Research Institute, China), Mingming Yan (Beijing Jiaotong University, China)	N/A
Si	ignal Processing for Communications #2	
•	Adaptive Texts Deconvolution Method for Real Natural Images	
	Le Thi Thanh (Ho Chi Minh city University of Transport, Vietnam), Dang N. H. Thanh (Hue Co	llege
	of Industry, Vietnam), V. B. Surya Prasath (Cincinnati Children's Hospital Medical Center &	5
	University of Cincinnati, USA)	110
٠	Early and late features fusion for kinship verification based on constraint selection	
	Vinh Truong Hoang (Ho Chi Minh City Open University, Vietnam), Tien Nguyen Van (Ho Chi M	linh
	City Open University, Vietnam)	116
٠	A Semi-deterministic Approach for Clipping Noise Mitigation in DCO-OFDM Systems	
	Krishnendu Bera (Monash University, Australia), Masud Bakaul (DIODAR, Australia), Nemai	
	Karmakar (MONASH University, Australia)	122
•	Ternary Weighted Networks with Equal Quantization Levels	
	Yuanyuan Chang (Nanjing University of Posts and Telecommunications, China), Xiaofu Wu (Nanjing University of Posts and Telecommunications, China), Suofei Zhang (Nanjing Univers of Posts and Telecommunications, China), Jun Yan (Nanjing University of Posts and	ity
	Telecommunications, China)	126
W	/ireless Communications #3	
•	Fast Fading Compensation by Frame Splitting and Decision Directed Channel Extrapolation for C Kouichi Motosugi (University of Chiba, Japan), Kentaro Yonei (Chiba University, Japan), Kazu Maruta (Chiba University, Japan), Chang-Jun Ahn (Chiba University, Japan)	
٠	Performance Analaysis of 5G Waveform - Pruned DFT Spread FBMC with Real Time Fading	
	Conditions Ravi Sekhar Yarrabothu (Vignan's Foundation for Science Technology and Research, India),	
	Lourdu Pasala (Vignan's Foundation for Science Technology and Research, India)	136
	Statistical Carrier Phase Recovery for Narrow-band Backscatter Wireless Link	150
-	Yuki Sato (Keio University, Japan), Jin Mitsugi (Keio University, Japan), Yuusuke Kawakita	
	(Kanagawa Institute of Technology, Japan), Haruhisa Ichikawa (The University of Electro-	
	Communications, Japan)	142
•	Hierarchical Extrinsic Information Performance Analysis of H-Soft Aided 2-Source BPSK H-MAC Channel Phase Estimator for WPNC Networks	
	Jan Sykora (Czech Technical University in Prague, Czech Republic)	148

• Secrecy analysis under dual correlated Rician fading employing opportunistic relays

Khoa N Le (Western Sydney University, Australia), Vo Nguyen Quoc Bao (Posts and Telecommunications Institute of Technology, Vietnam) 153 Emerging Technologies, Applications, and Services Track #3 Trust-based Verification Attack Prevention Scheme using Tendency of Contents Request on NDN Hironori Nakano (Keio University, Japan), Hiroya Kato (University of Keio, Japan), Shuichiro Haruta (Keio University, Japan), Masashi Yoshida (Keio University, Japan), Iwao Sasase (Keio University, Japan) 159 Performance Modelling of Synchronized Predictive Sensing for Clustered Wireless Sensor Networks Jeremiah D. Deng (University of Otago, New Zealand) 165 *QoS-aware Traffic Engineering in Software Defined Networks* May Thu Zar Win (University of Computer Studies, Yangon, Myanmar), Yutaka Ishibashi (Nagoya Institute of Technology, Japan), Khin Mya (University of Computer Studies, Yangon, Myanmar, Myanmar) 171 Blockchain Leveraged Task Migration in Body Area Sensor Networks Md Ashraf Uddin (Federation University Australia, Australia), Andrew Stranieri (Federation University Australia, Australia), Igbal Gondal (Federation University, Australia), Venki Balasubramanian (Federation University Australia, Australia) 177 Signal Processing for Communications #3 Channel Ranking based Spread Code Optimization for Visible Light Communication OFDM-IDMA Systems Kazushi Shimada (Chiba University, Japan), Mitsuki Takahashi (Chiba University, Japan), Kazuki Maruta (Chiba University, Japan), Chang-Jun Ahn (Chiba University, Japan) 185 Generalizing Stochastic Pooling to CNNs with Negative-Response Activations Lulu Shi (Nanjing University of Posts and Telecommunications, China), Xiaofu Wu (Nanjing University of Posts and Telecommunications, China), Suofei Zhang (Nanjing University of Posts and Telecommunications, China) N/A Machine Learning-based RSSI Prediction in Factory Environments Julian L Webber (Advanced Telecommunications Research Institute International (ATR) & Osaka University, Japan), Norisato Suga (ATR & Tokyo University of Science, Japan), Susumu Ano (ATR, Japan), Yafei Hou (ATR & Okayama University, Japan), Abolfazl Mehbodniya (ATR & Kuwait College of Science and Technology, Kuwait, Kuwait), Toshihide Higashimori (ATR, Japan), Kazuto Yano (ATR, Japan), Yoshinori Suzuki (ATR, Japan) 195 Codebook Design Optimization for Sparsified Distribution Converter in Davey-Mackay Watermark Codes over Channels with Synchronization Errors Tianbo Xue (The Hong Kong Polytechnic University, Hong Kong), Francis C.M. Lau (The Hong Kong Polytechnic University, Hong Kong) 201 Pilot Power Allocation for Enhancing Channel Estimation Quality in Multi-cell Multi-user Massive MIMO Systems Hieu Dao (University of Ulsan, Vietnam), Sunghwan Kim (University of Ulsan, Korea (South)) 207 Wireless Communications #4 Reliable Wireless Connection for Factory through a Distributed Antenna System in 920MHz

- Ryo Iizuka (Meiji University, Japan), Tetsushi Ikegami (Meiji University, Japan) 211
- Measurement-Based Performance Investigation on Mobile Video Streaming in LTE-A Cell Edge Areas

	Jong Seob Song (Hanyang University, Korea (South)), Hu Jin (Hanyang University, Korea
	(South)), Hyeyeon Kwon (ETRI, Korea (South)), Seung Keun Park (Electronics and
	Telecommunications Research Institute, Korea (South)) 215
٠	Enhancing C-RAN Downlink Performance via Inter-UE D2D Cooperation
	Daesung Yu (Jeonbuk National University, Korea (South)), Junbeom Kim (Jeonbuk National
	University, Korea (South)), Seok-Hwan Park (Jeonbuk National University, Korea (South)) 221
٠	Modified HTRCI with Time-domain CSI Separation for Pilot De-contamination
	Kakeru Matsubara (Chiba University, Japan), Shun Kuroki (Chiba University, Japan), Kazuki
	Maruta (Chiba University, Japan), Chang-Jun Ahn (Chiba University, Japan) 226
Er	nerging Technologies, Applications, and Services Track #4
٠	Tile-based Proactive Virtual Reality Streaming via Online Hierarchial Learning
	Xing Wei (Beihang University, China), Chenyang Yang (Beihang University, China) 232
•	Code Tamper-Proofing using Dynamic Canaries
	Rajesh Kumar Shrivastava (Birla Institute of Technology & Science, Pilani, Hyderabad Campus,
	India), Kevin Concessao (Birla Institute of Technology & Science, Pilani, Hyderabad Campus,
	India), Chittaranjan Hota (Birla Institute of Technology & Science, Pilani, Hyderabad Campus,
	India) 238
	End-to-End Dynamic Bandwidth Resource Allocation Based on QoS Demand in SDN
-	Nwe Thazin (University of Computer Studies Yangon & UCSY, Myanmar), Khine Moe Nwe
	(University of Computer Studies, Yangon & UCSY, Myanmar), Yutaka Ishibashi (Nagoya Institute
•	Abnormal SDN switches detection based on chaotic analysis of network traffic
	Phuc Dinh Trinh (Soongsil University, Korea, Korea (South)), TaeHee Lee (Soongsil University,
	Korea (South)), Nguyen Canh Thang (Soongsil University, Korea (South)), Sa Dang Pham
	(Soongsil University, Korea (South)), Sichul Kevin Noh (Soongsil University, Korea (South)),
	Minho Park (Soongsil University, Korea (South)) 250
٠	A Real-time Vehicle Detection for Traffic Surveillance System Using a Neural Decision Tree
	Hung Ngoc Phan (International University - Ho Chi Minh city, Vietnam), Long Pham
	(Sungkyunkwan University, Suwon, South Korea, Korea (South)), Tin Trung Thai (International
	University - Ho Chi Minh city, Vietnam), Nhat Chung (International University - Ho Chi Minh city,
	Vietnam), Ha Viet Uyen Synh (HCMIU, Vietnam) 256
Si	gnal Processing for Communications #4
	Drift Free Indeen Dedectrics Deed Deckering using Empirical Mede Decemberships
•	Drift-Free Indoor Pedestrian Dead Reckoning using Empirical Mode Decomposition
	Boney Labinghisa (Tongmyong University, Korea (South)), Dong Myung Lee (Tongmyong
	University, Korea (South)) 262
٠	ESIM OFDM with Schmidl and Cox Algorithm Synchronizer in Rayleigh fading channel
	Jeongbin Seo (PUSAN National University, Korea (South)), Jaehan Joo (Pusan National University,
	Korea (South)), Guohua Zhu (Pusan National University, Korea (South)), Suk Chan Kim (Pusan
	National University, Korea (South)) 267
٠	Optimal Waveform Design for Dual-functional Communication-Navigation System
	Peng Cheng (Shanghai Jiao Tong University, China), Feng Yang (Shanghai Jiaotong University,
	China), Yuan Cao (Naval Research Acadamy, China), Lianghui Ding (Shanghai Jiao Tong
	University, China), Cheng Zhi (Shanghai Jiao Tong University, China) 271
•	Some methods for generating sequences with run property
	Gangsan Kim (Yonsei University, Korea (South)), Hong-Yeop Song (Yonsei University, Korea
	(South)) 276

•	A Novel Visual Similarity-based Phishing Detection Scheme using Hue Information with Auto
	Updating Database
	Shuichiro Haruta (Keio University, Japan), Fumitaka Yamazaki (Keio University, Japan), Hiromu
۱۸/	Asahina (Keio University, Japan), Iwao Sasase (Keio University, Japan) 280
vv	ireless Communications #5
•	Protograph LPDC Coded Large-Scale MIMO Communications With Low-Resolution ADCs
	Hieu Vu (Posts and Telecommunications Institute of Technologies Hanoi, Vietnam), Thuy V.
	Nguyen (Posts and Telecommunications Institute of Technology, Vietnam), Hieu T. Nguyen
	(University in Southeast Norway, Norway) 286
•	A Comparative Study on the Compensation Schemes for Transceiver I/Q Imbalances of Massive
	MIMO System
	Jeongju Jee (KAIST, Korea (South)), Girim Kwon (Korea Advanced Institute of Science and
	Technology (KAIST), Korea (South)), Hyuncheol Park (KAIST, Korea (South)) 292
•	Performances of M-ACO-OFDM, DCO-OFDM and M-GLIM OFDM in Visible Light Communication
	Systems
	Assaidah Assaidah (National Chiao Tung University, Taiwan), Chi-Wai Chow (National Chiao Tung
	University, Taiwan) 297
•	Hybrid Beamforming Scheme for Millimeter-wave Massive MIMO and Dense Small Cell Networks
	Sang-Lim Ju (Chungbuk National University, Korea (South)), Nam-il Kim (ETRI, Korea (South)),
	Seung-Que Lee (ETRI, Korea (South)), Jin-Up Kim (ETRI, Korea (South)), Kyungseok Kim
	(Chungbuk National University, Korea (South)) 301
٠	Energy Cooperation in Renewable-Powered Cell-Free Massive MIMO Systems
	Rami Hamdi (Hamad Bin Khalifa University, Qatar), Marwa Qaraqe (Hamad Bin Khalifa University,
	Qatar) 305
Er	merging Technologies, Applications, and Services Track #5
	Knowledge representation for designing an Intelligent Tutoring System in learning of courses about
Ū	Algorithms
	Hien Nguyen (University of Information Technology, Vietnam), Trong Le (University of
	Information Techonology, VNU-HCM, Vietnam), Son Luu (University of Information Techonology,
	VNU-HCM, Vietnam), Nhon Do (Hoa Sen University, Vietnam) 310
•	AR-based Evacuation Route Guidance System in Indoor Fire Environment
	Gi Ho Nam (Tongmyong University, Korea (South)), Han Sol Seo (Tongmyong University, Korea
	(South)), Min Su Kim (Tongmyong University, Korea (South)), Yun Kyoung Gwon (Tongmyong
	University, Korea (South)), Cheol Min Lee (Tongmyong University, Korea (South)), Dong Myung
	Lee (Tongmyong University, Korea (South)) 316
•	Adaptive Smart Lighting Control based on Genetic Algorithm
	Cuong Xuan Viet Nguyen (VNU - University of Engineering and Technology, Vietnam), Khai Quang
	Duong (VNU - University of Engineering and Technology, Vietnam), Hoang Ngo (VNU - University
	of Engineering and Technology, Vietnam), HoaiSon Nguyen (VNU-University of Engineering and
	Technology, Vietnam) 320
•	Analyzing Location Accuracy of Unmanned Vehicle According to RTCM Message Frequency of RTK-
	GPS
	Inseop Um (Korea University, Korea (South)), Seongjoon Park (Korea University, Korea (South)),
	Seounghwan Oh (Korea University, Korea (South)), Hwangnam Kim (Korea University, Korea
	(South)) 326
•	Novel Communication System for SCADA Tied Smart Inverter for Vietnam

Thirasara Galketiya (RMIT University, Vietnam), Janani Kahahena (RMIT University, Vietnam), Jaideep Chandran (Swinburne University, Australia), Ilya Kavalchuk (RMIT University Vietnam, Vietnam) 331

### Wireless Communications #6

	Power-Domain NOMA or NOMA-2000?
	Ali Al Khansa (CentraleSupelec & Sequans Communications, France), Yue Yin (Nanjing University
	of Posts and Telecommunications, China), Guan Gui (Nanjing University of Posts and Telecommunications, China), Hikmet Sari (NJUPT & Sequans, France) 336
•	Novel Low-Power NRF24L01 Based Wireless Network Design for Autonomous Robots
	Veerandi Kulasekara (RMIT University, Vietnam), Sachintha Balasooriya (RMIT University,
	Vietnam), Jaideep Chandran (Swinburne University, Australia), Ilya Kavalchuk (RMIT University
	Vietnam, Vietnam) 342
•	Performance of MMSE-based Symbol-level Precoding in Multi-user MISO System
	Jae Won Lee (Korea University, Korea (South)), Chung G. Kang (Korea University, Korea (South))
	347
•	Comparison of Outage Performance between Precoding/Decoding Layouts in Multi-Hop MIMO Full- Duplex AF Relaying with Ideal Gain
	Dae-Kyo Jeong (Hanyang University, Korea (South)), Dongwoo Kim (Hanyang University, Korea
	(South)) 352
٠	Fusing Reflectance based LDR Images to Generate HDR Image
	Partha Pratim Banik (Kookmin University, Korea (South)), Rappy Saha (Kookmin University,
	Korea (South)), Tae-Ho Kwon (Kookmin University, Korea (South)), Ki-Doo Kim (Kookmin
	University, Korea (South)) 357
W	ireless Networks #1
•	Coverage Performance of Light Fidelity (Li-Fi) Network
	Hieu Danh Huynh (University of Technology Sydney, Australia), Kumbesan Sandy Sandrasegaran
	(University of Technology, Sydney, Australia) 361
•	Wavelength-aggregation Scheme with Delay-based Frame Distribution Technique for Incrementally
	Upgrading TWDM-PON toward 5G Beyond
	Harada Rintaro (Nippon Telegraph and Telephone Corporation, Japan), Hiroyuki Uzawa (NTT,
	Japan), Hirotaka Nakamura (NTT Access Network Service Systems Laboratories, Japan), Jun
	Terada (NTT Corporation, Japan) 367
•	Energy Efficiency of Cooperative Relay in a Spectrum Sharing Network
	Yee Loo Foo (Multimedia University, Malaysia) 373
•	Support of a Multi-access Session in 5G Mobile Network
	Jeounglak Ha (ETRI, Korea (South)), Young-il Choi (ETRI, Korea (South)) 378
•	Learning-based Distributed Multi-channel Dynamic Access for Cellular Spectrum Sharing of Multiple
	Operators
	Minsu Shin (Sungkyungkwan University, Korea (South)), Min Young Chung (Sungkyunkwan
	University, Korea (South)) 384
W	ireless Communications #7
•	Analysis of Channel Channeteristics for Outdoor 20 CUT Millimeter Mayo Channel
	Analysis of Channel Characteristics for Outdoor 28 GHz Millimeter Wave Channel

- University, Korea (South)), Seong-Cheol Kim (Seoul National University, Korea (South)) 388
- Model-Free Unsupervised Learning for Optimization Problems with Constraints

	Chengjian Sun (Beihang University, China), Dong Liu (University of Southampton, United	
	Kingdom (Great Britain)), Chenyang Yang (Beihang University, China)	392
٠	Data-aided SMI Algorithm using Common Correlation Matrix for Adaptive Array Interference	
	Suppression	
	Kosuke Shima (Chiba University, Japan), Katsuya Senoo (Chiba University, Japan), Kenta Go	to
	(Chiba University, Japan), Kazuki Maruta (Chiba University, Japan), Chang-Jun Ahn (Chiba	
	University, Japan)	398
٠	Distributed Indoor Femtocell System For Interference Mitigation And Path-loss Compensation	
	Khalid Sheikhidris Mohamed (Multimedia University, Malaysia), Mohamad Yusoff Alias (Multim	nedia
	University, Malaysia), Mardeni Roslee (MMU, Malaysia)	403
W	ireless Networks #2	
•	A Multi-Access Session Management for ATSSS Support in 5G Network	
	Yoohwa Kang (Electronics and Telecommunications Research Institute, Korea (South)), Chang	-
	Kim (ETRI, Korea (South))	409
•	Parallel Scheduling of Multiple Tasks in Heterogeneous Fog Networks	
	Zening Liu (ShanghaiTech University, China), Kunlun Wang (ShanghaiTech University, China)	, Kai
	Li (ShanghaiTech University, China), Ming-Tuo Zhou (Shanghai Research Center for Wireless	
	Communications, unknown), Yang Yang (ShanghaiTech University, China)	413
٠	A Smartphone Indoor Localization Based on Affinity Propagation Clustering and Kullback-Leibler	
	Multivariate Gaussian	
	Osamah Abdullah (Alm'moon University College, Iraq)	N/A
٠	Asymptotic Analysis of Switching-Based Hybrid FSO/RF System with DF-Relaying	
	Shubha Sharma (Nanyang Technological University, Singapore), A S Madhukumar (Nanyang	
	Technological University, Singapore), Swaminathan Ramabadran (Indian Institute of Technological University, Singapore), Swaminathan Ramabadran (Indian Institute of Technological Structure), Structure, Structur	ogy
	Indore, India)	425
٠	Network Lifetime Maximization for Full Area Coverage in Wireless Sensor Networks	
	Trung Thanh Nguyen (Hanoi University of Science and Technology, Vietnam), Thanh-Hung	
	Nguyen (Hanoi University of Science and Technology, Vietnam), Phi Le Nguyen (Hanoi Univer	sity
	of Science and Technology, Vietnam)	431
W	ireless Networks #3	
	Polite Centralized Random Backoff for Seamless Transition to Collision Free Wi-Fi Networks	
•	Jinho D Kim (Hyundai Motor Company, Korea (South)), David I Laurenson (The University of	
	Edinburgh, United Kingdom (Great Britain)), John Thompson (University of Edinburgh, United	
	(ingdom (Croot Pritain))	437
	Energy Aware Fault Tolerant Topology Design For Energy Constraint Sensor Networks	437
	Shubhangi Barsagade (National Institute Of Technology, Durgapur, India), Prajna Pradhan	
		to of
	(National Institute Of Technology, Durgapur, India), Sanghita Bhattacharjee (National Institu	
	Technology, Durgapur, India)	443
•	Trust Based Partially Distributed Key Management Scheme for Aeronautical Ad Hoc Networks	
	Bolin Wang (Shanghai Jiao Tong University, China), Lianghui Ding (Shanghai Jiao Tong	
	University, China), Feng Yang (Shanghai Jiaotong University, China), Liang Qian (Shanghai Ji	
	Tong University, China), Ning Liu (Shanghai Jiao Tong University, China)	449
٠	A Neighbor Quality Based Broadcast Scheme For FANET	
	Yuchen Chen (Shanghai Jiao Tong University, China), Lianghui Ding (Shanghai Jiao Tong	
	University, China), Feng Yang (Shanghai Jiaotong University, China), Liang Qian (Shanghai Ji	
	Tong University, China), Ning Liu (Shanghai Jiao Tong University, China)	455

## Special Session #1: Physical Layer Security and Integrity for IoT and Space Communications

•	Impacts of the transmitter signal key parameters on the Compressed Sensing spectrum
	reconstruction for IoT Cognitive Radio applications
	Lap Luat Nguyen (University of Brest, France), Anthony Fiche (University of Brest, France),
	Roland Gautier (University of Brest, France), Emanuel Radoi (University of Brest & CNRS UMR
	6285 Lab-STICC, France) 461
•	Identification Of Quantum Encoder Matrix From A Collection Of Pauli Errors
	Gilles Burel (Université de Bretagne Occidentale, France), Hugo Pillin (University of Brest,
	France), El-Houssain Baghious (Université de Bretagne Occidentale, France), Paul Baird
	(Université de Bretagne Occidentale, France), Roland Gautier (University of Brest, France) 467
•	BlockCom: Blockchain-based Efficient Communication and Storage Protocol
	Amritesh Kumar (NIIT University, India), Trupil Limbasiya (BITS Pilani, India), Debasis Das (IIT
	Jodhpur, Rajasthan, India) 473
•	To Verify The Correctness Of IoT Sensor Data In Real-Time
	Anh Lan Nguyen (Ha Noi University of Science and Technology, Vietnam), Eiji Kamioka (Shibaura
	Institute of Technology, Japan), Toan Nguyen-Duc (Hanoi University of Science and Technology,
	Vietnam) 479
•	Capacity Analysis of Wirelessly Powered Backscatter Communications for Green IoT
	Danish Mehmood Mughal (Sungkyunkwan University, Korea (South)), Tahira Mahboob
	(Sungkyunkwan University, Korea (South)), Min Young Chung (Sungkyunkwan University, Korea
	(South)) 485
Sp	pecial Session #2: Information and Coding Theory
•	An Enhanced Offset Min-Sum decoder for 5G LDPC Codes
	Hangxuan Cui (Nanjing University, China), Khoa Le Trung (University of Cergy-Pontoise, ENSEA,
	CNRS, France), Fakhreddine Ghaffari (ETIS University of Paris Seine ENSEA CNRS, France), David
	Declercq (ETIS ENSEA/univ. of Cergy-Pontoise/CNRS, France), Jun Lin (Nanjing University,
	China), Zhongfeng Wang (Nanjing University, China) 490
•	Run-Length Limited Decoding for Visible Light Communications: A Deep Learning Approach
	Dinh-Dung Le (Hue Industrial College, Vietnam), Nguyen Duc Phuc (Posts and
	Telecommunications Institute of Technology, Vietnam), Thi Hong Tran (Nara Institute of Science
	and Technology (NAIST), Japan), Yasuhiko Nakashima (Nara Institute of Science and Technology, Japan) 496
	Reliability Enhancement for Multi-level Cell NAND Flash Memory Using Error Asymmetry
	Nguyen Duc Phuc (Posts and Telecommunications Institute of Technology, Vietnam), Khoa Le
	Trung (University of Cergy-Pontoise, ENSEA, CNRS, France), Fakhreddine Ghaffari (ETIS
	University of Paris Seine ENSEA CNRS, France), David Declercq (ETIS ENSEA/univ. of Cergy-
	Deptoise (CNDS_Erappo) 502
	Pontoise/CNRS, France) 502 About Some Methods of Implementing Network Coding based on Polynomial Rings and
•	Polynomial Fields
	Thien Ngo Duc (Posts and Telecommunications Institute of Technology, Vietnam), Au Pham Long
	(Posts and Telecommunications Institute of Technology, Vietnam), Binh Nguyen (Posts and
	Tolocommunications Institute of Tochnology Vietnam)
	Known Bits Puncturing for Systematic Polar Codes
•	
	Naoya Tanuma (Chiba University, Japan), Ryo Marumo (Chiba University, Japan), Kazuki Maruta (Chiba University, Japan), Chang-Jun Ahn (Chiba University, Japan) 511
	(Chiba University, Japan), Chang-Jun Ahn (Chiba University, Japan) 511

## Special Session #3: Emerging Technologies for 5G and beyond networks

• Performance Enhancement of Random Wireless Networks with Non-orthogonal Multiple Access (NOMA) technique

Nguyen Thi Yen Linh (PTITHCM, Vietnam), Vo Nguyen Quoc Bao (Posts and Telecommunications Institute of Technology, Vietnam) 516

• Performance Evaluation of Radio Frequency Energy Harvesting-Aided Multi-hop Cooperative Transmission Networks

Pham Minh Quang (Posts and Telecommunications Institute of Technology in Hochiminh City,Vietnam), Tran Trung Duy (Posts and Telecommunications Institute of Technology, Vietnam), VoNguyen Quoc Bao (Posts and Telecommunications Institute of Technology, Vietnam)521

Outage Performance of Cooperative Underlay Cognitive Radio with Non-Orthogonal Multiple Access
 Huynh Hoa (Posts and Telecommunications Institute of Technology, Vietnam), Vo Nguyen Quoc
 Bao (Posts and Telecommunications Institute of Technology, Vietnam) 527