## 2023 28th Asia Pacific Conference on Communications (APCC 2023)

Sydney, Australia 19-22 November 2023



IEEE Catalog Number: CFP23790-POD ISBN: 979-8-3503-8262-4

## Copyright © 2023 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:
 CFP23790-POD

 ISBN (Print-On-Demand):
 979-8-3503-8262-4

 ISBN (Online):
 979-8-3503-8261-7

ISSN: 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**

Welcome message from the ASC chair	. X
Welcome message from General Chairs	хi
Message from Technical Program Committee Co-Chairsx	cii
Welcome message from Western Sydney University xi	iii
Conference Committeex	iv
Technical Program Committee	۲V
Additional Reviewersxx	aii
Keynote #1xxi	iii
Keynote #2xx	iv
Keynote #3xx	ΚV
Keynote #4xx	vi
Tutorial xxv	⁄ii
Signal Processing for Communications	
<ul> <li>MAGLN: Multi-Attention Graph Learning Network for Channel Estimation in Multi-User SIMO         Liqing Shan (Southeast University, China), Yuntao Hu (Southeast University, China), Wei Shan (Jiangsu Communications Holdings, China), Zhang Fenghui (School of Electronics and Information Engineering, West Anhui University, Canada), Ming     </li> </ul>	
Chen (Southeast University, China)	J
<ul> <li>Demonstration of a Variably Biased Asymmetrically Clipped Optical OFDM for VLC Systems</li> </ul>	
Ganesh Miriyala (National Institute of Technology - Warangal, India), Renikunta Mallaiah (NIT Warangal, India), Venkata Mani	
Vakamulla (National Institute of Technology Warangal, India) 7  • Efficient Joint Parameter Estimation and Soft Noncoherent Detection Scheme for LoRa-based IoT System  Zhongyang Yu (Henan University of Engineering, China), Zhengying Wen (Henan University of Engineering, China), Jixun Gao	
(Henan University of Engineering, China)	)
<ul> <li>Weighted Sum Rate Optimization for Multi-User MIMO Cognitive Radio Systems</li> </ul>	••••
Yongquan Chen (Sun Yat-Sen University, China), Yuan Jiang (Sun Yat-sen University, China), Lei Zhao (Sun Yat-Sen University, China)	_
• Achievable Rate of Relay Massive MIMO With Mixed Low-Resolution ADCs	••••
Thang Le Nhat (Post and Telecommunications Institute Technologies, Vietnam), Hung Dang (Posts and Telecommunications Institute of Technology, Vietnam), Hoai Bui (Posts and Telecommunications Institute of Technologies, Vietnam), Hieu T.	
Nguyen (University in Southeast Norway, Norway) 24	ļ
Wireless Communications	
Decigns of Finite Perclution IPS aided MIMO Multipeer Communications Perced on SZEDDC	
<ul> <li>Designs of Finite Resolution IRS-aided MIMO Multiuser Communications Based on SZFDPC</li> <li>Lian-Ming Lyu (National Yang Ming Chiao Tung University, Taiwan), Hsin-Chih Huang (National Yang Ming Chiao Tung</li> </ul>	
University Taiwan) Hsiao-feng Francis III (Taiwan)	)
• Lightweight Network for Modulation Recognition Based on Stochastic Pruning-Asymmetric Quantization	

	Tianyu Zhao (Beijing Institute of Technology, China), Zunwen He (Beijing Institute of Technology, China), Mingyu Chen Institute of Technology, China), Yan Zhang (Beijing Institute of Technology, China), Hongji Yang (Beijing Institute of	(Beijing
	Technology, China), Wancheng Zhang (Beijing Institute of Technology, China)	36
	Preamble Design for LEO Satellite Communication System	
	Yuan Jiang (Sun Yat-sen University, China), Lei Zhao (Sun Yat-Sen University, China), Wang Yanzhao (Sun Yat-Sen Univ China)	ersity, 42
	• Sensing-Communication-Computing-Control Closed-Loop Optimization for Coordinated UAV-Robot Syste	ms
	Xinran Fang (Tsinghua University, China), Wei Feng (Tsinghua University, China), Yunfei Chen (University of Durham, Un	
	Kingdom (Great Britain)), Yanmin Wang (Minzu University of China, China), Ning Ge (Tsinghua University, China)  • Software Implementation of O-RAN Fronthaul Interface	48
	Seung Nam Choi (ETRI, Korea (South)), Nam-il Kim (ETRI, Korea (South))	53
Wir	eless Networks	
	• Design, Implementation and Analysis of L1 Control SW for FAPI based 5G NR gNB	
	Seung-Que Lee (ETRI, Korea (South)), JunHwan Lee (ETRI, Korea (South)), Moon-Sik Lee (Electronics and Telecommunic	
	Research Institute, Korea (South)), Seung-gyu Kim (NESSLAB, Korea (South)), Seongjin Lee (NESSLAB, Korea (South))	57
	MARL-based Resource Allocation for Heterogeneous Traffic in V2X Communications    Source	61
	Insung Lee (Inha University, Korea (South)), Duk Kyung Kim (Inha University, Korea (South))	01
	<ul> <li>A Multi-objective Reinforcement Learning solution for Handover optimization in URLLC</li> <li>Azadeh Arnaz (University of Technology, Sydney, Australia), Justin Lipman (University of Technology, Sydney (UTS), Au-</li> </ul>	stralia)
	Mehran Abolhasan (University of Technology Sydney, Australia)	68
	• High Reliability Air-to-Ground Communication System based on Aggregation of Terrestrial Networks	
	Claes Beckman (KTH Royal Institute of Technology, Sweden), Helmut Brutscher (Airbus, Germany), Frank Gottfried (Airb Germany), Mats Karlsson (Icomera AB, Sweden), Herman Mikkelsen (Icomera AB, Sweden), Rikard Reinhagen (Icomera	
	Sweden)	75
	- AA J JI' J J J J J J J G GDJAGALG J A J J J	
	<ul> <li>Modelling and Implementation Tools for SDWSN Smart Applications</li> </ul>	
	<ul> <li>Modelling and implementation Tools for SDWSN Smart Applications</li> <li>Duaa Zuhair Al-hamid (Auckland University of Technology, New Zealand), Pejman Karegar (Auckland University of Technology)</li> </ul>	nnology,
_	Duaa Zuhair Al-hamid (Auckland University of Technology, New Zealand), Pejman Karegar (Auckland University of Tecl New Zealand), Peter Han Joo Chong (Auckland University of Technology, New Zealand)	nnology, 81
Em	Duaa Zuhair Al-hamid (Auckland University of Technology, New Zealand), Pejman Karegar (Auckland University of Tech	
Em	Duaa Zuhair Al-hamid (Auckland University of Technology, New Zealand), Pejman Karegar (Auckland University of Technology, New Zealand), Peter Han Joo Chong (Auckland University of Technology, New Zealand)  erging Technologies, Applications, and Services	
Em	Duaa Zuhair Al-hamid (Auckland University of Technology, New Zealand), Pejman Karegar (Auckland University of Tecl New Zealand), Peter Han Joo Chong (Auckland University of Technology, New Zealand)	81
Em	Duaa Zuhair Al-hamid (Auckland University of Technology, New Zealand), Pejman Karegar (Auckland University of Technology, New Zealand)  New Zealand), Peter Han Joo Chong (Auckland University of Technology, New Zealand)  erging Technologies, Applications, and Services  • Fast-Convergence Federated Edge Learning via Bilevel Optimization	81
Em	Duaa Zuhair Al-hamid (Auckland University of Technology, New Zealand), Pejman Karegar (Auckland University of Technology, New Zealand)  New Zealand), Peter Han Joo Chong (Auckland University of Technology, New Zealand)  erging Technologies, Applications, and Services  • Fast-Convergence Federated Edge Learning via Bilevel Optimization  Sai Wang (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology)	81 blogy, 87
Em	Duaa Zuhair Al-hamid (Auckland University of Technology, New Zealand), Pejman Karegar (Auckland University of Technology, New Zealand)  Perging Technologies, Applications, and Services  Fast-Convergence Federated Edge Learning via Bilevel Optimization  Sai Wang (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China)  Provenance-based smart parking system with multilevel fog nodes	81 blogy, 87
Em	Duaa Zuhair Al-hamid (Auckland University of Technology, New Zealand), Pejman Karegar (Auckland University of Technology, New Zealand)  Perging Technologies, Applications, and Services  Fast-Convergence Federated Edge Learning via Bilevel Optimization Sai Wang (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China)  Provenance-based smart parking system with multilevel fog nodes Asad Masood Khattak (Zayed University, United Arab Emirates), Bashir Hayat (IM Sciences Peshawar, Pakistan), Noman (Institute of Management Sciences (IMSciences), Pakistan)  IEEE 802.15.6: Physical Layer Implementation and Evaluation of Medical Bands for ns-3	81 Blogy, 87 Gul 93
Em	Duaa Zuhair Al-hamid (Auckland University of Technology, New Zealand), Pejman Karegar (Auckland University of Technology, New Zealand)  Perging Technologies, Applications, and Services  Fast-Convergence Federated Edge Learning via Bilevel Optimization Sai Wang (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China)  Provenance-based smart parking system with multilevel fog nodes Asad Masood Khattak (Zayed University, United Arab Emirates), Bashir Hayat (IM Sciences Peshawar, Pakistan), Noman (Institute of Management Sciences (IMSciences), Pakistan)  IEEE 802.15.6: Physical Layer Implementation and Evaluation of Medical Bands for ns-3 Drishti Tushar Oza (Ritsumeikan University, Japan), Alberto Gallegos Ramonet (Tokushima University, Japan), Masami Yangaran Alberto Gallegos Ramonet (Tokushima University, Japan)	81 Blogy, 87 Gul 93
Em	Duaa Zuhair Al-hamid (Auckland University of Technology, New Zealand), Pejman Karegar (Auckland University of Technology, New Zealand)  Perging Technologies, Applications, and Services  Fast-Convergence Federated Edge Learning via Bilevel Optimization  Sai Wang (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China)  Provenance-based smart parking system with multilevel fog nodes  Asad Masood Khattak (Zayed University, United Arab Emirates), Bashir Hayat (IM Sciences Peshawar, Pakistan), Noman (Institute of Management Sciences (IMSciences), Pakistan)  IEEE 802.15.6: Physical Layer Implementation and Evaluation of Medical Bands for ns-3  Drishti Tushar Oza (Ritsumeikan University, Japan), Alberto Gallegos Ramonet (Tokushima University, Japan), Masami Y (Ritsumeikan University, Japan), Taku Noguchi (Ritsumeikan University, Japan)	81 Blogy, 87 Gul 93
Em	Duaa Zuhair Al-hamid (Auckland University of Technology, New Zealand), Pejman Karegar (Auckland University of Technology, New Zealand)  Perging Technologies, Applications, and Services  • Fast-Convergence Federated Edge Learning via Bilevel Optimization Sai Wang (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Provenance-based smart parking system with multilevel fog nodes  Asad Masood Khattak (Zayed University, United Arab Emirates), Bashir Hayat (IM Sciences Peshawar, Pakistan), Noman (Institute of Management Sciences (IMSciences), Pakistan)  • IEEE 802.15.6: Physical Layer Implementation and Evaluation of Medical Bands for ns-3  Drishti Tushar Oza (Ritsumeikan University, Japan), Alberto Gallegos Ramonet (Tokushima University, Japan), Masami Yakistan University, Japan), Taku Noguchi (Ritsumeikan University, Japan)  • Deep Learning-based Anomaly Detection in Radar Data with Radar-Camera Fusion	81 81 87 Gul 93 Yoshida 99
Em	Duaa Zuhair Al-hamid (Auckland University of Technology, New Zealand), Pejman Karegar (Auckland University of Technology, New Zealand)  Perging Technologies, Applications, and Services  Fast-Convergence Federated Edge Learning via Bilevel Optimization  Sai Wang (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China)  Provenance-based smart parking system with multilevel fog nodes  Asad Masood Khattak (Zayed University, United Arab Emirates), Bashir Hayat (IM Sciences Peshawar, Pakistan), Noman (Institute of Management Sciences (IMSciences), Pakistan)  IEEE 802.15.6: Physical Layer Implementation and Evaluation of Medical Bands for ns-3  Drishti Tushar Oza (Ritsumeikan University, Japan), Alberto Gallegos Ramonet (Tokushima University, Japan), Masami Y (Ritsumeikan University, Japan), Taku Noguchi (Ritsumeikan University, Japan)	81 81 87 Gul 93 Yoshida 99
Em	Duaa Zuhair Al-hamid (Auckland University of Technology, New Zealand), Pejman Karegar (Auckland University of Technology, New Zealand)  Perging Technologies, Applications, and Services  • Fast-Convergence Federated Edge Learning via Bilevel Optimization  Sai Wang (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China)  • Provenance-based smart parking system with multilevel fog nodes  Asad Masood Khattak (Zayed University, United Arab Emirates), Bashir Hayat (IM Sciences Peshawar, Pakistan), Noman (Institute of Management Sciences (IMSciences), Pakistan)  • IEEE 802.15.6: Physical Layer Implementation and Evaluation of Medical Bands for ns-3  Drishti Tushar Oza (Ritsumeikan University, Japan), Alberto Gallegos Ramonet (Tokushima University, Japan), Masami Yi (Ritsumeikan University, Japan), Taku Noguchi (Ritsumeikan University, Japan)  • Deep Learning-based Anomaly Detection in Radar Data with Radar-Camera Fusion  Dong Seog Han (Kyungpook National University, Korea (South)), Dian Ning (Kyungpook National University, Korea (South)), Pain Ning (Kyungpook National University, Korea (Sout	81  Slogy, 87  Gul 93  Soshida 99  uth)) 107
Em <sup>,</sup>	Duaa Zuhair Al-hamid (Auckland University of Technology, New Zealand), Pejman Karegar (Auckland University of Technology, New Zealand)  Perging Technologies, Applications, and Services  • Fast-Convergence Federated Edge Learning via Bilevel Optimization  Sai Wang (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Aizu, Pakistan)  • Provenance-based smart parking system with multilevel fog nodes  Asad Masood Khattak (Zayed University, United Arab Emirates), Bashir Hayat (IM Sciences Peshawar, Pakistan), Noman (Institute of Management Sciences (IMSciences), Pakistan)  • IEEE 802.15.6: Physical Layer Implementation and Evaluation of Medical Bands for ns-3  Drishti Tushar Oza (Ritsumeikan University, Japan), Alberto Gallegos Ramonet (Tokushima University, Japan), Masami Yi (Ritsumeikan University, Japan), Taku Noguchi (Ritsumeikan University, Japan)  • Deep Learning-based Anomaly Detection in Radar Data with Radar-Camera Fusion  Dong Seog Han (Kyungpook National University, Korea (South)), Dian Ning (Kyungpook National University, Korea (South)), Dian Ning (Kyungpook National University, Korea (South)), Dian Ning (Kyungpook National University, Korea (South)), Thanh Pham (Shizuoka University), Hoang D. Le (University of Aizu, Japan), Thanh Pham (Shizuoka University),	81 81 81 87 Gul 93 Yoshida 99 uth)) 107
	Duaa Zuhair Al-hamid (Auckland University of Technology, New Zealand), Pejman Karegar (Auckland University of Technology, New Zealand)  Perging Technologies, Applications, and Services  • Fast-Convergence Federated Edge Learning via Bilevel Optimization  Sai Wang (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Provenance-based smart parking system with multilevel fog nodes  Asad Masood Khattak (Zayed University, United Arab Emirates), Bashir Hayat (IM Sciences Peshawar, Pakistan), Noman (Institute of Management Sciences (IMSciences), Pakistan)  • IEEE 802.15.6: Physical Layer Implementation and Evaluation of Medical Bands for ns-3  Drishti Tushar Oza (Ritsumeikan University, Japan), Alberto Gallegos Ramonet (Tokushima University, Japan), Masami Y (Ritsumeikan University, Japan), Taku Noguchi (Ritsumeikan University, Japan)  • Deep Learning-based Anomaly Detection in Radar Data with Radar-Camera Fusion  Dong Seog Han (Kyungpook National University, Korea (South)), Dian Ning (Kyungpook National University, Korea (South)), Dian Ning (Kyungpook National University, Korea (South)), Dian Ning (Kyungpook National University, Korea (South)), Chuyen T. Nguyen (Hanoi University of Aizu, Japan), Hoang D. Le (University of Aizu, Japan), Thanh Pham (Shizuoka University, Chuyen T. Nguyen (Hanoi University of Science and Technology, Vietnam), Anh T. Pham (The University of Aizu, Japan)	81 81 87 Gul 93 Yoshida 99 uth)) 107
	Duaa Zuhair Al-hamid (Auckland University of Technology, New Zealand), Pejman Karegar (Auckland University of Technology, New Zealand)  Perging Technologies, Applications, and Services  • Fast-Convergence Federated Edge Learning via Bilevel Optimization  Sai Wang (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Aizu, Pakistan)  • Provenance-based smart parking system with multilevel fog nodes  Asad Masood Khattak (Zayed University, United Arab Emirates), Bashir Hayat (IM Sciences Peshawar, Pakistan), Noman (Institute of Management Sciences (IMSciences), Pakistan)  • IEEE 802.15.6: Physical Layer Implementation and Evaluation of Medical Bands for ns-3  Drishti Tushar Oza (Ritsumeikan University, Japan), Alberto Gallegos Ramonet (Tokushima University, Japan), Masami Yi (Ritsumeikan University, Japan), Taku Noguchi (Ritsumeikan University, Japan)  • Deep Learning-based Anomaly Detection in Radar Data with Radar-Camera Fusion  Dong Seog Han (Kyungpook National University, Korea (South)), Dian Ning (Kyungpook National University, Korea (South)), Dian Ning (Kyungpook National University, Korea (South)), Dian Ning (Kyungpook National University, Korea (South)), Thanh Pham (Shizuoka University), Hoang D. Le (University of Aizu, Japan), Thanh Pham (Shizuoka University),	81 81 81 87 Gul 93 Yoshida 99 uth)) 107
	Duaa Zuhair Al-hamid (Auckland University of Technology, New Zealand), Pejman Karegar (Auckland University of Technology, New Zealand)  Perging Technologies, Applications, and Services  • Fast-Convergence Federated Edge Learning via Bilevel Optimization  Sai Wang (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Provenance-based smart parking system with multilevel fog nodes  Asad Masood Khattak (Zayed University, United Arab Emirates), Bashir Hayat (IM Sciences Peshawar, Pakistan), Noman (Institute of Management Sciences (IMSciences), Pakistan)  • IEEE 802.15.6: Physical Layer Implementation and Evaluation of Medical Bands for ns-3  Drishti Tushar Oza (Ritsumeikan University, Japan), Alberto Gallegos Ramonet (Tokushima University, Japan), Masami Y (Ritsumeikan University, Japan), Taku Noguchi (Ritsumeikan University, Japan)  • Deep Learning-based Anomaly Detection in Radar Data with Radar-Camera Fusion  Dong Seog Han (Kyungpook National University, Korea (South)), Dian Ning (Kyungpook National University, Korea (South)), Dian Ning (Kyungpook National University, Korea (South)), Dian Ning (Kyungpook National University, Korea (South)), Chuyen T. Nguyen (Hanoi University of Aizu, Japan), Hoang D. Le (University of Aizu, Japan), Thanh Pham (Shizuoka University, Chuyen T. Nguyen (Hanoi University of Science and Technology, Vietnam), Anh T. Pham (The University of Aizu, Japan)	81 81 81 87 Gul 93 (oshida 99 uth)) 107 Japan), 113
	Duaa Zuhair Al-hamid (Auckland University of Technology, New Zealand), Pejman Karegar (Auckland University of Technology, New Zealand)  erging Technologies, Applications, and Services  • Fast-Convergence Federated Edge Learning via Bilevel Optimization Sai Wang (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science), Pakistan), Noman (Institute of Management Sciences (IMSciences), Pakistan)  • IEEE 802.15.6: Physical Layer Implementation and Evaluation of Medical Bands for ns-3 Drishti Tushar Oza (Ritsumeikan University, Japan), Alberto Gallegos Ramonet (Tokushima University, Japan), Masami Y (Ritsumeikan University, Japan), Taku Noguchi (Ritsumeikan University, Japan)  • Deep Learning-based Anomaly Detection in Radar Data with Radar-Camera Fusion Dong Seog Han (Kyungpook National University, Korea (South)), Dian Ning (Kyungpook National University, Korea (South)), Dian Ning (Kyungpook National University, Korea (South)), Chuyen T. Nguyen (Hanoi University of Science and Technology, Vietnam), Anh T. Pham (The University of Aizu, Japan)  • Improving Signal Quality in Terahertz Communications with Neural Networks	81 81 81 87 Gul 93 (oshida 99 uth)) 107 Japan), 113
	Duaa Zuhair Al-hamid (Auckland University of Technology, New Zealand), Pejman Karegar (Auckland University of Technology, New Zealand)  Perging Technologies, Applications, and Services  Fast-Convergence Federated Edge Learning via Bilevel Optimization  Sai Wang (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University, Japan), Noman (Institute of Management Sciences) (IMSciences), Pakistan, Yi Gong (Southern University, Japan), Noman (Institute of Management Sciences) (IMSciences), Pakistan)  Items 802.15.6: Physical Layer Implementation and Evaluation of Medical Bands for ns-3  Drishti Tushar Oza (Ritsumeikan University, Japan), Alberto Gallegos Ramonet (Tokushima University, Japan), (Ritsumeikan University, Japan)  Deep Learning-based Anomaly Detection in Radar Data with Radar-Camera Fusion  Dong Seog Han (Kyungpook National University, Korea (South)), Dian Ning (Kyungpook National University, Korea (South)), Dian Ning (Kyungpook National University, Korea (South)), Dian Ning (Kyungpook National University, Korea (South)), Chuyen T. Nguyen (Hanoi University of Aizu, Japan), Hoang D. Le (University of Aizu, Japan), Thanh Pham (Shizuoka University, Chuyen T. Nguyen (Hanoi University of Science and Technology, Vietnam), Anh T. Pham (The University of Aizu, Japan)  Improving Signal Quality in Terahertz Communications with Neural Networks  Mariam Abdullah (Uni	81 81 slogy, 87 Gul 93 'oshida 99 uth)) 107 Japan), 113
	Duaa Zuhair Al-hamid (Auckland University of Technology, New Zealand), Pejman Karegar (Auckland University of Technology, New Zealand).  Perging Technologies, Applications, and Services  Fast-Convergence Federated Edge Learning via Bilevel Optimization  Sai Wang (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology), China (Institute of Management Sciences), Pakistan)  Provenance-based Smart parking system with multilevel fog nodes  Asad Masood Khattak (Zayed University, Jakistan)  Institute of Management Sciences (IMSciences), Pakistan)  Institute of Management Sciences (IMSciences), Pakistan), Alberto Gallegos Ramonet (Tokushima University, Japan), Masami Yakistania, Pakistania, Pakista	81 81 81 81 81 81 81 87 87 87 87 87 87 88 99 88 99 88 88 107 107 113 113 Vithawat 120 Abebe
	Duaa Zuhair Al-hamid (Auckland University of Technology, New Zealand), Pejman Karegar (Auckland University of Technology, New Zealand)  Perging Technologies, Applications, and Services  • Fast-Convergence Federated Edge Learning via Bilevel Optimization  Sai Wang (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, Passakara, Pakistan), Noman (Institute of Management Sciences (IMSciences), Pakistan)  • IEEE 802. 15.6: Physical Layer Implementation and Evaluation of Medical Bands for ns-3  Drishit Tushar Oza (Ritsumeikan University, Japan), Alberto Gallegos Ramonet (Tokushima University, Japan), Masami Yi (Ritsumeikan University, Japan), Nasami Yi (Ritsumeikan University, Japan), Nasami Yi (Ritsumeikan University, Japan)  • Deep Learning-based Anomaly Detection in Radar Data with Radar-Camera Fusion  Dong Seog Han (Kyungpook National University, Korea (South)), Dian Ning (Kyungpook National University, Korea (South)), Dian Ning (Kyungpook National University, Korea (South)), Dian Ning (Kyungpook National University, Korea (South)), Chuyen T. Nguyen (Hanoi University of Aziu, Japan), Hoang D. Le (University of Aizu, Japan), Thanh Pham (Shizuoka University, Chuyen T. Nguyen (Hanoi University of Science and Technology, Vietnam), Anh T. Pham (The University of Aizu, Japan)  • Improving Signal Quality in Terahertz Communications with Neural Networks  Mariam Abdullah (University of Adelaide, Aus	81 81 slogy, 87 Gul 93 'oshida 99 uth)) 107 Japan), 113
	Duaa Zuhair Al-hamid (Auckland University of Technology, New Zealand), Pejman Karegar (Auckland University of Technology, New Zealand)  Perging Technologies, Applications, and Services  • Fast-Convergence Federated Edge Learning via Bilevel Optimization  Sai Wang (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, Vience and Masood Khattak (Zayed University, United Arab Emirates), Bashir Hayat (IM Sciences Peshawar, Pakistan), Noman (Institute of Management Sciences (IMSciences), Pakistan)  • IEEE 802. 15.6: Physical Layer Implementation and Evaluation of Medical Bands for ns-3  Drishit Tushar Oza (Ritsumeikan University, Japan), Alberto Gallegos Ramonet (Tokushima University, Japan), Masami Yi (Ritsumeikan University, Japan), Masami Yi (Ritsumeikan University, Japan), Takun Noguchi (Ritsumeikan University, Japan)  • Deep Learning-based Anomaly Detection in Radar Data with Radar-Camera Fusion  Dong Seog Han (Kyungpook National University, Korea (South)), Dian Ning (Kyungpook National University, Korea (South)), Dian Ning (Kyungpook National University, Korea (South)), Dian Ning (Kyungpook National University, Korea (South)), Chuyen T. Nguyen (Hanoi University of Aizu, Japan), Hoang D. Le (University of Aizu, Japan), Thanh Pham (Shizuoka University, Chuyen T. Nguyen (Hanoi University of Adelaide, Australia), Estrid He (RMIT, Australia), Ke Wang (RMIT University, Australia), V Withayachumnankul (The University of Adelaide, Australia), Estrid He (RMIT,	81 81 81 87 87 Gul 93 'oshida 99 uth)) 107 Japan), 113
	Duaa Zuhair Al-hamid (Auckland University of Technology, New Zealand), Pejman Karegar (Auckland University of Technology, New Zealand)  Perging Technologies, Applications, and Services  • Fast-Convergence Federated Edge Learning via Bilevel Optimization  Sai Wang (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, China), Yi Gong (Southern University of Science and Technology, Passakara, Pakistan), Noman (Institute of Management Sciences (IMSciences), Pakistan)  • IEEE 802. 15.6: Physical Layer Implementation and Evaluation of Medical Bands for ns-3  Drishit Tushar Oza (Ritsumeikan University, Japan), Alberto Gallegos Ramonet (Tokushima University, Japan), Masami Yi (Ritsumeikan University, Japan), Nasami Yi (Ritsumeikan University, Japan), Nasami Yi (Ritsumeikan University, Japan)  • Deep Learning-based Anomaly Detection in Radar Data with Radar-Camera Fusion  Dong Seog Han (Kyungpook National University, Korea (South)), Dian Ning (Kyungpook National University, Korea (South)), Dian Ning (Kyungpook National University, Korea (South)), Dian Ning (Kyungpook National University, Korea (South)), Chuyen T. Nguyen (Hanoi University of Aziu, Japan), Hoang D. Le (University of Aizu, Japan), Thanh Pham (Shizuoka University, Chuyen T. Nguyen (Hanoi University of Science and Technology, Vietnam), Anh T. Pham (The University of Aizu, Japan)  • Improving Signal Quality in Terahertz Communications with Neural Networks  Mariam Abdullah (University of Adelaide, Aus	81 81 81 81 81 81 81 87 87 87 87 87 87 88 99 88 99 88 88 107 107 113 113 Vithawat 120 Abebe

	Meng Zian (Huazhong University of Science and Technology, China), Likun Huang (Wuhan Institute of Technolog Qiang Li (Huazhong University of Science and Technology, China), Wensheng Zhang (Shandong University, China (Huazhong University of Science and Technology, China), Chen Wang (Huazhong University of Science and Technology)	ı), Bing Tang
	China), Xiaohu Ge (Huazhong University of Science & Technology, China)	136
	• Dither-free Auto Bias Control Technique for In-service Optical IQ modulator Using Reference Pulsed L	
	Hiroto Kawakami (NTT, Japan), Yoshiaki Kisaka (NTT, Japan), Etsushi Yamazaki (NTT, Japan)	143
Wir	eless Communications	
V V 11	cless communications	
	• Low Complexity Hybrid Precoding Design for Sub-Connected Massive MIMO Systems	
	Lei Zhao (Sun Yat-Sen University, China), Junjie Li (Sun Yat-Sen University, China), Yuan Jiang (Sun Yat-sen Univer	sity, China)
		148
	• Tailoring Routing Protocols for Flying Ad Hoc Networks: Challenges and Possible Countermeasures	
	Wei Liu (Chongqing University of Technology, China), Ming Xu (Nanjing University of Aeronautics and Astronauti Yun Feng (Chongqing University of Technology, China), Yabo Zhang (Chongqing University of Technology, China (Nanjing University of Aeronautics and Astronautics, China), Jing Mao (Chongqing University of Technology, Chin	), Yu Xia
	Huang (Nanjing University of Aeronautics and Astronautics, China)	154
	An Overloaded MIMO 2-Hop Network With Physical Layer Network Coding	
	Satoshi Denno (Okayama University, Japan), Tomoya Tanikawa (Okayama University, Japan), Yafei Hou (Okayama	
	Japan)	160
	<ul> <li>TDM Scheduling Based on Receiver Grouping for Indoor Wireless Power Transfer</li> <li>Yuna Sawada (Tokyo Metropolitan University, Japan), Shino Shiraki (Tokyo Metropolitan University, Japan), Takah</li> <li>(Tokyo Metropolitan University, Japan), Takefumi Hiraguri (Nippon Institute of Technology, Japan), Kazuki Maruta</li> </ul>	
	University of Science, Japan), Tomotaka Kimura (Doshisha University, Japan)	166
	• Implementing Hardware-in-the-Loop Protocol Simulation for UAV Networks	
	Ming Xu (Nanjing University of Aeronautics and Astronautics, China), Wei Liu (Chongqing University of Technolog Cheng Xu (Nanjing University of Aeronautics and Astronautics, China), Yabo Zhang (Chongqing University of Technology, China), Ke Zhang (Chongqing University of Technology, China), Yun Feng (Chongqing University of Technology, China), Daqing Huang (Nanjing University of Aeronautics and Astronautics, China), Daqing Huang (Nanjing University of Aeronautics and Astronautics)	hnology, China), Yu Xia
	Astronautics, China)  eless Networks	172
	• A Deep Learning Approach for Detecting Virtual Link Anomalies in LEO Satellite Networks  Rui Pang (Chongqing University of Posts and Telecommunications, China), Lizhi He (Chongqing University of Posts Telecommunications, China), Liu Zhanjun (Chongqing University of Posts and Telecommunications, China), Cheng	
	(Chongqing University of Posts and Telecommunications, China & Carleton University, Canada)	178
	<ul> <li>5G Millimeter Wave Array with Compact End-fire MIMO Architecture</li> <li>Yi Gong (Southeast University, China), Xian-Long Yang (Southeast University, China), Wen-Liang Song (Southeast</li> </ul>	University,
	China), Dong-Yi Huang (Southeast University, China), Xiao-Wei Zhu (Southeast University, China)	184
	<ul> <li>Analytical Perspective of 5G PCF with Proxy BSF</li> <li>Priyatosh Mandal (Centre for Development of Telematics, New Delhi, India), Shubham Verma (Centre for Development of Telematics)</li> </ul>	ment of
	Telematics, New Delhi, India), Anurag Gupta (C-DOT, India)	189
	Drone Detection and Classification approaches based on ML algorithms	
	Maha Sliti (Communication Networks and Security Research Lab., Tunisia), Mouna Garai (Communication Networ	ks and
	Security Research Lab., Tunisia)	195
	<ul> <li>Radar-Communication Integration System based on PMCW Radar using Zadoff-Chu Sequence</li> </ul>	
	Masahiro Umehira (Nanzan University & Ibaraki University, Japan), Katsuyuki Fujii (Nanzan University, Japan), Yas	,
	Okumura (NANZAN University, Japan)	202
Eme	erging Technologies, Applications, and Services	
	• Performance of a Dielectric Resonator Antenna for Structural Health Monitoring Applications	
	Reenu Tresa Jacob (Western Sydney University, Australia), Robert Salama (Western Sydney University, Australia), I	Ranjith
	Liyanapathirana (Western Sydney University, Australia)	207
	<ul> <li>FingerFi: An Alpha-numeric Character-based Gesture recognition using Wi-Fi Sensing</li> </ul>	
	Sruthi Penmetsa (University of Hyderabad, India), Udgata Siba Kumar (University of Hyderabad, India)	213
	• Energy Efficiency in Semantic Networks: A Heuristic Optimization Approach for Resource Allocation	
	Ao Xiao (Chongqing University of Posts and Telecommunications, China), Kaixuan Zhao (Chongqing University of	
	Telecommunications, China), Liu Zhanjun (Chongqing University of Posts and Telecommunications, China), Cheng	
	(Chongqing University of Posts and Telecommunications, China & Carleton University, Canada)	219
	<ul> <li>Client Selection Based on Channel Capacity for Federated Learning Under Wireless Channels</li> </ul>	

	Satoshi Yamazaki (National Institute of Technology, Numazu College & Control & Computer Engineering, Japan), Taku	ıma
	Furuki (Tokyo University, Japan)	225
	<ul> <li>Online Learning based Matching for Decentralized Task Offloading in Fog-enabled IoT Systems</li> <li>Tran Hoa (Kumoh National Institute of Technology, Korea (South)), Dong Seong Kim (Kumoh National Institute of Technology)</li> </ul>	nnology,
	Korea (South))	231
Amb	pient Intelligence for Smart City	
	Adopted Acceptance Test-Driven Development to produce RPA for reducing teaching workload	
	Jirayus Arbking (Burapha, Thailand), Wantana Sisomboon (Burapha University, Thailand), Nuttaporn Phakdee (Burapha	
	University, Thailand)	237
	<ul> <li>Visible Light Communication Systems Using a High-speed Display and Rolling-shutter Camera</li> </ul>	
	Hiraku Okada (Nagoya University, Japan), Taiga Hayashi (Nagoya University, Japan), Kentaro Kobayashi (Meijo Univers Japan), Tadahiro Wada (Shizuoka University, Japan), Chedlia Ben Naila (Nagoya University, Japan), Masaaki Katayama	Nagoya
	University, Japan)	244
	<ul> <li>An LSTM-Based Approach for Fall Detection Using Accelerometer-Collected Data         Yoshiya Uotani (Keio University, Japan), Kohei Yamamoto (Keio University, Japan), Chen Ye (Nanjing University of Post     </li> </ul>	and
	Telecommunications, China), Mondher Bouazizi (Keio University, Japan), Tomoaki Ohtsuki (Keio University, Japan)	250
	<ul> <li>Leveraging Fog Layer Data Prediction Using Deep Learning for Enhanced IoT Sensor Longevity</li> <li>Made Adi Paramartha Putra (Primakara University, Indonesia), Mideth Abisado (National University, Philippines), Gabri Avelino R Sampedro (University of the Philippines, Philippines &amp; Kumoh National Institute of Technology, Korea (Sout</li> </ul>	
	Decentralized Optimal Parking Lot Allocation via Dynamic Parking Fee	
	Toru Namerikawa (Keio University, Japan)	261
\//irc	eless Communications	
	Beam Direction Optimization for Next-Generation GEO Satellite Networks  Heba Shehata (Macquarie University, Australia), Hazer Inaltekin (Macquarie University, Australia), Iain B. Collings (Macquarie University, Australia), Stephen Hanly (School of Engineering, Macquarie University, Australia), Philip Whiting (Macquarie University, Australia), Philip Whiting (Macquarie University, Australia), Philip Whiting (Macquarie University), Philip Whiting (Macquar	-
	University, Australia)	267
	• Endurance Enhancement of Aerial Vehicle Energy Transmitters Using Conical Corrugated Horn Antenna	
	Archiman Lahiry (School of Engineering Design and Built Environment, Western Sydney University, Penrith Kingswood Western Sydney University, Australia), Khoa N Le (Western Sydney University, Australia), Vo Nguyen Quoc Bao (Posts a Telecommunications Institute of Technology, Vietnam), Vivian W.Y. Tam (School of Engineering, Design and Built Envi	and
	Western Sydney University, Australia)	273
	<ul> <li>Priority Based Spectrum Allocation</li> <li>Chamath Divarathne (RMIT University, Australia), Tharaka Samarasinghe (University of Moratuwa, Sri Lanka), Sithampa</li> </ul>	ranathan
	Kandeepan (RMIT University, Australia), Ke Wang (RMIT University, Australia)	279
	<ul> <li>Proactive Cell Switching for mmWave Networks with Hybrid Beamforming and Dynamic Blockers</li> <li>Xiaohui Zhou (Macquarie University, Australia), Iain B. Collings (Macquarie University, Australia), Stephen Hanly (School</li> </ul>	l of
	Engineering, Macquarie University, Australia), Philip Whiting (Macquarie University, Australia)	285
	An Efficient Client Selection for Wireless Federated Learning	
	Jingyi Chen (Beijing University of Posts and Telecommunications, China), Wang Qiang (Beijing University of Posts and	201
	Telecommunications, China), Wenqi Zhang (Beijing University of Posts and Telecommunications, China)	291
Eme	erging Technologies for B5G/6G Wireless Communication Systems	
	Over-the-Air Computation for Partial Aggregation of IoT Data     Go Fukuda (Kansai University, Japan), Seiji Miyoshi (Kansai University, Japan), Hiroyuki Yomo (Kansai University & ATR	207
	Adaptive Communications Research Lab., Japan)	297
	<ul> <li>Performance Analysis of MIMO-Underwater Optical Wireless Communication</li> <li>Maha Sliti (Communication Networks and Security Research Lab., Tunisia), Mouna Garai (Communication Networks and Security Research Lab., Tunisia)</li> </ul>	d
	Security Research Lab., Tunisia)	301
	Energy Efficiency Optimization of Intelligent Reflective Surface-assisted Terahertz-RSMA System	
	Xiaoyu Chen (University of Sydney, China), Menghan Hu (University of Sydney, Australia), Feng Yan (Southeast University of Sydney, Australia), Feng Yan (Sou	ity,
	China), Zihuai Lin (University of Sydney, Australia)	307
	• Collaborative MIMO Reception: Measurement Campaign and Mutual Information Rate Analysis	
	Hidekazu Murata (Yamaguchi University, Japan), Daisuke Umehara (Kyoto Institute of Technology, Japan)	313
	Millimeter-Wave Rand Coverage Extension by Reducina Noise Figure at Cryogenic Temperatures	

University, Japan)	315
Emerging Technologies, Applications, and Services	
• Evaluation of Applying Blockchain Technology to IoT Data Distribution	
Hayato Kumazaki (Kogakuin University, Japan), Osamu Mizuno (Kogakuin University, Japan)	318
• Fun Button Experiment: The Long-Term Effect of Gamification on User Engagement and Behavior	
Mohammad Hajarian (Universidad Carlos III de Madrid, Spain), Paloma Diaz (Universidad Carlos III de Madrid, Spain), Id	gnacio
Aedo (Universidad Carlos III de Madrid, Spain)	324
• Evaluation of Dynamic Routing in Information-Centric based Wireless Sensor Networks	
Kohei Yamamoto (Kogakuin University, Japan), Takafumi Taya (Kogakuin University, Japan), Osamu Mizuno (Kogakuin	
University, Japan)	329
<ul> <li>A Review of Recent Trends in Blockchain Consensus Algorithms: Artificial Intelligence-Based Approach</li> </ul>	
Jauzak Hussaini Windiatmaja (University of Indonesia, Indonesia), Muhammad Salman (Universitas Indonesia, Indonesia	
Sari (University of Indonesia, Indonesia)	335
<ul> <li>Research on the Charging Socket Detection based on Improved YOLOv5 Algorithm</li> </ul>	
Guangmeng Chen ( & Xidian University, China)	342
Ambient Intelligence for Smart City	
<ul> <li>Evaluation of path planning algorithms for mobile energy storage and charging robots</li> </ul>	
Kaixinguang Li (Xidian University, China)	347
• Laser SLAM research for mobile energy storage and charging robots	•••••
Ziheng Wang (Xidian University & Hangzhou Enrgmax Technology Co., Ltd., China)	352
• Facial Expression Recognition by Photo-Reflective Sensors Considering Time Series and Head Posture	
Yuki Nakabayashi (Keio University, Japan), Fumihiko Nakamura (Ritsumeikan University, Japan), Maki Sugimoto (Keio	
University, Japan)	358
• An Efficient Radio Frequency Fingerprint Extraction Method Using Asymmetric Masked Auto-Encoder	
Zhisheng Yao (Nanjing University of Posts and Telecommunications, China), Xue Fu (Nanjing University of Posts and Telecommunications, China), Shufei Wang (Nanjing & Nanjing University of Posts and Telecommunications, China), Yu (Nanjing University of Posts and Telecommunications, China), Guan Gui (Nanjing University of Posts and Telecommunications, China), Guan Gui (Nanjing University of Posts and Telecommunications, China), Guan Gui (Nanjing University of Posts and Telecommunications)	-
China), Shiwen Mao (Auburn University, USA)	364
• HomeShelf: Cultivating Individual Relationships with Digital Contents	
Sota Tanaka (Keio University, Japan), Issei Fujishiro (Keio University, Japan)	369
-	
Signal Processing for Communications	
• Efficient Multiple UAV Deployment for Maximal Communication Connectivity over Wide Areas	
Qiwei Yang (Macquarie University, Australia), Iain B. Collings (Macquarie University, Australia), Stephen Hanly (School o	of
Engineering, Macquarie University, Australia)	375
• A Resource Allocation Scheme in Heterogeneous Multi-system Satellite Network with Beam-hopping	
Yilin Zhai (Chongqing University of Posts and Telecommunications, China), Yu Zhang (Chongqing University of Posts an	
Telecommunications, China), Chengchao Liang (Chongqing University of Posts and Telecommunications, China & Carle	
University, Canada)	381
Performance of PSA-EKF Phase Noise Compensation in 3GPP Phase Noise Models for Mobile Backhaul Lin	
Ryota Kuribayashi (Tokyo City University, Japan), Mamoru Sawahashi (Tokyo City University, Japan), Norifumi Kamiya (N	
Corporation, Japan)	387
Performance of NR Downlink Initial Access Using Synchronization Signal Block for mm-Wave Bands     Share Year of Tales Citathia and All Tales Citathia and	
Shun Yoneda (Tokyo City University, Japan), Mamoru Sawahashi (Tokyo City University, Japan), Satoshi Nagata (NTT Do	394
Inc., Japan)	334
<ul> <li>Double Deep Reinforcement Learning for UxV-Enabled Multi-User Communication Systems</li> <li>Silvirianti Silvirianti (Kumoh National Institute of Technology, Korea (South)), Soo Young Shin (Kumoh National Institute)</li> </ul>	e of
Technology, Korea (South))	401
	<del></del>
Emerging Technologies for B5G/6G Wireless Communication Systems	

Yasunori Suzuki (NTT DOCOMO, INC., Japan), Tomoyuki Furuichi (Tohoku University, Japan), Noriharu Suematsu (Tohoku

• Bandwidth Enhancement of A Planar Monopole Antenna Using CMA-ES Optimizer for B5G/6G Applications

Agus D. Prasetyo (Telkom University & Institut Teknologi Bandung, Indonesia), Hurianti Vidyaningtyas (Telkom Univ Indonesia), Deny Hamdani (Institut Teknologi Bandung, Indonesia), Achmad Munir (Institut Teknologi Bandung, Indo	-
	407
Performance Evaluation of MIMO Channel Capacity Based on Polarization Loss Factor  Trasma Yunita (Telkom University, Indonesia), Hartuti Mistialustina (Institut Teknologi Bandung, Indonesia), Imelda L Simanjuntak (Universitas Mercu Buana & Institute Technology Bandung, Indonesia), Chairunnisa Chairunnisa (Institut Teleplaci Bandung, Indonesia), Administra Teleplaci Bandung, Indonesia, Indone	it
Teknologi Bandung, Indonesia), Aloysius Adya Pramudita (Telkom University, Indonesia), Achmad Munir (Institut Tek Bandung, Indonesia)	412
Construction of partially-doped generalized LDPC codes over regular LDPC codes	712
Jaewha Kim (Electrical and Telecommunications Research Institute (ETRI), Korea (South)), Jae-Won Kim (Gyeongsang University, Korea (South)), Jong-Seon No (Seoul National University, Korea (South))	National 416
Envelope Correlation Evaluation of MIMO Antenna with Guard Trace Structures	
Zulfi Zulfi (Telkom University, Indonesia), Joko Suryana (Institut Teknologi Bandung, Indonesia), Nachwan Mufti Adri	-
(Universitas Telkom, Indonesia), Achmad Munir (Institut Teknologi Bandung, Indonesia)	419
Advancements in Millimeter Wave MIMO Antenna Arrays for Enhanced 5G Connectivity	424
Akram A Almohammedi (Karabük University, Turkey)	424
<ul> <li>Emerging Technologies, Applications, and Services Track</li> <li>Software-Defined IoT with Machine Learning-Based Enhanced Security</li> </ul>	
Ali Husnain (University of Wollongong, Australia), Chau Nguyen (University of Wollongong, Australia), Ngoc Thuy Le	
(University of Wollongong, Australia)	430
Design and Implementation of IoT-enabled Intelligent Irrigation System Using Machine Learning	
Akram A Almohammedi (Karabük University, Turkey)	436
Predicting Traffic Accidents Severity using Collaborative ML on Blockchain	
Priyanshi Jain (IIT Jodhpur, India), Yashvi Ramanuj (IIT Jodhpur, India), Debasis Das (IIT Jodhpur, India)  • Edge-Centric Security Framework for Electric Vehicle Connectivity: A Deep Learning Approach	442
Koustav Kumar Mondal (Indian Institute of Technology, Jodhpur, India), Divya Mahendia (Indian Institute of Technology, Jodhpur, India), Decker (Indian Institute of Technology), Jodhpur, India)	ogy <b>448</b>
Jodhpur, India), Debasis Das (IIT Jodhpur, India), Sumit Kalra (IIT Jodhpur, India)  • Performance analysis of FSO communication systems under different atmospheric conditions	440
Maha Sliti (Communication Networks and Security Research Lab., Tunisia), Mouna Garai (Communication Networks and Security Research Lab., Tunisia), Mouna Garai (Communication Networks and Security Research Lab., Tunisia), Mouna Garai (Communication Networks and Security Research Lab., Tunisia), Mouna Garai (Communication Networks and Security Research Lab., Tunisia), Mouna Garai (Communication Networks and Security Research Lab., Tunisia), Mouna Garai (Communication Networks and Security Research Lab., Tunisia), Mouna Garai (Communication Networks and Security Research Lab., Tunisia), Mouna Garai (Communication Networks and Security Research Lab., Tunisia), Mouna Garai (Communication Networks and Security Research Lab., Tunisia), Mouna Garai (Communication Networks and Security Research Lab., Tunisia)	and
Security Research Lab., Tunisia)	454
Ambient Intelligence for Smart City	
Ambient intelligence for bindire city	
• Blockchain-Based Data Management System for Validation and Accuracy of Technical Data in Broadbar	nd N
Sigit Anggraito (Researcher Telco Company & Telkom Indonesia, Indonesia), Rahman Parentio (Blockchain Research Telkom Indonesia, Indonesia), Ratih Ruffianti (Senior Expert & PT TELKOM INDONESIA, Indonesia), Baskoro Nugroho Telkom Indonesia, Indonesia), Dian Hendrayana (PT. Telkom Indonesia, Indonesia), Arief Hamdani Gunawan (Telkom	er & o (PT.
Indonesia, Indonesia)	459
<ul> <li>Monitoring System Based on LoRa and IoT for BTS to Enhance 5G Network Efficiency in Smart Cities</li> <li>Muhammad Ary Murti (Telkom University, Indonesia), Leonardus Sandy Ade Putra (Universitas Tanjungpura, Indonesia)</li> </ul>	 sia), Eka
Kusumawardhani (Universitas Tanjungpura, Indonesia)	465
<ul> <li>Efficient and Accurate HD Map Generation for Unstructured Automated Valet Parking (UAVP) Environment</li> </ul>	ent
Sung-II Kim (Pusan National University, Korea (South)), Han-You Jeong (Pusan National University, Korea (South))	472
Image processsing for Communications	
• U-Net-based Chip Detection in CNC Machine  Dong Seog Han (Kyungpook National University, Korea (South)), Hyojeong Seo (Kyungpook National University, Korea (South))	rea
(South)), Sehoon Park (DN Solutions, Korea (South)), Min Jae Kang (DNsolutions, Korea (South))	478
<ul> <li>An Uniformalized Quality Encoding in Cloud Transcoding System</li> <li>Jeong-mee Moon (SKBroadband, Korea (South)), Jaeil Kim (SK Telecom Co, Korea (South)), Taeseung Hwang (SK Telecom Co, Korea (South)), Taeseung (SK Telecom Co, Korea (South)), Taese</li></ul>	ecom,
Korea (South)), Dongwon Kim (SK Telecom, Korea (South)), SeongSoo Park (SK Telecom, Korea (South))	483
<ul> <li>Performance Characteristics of CS-Based Image Reconstruction on Microwave Imaging Using Horn Ante         Folin Oktafiani (Lembaga Ilmu Pengetahuan Indonesia, Indonesia), Budi Syihabuddin (Telkom University, Indonesia),</li></ul>	Levy
Teknologi Bandung, Indonesia)	489
• Path Loss Models in Dense Urban Areas: A Study of Lagos Island, Nigeria	
Simon Karanja Hinga (Santa Clara University, USA), Tokunbo Ogunfunmi (Santa Clara University, USA)	493