

2021 International Wireless Communications and Mobile Computing (IWCMC 2021)

**Harbin City, China
28 June – 2 July 2021**

Pages 1-714



**IEEE Catalog Number: CFP2119E-POD
ISBN: 978-1-7281-8617-7**

**Copyright © 2021 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

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

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

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

IEEE Catalog Number:	CFP2119E-POD
ISBN (Print-On-Demand):	978-1-7281-8617-7
ISBN (Online):	978-1-7281-8616-0
ISSN:	2376-6492

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

Monday, June 28th, 2021

MA-1: Multimedia Communications (Multimedia Symposium)

Session Chair: Liang Zhou, Nanjing University of Posts and Telecommunications, China

Session Co-Chair: Xin Wei, Nanjing University of Posts and Telecommunications, China

Automatic Modulation Classification based on Improved R-Transformer 1

Xueyuan Liu

The University of Sydney, Australia

A Novel GCN based Indoor Localization System with Multiple Access Points 9

Yanzan Sun, Qinggang Xie, Guangjin Pan, Shunqing Zhang, Shugong Xu

Shanghai University, China

Secure Multimedia Content Retrievals via Multi-path Transmission in Named Data Networking 15

Jie Song, Yanming Xue, Tong Li, Hao Xing

Beijing Institute of Technology, China

Graph Mapping Offloading Model based on Deep Reinforcement Learning with Dependent Task 21

Ning Mao¹, Yuanfang Chen², Mohsen Guizani³, Gyu Myoung Lee⁴

¹Dalian University of Technology, China, ²Hangzhou Dianzi University, China, ³Qatar University, Qatar, ⁴Liverpool John Moores University, United Kingdom

RL-CNN: Reinforcement Learning-designed Convolutional Neural Network for Urban Traffic

Flow Estimation 29

Mostafa Karimzadeh¹, Alessandro Esposito¹, Zhongliang Zhao^{1,2}, Torsten Braun¹, Susana Sargento³

¹University of Bern, Switzerland, ²Beihang University, China, ³Instituto de Telecomunicações, Portugal

PPO-RM: Proximal Policy Optimization based Route Mutation for Multimedia Services 35

Jiahao Shen¹, Tao Zhang¹, Bingchi Zhang¹, Weixiao Ji¹, Xiaohui Kuang^{1,2}, Changqiao Xu¹

¹Beijing University of Posts and Telecommunications, China, ²State key Laboratory of Science and Technology on Information System Security, China

MA-2: Intelligent Cloud/Slicing/Internet (Intelligent Network Computing Workshop)

Session Chair: Ying Wang, Beijing University of Posts and Telecommunications, China

Multi-source Data Analysis Method of Exhibition Site based on Mobile Internet 41

Xiaoyin Yin¹, Jiangnan He², Ying Gao¹, Jingxian Li¹

¹Yunnan Minzu University, China, ²Yunnan University of Finance and Economics, China

Dynamic Resource Scheduling of Container-based Edge IoT Agents	45
Yutong Ji ¹ , Jia Tang ² , Ning Zhang ² , Zhen Wei ³ , Ying Wang ³ , Peng Yu ³	
¹ State Grid Jibei Information & Telecommunication Company, China, ² State Grid Information & Telecommunication Branch, China, ³ Beijing University of Posts and Telecommunications, China	
An Efficiency Evaluation Method for Cloud-Edge Collaborative Network	51
Shen Jin ¹ , Qinghai Ou ² , Yuqing Feng ¹ , Ningchi Zhang ² , Lin Cong ³ , Ying Wang ³ , Peng Yu ³	
¹ State Grid Jibei Information & Telecommunication Company, China, ² Beijing Fibrlink Communications Co., Ltd., China, ³ Beijing University of Posts and Telecommunications, China	
Slice Network Framework and Use Cases based on FlexE Technology for Power Services	57
Zhengyang Ding ¹ , Wei Li ¹ , Yufan Cheng ² , Yong Xu ¹ , Yong Dai ¹ , Ying Wang ² , Peng Yu ²	
¹ State Grid Jiangsu Electric Power Co., Ltd, China, ² Beijing University of Posts and Telecommunications, China	
Deep Reinforcement learning-based Resource Reservation Method for Power Emergency Internet-of-things Slice	63
Mingshi Wen ¹ , Tianxiang Hai ¹ , Li Zhang ¹ , Jiakai Hao ¹ , Guanghuai Zhao ¹ , Zerui Zhen ² , Yikun Zhao ² , Lei Feng ²	
¹ State Grid Beijing Electric Power Company, China ² Beijing University of Posts and Telecommunications, China	
Service Function Chain Deployment for 5G Delay-Sensitive Network Slicing	68
Yujing Zhao ¹ , Jing Shen ¹ , Qi Wang ¹ , Sheng Zheng ¹ , Kunyi Xie ² , Jing Gao ² , Lei Feng ²	
¹ State Grid Henan Electric Power Company, China, ² Beijing University of Posts and Telecommunications, China	
MA-3: IoT Applications (WSNs & IoT Symposium)	
Session Chair:	Moayad Aloqaily, Gnowit Inc., Canada
Scalability of LPWAN for Smart City Applications	74
Renato Caminha Juaçaba Neto ¹ , Pascal Mérindol ¹ , Antoine Gallais ² , Fabrice Théoleyre ¹	
¹ University of Strasbourg, France, ² Université Polytechnique Hauts-de-France, France	
A Personal LPWAN Remote Monitoring System	80
Gaby Bou Tayeh ¹ , Christophe Guyeux ¹ , Abdallah Makhoul ¹ , Jacques M. Bahi ¹ , Sébastien Freidig ²	
¹ University Bourgogne Franche-Comté, France, ² SDIS 25, France	
VHMM-based E-ADR for LoRaWAN networks with unknown mobility patterns	86
Norhane Benkahla ^{1,2} , Hajer Tounsi ¹ , Ye-Qiong Song ² , Mounir Frikha ¹	
¹ University of Carthage, Tunisia, ² Université de Lorraine, France	
Wireless IoT Approach for Testing in situ Motor's Axis Vibration Monitoring	92
Mohamed Hayouni ¹ , Zayneb Bousselmi ² , Tan-Hoa Vuong ³ , Fethi Choubani ¹ , Jacques David ³	
¹ University of Carthage, Tunisia, ² University of Jendouba, Tunisia, ³ INPT-ENSEEIH, France	
Multi-objective Optimisation of Wireless Sensor Networks Deployment: Application to Fire Surveillance in Smart Car Parks	98
Slimane Charafeddine Benghelima ¹ , Mohamed Ould-Khaoua ¹ , Ali Benzerbadj ² , Oumaya Baala ³	
¹ Université Blida 1, Algeria, ² Université de Ain Témouchent Belhadj Bouchaib, Algeria, ³ University Bourgogne Franche-Comté, France	
Deep Federated Learning for IoT-based Decentralized Healthcare Systems	105
Haya Elayan ¹ , Moayad Aloqaily ² , Mohsen Guizani ²	
¹ xAnalytics Inc., Canada, ² Qatar University, Qatar	

MA-4: 5G IoT I (5G-IoT Symposium)

Session Chair: Tao Hong, Beihang University, China

Supervised Learning Classifier based Transmit Antenna Selection for SM-MIMO System 110

Abeer Mohamed¹, Zhiquan Bai¹, Jean Paul Twarayisenze¹, Ke Pang¹, Guangyu Li¹, Oloruntomilayo Femi-Philips¹, Xinghai Yang²

¹Shandong University, China, ²Qingdao University of Science and Technology, China

Multi-Agent Deep Reinforcement Learning for Resource Allocation in the Multi-Objective HetNet 116

Hongrui Nie, Shaosheng Li, Yong Liu

Beijing University of Posts and Telecommunications, China

Iterative Receiver of Uplink Massive MIMO Unsourced Random Access 122

Zijie Liang, Jianping Zheng

Xidian University, China

Simplified Random Access Design for Satellite Internet of Things with NOMA 128

Jiacheng Yang, Aihua Wang, Neng Ye, Yun Liu, Hao Xu

¹Beijing Institute of Technology, China, ²China Electronics Technology Group Corporation, China, ³Huaneng Coal Technology Research Co., Ltd., China

Online Reconfigurable Deep Learning-Aided Multi-User Detection for IoT 133

Neng Ye, Jianxiong Pan, Xiaojuan Wang, Peisen Wang, Xiangming Li

Beijing Institute of Technology, China

Research on Application Technology of 5G Internet of Things and Big Data in Dairy Farm 138

Jinmeng Zhang¹, Renlong Zhang¹, Qiye Yang², Tingting Hu¹, Kaijun Guo¹, Tao Hong^{2,3}

¹Beijing University of Agriculture, China, ²Beihang University, China, ³Yunnan Innovation Institute-BUAA, China

MA-5: Intelligent 5G/6G Communications (Intelligent Network Computing Workshop)

Session Chair: Fei Zheng, Guilin University of Electronic Technology, China

Indoor Localization on Smartphone using PDR and Sparse Deployed BLE Beacons in Large Open Area 141

Mei Wang, Nan Duan, Zou Zhou, Hongbing Qiu, Xiaopeng Li, Fei Zheng

Guilin University of Technology

Res6Edge: An Edge-AI Enabled Resource Sharing Scheme for C-V2X Communications towards 6G 149

Jainam Sanghvi¹, Pronaya Bhattacharya¹, Sudeep Tanwar¹, Rajesh Gupta¹, Neeraj Kumar², Mohsen Guizani³

¹Nirma University, India, ²Thapar Institute of Engineering & Technology, India, ³Qatar University, Qatar

Service Fault Diagnosis Algorithm of Noise Network under 5G Network Slice 155

Jiajia Fu¹, Ying Zeng¹, Zanhong Wu¹, Song Kang²

¹Electric Power Dispatching Control Center of Guangdong Power Grid Co., Ltd., China, ²Beijing University of Posts and Telecommunications, China

Mobility-Aware Blockchain Resource Allocation Algorithm for Vehicular Networks 160

Boxian Liao¹, Siya Xu¹, Qiang Gao², Qian Wu², Jia Chen²

¹Beijing University of Posts and Telecommunications, China, ²Shenzhen Power Supply Co, Ltd., China

Service Fault Location Algorithm based on Network Characteristics under 5G Network Slicing 166

Jiangang Lu¹, Jiajia Fu¹, Ying Zeng¹, Linna Ruan²

¹Electric Power Dispatching Control Center of Guangdong Power Grid Co., Ltd., China²Beijing University of Posts and Telecommunications, China

Dynamic Network Fault Diagnosis Algorithm under 5G Network Slice 172

Hongyuan Zheng¹, Jiangang Lu¹, Zhan Shi¹, Yuhang Chen¹, Keqin Zhang²

¹Electric Power Dispatching Control Center of Guangdong Power Grid Co., Ltd., China²Beijing University of Posts and Telecommunications, China

MA-6: IIIoT I (IIIoT Symposium)

Session Chair: Fei Qi, China Telecom Research Institute, China

Internet of Things over GEO Satellite: A Novel Space Information Network Solution 177

Yunbin Cai¹, Shaowei Zhang², Jijiang Hou³, Hongbiao Jiao³

¹Shanghai Emergency Communication Bureau of China Telecom, China,²China Telecom Research Institute, China,
³China Telecommunications Corporation, China

Research on 5G Co-construction and Shared Voice Service Solution 182

Xiao Li¹, Weiliang Xie¹, Na Lu²

¹China Telecom Research Institute, China,²China Telecom Corporation, China

Multi-operator Radio Access Network Sharing for 5G SA Network 187

Xiaoyin Zhao¹, Chunlei Hu¹, Zhijun Li²

¹China Telecom Research Institute, China,²China Telecom Corporation, China

Research on Performance of Power Saving Technology for 5G Base Station 194

Hua Zhang, Han Guo, Weiliang Xie

China Telecom Research Institute, China

The Semi-Intelligent Indoor Antenna based on Pattern Reconfigurable Dual-polarized Glass DRA 199

Yuetian Zhou¹, Xiaohang Xu¹, Chunlei Hu¹, Zhijiao Chen², Yuan Yao², Junsheng Yu²

¹China Telecom Research Institute, China,²Beijing University of Posts and Telecommunications, China

Analysis of the Evolution Scheme of NSA RAN Sharing to SA RAN Sharing 204

Zhirong Zhang¹, Jiangang Chen², Jia Hou¹

¹China Telecom Research Institute, China,²China Telecom Corporation, China

MA-7: Satellite Communications (Satellite Symposium)

Session Chair: Chunxiao Jiang, Tsinghua University, China

Blind Constellation Identification for MQAM in Hybrid Satellite-Terrestrial Networks 212

Mingqian Liu, Nan Qu, Bingbing Li

Xidian University, China

An Energy Efficient Approach for Service Chaining Placement in Satellite Ground Station Networks 217

Xiangqiang Gao¹, Rongke Liu¹, Aryan Kaushik²

¹Beihang University, China,²University College London, United Kingdom

LRAR: A Lightweight Risk-Avoidance Routing Algorithm for LEO Satellite Networks 223

Zheng Zhao, Qian Wu, Hewu Li, Zeqi Lai, Jun Liu

Tsinghua University, China

GAMS: An IP Address Management Mechanism in Satellite Mega-constellation Networks	229
Yazheng Chen ¹ , Hewu Li ^{1,2} , Jun Liu ^{1,2} , Qian Wu ^{1,2} , Zeqi Lai ^{1,2}	
¹ Tsinghua University, China, ² Beijing National Research Center for Information Science and Technology, China	
Research on Ground Station Selection for Ka-band Satellite Communication Considering Rain Attenuation	235
Ren Shuqian ¹ , Yafeng Zhan ² , Zeng Guanming ¹	
¹ Tsinghua University, China, ² Beijing National Research Center for Information Science and Technology, China	
CCOS: A Coded Computation Offloading Strategy for Satellite-Terrestrial Integrated Networks	242
Bo Pang ¹ , Shushi Gu ^{1,2} , Qinyu Zhang ^{1,2} , Ning Zhang ³ , Wei Xiang ^{2,4}	
¹ Harbin Institute of Technology, China, ² Peng Cheng Laboratory, China, ³ University of Windsor, Canada, ⁴ La Trobe University, Australia	
Maximum Rate based Relay Selection and Power Allocation Method for Relay Satellite Networks	248
Ruisong Wang ¹ , Xiaogang Tang ² , Qi Wang ³ , Gongliang Liu ¹ , Ruofei Ma ¹ , Guinian Feng ⁴	
¹ Harbin Institute of Technology, China, ² Space Engineering University, China, ³ Beijing Institute of Tracking and Telecommunications Technology, China, ⁴ Innovation Academy for Microsatellite of CAS, China	
MA-8: Vehicular Communications (Vehicular Symposium)	
Session Chair:	Hassine Moun gla, University of Paris Descartes, France
Edge Computing Assisted Autonomous Driving using Artificial Intelligence	254
Hatem Ibn-khedher ¹ , Mohammed Laroui ^{2,3} , Mouna Ben Mabrouk ¹ , Hassine Moun gla ^{2,3} , Hossam Afifi ³ , Alberto Nai Oleari ¹ , Ahmed E. Kamal ⁴	
¹ ALTRAN Labs, France, ² Université de Paris, France, ³ Telecom SudParis, France, ⁴ Iowa State University, United States	
Safe Driving of Autonomous Vehicles through State Representation Learning	260
Abhishek Gupta, Ahmed Shaharyar Khwaja, Alagan Anpalagan, Ling Guan	
Ryerson University, Canada	
End-to-End Network Slicing for ITS-G5 Vehicular Communications	266
Rachedi Abdennour, Toufik Ahmed, Mohamed Mosbah	
Université de Bordeaux, France	
Edge-based Safety Intersection Assistance Architecture for Connected Vehicles	272
Khamari Sabri, Ahmed Toufik, Mosbah Mohamed	
Université de Bordeaux, France	
UAVs Smart Heuristics for Target Coverage and Path Planning through Strategic Locations	278
Hend Gedawy ¹ , Abdulla Al-Ali ¹ , Amr Mohamed ¹ , Aiman Erbad ² , Mohsen Guizani ¹	
¹ Qatar University, Qatar, ² Hamad Bin Khalifa University, Qatar	
Impacts of Scene Geometry and Vehicle Speed on the Performance of RFID based AVI/ETC System	285
Kai She ¹ , Yichuang Sun ²	
¹ Hunan University of Science and Technology, China, ² University of Hertfordshire, United Kingdom	
MDLB: A Matching based Dynamic Load Balancing Algorithm for Road Side Units	291
Swagat Ranjan Sahoo ¹ , Moumita Patra ¹ , Arobinda Gupta ²	
¹ Indian Institute of Technology Guwahati, India, ² Indian Institute of Technology Kharagpur, India	

MA-9: 5G IoT II (5G-IoT Symposium)

Session Chair: Lei Feng, Beijing University of Posts and Telecommunications, China

A Cooperative EEG-based BCI Control System for Robot-Drone Interaction 297

Abdelkader Nasreddine Belkacem, Abderrahmane Lakas
United Arab Emirates University, United Arab Emirates

Hybrid Positioning with DTMB and LTE Signals 303

Tao Hong^{1,2}, Jialiang Sun², Tian Jin², Yang Yi³, JiaQing Qu⁴
¹Yunnan Innovation Institute-BUAA, China, ²Beihang University, China, ³Unit 32381, China, ⁴Shanghai Radio Equipment Research Institute, China

Identification Technology of UAV based on Micro-Doppler Effect 308

Tao Hong^{1,2}, Chaoqun Fang², Hai Hao³, Wenbo Sun⁴
¹Yunnan Innovation Institute-BUAA, China, ²Beihang University, China, ³Beijing Institute of Remote Sensing Equipment, China, ⁴Aerospace Hi-Tech Holding Group Co., Ltd., China

Balance Car Control System based on Stm32 312

Jian Huang¹, Tongfei Shang²
¹XiJing University, China, ²National University of Defense Technology, China

A Computation Offloading Algorithm for Cloud Edge Collaborative Network based on Sleep Mechanism 317

Qian Wu^{1,2}, Jinyu Zhou^{1,2}, Jing Zhou^{1,2}, Junhong Weng^{1,2}, Qingchuan Liu³, Yifei Xing³, Siya Xu³
¹Shenzhen Power Supply Co., Ltd., China, ²China Southern Power Grid Company Limited, China, ³Beijing University of Posts and Telecommunications, China

Design of Agricultural Product Traceability Platform based on 5G-IoT and Blockchain 323

Yuhui Huang, Xin Xie, Weiye Ning, Fengping Hu
East China Jiaotong University, China

Data Sharing Scheme for 5G IoT based on Blockchain 327

Weiye Ning, Xin Xie, Yuhui Huang, Fengping Hu
East China Jiaotong University

Tuesday, June 29th, 2021

TM-0: Special Session

Session Chair: Augusto Neto, Federal University of Rio Grande do Norte, Brazil

HSim – A Scalable Tool for Health-data Simulation 330

Jordano Celestrini, Renato Rocha, Celso Santos, José Gonçalves Pereira Filho, Rodrigo Varejão Andreão
Federal University of Espirito Santo, Brazil

Analysis of ML Algorithms to Support Elastic Service Chaining in eHealth Vertical Applications 336

Sandino Jardim^{1,2}, Felipe S. Dantas Silva^{2,3}, Augusto Neto², Harold Bustos⁴, Roger Immich², Ramon Fontes²
¹Federal University of Mato Grosso, Brazil, ²Federal University of Rio Grande do Norte, Brazil, ³LaTARC Research Lab, Brazil, ⁴State University of Rio Grande do Norte, Brazil

On the Performance Analysis of a TensorFlow based Neural Network for Face Mask Detection 342

Victor L. Costa¹, Eduardo H. Teixeira¹, Samuel B. Mafra¹, Joel J.P.C. Rodrigues^{2,3}
¹National Institute of Telecommunications, Brazil, ²Federal University of Piau , Brazil, ³Instituto de Telecomunica es, Portugal

Smart Human Identification System based on PPG and ECG Signals in Wearable Devices	347
Lucas Bastos ¹ , Bruno Cremonesi ² , Thais Tavares ¹ , Denis Rosário ¹ , Eduardo Cerqueira ¹ , Aldri Santos ²	
¹ Federal University of Pará, Brazil, ² Federal University of Paraná, Brazil	
Health Systems with Resilient Reporting based on Internet-of-Things	353
Yuri Melo ¹ , Vinicius C.M. Borges ² , Antonio Oliveira-Jr ^{2,4} , Bruno L. Dalmazo ³ , André Riker ¹	
¹ Federal University of Pará, Brazil, ² Federal University of Goiás, Brazil, ³ Federal University of Rio Grande, Brazil, ⁴ Fraunhofer Portugal AICOS, Portugal	
TOVEC: Task Optimization Mechanism for Vehicular Clouds using Meta-heuristic Technique	358
Douglas D. Lieira ^{1,2} , Matheus S. Quessada ¹ , Johannes B.D. da Costa ³ , Eduardo Cerqueira ⁴ , Denis Rosário ⁴ , Rodolfo I. Meneguette ⁵	
¹ São Paulo State University, Brazil, ² Federal Institute of São Paulo, ³ University of Campinas, Brazil, ⁴ Federal University of Pará, Brazil, ⁵ University of São Paulo, Brazil	
Classification of Electrocardiography Signals for User Authentication based on Ensembles with Random Undersampling	364
Silas L. Albuquerque ¹ , Cristiano J. Miosso ² , Adson Ferreira da Rocha ¹ , Paulo de Lira Gondim ¹	
¹ University of Brasilia, Brazil, ² University of Brasilia at Gama, Brazil	
Authentication Protocol built from a Chaotic Cryptosystem for a Fog and Cloud-based CWD-WPT Charging Station	370
Luis F.A. Roman, Paulo de Lira Gondim	
University of Brasilia, Brazil	
TM-1: Link Layer Protocols (WSNs & IoT Symposium)	
Session Chair:	Nidal Nasser, Alfaisal University, Kingdom of Saudi Arabia
On Distributed Node Sleep Scheduling Optimization Method based on Time Switching of SWIPT	376
Fangwei Lu ¹ , Gongliang Liu ¹ , Maohan Song ² , Weidang Lu ² , Hong Peng ²	
¹ Harbin Institute of Technology, China, ² Zhejiang University of Technology, China	
D2D Joint Power Control Algorithm based on Two Factor Power Compensation	382
Jingqiu Ren ¹ , Liguang Du ¹ , Pan Zhong ¹ , Xiaoxin Wang ¹ , Guanghua Zhang ¹ , Weidang Lu ²	
¹ Northeast Petroleum University, China, ² Zhejiang University of Technology, China	
Performance Evaluation of IEEE 802.15.6 MAC under Varying Health Emergency Conditions	388
Farag Sallabi ¹ , Muhammed Adnan ² , Khaled Shuaib ¹ , Mohammed Abdel-Hafez ¹	
¹ United Arab Emirates University, United Arab Emirates, ² Higher College of Technology, United Arab Emirates	
Duration-aware Data Collection in UAV-aided Mobile Sensor Networks	394
Xiaoyan Ma ¹ , Tianyi Liu ² , Rahim Kacimi ³ , Riadh Dhaou ³ , Song Liu ¹	
¹ Tongji University, China, ² Ningbo Tusi Electromechanical Co., Ltd., China, ³ Toulouse University, France	
Inter-cell Interference Reduction Scheme for Uplink Transmission in NB-IoT Systems	400
Collins Burton Mwakwata ¹ , Osama Elgarhy ¹ , Yannick Le Moullec ¹ , Muhammad Mahtab Alam ¹ , Sven Päränd ² , Ivar Annus ¹	
¹ Tallinn University of Technology, Estonia, ² Telia Estonia Ltd., Estonia	
Transmission Power Control using Deep Neural Networks in TDMA-based Ad-hoc Network Clusters	406
Rina Azoulay ¹ , Kiril Danilchenko ² , Yoram Haddad ¹ , Shulamit Reches ¹	
¹ Jerusalem College of Technology, Israel, ² Ben-Gurion University of Negev, Israel	

Investigation on Narrowband IoT Link Adaptation with Rate and Energy Objectives 412

Farah Yassine^{1,2}, Melhem El Helou², Oussama Bazzi¹, Samer Lahoud²

¹Lebanese University, Lebanon, ²Saint Joseph University of Beirut, Lebanon

TM-2: Smart Communications (Intelligent Network Computing Workshop)

Session Chair: Kaixuan Wang, Shanxi University of Finance and Economics, China

Mining Fault Association Rules in the Perception Layer of Electric Power Sensor Network based on Improved Eclat 418

Yongsheng Zhao¹, Yuxiang Lv¹, Jian Zeng², Yawen Dong¹, Honglin Fang³, Peng Yu¹, Siya Xu³

¹Anhui Jiyuan Software Company, Ltd., China ²State Grid Sichuan Electric Power Company Economic and Technical Research Institute, China ³Beijing University of Posts and Telecommunications, China

Research on the Innovation of Sharing Logistics Mode based on Internet of Things 424

Jun Zhou, Wenxiang Huang

Nanchang Institute of Science and Technology, China

Big Data of Rhizome Chinese Herbal Medicine Harvester from the Perspective of Internet 428

Xiaoze Yu, Li Shi, Xiaowei Bi

Inner Mongolia University for Nationalities, China

Internet User Behavior Analysis based on Big Data 432

Jiangnan He, Xiaoyin Yin

¹Yunnan University of Finance and Economics, China ²Yunnan Minzu University, China

Application of Big Data Technology in News Analytics on Social Networks 436

Sucheng Chen, Siwei Long, Yan Zhou

Communication University of China, China

Distributed Simulation System based on Data Distribution Service Standard 440

Geng Zhang, Yanan Wang, Jiaying Ren, Wei Liu, Kaiqiang Gao

China Electric Power Research Institute, China

Q-Learning-based Edge Node Resource Allocation Algorithm in the Environment of Power Distribution Internet of Things 446

Xi Chen¹, Rui Xin¹, Yue He¹, Bo Zhang¹, Peng Lin²

¹State Grid Hebei Electric Power Co. Ltd., China, ²Beijing VectInfo Technologies Co., Ltd., China

TM-3: Network Security (Security Symposium)

Session Chair: Sghaier Guizani, Alfaisal University, Kingdom of Saudi Arabia

Security Enhancements to Subscriber Privacy Protection Scheme in 5G Systems 451

Fuwen Liu, Li Su, Bo Yang, Haitao Du, Minpeng Qi, Shen He

China Mobile Research Institute, China

BILPAS: Blockchain-Based Indoor Location Paging and Answering Service 457

Changxin Yang¹, Erwu Liu¹, Rui Wang¹, Weixiong Rao¹, Shaojun Feng²

¹Tongji University, China, ²Qianxun Spatial Intelligence Inc., China

Network Intrusion Detection based on Dense Dilated Convolutions and Attention Mechanism	463
Ke Cao ¹ , Jinqi Zhu ¹ , Weijia Feng ¹ , Chunmei Ma ¹ , Ming Liu ² , Tian Du ¹	
¹ Tianjin Normal University, China, ² University of Electronic Science and Technology of China, China	
Advanced Persistent False Data Injection Attacks against Optimal Power Flow in Power Systems	469
Sani Umar, Muhamad Felemban, Yahya Osais	
King Fahd University of Petroleum & Minerals, Kindom of Saudi Arabia	
Analysis of Lightweight and Secure Two-Factor Authentication Scheme for Wireless Body Area Networks in Health-Care IoT	475
Ahmed Alsahlani ^{1,2} , Alexandru Popa ^{1,3}	
¹ University of Bucharest, Romania, ² University of Technology, Iraq, ³ National Institute for Research and Development in Informatics, Romania	
Quantum Entanglement Percolation Analysis in Kleinberg Small World Quantum Networks	481
Jianxiong Liang, Xiaoguang Chen	
Fudan University, China	
A Testbed for Implementing Lightweight Physical Layer Security in an IoT-based Health Monitoring System	486
Ahmed Mohamed Hussain ¹ , Khalid Abualsaud ¹ , Elias Yaacoub ¹ , Tamer Khattab ¹ , Abdurrazzak Gehani ² , Mohsen Guizani ¹	
¹ Qatar University, Qatar, ² Al-Ahli Hospital, Qatar	
TM-4: IIoT II (IIoT Symposium)	
Session Chair:	Xiao Li, China Telecom Research Institute, China
Blockchain based Spectrum Sharing over 6G Hybrid Cloud	492
Lei Liu, Wei Liang, Ge Mang, Zhongping Dong	
China Telecom Corporation Limited, China	
Verificatin and Evaluation on 5G Multi-Operator Core Network	498
Yong Zhao ¹ , Peng Li ² , Chunlei Hu ¹	
¹ China Telecom Research Institute, China, ² China Telecom, China	
Research on 5G SA Mobility Management	503
Pingping Lin, Jia Hou, Xiaohang Xu	
China Telecom Research Institute, China	
Research on Wireless Resource Management and Scheduling for 5G Network Slice	508
Yi Li, Yong Wang, Yuchao Jin, Xinzhou Cheng, Lexi Xu, Guanghai Liu	
China Unicom, China	
Unmanned Aerial Vehicle Detection and Identification using Deep Learning	514
Hongjie Liu	
Borsche Technologies Co., Ltd., China	
Research on Beamforming in 5G NR Carrier Aggregation	519
Yingnan Liu, Tao Zhang, Fuchang Li, Xuetian Zhu	
China Unicom Research Institute, China	

TM-5: 5G IoT III (5G-IoT Symposium)

Session Chair: Bo Rong, Communications Research Centre, Canada

Optimal Decision-making Method of Transportation Route based on Information Gain 523

Tongfei Shang¹, Zheng Liang¹, Jingwei Yang², Jiaqing Zhao³

¹National University of Defense Technology, China, ²78111 Troops, China ³32072 Troops, China

A Simulation Model based on Artificial System to Analyze Correlation between Journal Impact Factor and Article Quality 527

Ke Dong¹, Yiran Wang², Wen Fan³

¹Hefei University of Technology, China, ²Hebei University, China, ³University of Manchester, United Kingdom

A Parallel Coordinates Plot Method based on Unsupervised Feature Selection for High- Dimensional Data Visualization 532

Jiaqi Lou¹, Ke Dong², Maosen Wang¹

¹Cranfield University, United Kingdom, ²Hefei University of Technology, China

Speech Emotion Recognition Model with Time- Scale-Invariance MFCCs as Input 537

Xiaohan Xie¹, Jiaqi Lou², Lingzhi Zhang³

¹Shandong Province Tengzhou No. 1 High School, China, ²Cranfield University, United Kingdom, ³The University of Manchester, United Kingdom

Merged Biogeography-Based Optimization Algorithm for Color Image Segmentation 543

Lingzhi Zhang¹, Xiaohan Xie²

¹The University of Manchester, United Kingdom, ²Shandong Province Tengzhou No. 1 High School, China

The Dissemination Strategy of Travel Products among Young People from the Perspective of the Internet 549

Xin Huang

Bohai University, China

TM-6: Cognitive to Intelligent II (Cognitive to Intelligent Workshop)

Session Chair: Xiao jun Jing, Beijing University of Posts and Telecommunications, China

Recognition of Casting Embossed Convex and Concave Characters based on YOLO v5 for Different Distribution Conditions 553

Zhiyue Zhang¹, Guang Yang¹, Chensheng Wang¹, Guangjian Chang²

¹Beijing University of Posts and Telecommunications, China, ²Army Academy of Armored Force, China

Trust-aware Truth Discovery with Long-term Vehicle Reputation for Internet of Vehicles Crowdsensing 558

Lei Yan, Shouyi Yang

Zhengzhou University, China

MTL-LSTM: Multi-Task Learning-based LSTM for Urban Traffic Flow Forecasting 564

Mostafa Karimzadeh¹, Samuel Martin Schwegler¹, Zhongliang Zhao^{1,2}, Torsten Braun¹, Susana Sargento³

¹University of Bern, Switzerland, ²Beihang University, China, ³Instituto de Telecomunicações, Portugal

A Novel Framework for Predicting the Spread of COVID-19 by Contact Tracing through Smartphone 570

Jiayi Shi, Weixue Sheng, Pushpendu Kar, Monideepa Roy, Sujoy Datta

¹University of Nottingham Ningbo China, China, ²Kalinga Institute of Industrial Technology, India

A Perspective of LSTM based Stock Prediction	576
Guangjian Chang ¹ , Jiehua Qiao ¹ , Yazhuo Liu ¹ , Yubo Wang ¹ , Zhiyue Zhang ²	
¹ Army Academy of Armored Force, China, ² Beijing University of Posts and Telecommunications, China	
UAV Control Signal Detection based on Convolution Neural Network	581
Haitao Gao, Junsheng Mu, Xiaojun Jing, Yuzhou Yang	
Beijing University of Posts and Telecommunications, China	
TM-7: Smart Communication & Computing II (Smart Communication & Computing Workshop)	
Session Chair:	Bing Du, University of Science and Technology Beijing
Reliability and Availability Modeling Techniques in 6G IoT Networks: A Taxonomy and Survey	586
Abhishek Gupta, Xavier Fernando, Olivia Das	
Ryerson University, Canada	
Stages of CoopNet: A Multipath Parallel Link Architecture for Next-Gen Networks	592
Razvan Cristian Voicu ¹ , Yusun Chang ²	
¹ Georgia Institute of Technology, United States, ² Kennesaw State University, United States	
Context-Aware Fog Computing Implementation for Industrial Internet of Things	598
Adel Atieh, Priyadarsi Nanda, Manoranjan Mohanty	
University of Technology, Sydney	
A Survey on Unified Modeling under Identification Exploding Tendency in the Internet of Things	604
Shiquan Dong, Zhou Fang, Zhimin Zhang, Fadi Farha, Huansheng Ning	
University of Science and Technology Beijing, China	
Satellite Communication Antenna Structure Design Method and Model Design Analysis based on 5G Background	610
Dequ Gu, Junhan Cen, Jiajia Chen, Hang Pan, Gengjie Liu, Zhizhou Chen	
Wenzhou University, China	
Cooperative Driving System based on Artificial Intelligence Learning	615
Anis Boubakri, Sonia Mettali Gammar	
ENSI, Tunisia	
TM-8: IIoT III (IIoT Symposium)	
Session Chair:	Yong Zhao, China Telecom Research Institute, China
Design of Cerebral Palsy Rehabilitation Training System based on Human-Computer Interaction	621
Chen Gong, Guang Wu	
¹ The University of Manchester, United Kingdom, ² Guangxi University, China	
An Efficient Identity-based Forward Secure Signature Scheme from Lattices	626
Guang Wu, Ruwei Huang	
Guangxi University, China	
5G Mobile Communication System based on Cloud Wireless Access Network	632
Yuling Chen ¹ , Lei Li ² , Fei Zhang ¹ , XianLong Ren ¹	
¹ Shenyang Institute of Technology, China, ² ShenYang FangZhou Petroleum Science and Technology, China	

Application of FPGA Array Structure Digital Signal Processing Platform in Communication Field	637
Yuling Chen ¹ , Lei Li ² , Ying Liu ¹	
¹ Shenyang Institute of Technology, China, ² ShenYang FangZhou Petroleum Science and Technology, China	
Motor Online Monitoring System based on Wireless Communication System	642
Fei Zhang, Xin Sun, Quanwen Chen	
Shenyang Institute of Technology, China	
Application of 5G Mobile Communication Technology in Specific Environment of Power System	648
Xin Sun, Fei Zhang, ChunYang Wang, Bin Lv	
Shenyang Institute of Technology, China	
TA-1: Routing Protocols (WSNs & IoT Symposium)	
Session Chair:	Muhammad Imran, King Saud University, Kingdom of Saudi Arabia
Joint Technology and Route Selection in Multi-RAT Wireless Sensor Networks with RODENT	652
Brandon Foubert, Nathalie Mitton	
Inria, France	
A Combination of Kruskal and K-means Algorithms for Network Lifetime Extension in Wireless Sensor Networks	658
Wadii Jlassi ¹ , Rim Haddad ² , Ridha Bouallegue ³ , Raed Shubair ⁴	
¹ University Tunis El Manar, Tunisia, ² Laval University, Canada, ³ University of Carthage, Tunisia, ⁴ New York University Abu Dhabi, United Arab Emirates	
An Optimal Energy-Efficient Transmission Design for SWIPT Systems in WSNs	664
Shiqi Wang, Lin Ma, Wei Wu	
Harbin Institute of Technology, China	
Deep Q-Networks for Aerial Data Collection in Multi-UAV-Assisted Wireless Sensor Networks	669
Yousef Emami ¹ , Bo Wei ² , Kai Li ¹ , Wei Ni ³ , Eduardo Tovar ¹	
¹ CISTER Research Centre, Portugal, ² Northumbria University, United Kingdom, ³ CSIRO, Australia	
An Approach to using Machine Learning and Public Data to Detect Traffic Jams	675
Tiago do Vale Saraiva, Carlos Alberto Vieira Campos	
Federal University of the State of Rio de Janeiro, Brazil	
TA-2: e-Health I (e-Health Symposium)	
Session Chair:	Emna Baccour, Hamad Bin Khalifa University, Qatar
Emotion Recognition for Healthcare Surveillance Systems using Neural Networks: A Survey	681
Marwan Dhuheir, Abdullatif Albaseer, Emna Baccour, Aiman Erbad, Mohamed Abdallah, Mounir Hamdi	
Hamad Bin Khalifa University, Qatar	
Smart GIS-based Organ and Blood Donation System	688
Ismail Khram ¹ , Wassim Itani ² , Ahmad M. El-Hajj ¹	
¹ Beirut Arab University, Lebanon, ² University of Houston-Victoria, United States	

CLRS: A Novel CSI-Based Indoor Localization Approach by Region Sectioning	692
Honglei Sun ¹ , Lei Wang ¹ , Chunsheng Zhu ^{4,5} , Jingbin Liu ² , Chen Qian ³ , Ning Ding ¹ , Bingxian Lu ¹ , Zhenquan Qin ¹ , Xin Han ¹ , Ziyu Fei ¹	
¹ Dalian University of Technology, China, ² Inner Mongolia University, China, ³ Tsinghua University, China, ⁴ Southern University of Science and Technology, China, ⁵ Peng Cheng Laboratory, China	
Task Offloading and Caching for Mobile Edge Computing	698
Chaogang Tang ¹ , Chunsheng Zhu ^{2,3} , Xianglin Wei ⁴ , Huaming Wu ⁵ , Qing Li ⁶ , Joel J.P.C. Rodrigues ^{7,8}	
¹ China University of Mining and Technology, China, ² Southern University of Science and Technology, China, ³ Peng Cheng Laboratory, China, ⁴ National University of Defense Technology, China, ⁵ Tianjin University, China, ⁶ The Hong Kong Polytechnic University, Hong Kong, ⁷ Federal University of Piau, Brazil, ⁸ Instituto de Telecomunicações, Portugal	
Comparing ANN and SVM Algorithms for Predicting Exercise Routines of Diabetic Patients	703
Anwar Khan ¹ , Shama Siddiqui ² , Shahid Munir Shah ³ , Farid Nait-Abdesselam ⁵ , Indrakshi Dey ⁶	
¹ Institute of Business Administration, Pakistan, ² DHA Suffa University, Pakistan, ³ Barrett Hodgson University, Pakistan, ⁴ University of Missouri Kansas City, USA, ⁵ Maynooth University, Ireland	
TA-3: Signal Processing for Wireless Communications I (Communications & SP Symposium)	
Session Chair:	Rodolfo Oliveira, NOVA University of Lisbon, Portugal
Outage Probability for Directional Beamforming in High Density Wireless Networks	709
Ayman T. Abusabah ^{1,2} , Rodolfo Oliveira ^{1,2}	
¹ Universidade Nova de Lisboa, Portugal, ² Instituto de Telecomunicações, Portugal	
Dual-Band On-Chip Rectangular Resonator Antenna for Millimetre Wave Application	715
Meshari D. Alanazi, Salam K. Khamas University of Sheffield, United Kingdom	
Improved Tabu-Search Preamble Assignment in Cell-Free Massive MIMO Systems	718
Jie Ding ¹ , Dejing Kong ² , Daiming Qu ³	
¹ Deakin University, Australia, ² Wuhan Textile University, China, ³ Huazhong University of Science and Technology, China	
Hybrid Multikernel-Constructed Polar Codes for Short Blocklength Transmissions	724
Cita Aisah Nurbani, Khoirul Anwar, Willy Anugrah Cahyadi Telkom University, Indonesia	
How SIC-enabled LoRa Fares under Imperfect Orthogonality?	729
Syed Usama Minhaj ¹ , Syed Haider Ali ¹ , Muhammad Talha Bhatti ¹ , Syed Ali Hassan ¹ , Aamir Mahmood ² , Mikael Gidlund ²	
¹ National University of Sciences and Technology, Pakistan, ² Mid Sweden University, Sweden	
SCMA-OFDM Codebook Design based on IRM	735
TuoFeng Lei, Ni ShuYan, NaiPing Cheng, AiDi Zhang, Xin Song, DaShuang Yan Space Engineering University, China	
Interference Cancellation in Full Duplex Uplink Multi-User MIMO DF Relaying System with Imperfect CSI	740
Sarah Imam ¹ , Mahmoud Zaher ² , Ahmed El-Mahdy ¹	
¹ German University in Cairo, Egypt, ² KTH Royal Institute of Technology, Sweden	

TA-4: Smart Industry Applications (Intelligent Network Computing Workshop)

Session Chair: Tao Hong, Beihang University, China

Research on the Innovation of "Cloud Financing" Mode of Family Farm from the Perspective of Agricultural Industry Chain 746

Xiao Wang¹, Jingru Sun², Yanhong Wu³

¹Jiangsu Polytechnic College of Agriculture and Forestry, China, ²Central Agricultural Broadcasting and Television School, China, ³Guangdong Ocean University Cunjin College, China

Reform Path of Financial Management based on Smart Finance under the Background of Internet 750

Yanhong Wu

Guangdong Ocean University Cunjin College, China

Application of Fuzzy Algorithm in Hydraulic Synchronous Lifting System based on Internet 754

Li Shi, Xiaoze Yu, Xiaowei Bi

Inner Mongolia University for Nationalities, China

Intelligent Storage Device for Chinese Medicinal Materials 759

Shaofei Wang, Zuliang Wang, Ting Zhang, Hongtao Yu

Xijing University, China

Attendance System based on Face Recognition Technology 763

Hongtao Yu, Zuliang Wang, Ting Zhang, Shaofei Wang, Kexin Ma

Xijing University, China

Research on Cultivating Innovation Ability of Computer Majors based on Innovation Cluster 767

Fang Fang, Hui Xie, Dong Liu

Xiangnan University, China

Problems and Countermeasures of Financial Management Specialty based on Genetic Algorithm 771

Juan Xia, Bo Song

Hebei Normal University for Nationalities, China

TA-5: Cognitive to Intelligent III (Cognitive to Intelligent Workshop)

Session Chair: Junsheng Mu, Beijing University of Posts and Telecommunications, China

Sentiment Analysis using Machine Learning Algorithms 775

Fatma Jemai¹, Mohamed Hayouni², Sahbi Baccar³

¹University of Jendouba, Tunisia, ²University of Carthage, Tunisia, ³CESI Graduate School of Engineering, France

SNR Estimation of UAV Control Signal based on Convolutional Neural Network 780

Yuzhou Yang, Xiaojun Jing, Junsheng Mu, Haitao Gao

Beijing University of Posts and Telecommunications, China

Network Representation Learning Aided Resource Allocation in Software Defined Networks 785

Chenxi Li, Haipeng Yao, Tianle Mai

Beijing University of Posts and Telecommunications, China

Non-cooperative UAV Detection with Adaptive Sampling of Remote Signal 791

Junsheng Mu¹, Fangpei Zhang², Yuanhao Cui¹, Jia Zhu¹, Xiaojun Jing¹

¹Beijing University of Posts and Telecommunications, China, ²China Electronics Technology Group Corporation, China

Spectrum Sensing based on Deep Convolutional Generative Adversarial Networks 796

Zheng Liu, Xiaojun Jing, Ronghui Zhang, Junsheng Mu
Beijing University of Posts and Telecommunications, China

Autonomous Cruise System Equipped with Farmland Environmental Information Sensors 802

Dan Li¹, Zhizhou Chen²
¹Jilin Agricultural Science and Technology University, China, ²Wenzhou University, China

TA-6: Privacy & Security (Security Symposium)

Session Chair: Khalid Abualsaud, Qatar University, Qatar

Towards Information Theoretic Interpretation of Practical Ciphers 807

Basem Abdellatif³, Tarek Elfouly², Khalid Abualsaud¹, Ala Gouisse¹, Elias Yaacoub¹, Tamer Khattab¹
¹Qatar University, Qatar, ²Tennessee Technological University, United States, ³University of California Riverside, United States

A Multidimensional Network Forensics Investigation of a State-Sanctioned Internet Outage 813

Antonio Mangino, Elias Bou-Harb
The University of Texas at San Antonio, United States

A Lightweight Security Technique for Unmanned Aerial Vehicles against GPS Spoofing Attack 819

Chafiq Titouna¹, Farid Nait-Abdesselam^{1,2}
¹University of Paris, France, ²University of Missouri Kansas City, USA

Securing Unmanned Aerial Systems using Mobile Agents and Artificial Neural Networks 825

Chafiq Titouna¹, Farid Nait-Abdesselam^{1,2}
¹University of Paris, France, ²University of Missouri Kansas City, USA

Data Augmentation for Intrusion Detection and Classification in Cloud Networks 831

Zina Chkirbene¹, Habib Ben Abdallah², Kawther Hassine¹, Ridha Hamila¹, Aiman Erbad³
¹Qatar University, Qatar, ²University of Winnipeg, Winnipeg, Canada, ³Hamad Bin Khalifa University, Qatar

Cooperative Machine Learning Techniques for Cloud Intrusion Detection 837

Zina Chkirbene¹, Ridha Hamila¹, Aiman Erbad², Serkan Kiranyaz¹, Nasser Al-Emadi¹, Mounir Hamdi²
¹Qatar University, Qatar, ²Hamad Bin Khalifa University, Qatar

Intercept Probability and Secrecy Capacity Analysis of RIS-based Wireless Communication with Full-duplex Receiver 843

Oussama Zaghdoud¹, Adel Ben Mnaouer², Hatem Boujemaa¹
¹University of Carthage, Tunisia, ²Canadian University Dubai, United Arab Emirates

TA-7: Big Data and Applications (Intelligent Network Computing Workshop)

Session Chair: Shuanli Wu, Chinese Academy of Science, China

On the Informatization of Teaching Management in Colleges and Universities under the Background of Big Data 849

Zhongmin Zhao
Hubei Business Collee, China

Discussion on the Construction of Big Data Student Management Platform in the Information Age 853

Zhongmin Zhao
Hubei Business Collee, China

Demand Analysis of Automated Warehouse Construction under the Background of Big Data	857
Jun Zhou, Han Jiang Nanchang Institute of Science and Technology, China	
Application of Big Data Technology in Economic Statistics	861
Xia Wang Wuhan Business University, China	
Introducing Cloud Data Technology into Economic Statistics	865
Xia Wang Wuhan Business University, China	
Research on Marketing System Construction of Internet Platform based on Big Data Technology	870
Dianyi Wu, Siwei Long, Xiaolin Zhou, Yan Zhou Communication University of China, China	
TA-8: IIoT IV (IIoT Symposium)	
Session Chair:	Pingping Lin, China Telecom Research Institute, China
Capability Exposure Vitalizes 5G Network	874
Pengyu Li, Yanxia Xing China Telecom Research Institute, China	
The Local Inheritance of Documentary Creation in the Internet	879
Xin Huang Bohai University, China	
Smart Tourism Scenic Spot Platform based on 5G Internet of Things Virtual Reality Technology	884
Peilin Chen China University of Labor Relations, China	
Network Security Risk and Defense Measures under IPV6 Environment	888
Qinghai Wu Jilin Agriculture Science and Technology College, China	
Application and Development of Mobile Communication Technology	893
Haibin Yang Jilin Agriculture Science and Technology College, China	
The Impact of E-commerce Development on Chinese Residents' Income in the Internet Age	897
Zi Wang, Yalin Wang Zhixing College of Hubei University, China	

TA-9: 5G IoT IV (5G-IoT Symposium)

Session Chair: Michel Kadoch, ETS-University of Quebec, Canada

Classification Storage System based on Wireless Network Communication	901
Jingqin Hu, Hao Sun Xi'an FanYi University, China	

Study on the Wireless Sensor Network Monitoring System based on ZigBee Technology and Optimization Algorithm Simulation	905
Hao Sun, Jingqin Hu Xi'an FanYi University, China	
Smart Tour Guide Application based on 5G IoT System Environment	910
Peilin Chen China University of Labor Relations, China	
4G Communication Technology Wireless Network Secure Communication	915
Qinghai Wu Jilin Agriculture Science and Technology College, China	
Research on Network Security of the Fifth Generation Mobile Communication Technology	919
Haibin Yang Jilin Agriculture Science and Technology College, China	
Discussion on the Impact of Stock Index Futures on the Development of Quantum Communication Industry and Investment Opportunities	924
Yalin Wang, Zi Wang Zhixing College of Hubei University, China	
TA-10: Smart Communication & Computing III (Smart Communication & Computing Workshop)	
Session Chair:	Yiping Duan, Tsinghua University, China
A Blockchain based Authentication Scheme for Mobile Data Collector in IoT	929
Wassim Jerbi ¹ , Omar Cheikhrouhou ¹ , Abderrahmen Guermazi ¹ , Habib Hamam ² , Hafedh Trabelsi ¹ ¹ University of Sfax, Tunisia, ² Moncton University, Canada	
SACP: Secure Access Control Protocol	935
Wided Ben Daoud ¹ , Malek Rekik ¹ , Amel Meddeb-Makhlouf ¹ , Faouzi Zarai ¹ , Sami Mahfoudhi ² ¹ University of Sfax, Tunisia, ² Qassim University Buraidah, Kingdom of Saudi Arabia	
SEM-Based Trust Evaluation Model and Algorithm for B2C E-Commerce	942
Xiang Ren Henan College of Industry & Information Technology, China	
Image Processing and Optimization based on Multi-Azimuth Coupling of Large Plane Scanner	947
Kun Wu, Na Yang, Xiaobao He School of Xijing University, China	
A Survey on the Development of Intelligent Robots in Speech Emotion Recognition	951
Qingnan Gao, Huansheng Ning, Bing Du University of Science and Technology Beijing	
A Survey: Challenges and Future Research Directions of fMRI based Brain Activity Decoding Model	957
Xiaomu Cheng, Huansheng Ning, Bing Du University of Science and Technology Beijing, China	

TA-11: Satellite Networks (Satellite Symposium)

Session Chair: Chunxiao Jiang, Tsinghua University, China

A NFV-based Resource Orchestration Algorithm for DDoS Mitigation in MEC 961

Lei Guo¹, Yiping Xing², Chunxiao Jiang², Lin Bai³

¹Beihang University, China, ²Beijing Municipal Bureau of Economy and Information Technology, China, ³Tsinghua University, China

Collaborate Q-learning Aided Load Balance in Satellites Communications 968

Yutong Zhao, Haipeng Yao, Zeyu Qin, Tianle Mai

Beijing University of Posts and Telecommunications, China

Distributed Multi-Agent Empowered Resource Allocation in Deep Edge Networks 974

Yongkang Gong¹, Jingjing Wang², Haipeng Yao¹

¹Beijing University of Posts and Telecommunications, China, ²Tsinghua University, China

A Hybrid Interference Suppression Method based on Robust Beamforming 980

Mengfan Wang¹, Ling Wang¹, Jian Xie¹, Tao Zhang², Chuang Han¹, Yanyun Gong¹

¹Northwestern Polytechnical University, China, ²China Academy of Launch Vehicle Technology, China

Multicast Directional Modulation based on Sparse Array Optimization 985

Na-Ying Liu¹, Xin Yang¹, Wen-Bin Sun¹, Yan-Yun Gong¹, Ruofan Wang²

¹Northwestern Polytechnical University, China, ²China Academy of Launch Vehicle Technology, China

Throughput Maximization in Hybrid NOMA assisted Beyond 5G Heterogenous Networks 991

Umar Ghafoor¹, Mudassar Ali^{1,2}, Humayun Zubair Khan¹, Adil Masood Siddiqui¹, Muhammad Naeem³

¹National University of Sciences and Technology, Pakistan, ²University of Engineering and Technology, Pakistan,

³COMSATS University Islamabad, Pakistan

Efficient On-Demand UAV Deployment and Configuration for Off-Shore Relay Communications 997

Sanghai Guan¹, Jingjing Wang¹, Chunxiao Jiang¹, Xiangwang Hou¹, Zhengru Fang¹, Yong Ren^{1,2}

¹Tsinghua University, China, ²Peng Cheng Laboratory, China

Wednesday, June 30th, 2021

WM-1: Machine Learning Algorithms Applications (Intelligent Network Computing Workshop)

Session Chair: Lei Shi, Institute of Technology Carlow, Ireland

Research on Privacy Protection based on Machine Learning 1003

Hui Xie, Li Wei, Fang Fang

Xiangnan University, China

Teaching Reform of Financial Management Major in Applied Undergraduate based on Decision Tree Algorithm 1007

Juan Xia, HaiYan Jiang

Hebei Normal University for Nationalities, China

Facial Expression Recognition Method based on Cascade Convolution Neural Network 1012

Weida Liu, Jian Fang

Jilin Engineering Normal University, China

Facial Expression Recognition Method of Educational Ro-Bot based on Non-Overlap Region 1016

Jian Fang^{1,2}, Weida Liu³

¹Chang Chun University of Technology, China,²Jilin Engineering Normal University, China,³Chang Chun University of Technology, China

The Application of Parity Check Algorithm in Human Anatomy 1021

Quzhe Lu, Dongqiang Liu

Shaoyang University, China

Research on Edge Detection of Medical Image based on Wavelet Transform and Fuzzy Algorithm 1025

Quzhe Lu, Dongqiang Liu

Shaoyang University, China

A CGAN-based DDoS Attack Detection Method in SDN 1030

Gang Liu¹, Dan Luo¹, Hao Jiang¹, Xiaoyu Wang¹, Yin Li¹, Jia Huibin²

¹China Academy of Information and Communications Technology, China²North China Electric Power University, China

WM-2: Multimedia Services (Multimedia Symposium)

Session Chair: Liang Zhou, Nanjing University of Posts and Telecommunications, China)

Session Co-Chair: Xin Wei, Nanjing University of Posts and Telecommunications, China

Human Activity Recognition using Time Series Pattern Recognition Model-Based on Tsfresh Features 1035

Sun Luqian, Zhao YuYuan

Peking University, China

Can Accurate Future Bandwidth Prediction Improve Volumetric Video Streaming Experience? 1041

Muhammad Jalal Khan¹, Abdelhak Bentaleb², Saad Harous¹

¹United Arab Emirates University, United Arab Emirates,²National University of Singapore, Singapore

Video QoE Inference with Machine Learning 1048

Tisa Selma¹, Abdelhak Bentaleb², Saad Harous¹

¹United Arab Emirates University, United Arab Emirates,²National University of Singapore, Singapore

Research on the Relationship between Terminal Registration Time and Terminal Quantity in PDT

System based on Finite-dimensional Markov Chain Model 1054

Yang Yu¹, Pengfei Sun², Hong Sun¹, Xiaotian Chen¹

¹Hytera Communications Corporation Ltd.,²Harbin Institute of Technology, China

Forecasting of Vessel Traffic Flow using BPNN based on Genetic Algorithm Optimization 1059

Qihang Yi¹, Yi Zuo¹, Tieshan Li¹, Yuhao Mao¹, Yang Xiao²

¹Dalian Maritime University, China,²The University of Alabama, United States

A Solution of Human-Computer Remote Interaction with Tactile Feedback 1064

Shouxiang Ni, Jianxin Chen, Yanan Chen, Mingkai Chen

Nanjing University of Posts and Telecommunications, China

WM-3: Communication & Signal Processing (Communication & Signal Processing Symposium)

Session Chair: Tianle Mai, Beijing University of Posts and Telecommunications, China

A Master-Slave Rake Receiver for Integrated Navigation/Communication Signal 1070

Xinyue Li, Yajie Yan, Deyue Zou

Dalian University of Technology, China

Uplink/Downlink Initiated based MAC Protocol for Asymmetric Full Duplex Radio to Improve Throughput	1075
Xin Yang, Yaqi Mao, Yanyun Gong, Tao Zhang	
¹ Northwestern Polytechnical University, China ² China Academy of Launch Vehicle Technology, China	
A CCSK based Navigation and Communication Integrated Satellite Signal	1079
Shouchuan Ma, Xinyue Li, Deyue Zou	
Dalian University of Technology, China	
Measurement and Calibration Method of Doppler Shift Factor for Underwater Acoustic Communication	1083
Liu Yuan, Hu Heming	
National Institute of Technology, China	
Transmit Antenna Number Estimation for MIMO Systems with Alpha-Stable Noise	1088
Mingqian Liu, Junlin Zhang, Qinghai Yang	
Xidian University, China	
Optical Rectenna for 2.4 GHz Wireless Communications	1093
Chayma Bahhar ¹ , Chokri Baccouch ² , Farid Mnif ¹ , Hedi Sakli ^{1,3}	
¹ University of Gabès, Tunisia, ² Université de Tunis El Manar, Tunisia, ³ EITA Consulting, France	
Low Complexity Multi-User Detector for Grant-free Massive Access with Massive MIMO with Consideration of both Temporal and Spatial Correlation	1098
Yongxin Liu, Shidong Zhou	
Tsinghua University, China	
WM-4: Vehicular Communications II (Vehicular Symposium)	
Session Chair:	Aiman Erbad, Hamad Bin Khalifa University, Qatar
Centralized Vehicle Coordination Strategies based on Improved Age of Information	1105
Gang Chen, Langying Chen, Yizhen Wang, Yixiao Zhang, Tingting Zhang	
Harbin Institute of Technology, China	
Integration of Motion Prediction with End-to-end Latent RL for Self-Driving Vehicles	1111
Yasser H. Khalil, Hussein T. Mouftah	
University of Ottawa, Canada	
Markov Chain based Predictive Model for Efficient Handover Management in Vehicle-to-Infrastructure Communications	1117
Ahmed Aboud ¹ , Haifa Touati ¹ , Brahim Hnich ²	
¹ University of Gabes, Tunisia, ² University of Sfax, Tunisia	
Non-orthogonal Multiple Access assisted Federated Learning for UAV Swarms: An Approach of Latency Minimization	1123
Yuxiao Song ¹ , Tianshun Wang ¹ , Yuan Wu ^{1,2} , Liping Qian ³ , Zhiguo Shi ³	
¹ University of Macau, China, ² Zhuhai UM Science & Technology Research Institute, China, ³ Zhejiang University of Technology, China	
A Blockchain-based Solution for Reputation Management in IoV	1129
Slim Abbes, Slim Rekhis	
University of Carthage, Tunisia	

Connected and Autonomous Electric Vehicles Charging Reservation and Trip Planning System 1135

Palwasha W. Shaikh, Hussein T. Mouftah
University of Ottawa, Canada

WM-5: 5G IoT V (5G-IoT Symposium)

Session Chair: Jingcheng Zhao, Beihang University, China

Electric Vehicle Charging Scheduling Algorithm based on Online Multi-objective Optimization 1141

Tao Hong^{1,2}, Jihan Cao², Weiting Zhao³, Mingshu Lu⁴
¹Yunnan Innovation Institute-BUAA, China, ²Beihang University, China, ³State Grid Shandong Electric Power Company, China, ⁴University of California Irvine, United States

Analysis of Ontology Semantic Tagging Method for Semantic Web-Oriented Big Data 1147

Hongsheng Xu, Shengli Jiang, Cong Zheng
Luoyang Normal University, China

Research on Radar Communication Integrated Signal based on 64QAM-LFM 1151

Jingcheng Zhao^{1,2}, Jiabi Li¹, Yang Yi³
¹Yunnan Innovation Institute-BUAA, China, ²Beihang University, China, ³Unit 32381, China

A Virtual and Non-contact Bounce System based on Ultrasonic Haptic Technology 1156

Yanan Chen, Gaolong Jiang, Jianxin Chen, Shouxiang Ni, Mingkai Chen
Nanjing University of Posts and Telecommunications, China

Design and Analysis of the EWFRT-based Extended Hybrid Carrier System 1162

Ge Song, Xiaojie Fang, Xuejun Sha
Harbin Institute of Technology, China

A Resource Management based on Deep Learning in Ubiquitous Power Internet of Things 1168

Wenhao Yao¹, Huaide Peng¹, Huiyun Peng¹, Yanfang Xiong¹, Xueting Li², Qiang Kong¹
¹State Grid Corporation of China, China, ²Beijing University of Posts and Telecommunications, China

A Secure Device Access based on Blockchain for IoT in Smart City 1172

Chao Li, Hui Yang, Bowen Bao, Zhengjie Sun, Shuai Dong, Jie Zhang
Beijing University of Posts and Telecommunications, China

Residual Transformer Network for 3D Objects Classification 1175

Shan Meng, Daoyuan Liang, Yumei Li
Shenzhen University, China

WM-6: Cognitive to Intelligent VI (Cognitive to Intelligent Workshop)

Session Chair: Hai Huang, Beijing University of Posts and Telecommunications, China

Opportunities and Challenges of AI City Construction in Qiqihar City 1180

Kena Wang¹, Guoming Zhang², Quanzhi Zhang², Guohong Wang¹, Danfeng Lu³
¹Qiqihar Medical University, China, ²Qiqihar Urban Construction Research Association, China, ³Guangzhou College of South China University of Technology, China

Bank Management System based on QT 1184

Hongting Li, Liping Wang, Jiajun Qin, Baonan Yang
Xijing University, China

Design of Embedded Intelligent Face Recognition Access Control System 1189
Na Yang
Xijing University, China

Application of Apriori Association Rules Algorithm to Data Mining Technology to Mining E-commerce Potential Customers 1193
Xiang Ren
Henan College of Industry & Information Technology, China

Application of Cloud-Based Network Curriculum Platform in Physical Education Teaching 1197
Taotao Su
Henan College of Industry & Information Technology, China

Research on China's Cross-Border E-Commerce Promotion Strategy of Foreign Trade Transformation and Upgrading based on the Perspective of Industrial Integration in the Internet Era 1202
Falın Li
Yunnan Open University, China

WM-7: Smart Communication & Computing IV (Smart Communication & Computing Workshop)
Session Chair: Shiquan Dong, University of Science and Technology Beijing, China

Research on Peer Mutual Aid Psychological Education of College Students in the Era of We Media based on Big Data 1206
Danfeng Lu¹, Kena Wang²
¹Guangzhou College of South China University of Technology, China, ²Qiqihar Medical University, China

Frost Prevention and Mitigation System of Mountain Orchard based on LoRa 1210
Jiajun Qin, Liping Wang, Hongting Li
Xijing University, China

Application of Computer Measurement Software in College Physical Fitness Test 1215
Taotao Su
Henan College of Industry & Information Technology, China

Research on the Core Mechanism of Digital Marketing Communication Effect based on the Big Data Era 1220
Falın Li
Yunnan Open University, China

WA-1: Physical Layer Design (Wireless Nets Symposium)
Session Chair: Ruoyu Su, Nanjing University of Posts and Telecommunications, China

Coverage Probability and Area Spectral Efficiency Analysis of Multi-Antenna Ultra-Dense Networks over Nakagami-m Fading Channels 1225
Donglai Zhao¹, Gang Wang¹, Haoyang Liu¹, Ruoyu Zhang²
¹Harbin Institute of Technology, China, ²Nanjing University of Science and Technology, China

Post-selection based Generalized Kennedy Receiver for Discriminating Binary Coherent States 1231
Mufei Zhao¹, Renzhi Yuan², Julian Cheng², Shuai Han¹
¹Harbin Institute of Technology, China, ²The University of British Columbia, Canada

NOMA-based Joint Allocation and Offloading Strategy of Communication and Computing Resources 1236

Dengxu Li¹, Yuanfang Chen², Mohsen Guizani³, Gyu Myoung Lee⁴

¹Dalian University of Technology, China, ²Hangzhou Dianzi University, China, ³Qatar University, Qatar, ⁴Liverpool John Moores University, United Kingdom

Joint Estimation Method of Frame Synchronization and Carrier Frequency Offset for QAM Modulation 1244

Li Tang¹, Pengfei Sun², Jiabin Fu¹, Ge Dong¹, Hao Jiang¹

¹Hytera Communications Corporation Ltd., ²Harbin Institute of Technology, China

OFDM and Generalized LED based on Index Modulation for Optical MIMO System 1249

Jike Qu¹, Zhiquan Bai¹, Ke Pang¹, Yingchao Yang¹, Xinhong Hao², Kyungsup Kwak³

¹Shandong University, China, ²Beijing Institute of Technology, China, ³INHA University, Korea

Impedance Matching Enhancement of a Microstrip Antenna Array Designed for Ka-band

5G Applications 1254

Emna Jebabli, Mohamed Hayouni, Fethi Choubani

University of Carthage, Tunisia

An Improved Partial Transmit Sequence Scheme for PAPR Reduction in FBMC/OQAM Systems 1259

Shiyong Zeng¹, Peiran Wu^{1,2}, Minghua Xia^{1,2}

¹Sun Yat-Sen University, China, ²Southern Marine Science and Engineering Guangdong Laboratory, China

WA-2: IIIoT V (IIIoT Symposium)

Session Chair: Lei Liu, Beijing University of Posts and Telecommunications, China

Application of Combination Thinking Model of Inspiration and Action to Effect of Pipa Teaching 1265

Cong Zheng

Luoyang Normal University, China

5G Release 16 Key Technologies for Vertical Industries Application 1269

Xuetian Zhu, Yongsheng Chi

China United Network Communications Corporation Limited, China

Graph Convolution Network Deep Reinforcement Learning Approach based on Manifold

Regularization in Cognitive Radio Network 1275

Zhang Yanyan, Liu Zeyu, Wang Baocong

¹China Mobile Group Design Institute Co., Ltd., China, ²Beijing University of Posts and Telecommunications, China

Analysis and Field Trial on Interference Coexistence of 5G NR and 4G LTE Dynamic Spectrum Sharing 1281

Bowen Cai, Weiliang Xie, Han Guo

China Telecom Research Institute, China

Research on the Application of 5G Cloud-network-edge-device Convergence and Intelligent Video

Technology in Smart Grid 1286

Ding Peng, Xue Yuying, Shen Yun, Duan Huibin

China Telecom Corporation Limited Research Institute, China

Industrial Vision Optimization Distributed Strategy based on Edge Intelligence Collaboration 1291

Yaqi Song, Yun Shen, Peng Ding, Xuezhi Zhang, Yuying Xue

China Telecom Corporation Limited Research Institute, China

WA-3: Optimization & ML for Communications and Nets (Wireless Nets Symposium)

Session Chair: Shuai Han, Harbin Institute of Technology, China

An Algorithm of Fire Situation Information Perception using Fuzzy Neural Network 1297

Wei Shouming^{1,2}, Lu Jiaqi¹, He Chenguang^{1,2}, Han Shuai^{1,2}

¹Harbin Institute of Technology, China, ²Ministry of Public Security, China

Mobility-Aware Multi-Instance VNF Placement in Mobile Edge Computing Networks 1303

Qingyu Wei¹, Pengchao Han¹, Yejun Liu²

¹Northeastern University, China, ²Chongqing University of Posts and Telecommunications, China

Modulation Classification of MQAM Signals based on Gradient Color Constellation and Deep Learning 1309

Gang Huang¹, Yue Li¹, Qianqian Zhu¹, Chenguang He²

¹Heilongjiang University, China, ²Harbin Institute of Technology, China

Latency Filtering for Q-routing on Wireless Networks 1314

Alexis Bitailou, Benoit Parrein, Guillaume Andrieux, Killian Couty

University of Nantes, France

Joint Access Selection and Bandwidth Allocation Methods: Evolutionary Game 1320

Mi Zhou¹, Yue Guan¹, Kaicheng Niu¹, Mohammad Hayajneh³, Chaouki Abdallah¹

¹Georgia Institute of Technology, Georgia, ²United Arab Emirates University, United Arab Emirates

Deep Neural Network Based Detection Algorithm for High-Order Modulation in Uplink Massive MIMO 1326

Huijun Hou¹, Lin Li², Weixiao Meng³

¹The 14th Research Institute of CETC, China, ²Nanjing University of Posts and Telecommunications, China, ³Harbin Institute of Technology, China

A Graph Attention Mechanism based Multi-Agent Reinforcement Learning Method for Efficient

Traffic Light Control 1332

Changqing Su¹, Yan Yan¹, Tao Wang¹, Baoxian Zhang¹, Cheng Li²

¹University of Chinese Academy of Sciences, China, ²Memorial University, Canada

WA-4: Communications & Signal Processing I (Communications & Signal Processing Symposium)

Session Chair: Azzedine Zerguine, King Fahd University of Petroleum & Minerals, Kingdom of Saudi Arabia

Blind 2D-SIMO Channel Identification using Helix Transform and Cross Relation Technique 1338

Abdulmajid Lawal¹, Karim Abed-Meraim², Naveed Iqbal¹, Azzedine Zerguine¹, Qadri Mayyala³

¹King Fahd University of Petroleum & Minerals, Kingdom of Saudi Arabia, ²Université d'Orléans, France, ³Birzeit University, Palestine

Full-Duplex Relaying based on Distributed Decoding in OFDM Systems 1343

Alireza Rahmati, Alagan Anpalagan

Ryerson University, Canada

Deep Learning Assisted Channel Estimation Refinement in Uplink OFDM Systems under

Time-Varying Channels 1349

Rugui Yao, Qiannan Qin, Shengyao Wang, Nan Qi, Ye Fan, Xiaoya Zuo

¹Northwestern Polytechnical University, China, ²Nanjing University of Aeronautics and Astronautics, China

Direction Finding of Coherent Signals in the Presence of Direction-Dependent Mutual Coupling	1354
Fei Ma, Yuexian Wang, Ling Wang, Yanyun Gong, Chuang Han Northwestern Polytechnical University, China	
Non-Coherent C-RAN: Index Modulation Aided Transmission and Non-Bayesian Detection	1358
Leixuan Jing, Jianping Zheng Xidian University, China	
The Impact of Network Densification and Spectrum Sharing on Real-World mmWave Mobile Networks ...	1364
Constantinos Vrontos, Simon Armour, Angela Doufexi University of Bristol, United Kingdom	
Anti-Jamming Trajectory and Power Design for Cognitive UAV Communications	1370
Yufang Gao, Yang Wu, Zhichao Cui, Wendong Yang, Ning Li University of PLA, China	
WA-5: 5G IoT VI (5G-IoT Symposium)	
Session Chair:	FanQin Zhou, Beijing University of Posts and Telecommunications, China
KNN and SVM based Optimal Adaptive Modulation Selection in Spatial Modulation	1376
Jean Paul Twarayisenze ¹ , Zhiquan Bai ¹ , Abeer Mohamed ¹ , Ke Pang ¹ , Jibiao Han ² , KyungSup Kwak ³ ¹ Shandong University, China, ² Harbin Institute of Technology, China, ³ INHA University, Korea	
Hysteresis Optimized Multipath TCP Data Scheduling Algorithm in Predictable Networks	1381
Zhaojie Song, Qian Wu, Hewu Li, Jun Liu, Zeqi Lai Tsinghua University, China	
ioFog: Prediction-based Fog Computing Architecture for Offline IoT	1387
Mehbub Alam ¹ , Nurzaman Ahmed ² , Rakesh Matam ¹ , Ferdous Ahmed Barbhuiya ¹ ¹ Indian Institute of Information Technology Guwahati, India, ² Indian Institute of Technology Kharagpur, India	
Flexibility Analysis of Adaptive Data Rate Algorithm in LoRa Networks	1393
Kamil Ksiazek ^{1,2} , Krzysztof Grochla ¹ ¹ Institute of Theoretical and Applied Informatics, Polish Academy of Sciences, Poland, ² Silesian University of Technology, Poland	
Utilizing Csiszar Divergences to Analyze Deployments of Binary Sensors with Modulators	1399
Longxiang Luo ¹ , Yang Xiao ² , Wei Liang ¹ , Meng Zheng ¹ ¹ Chinese Academy of Sciences, China, ² The University of Alabama, United States	
Dynamic Resource Allocation Algorithm based on Queue Management in High-Speed Railway Communication Networks	1405
Zan Chen, Jie Sheng, Ziwen Tang, Qian Wu, Cheng Wu, Yiming Wang Soochow University, China	
Welding Defect Recognition Technology and Application based on Convolutional Neural Network	1412
Lei Xu, Xin Xie, Xinlei Li, Fengping Hu East China Jiaotong University, China	
Application of New Generation Communication Technology in Power Internet of Things	1415
Xinlei Li, Xin Xie, Lei Xu, Fengping Hu East China Jiaotong University, China	

WA-6: Vehicular Networks (Vehicular Symposium)

Session Chair: Shun-Ren Yang, National Tsing Hua University, Taiwan

An NFV-Based Edge Platform for Low-Latency V2X Services Supporting Vehicle Mobility-Driven

Auto Scaling 1418

Wei-Chieh Hung¹, Shun-Ren Yang¹, Shan-Ni Lee¹, Yi-Chun Lin¹, Phone Lin²

¹National Tsing Hua University, Taiwan, ²National Taiwan University, Taiwan

Provisioning Road Weather Management using Edge Cloud and Connected and Autonomous Vehicles

 1424

Binod Vaidya, Parul Preet Kaur, Hussein T. Mouftah

University of Ottawa, Canada

Opportunistic Coded Distributed Computing: An Evolutionary Game Approach

 1430

Yue Han¹, Dusit Niyato¹, Cyril Leung^{2,3}, Dong In Kim⁴

¹Nanyang Technological University, Singapore, ²The University of British Columbia, Canada, ³NTU-UBC Research Centre of Excellence in Active Living for the Elderly, Singapore, ⁴Sungkyunkwan University, Korea

Joint Charging, Routing, and Power Allocations in Rechargeable Wireless Sensor Networks

 1436

Chunhui Guo, Dongmei Zhao

McMaster University, Canada

A Vehicle-to-Infrastructure Data Offloading Scheme for Vehicular Networks with QoS Provisioning

 1442

Yasir Saleem, Nathalie Mitton, Valeria Loscrí

Inria Lille – Nord Europe, France

A Distributed Resource Management for VANET using Smart Contract

 1448

Amira Kchaou¹, Ryma Abassi¹, Samiha Ayed², Sihem Guemara El Fatmi¹

¹University of Carthage, Tunisia, ²University of Technology of Troyes, France

Adaptive V2X User Selection and Resource Allocation for Ultra-Dense 5G HetNet Network

 1454

Amal Bouaziz¹, Ahlem Saddoud¹, Lamia Chaari Fourati¹, Hakima Chaouchi²

¹University of Sfax, Tunisia, ²Télécom SudParis, France

WA-7: Security, Trust, and Reliability (WSNs & IoT Symposium)

Session Chair: Jalal Almhana, Université de Moncton, Canada

Redundant Transmitter Placement in Rural Areas for User-to-User Communication in Green Computing

 1460

Lucas Rouquier¹, Lutful Karim², Jalal Almhana¹

¹Moncton University, Canada, ²Seneca College of Applied Arts and Technology, Toronto, Canada

An efficient Trust Related Attack Detection Model based on Machine Learning for Social

Internet of Things 1465

Rim Megdich, Hanen Jemal, Chaima Nakti, Mounir Ben Ayed

University of Sfax, Tunisia

Efficient Reduction of the Transmission Delay of the Authentication based Elliptic Curve

Cryptography in 6LoWPAN Wireless Sensor Networks in the Internet of Things 1471

Balkis Bettoumi^{1,2}, Ridha Bouallegue¹

¹University of Carthage, Tunisia, ²National Engineering School of Tunis, Tunisia

ML for IEEE 802.15. 4e/TSCH: Energy Efficient Approach to Detect DDoS Attack using Machine Learning ... 1477

Pradeepkumar Bhale¹, Santosh Biswas², Sukumar Nandi¹

¹Indian Institute of Technology Guwahati, India,²Indian Institute of Technology Bhilai, India

Grey Wolf Optimizer Enhanced SVM for IoT Fault Detection 1483

Ines Rahmany¹, Hadhami Mnassri¹, Tarek Moulahi², Salim El khediri²

¹University of Kairouan, Tunisia,²Laboratoire HATEM Bettaher, Tunisia

An Enhanced Pansharping Approach based on Second-Order Polynomial Regression 1489

Hind Hallabia¹, Habib Hamam^{2,3,4}

¹Aix Marseille Université, France,²Université de Moncton, Canada,³International Institute of Technology, Tunisia,

⁴University of Johannesburg, South Africa

WA-8: IIIoT VI (IIIoT Symposium)

Session Chair: Shaowei Zhang, China Telecom Research Institute, China

Industrial Intelligent Edge Computing System based on 5G 1494

Peng Ding, Dan Liu, Yun Shen, Xiaohou Shi, Hengrui Zhou, Haolong Kan

China Telecom Corporation Research Institute, China

Research on 5G Lightweight Core Network Technology for Vertical Industries 1499

Xuetian Zhu¹, Xuemin Qu²

¹China United Network Communications Corporation Limited, China,²Jinan Second Middle School, China

Application of Big Data Technology in Financial Management Teaching 1506

Chao Zhang

Chengdu Polytechnic, China

Research on the Difference Between the Internet of Things and the Traditional Internet under Artificial Intelligence 1510

Yongjun Qi¹, Haiyan Wu²

¹Guangdong Baiyun University, China,²Guangdong University of Foreign Studies, China

Application of Computer Software Processing Technology in Performance Information Management System 1514

Haiyan Wu¹, Yongjun Qi²

¹South China Business College Guangdong University of Foreign Studies, China²Guangdong Baiyun University, China

Research on the Reform of Physical Education in Colleges and Universities under the Background of Big Data Era 1519

Linlan Yu¹, Qing Lu², Tingting Yang¹, Junxiang Wan³, Weijiang Wen³, Dayan Hu³

¹Changsha Normal University, China²Hunan Police Academy, China³Public Security Bureau of Yueyang City, China,

⁴Public Security Bureau of Yueyang City, China,⁵Public Security Department of Hunan Province, China

WA-9: 5G IoT VII (5G-IoT Symposium)

Session Chair: Peng Yu, Beijing University of Posts and Telecommunications, China

Adaptive Prescribed Performance tuning for Model Predictive Control 1523

Junjie Wang¹, Xuetian Zhu¹, Yushan Pei¹, Di Wang², Qi Shen³, Yiyang Niu¹

¹China Unicom Research Institute, China,²China Information Technology Design & Consulting Institute Co., Ltd., China,

³China Unicom Smart City Research Institute, China

The Application of Financial Analysis based on the Perspective of Big Data	1530
Chao Zhang Chengdu Polytechnic, China	
Satellite Routing in Space-air-ground Integrated IoT Networks	1534
Jinlin Liu ¹ , Hang Du ¹ , Xueguang Yuan ¹ , Yangan Zhang ¹ , Kadoch Michel ² ¹ Beijing University of Posts and Telecommunication, China, ² University of Quebec, Canada	
FIFA: Fighting against Interest Flooding Attack in NDN-based VANET	1539
Jeet Rabari, Arun Raj Kumar P. National Institute of Technology, India	
Energy-Efficient Joint Scheduling for Relay-Involved D2D Communications	1545
Tianyi Shi, Kunmei Cao, Ruofei Ma, Gongliang Liu Harbin Institute of Technology, China	
Impact of RTS/CTS Jamming Attacks in IEEE 802.11ah Dense Networks	1551
Abdelhak Moussa ¹ , Issam Jabri ² ¹ Digital Research Center of Sfax, Tunisia, ² Al Yamamah University, Kingdom of Saudi Arabia	
Research on UAV Networking Technology for High-speed Railway Emergency Communication	1557
Qian Wu, Jie Sheng, Cheng Wu, Jin Zhang, Yiming Wang Soochow University, China	
WA-10: Network and Energy Management (WSNs & IoT Symposium)	
Session Chair: Abderrahmane Lakas, United Arab Emirates University, United Arab Emirates	
The Impact of Wireless Power Charging on the Future of the Battlefield	1563
Mohamed Zied Chaari, Rashid Al-Rahimi Qatar Scientific Club, Qatar	
Clustering-Coefficient based Resiliency Approach for Smart Grid	1569
Yaser Al Mtawa, Anwar Haque Western University, Canada	
Profit Maximization for EVSEs-based Solar Energy in Smart Cities	1575
Turki G. Alghamdi, Dhaou Said, Hussein T. Mouftah University of Ottawa, Canada	
Network Management in Heterogeneous IoT Networks	1581
Shunmuga Selvaraju ¹ , Ali Balador ^{1,2} , Hossein Fotouhi ¹ , Maryam Vahabi ¹ , Mats Björkman ¹ ¹ Mälardalen University, Sweden, ² RISE Research Institute of Sweden, Sweden	
Continuous Energy-efficient Monitoring Model for Mobile Ad Hoc Networks	1587
Nadia Battat ³ , Abdallah Makhoul ¹ , David Laiymani ¹ , Hamamache Kheddouci ² ¹ Université de Bourgogne Franche-Comté, France, ² University of Lyon 1, France, ³ University of Bejaia, Algeria	
Energy Harvesting Effect on the Sensors Battery Lifespan of an Energy Efficient SmartBAN Network	1593
Jaume Ramis-Bibiloni ^{1,2} , Loren Carrasco ^{1,2} ¹ University of the Balearic Islands, Spain, ² Health Research Institute of the Balearic Islands, Spain	

On the Comparison of Broadcasting Techniques in Vehicular Ad hoc Networks	1599
Abir Mchergui ¹ , Tarek Moulahi ² , Salim El Khediri ²	
¹ Gabes University, Tunisia, ² Laboratoire HATEM Bettaher, Tunisia	

Thursday, July 1st, 2021

ThM-1: 5G IoT VIII (5G-IoT Symposium)

Session Chair: Fei Qi, China Telecom Research Institute, China

On the Influence of Big Data Era on Physical Education Teaching Research	1604
---	-------------

Linlan Yu¹, Qing Lu², Tingting Yang¹, De Wan³, Rong Xun³, Fangxia Li³
¹Changsha Normal University, China²Hunan Police Academy, China,³Public Security Bureau of Yueyang City, China

Research on the Promotion and Implementation of the "1+X" Certificate System	1608
---	-------------

Bin Huang
 Jilin Agricultural Science and Technology University, China

Application of Big Data Information Processing Technology in the Internet Financial System	1612
---	-------------

Renlan Wang
 Guangdong Ocean University Cunjin College, China

Research on 5G Application in Special Scenarios	1616
--	-------------

Jingning Wang, Lei Lang
 The 54th Research Institute of CETC, Science and Technology on Communication Networks Laboratory, China

Teaching Mode of Mechanical Manufacturing Specialty based on the Network Teaching Platform	1620
---	-------------

Kai Wang
 Henan College of Industry & Information Technology, China

A Scalable Indexing and Discovery Scheme in Large Scale Connected Environments	1625
---	-------------

Taoufik Yeferny, Sabri Allani, Richard Chbeir
 Université de Pau et des Pays de l'Adour, France

A Novel Cell Zooming Algorithm based on Motion Prediction In High-Speed Railway Communication Networks	1631
---	-------------

Ziyue Wang^{1,2}, Qingyang Li², Jie Sheng², Cheng Wu²
¹Soochow University, China,²Southeast University, China

ThM-2: Applications (General Symposium)

Session Chair: Lin Ma, Harbin Institute of Technology, China

Communication-Efficient Federated Learning for Connected Vehicles with Constrained Resources	1636
---	-------------

Shuaiqi Shen¹, Chong Yu¹, Kuan Zhang¹, Xi Chen², Huimin Chen², Song Ci³
¹University of Nebraska-Lincoln, United States,²State Grid Corporation of China, China,³Tsinghua University, China

Fusion Convolutional Neural Network for Multi-Class Motor Imagery of EEG Signals Classification	1642
--	-------------

Amira Echtioui^{1,2}, Wassim Zouch³, Mohamed Ghorbel¹, Chokri Mhiri^{1,4}, Habib Hamam^{2,5,6}
¹University in Sfax, Tunisia,²Université de Moncton, Canada,³King Abdulaziz University, Kingdom of Saudi Arabia,⁴Habib Bourguiba University Hospital, Tunisia,⁵International Institute of Technology, Tunisia,⁶University of Johannesburg, South Africa

A Novel Ensemble Learning Approach for Classification of EEG Motor Imagery Signals 1648
Amira Echtioui^{1,2}, Wassim Zouch^{1,3}, Mohamed Ghorbel¹, Chokri Mhiri^{1,4}, Habib Hamam^{2,5,6}
¹University of Sfax, Tunisia, ²Université de Moncton, Canada, ³King Abdulaziz University, Kingdom of Saudi Arabia; ⁴Habib Bourguiba University Hospital, Tunisia, ⁵International Institute of Technology, Tunisia, ⁶University of Johannesburg, South Africa

Network-side Localization via Semi-Supervised Multi-point Channel Charting 1654
Junquan Deng¹, Olav Tirkkonen², Jianzhao Zhang¹, Xianlong Jiao³, Christoph Studer⁴
¹National University of Defense Technology, China, ²Aalto University, Finland, ³Chongqing University, China, ⁴ETH Zurich, Switzerland

ThM-3: Applications (WSNs & IoT Symposium)

Session Chair: Pushpendu Kar, University of Nottingham Ningbo, China

Instance Segmentation in Mobile Computing Environments for Identification of Specific Characteristics in Endangered Species 1661
Morgana C.O. Ribeiro¹, Rhayane S. Monteiro¹, Mário W.L. Moreira¹, Joel J.P.C. Rodrigues^{2,3}
¹Federal Institute of Education, Science and Technology of Ceará, Brazil, ²Federal University of Piauí, Brazil, ³Instituto de Telecomunicações, Portugal

A Novel Monocular SLAM Algorithm for High Real-Time based on Kalman Filter 1667
Wanqing Wu, Lin Ma, Bin Wang
Harbin Institute of Technology, China

Distributed Weighted Least Squares Estimator without Prior Distribution Knowledge 1673
Shun Liu^{1,2}, Zhifei Li³, Weifang Zhang⁴, Liang Yan^{1,2}
¹Northwestern Polytechnical University, China, ²Ministry of Education, China, ³Space Engineering University, China, ⁴Shanghai Electro-Mechanical Engineering Institute, China

Research on 3D Reconstruction Method of Indoor Environment based on Image and Point Cloud Fusion 1679
Wanqing Wu, Lin Ma
Harbin Institute of Technology, China

WITHDRAWN

ThM-4: THZ Communications (THZ Communications Workshop)

Session Chair: Richie Leo, ZTE, China

Accurate Load Prediction Algorithms Assisted with Machine Learning for Network Traffic 1683
Yin Gao^{1,2}, Man Zhang^{1,2}, Jiajun Chen^{1,2}, Jiren Han^{1,2}, Dapeng Li^{1,2}, Ruitao Qiu²
¹State Key Laboratory of Mobile Network and Mobile Multimedia, China, ²ZTE Corporation, China

A New Data Modulation and Demodulation Scheme for THz Communications 1689
Yu Xin, Tong Bao, Jian Hua
ZTE Corporation, China

Utilizing OAM in Terahertz Frequency Band to Improve Transmission Capacity 1694
Mengnan Jian^{1,2}, Yijian Chen^{1,2}, Guanghui Yu^{1,2}
¹State Key Laboratory of Mobile Network and Mobile Multimedia Technology, China, ²ZTE Corporation, China

Applications of Machine Learning for 5G Advanced Wireless Systems 1700
Yingjun Zhou^{1,2}, Jiajun Chen^{1,2}, Man Zhang^{1,2}, Dapeng Li^{1,2}, Yin Gao^{1,2}
¹State Key Laboratory of Mobile Network and Mobile Multimedia Technology, China, ²ZTE Corporation, China

A Novel Design of G-band TWT Slow-wave Structure for High-speed Wireless Communication 1705

Yuan Feng, Pan Pan, Ying Li, Bowen Song, Jun Cai, Jinjun Feng
Beijing Vacuum Electronics Research Institute, China

Baseband Signal Processing for Terahertz: Waveform Design, Modulation and Coding 1710

Mengnan Jian^{1,2}, Ruiqi Liu^{1,2}
¹State Key Laboratory of Mobile Network and Mobile Multimedia Technology, China,²ZTE Corporation, China

ThM-5: Internet of Things and Emerging Technologies I (Wireless Nets Symposium)

Session Chair: Ruoyu Su, Nanjing University of Posts and Telecommunications, China

A Mobile Node Assisted Localization System for Wireless Sensor Networks 1716

Ruoyu Su¹, Xiaolin Pang², Zijun Gong², Cheng Li², Xueheng Tao², Fan Jiang³
¹Nanjing University of Posts and Telecommunications, China,²Memorial University of Newfoundland, Canada,
³Chalmers University of Technology, Sweden

Network Topology Control based on Positive Evaluation Method for Heterogeneous Resource Sharing Network 1721

Meng Wang, Nan Bao, Jiakuo Zuo, Chao Meng, Xixia Sun, Su Pan
Nanjing University of Posts and Telecommunications, China

A Cloud-based Brain-controlled Wheelchair with Autonomous Indoor Navigation System 1727

Abderrahmane Lakas, Fekri Kharbush, Abdelkader Nasreddine Belkacem
United Arab Emirates University, United Arab Emirates

Spatiotemporal Location Differential Privacy for Sparse Mobile Crowdsensing 1734

Qifan Yang¹, Yuanfang Chen², Mohsen Guizani³, Gyu Myoung Lee⁴
¹Dalian University of Technology, China,²Hangzhou Dianzi University, China,³Qatar University, Qatar,⁴Liverpool John Moores University, United Kingdom

A Novel Combined Control Loop based on FLL-Assisted-PLL for Highly Dynamic Tracking 1742

Yanqing Chen¹, Xijun Wang¹, Xiang Chen¹, Shengfeng Li²
¹Sun Yat-sen University, China,²Guangzhou Haige Communications Group, Incorporated Company, China

Location-Aware Cross-Tier Cooperation in Cache-Enabled Heterogeneous Networks 1748

Tianming Feng¹, Shuo Shi^{1,2,3}, Chenyu Wu¹, Xuemai Gu^{1,2,3}
¹Harbin Institute of Technology, China,²Peng Cheng Laboratory, China,³International Innovation Institute of HIT in Huizhou, China

A Review of Channel Modeling Techniques for Internet of Underwater Things 1754

Ruoyu Su¹, Mingye Ju¹, Zijun Gong², Cheng Li², Ramachandran Venkatesan²
¹Nanjing University of Posts and Telecommunications, China,²Memorial University of Newfoundland, Canada

ThM-6: IIoT VII (Industrial IIoT Symposium)

Session Chair: Yuetian Zhou, China Telecom Research Institute, China

Research based on Remote Interference Management 1760

Mingshuo Wei¹, Weiliang Xie¹, Guanghui Zhang²
¹China Telecom Research Institute, China,²China Telecom, China

A Study on Interaction of College English Classroom in the Mobile Internet Environment	1766
Yu Shi, Wenrui Li, Weiwei Zeng Wuhan Donghu University, China	
A Study of University Teaching Model based on the Theory of Network Inquiry Community	1770
Weiwei Zeng, Wenrui Li, Yu Shi, Hao Huang Wuhan Donghu University, China	
Audio and Visual Exaggerated Expressive Speech Generation of English Language Learning based on Automatic Context Algorithm	1774
Jie Huang ¹ , Xun Gong ² ¹ Nanchang JiaoTong Institute, China, ² Heilongjiang Bayi Agricultural University, China	
Research on the Characteristics and Development Trend of Internet Sports News	1778
Xun Gong Heilongjiang Bayi Agricultural University, China	
Research on the Optimization Algorithm of Big Data Computing System	1783
Mengxuan Wu, Jingjing Jiang, Lijuan Wang ¹ School of China Agriculture University, China, ² Dalian University of Science and Technology, China	
Personalized Recommendation Algorithm based on Fuzzy Semantics in Big Data Environment	1788
Jingjing Jiang ¹ , Lijuan Wang ¹ , Mengxuan Wu ² , Nan Li ¹ ¹ Dalian University of Science and Technology, China, ² School of China Agriculture University, China	
ThA-1: 5G IoT IX (5G-IoT Symposium)	
Session Chair: Yuanhao Cui, Beijing University of Posts and Telecommunications, China	
Mechanical Properties of Presented Concrete Beams based on Open Sees	1793
Lingqiang Kong Henan College of Industry & Information Technology, China	
Iterative Signal Detection based on LRE-CG Method for Uplink Massive MIMO Systems	1798
Ahlam Jawarneh, Michel Kadoch École de technologie supérieure Montreal, Canada	
A Study of Voice Print Recognition Technology	1802
Jingyi Li ¹ , Jinmeng Zhang ² ¹ Chongqing College of Mobile Telecommunications, China, ² Beijing University of Agriculture, China	
A Multi-layer Architecture for Space-Air-Ground Network and IoT Services	1809
Fei Qi, Ge Mang, Shaowei Zhang, Lei Liu China Telecom Research Institute, China	
Intelligent Reflecting Surface-Assisted ambient Backscatter Networks: Reflection Design	1814
Qiang Liu ¹ , Sun Songlin ¹ , Michel Kadoch ² ¹ Beijing University of Posts and Telecommunications, China, ² University of Quebec, Canada	
Intelligent Vehicle Communication and Obstacle Detection based on Millimetre Wave Radar Base Station	1818
Jingcheng Zhao ^{1,2} , Changyu Lou ² , Hai Hao ³ ¹ Yunnan Innovation Institute-BUAA, China, ² Beihang University, China, ³ Beijing Institute of Remote Sensing Equipment, China	

ThA-2: Communications & Signal Processing (Communications & Signal Processing Symposium)

Session Chair: Sudeep Tanwar, Nirma University, India

Block6Tel: Blockchain-Based Spectrum Allocation Scheme in 6G-Envisioned Communications 1823

Farnazbanu Patel¹, Pronaya Bhattacharya¹, Sudeep Tanwar¹, Rajesh Gupta¹, Neeraj Kumar², Mohsen Guizani³
¹Nirma University, India, ²Thapar Institute of Engineering & Technology, India, ³Qatar University, Qatar

Research on the Optimal Decoding Overhead of LT Codes 1829

Shuang Wu¹, Qingyang Guan¹, Chen Cui²
¹Xi'an International University, China, ²Harbin Institute of Technology, China

A Single Beacon-Aided Cooperative Localization Algorithm based on Maximum Correntropy Criterion 1835

Wanlong Zhao¹, Huifeng Zhao², Lu Liu²
¹Harbin Institute of Technology, China, ²Harbin Engineering University, China

Joint Optimization of Area Spectral Efficiency and Fairness in Ultra-Dense Networks with Application of Joint Transmission 1840

Shuyi Chen¹, Yifan Qin², Shuai Han¹
¹Harbin Institute of Technology, China, ²Harbin Engineering University, China

Smart Contracts for Decentralized Vehicle Services 1846

Halima Mhamdi¹, Ahmed Zouinkhi¹, Hedi Sakli^{1,2}
¹University of Gabes, Tunisia, ²EITA Consulting, France

Location Determination of Partial Discharge Sources in Air-Insulated Substation 1852

Ziqi Yue¹, Zeqiu Liu²
¹Beijing Information Technology College, China, ²Beijing University of Technology, China

ThA-3: IIoT VIII (IIoT Symposium)

Session Chair: Shaowei Zhang, China Telecom Research Institute, China

Research on the Application of Internet of Things Monitoring System in Greenhouse Flowers 1856

Bin Huang
Jilin Agricultural Science and Technology University, China

Application of Blockchain Technology in Supply Chain Finance in Beibu Gulf Region 1860

Renlan Wang
Guangdong Ocean University Cunjin College, China

A Study into the Classification and Prediction of University Teachers' Workload Assessment based on Naive Bayesian 1865

ZhanBo Liu, Xiaoli Wang, Ping Zhang
Mudanjiang Medical University, China

A Study into the Value and Evaluation of Network Information Resources 1870

Xiaoli Wang, ZhanBo Liu, Liping Bai
Mudanjiang Medical University, China

Application and Development of Neural Network Technology in Mechanical Automation Processing Parameters	1874
Kai Wang Henan College of Industry & Information Technology, China	
Application of Wireless Communication in Intelligent Distribution Network Communication Technology	1879
Zi Li ¹ , Xiguo Yang ² , Yuling Chen ¹ , Jiarong Zhang ¹ ¹ Shenyang Institute of Technology, China, ² Liaoning Tongzheng Testing Co., Ltd., China	
ThA-4: IoT and Emerging Technologies II (Wireless Nets Symposium)	
Session Chair:	Ruofei Ma, Harbin Institute of Technology, China
Dynamic Multi-link Transmission Technology with High Reliability based on Link State Awareness and Network Coding	1884
Hongrui Nie, Shaosheng Li, Yong Liu Beijing University of Posts and Telecommunications, China	
DisNet: A General Framework for Dissolving Networks	1890
Yuanzhu Chen, Zhihao Dong Memorial University of Newfoundland, Canada	
Cluster-based Trust Management Approach to Mitigate Attacks in WBAN	1896
Samiha Ayed ¹ , Lamia Chaari Fourati ² , Hakim Ghazzai ³ ¹ University of Technology of Troyes, France, ² University of Sfax, Tunisia, ³ Stevens Institute of Technology, United States	
A Priority-based Resource Allocation Algorithm for Power Grid WSN Network	1902
Shouming Wei, Yu Wang, Chenguang He Harbin Institute of Technology, China	
New Adaptive 802.11 MAC Protocol to Enhance Throughput and Fairness in Multihop Wireless Networks	1908
Jalaa Hoblos The Pennsylvania State University, United States	
A Hybrid Method of Block Ack and Unsolicited Retry for Lossless Groupcast over Wireless LANs	1914
Toshiro Nunome, Akira Nagahara Nagoya Institute of Technology, Japan	
ThA-5: Mobile Computing (Mobile Computing Symposium)	
Session Chair:	A. Refaey, Manhattan College, United States
Session Co-Chair:	K. Elgazzar, University of Ontario Institute of Technology, Canada
An Efficient Downlink-QoS Aware Scheduling Approach for Adopting Wyner-Ziv Code	1919
Khaled Almutawa ¹ , Radwa Sultan ¹ , Ahmed Refaey ^{1,2} , Md. Jahidur Rahman ³ ¹ Manhattan College, United States, ² Western University, Canada, ³ Qualcomm, United States	
QoS-aware Energy Saving Scheme and Traffic Management in Mobile Edge Computing Networks	1925
Ali Alnoman ¹ , Alagan Anpalagan ² ¹ American University of Ras Al Khaimah, United Arab Emirates, ² Ryerson University, Canada	

Pedestrian Stride-Length Estimation Algorithm based on DTW Motion Mode Recognition 1931

Guoquan Li, Kai Yao, Enxu Geng, Jinzhao Lin, Yu Pang
University of Posts and Telecommunications, China

Performance of Learning based Classification Techniques for Cache Placement in MENS 1936

Lubna B. Mohammed, Alagan Anpalagan, Ahmed S. Khwaja, Muhammad Jaseemuddin
Ryerson University, Canada

Federated Learning for Energy-balanced Client Selection in Mobile Edge Computing 1942

Jingjing Zheng¹, Kai Li¹, Eduardo Tovar¹, Mohsen Guizani²
¹CISTER Research Centre, Portugal, ²Qatar University, Qatar

Classifying Urban Fabrics into Mobile Call Activity with Supervised Machine Learning 1948

Danny Qiu¹, Alassane Samba¹, Hossam Afifi², Yvon Gourhant¹
¹Orange Labs, France, ²Télécom SudParis, France

Efficient Real-Time Image Recognition using Collaborative Swarm of UAVs and Convolutional Networks 1954

Marwan Dhuheir¹, Emna Baccour¹, Aiman Erbad¹, Sinan Sabeeh², Mounir Hamdi¹
¹Hamad Bin Khalifa University, Qatar, ²Barzan Holdings QSTP LLC, Qatar

ThA-6: Communications & Signal Processing II (Communications & Signal Processing Symposium)

Session Chair: Habib Hamam, University of Moncton, Canada

A Local Dominance based Single Source Points Detector for Mixing Matrix Estimation 1960

Yu-Yang Huang, Ping Chu, Bin Liao
Shenzhen University, China

Soft Information Learning of BICM-ID System based on Deep Learning 1965

Guoquan Li¹, Yonghai Xu¹, Yongjun Xu¹, Zhengwen Huang², Lin Jinzhao¹
¹Chongqing University of Posts and Telecommunications, China, ²Brunel University London, United Kingdom

Blind CFO Estimation for Multi-user in SC-FDMA Uplink Systems using Variance Minimization 1971

Harsha¹, Sushant Kumar², Sudhan Majhi¹
¹Indian Institute of Technology Patna, India, ²National Institute of Technology, India

An l_0 -Norm Blind Decision Feedback Equalization with Adaptive Zero Attractor for Sparse Underwater Acoustic Channel 1977

Zhiyong Liu, Ling Jiang, Long Wang, Miao Ke
Harbin Institute of Technology, China

On Experimental Evaluation of Eigenvalue-based Spectrum Sensing using a Real-time SDR Testbed 1982

Hayfa Ben Thameur¹, Iyad Dayoub^{1,2}
¹Université Polytechnique Hauts-de-France, France, ²INSA des Hauts de France, France

ThA-7: IIoT IX (IIoT Symposium)

Session Chair: Zhirong Zhang, China Telecom Research Institute, China

Power Automation System based on GPRS / CDMA Wireless Communication Technology 1988

Xin Sun¹, ZhenBao Zhou², Zi Li¹
¹Shenyang Institute of Technology, China, ²ShenYang Yuan Da Power Electronic Science & Tecnology Co., Ltd., China

Audit Computer Information Management and Software Development System in the Internet Era 1993

PeiBo Xie, Yanhong Wu
Guangdong Ocean University Cunjin College, China

Exploration of Enterprise Audit Information Management System Model based on Data Flow Diagram ... 1997

Yanhong Wu, PeiBo Xie
Guangdong Ocean University Cunjin College, China

Fuzzy Control Algorithm of Structural Vibration in Civil Engineering 2002

Lingqiang Kong
Henan College of Industry & Information Technology, China

Innovation Research on Big Data-driven Student Management Work in Universities 2007

Jiangru Wang, Pengwen Wang
¹Xi'an Peihua University, China, ²XiJing University, China

Research on the Application of Data Visualization in the UI interface Design of Health Apps 2013

Pengwen Wang, Jiangru Wang
¹XiJing University, China, ²Xi'an Peihua University, China

Throughput-Delay Tradeoffs for Slotted-Aloha-based LoRaWAN Networks 2020

Imane Cheikh¹, Essaid Sabir^{1,2}, Rachid Aouami³, Mohamed Sadik¹, Sébastien Roy³
¹Hassan II University of Casablanca, Morocco, ²University of Quebec at Montreal, Canada, ³Université de Sherbrooke, Canada

ThA-8: Applications of IoT Technologies (General Symposium)

Session Chair: Amr Mohamed, Qatar University, Qatar

MMRL: A Multi-Modal Reinforcement Learning Technique for Energy-efficient Medical IoT Systems 2026

Amr Abo-eleneen, Amr Mohamed
Qatar University, Qatar

Connected Medical Kiosks to Counter COVID-19: Needs, Architecture & Design Guidelines 2032

Lamia Chaari Fourati¹, Slim Rekhis², Samiha Ayed³, Mohamed Jmaiel⁴
¹University of Sfax, Tunisia, ²University of Carthage, Tunisia, ³University of Technology of Troyes, France, ⁴National School of Engineers of Sfax, Tunisia

Hybrid DBSCAN based Community Detection for Edge Caching in Social Media Applications 2038

Huma Aftab¹, Junaid Shuja^{1,2}, Waleed Alasmay², Eisa Alanazi²
¹University Islamabad, Pakistan, ²Umm Al-Qura University, Kingdom of Saudi Arabia

On Optimal Scheduling of OTA Software Updates for Smart Vehicles Leveraging Fog Computing 2044

Md Yeakub Hassan^{1,2}, Salimur Choudhury², Zubair Md Fadlullah^{1,2}
¹Thunder Bay Regional Health Research Institute, Canada, ²Lakehead University, Canada

Session Management for URLLC in 5G Open Radio Access Network: A Machine Learning Approach 2050

Shao-Yu Lien¹, Der-Jiunn Deng², Bai-Chuan Chang³
¹National Chung Cheng University, Taiwan, ²National Changhua University of Education, Taiwan, ³Industrial Technology Research Institute, Taiwan

Using the Lens of Systems Thinking to Model Education During and Beyond COVID-19 2056

Umme Ammara¹, Hassan Qudrat-Ullah², Ala Al-Fuqaha³, Junaid Qadir¹
¹University of the Punjab, Pakistan, ²York University, Canada, ³Hamad Bin Khalifa University, Qatar

Friday, July 2nd, 2021

FrM-1: Cognitive to Intelligent I (Cognitive to Intelligent Workshop)

Session Chair: Yuanhao Cui, Beijing University of Posts and Telecommunications, China

R-N Algorithm for Crowdsensing On-street Parking Spaces 2062

Wenjun Zheng¹, Ruizhi Liao^{1,2}

¹The Chinese University of Hong Kong, China, ²Shenzhen Key Laboratory of IoT Intelligent Systems and Wireless Network Technology, China

Automatic Modulation Classification based on the Improved AlexNet 2068

Zheao Li^{1,2}, Zhongjin Jiang¹, Jie Huang^{1,2}

¹Southeast University, China, ²Purple Mountain Laboratories, China

Sidelobe Randomization Technique using Frequency Diverse Subarray for Secure MmWave Wireless Communications 2074

Yuanquan Hong, Yuqin Zhang, Yongming Zhou, Haoxiang Wen, Yuping Wu, Deqian Zhang
Shaoguan University, China

SferNet: A Novel Network for Static Facial Emotion Recognition 2080

Qianqian Chen, Ronghui Zhang, Sijie Wei, Junsheng Mu, Xiaojun Jing
Beijing University of Posts and Telecommunications, China

Detection System of Truck Blind Area based on Machine Vision 2086

Wenjing Ding, Yang Zhang, Yang Bu, Yilin Lu, Xia Zhu
Jinling Institute of Technology, China

FrM-2: Smart Communication & Computing I (Smart Communication & Computing Symposium)

Session Chair: Fadi Farha, University of Science and Technology Beijing, China

Exploring Secure Visible Light Communication in Next-generation (6G) Internet-of-Things 2090

Abhishek Gupta, Xavier Fernando
Ryerson University, Canada

Gap Analysis of VLC-MIMO Capacity Lower Bound with Different Signal Distributions 2098

Xiaoqian Wang, Xia Liang, Yifei Yuan, Jing Dong, Hanning Wang, Qixing Wang
China Mobile Research Institute, China

Correlation based Lamp Selection Scheme under Illumination Constraint for VLC MIMO Systems 2103

Zhitian Cheng, Xiaoqian Wang, Liang Xia, Yifei Yuan, Jing Jin, Qixing Wang
China Mobile Research Institute, China

3-Gb/s Visible Light Communication over 5 m Distance based on Imaging System with Low Transmission Power and Off-the-Shelf LEDs 2109

Zichen Yu, Chen Gong, Jiaqi Wei, Nuo Huang, Zhengyuan Xu
University of Science and Technology of China, China

Prototyping of an Efficient and Energy-Aware IoT-based Sensor Node for Water Pipeline Monitoring ... 2115

N. Atitallah, H. Hakim, M. Abid

¹Arab Open University, Kingdom of Saudi Arabia, ²ISIMS, Tunisia, ³ENIS, Tunisia

Evaluation of Artificial Intelligence Algorithms for Predicting Power Consumption in University Campus Microgrid 2121
Imad Hajjaji, Hassan El Alami, Mohammed Raiss El-Fenni, Hamza Dahmouni
Institut National des Postes et Télécommunications, Morocco

An Improved System for Large Population Text Independent Speaker Recognition with Short Utterances ... 2127
Rania Chakroun, Mondher Frikha
National School of Engineering of Sfax, Tunisia

FrM-3: IIoT X (IIoT Symposium)

Session Chair: Xiaoyin Zhao, China Telecom Research Institute, China

Analysis of Online and Offline Blended Teaching Design of Strategic Management Courses under the Background of Information Technology 2132
Zhe Wang, Libin Xie
Fuzhou University of International Studies and Trade, China

Curriculum Design of "Intermediate Financial Accounting" based on BOPPPS Teaching Mode under the Background of "Internet+" 2136
Libin Xie, Zhe Wang
Fuzhou University of International Studies and Trade, China

How Artificial Intelligence Changes the Relationship Between Man and Nature 2140
Huaiqin Mu, Zhen Zhang
Xijing University, China

Challenges and Solutions of Big Data Sharing 2144
Zhen Zhang, Huaiqin Mu
Xijing University, China

Using Spatial-temporal Structure to Predict Human Activities from RGB-D Video 2149
Shunan Liu, Liu Yang, Xiaoli Wang
Changchun University of Science and Technology, China

Analysis on the Development Status of ICV 2153
Liu Yang, Shunan Liu
Changchun SCI-TECH University, China

FrM-4: 5G and Beyond Networks and Services (Wireless Nets Symposium)

Session Chair: Shuai Han, Harbin Institute of Technology, China

Joint Beamforming Design Combined with Reconfigurable Intelligent Surface Selection 2157
Jinming Wang¹, Sai Xu², Shuai Han¹, Xinwu Chen¹, Weixiao Meng¹
¹Harbin Institute of Technology, China, ²Northwestern Polytechnical University, China

Mobility Prediction for Aerial Base Stations for a Coverage Extension in 5G Networks 2163
Elhadja Chaalal¹, Laurent Reynaud¹, Sidi Mohammed Senouci²
¹Orange Labs Network, France, ²University Bourgogne Franche-Comté, France

Attributed Network Embedding via Edge Information Enhancing for Wireless Communication Network	2169
Xiang Li, Donghai Guan, Weiwei Yuan Nanjing University of Aeronautics and Astronautics, China	
A Vehicular Communication Routing Algorithm based on Graph Theory	2176
Chenguang He, Guanqiao Qu, Shouming Wei Harbin Institute of Technology, China	
Performance Analysis of 5G Waveforms over Fading Environments	2182
Amina Darghouthi ¹ , Abdelhakim Khlifi ² , Belgacem Chibani ¹ ¹ University of Gabes, Tunisia, ² University of Carthage, Tunisia	
SLNR-Based Precoding for Multi-User Communications Assisted with Reconfigurable Surfaces	2188
Zina Mohamed, Caiyun Chen, Sonia Aissa University of Quebec, Canada	
Analysis of Outage Probability for Millimeter Wave Communications	2194
Ruoyu Su ¹ , Xiaolin Pang ² , Zijun Gong ² , Cheng Li ² , Xueheng Tao ² , Fan Jiang ³ ¹ Nanjing University of Posts and Telecommunications, China, ² Memorial University of Newfoundland, Canada, ³ Chalmers University of Technology, Sweden	
A New Factor Affecting the Performance of Wireless Networks: Port Scan	2199
Tao Gao, Fenghua Li, Zhiquan Wang, Quan Yuan, Shuanghong Yu Tsinghua University, China	