

2018 28th International Telecommunication Networks and Applications Conference (ITNAC 2018)

**Sydney, Australia
21-23 November 2018**



**IEEE Catalog Number: CFP1818D-POD
ISBN: 978-1-5386-7178-8**

**Copyright © 2018 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:	CFP1818D-POD
ISBN (Print-On-Demand):	978-1-5386-7178-8
ISBN (Online):	978-1-5386-7177-1
ISSN:	2474-1531

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

2018 28th International Telecommunication Networks and Applications Conference (ITNAC)

Session 1: Energy efficiency

<i>New Framework for analysis Of Energy Efficiency in massive MIMO With Hardware Impairments</i> Talha Younas (COMSATS University Islamabad, Sahiwal Campus, Pakistan)	1
<i>Energy-Aware Adaptive Trickle Timer Algorithm for RPL-based Routing in the Internet of Things</i> Arslan Musaddiq (Yeungnam University, Korea), Yousaf Bin Zikria (Yeungnam University, Korea), Sung Won Kim (Yeungnam University, Korea)	4
<i>Enabling Energy Efficient Data Ferrying</i> Robert Huniet (DST Group, Australia), Hong Jun Yu (University of Adelaide, Australia), Cheng-Chew Lim (University of Adelaide, Australia)	10
<i>Performance Analysis of Energy Harvesting based Two-way Multi-Relay Wireless Network</i> Supreet Singh (Baba Banda Singh Bahadur Engineering College, Fatehgarh Sahib Punjab India, India)	16

Session 3: IoT

<i>Comparison of pathfinding algorithms for visually impaired people in IoT based smart buildings</i> Payal Tusharkumar Mahida (Western Sydney University, Australia), Seyed Shahrestani (Western Sydney University, Australia), Hon Cheung (Western Sydney University, Australia)	22
<i>Prediction of Personalised Life Expectancy using Personal Health Devices in mHealth Networks</i> James Kang (Melbourne Polytechnic, Australia)	25
<i>Collaborative Neighbor Discovery with Slow Scan for Directional Sensor Networks</i> Nipun Sood (BITS Pilani KK Birla Goa Campus, India), Shamanth Naqaraju (BITS PILANI K. K. BIRLA GOA CAMPUS, India), Sreejith V (BITS-Pilani, KK Birla Goa Campus, India), Lucy Gudino (BITS Pilani, India)	30
<i>Dynamic Vehicular Traffic Load Quantification by Considering Intermittent Unused Road Space</i> Gerald Ostermayer (FH Upper Austria, Austria, Austria), Christian Backfrieder (FH Upper Austria, Austria, Austria), Manuel Lindorfer (FH Upper Austria, Austria)	33

Session 2: SDN

<i>Towards SDN Fault Tolerance using Petri-Nets</i> Wael Hosny Fouad Aly (University of Quebec in Montreal, Canada)	41
<i>Towards an Active Probing Extension for the ONOS SDN Controller</i> Christopher Metter (University of Würzburg, Germany), Valentin Burqer (University of Wuerzburg, Germany), Hu Zheng (Huawei, P.R. China), Ke Pei (Huawei, P.R. China), Florian Wamser (University of Wuerzburg, Germany)	44
<i>A Multi-agent Controller to enable Cognition in Software Defined Networks</i> Vijaya Durqa Chemalamarri (University of Technology Sydney, Australia), Robin Michael Braun (University of Technology, Sydney, Australia), Mehran Abolhasan (University of Technology Sydney, Australia), Justin Lipman (University of Technology, Sydney (UTS), Australia)	52

Session 4: IoT

<i>A Deep Learning Approach for Intrusion Detection in Internet of Things using Bi-Directional Long Short-Term Memory Recurrent Neural Network</i> Bipraneel Roy (Western Sydney University, Australia), Hon Cheung (Western Sydney University, Australia)	57
<i>Implementation and Performance Analysis of Power and Cost-Reduced OPC UA Gateway for Industrial IoT Platforms</i> Han Jun Cho (Sungkyunkwan University, Korea), Jongpil Jeong (Sungkyunkwan University, Korea)	63
<i>Comparative study of classification techniques for indoor localization of mobile devices</i> Hifsa Iram (National University of Computer and Emerging Sciences, Pakistan), Kamran Zia (National University of Sciences and Technology, Pakistan), Muhammad Aziz Ul haq (COMSATS University Islamabad, Pakistan), Aasim Zia (Comsats Institute of Information and Technology, Pakistan)	66

Session 5: IoT + SDN

<i>On the Error Rate Analysis of Distributed Transmit Beamforming</i> Ishtiaq Ahmad (University of South Australia, Australia), Gottfried Lechner (University of South Australia, Australia), Ismail Shakeel (Defence Science and Technology Group, Department of Defence, Australia)	71
<i>Four Single-Sideband M-QAM Modulation using Soft Input Soft Output Equalizer over OFDM</i> Mohammed Alhasani (Waseda University, Japan), Quang Nqoc Nquyen (Waseda University, Japan), Gen-Ichiro Ohta (Yokosuka Telecom Research Park, Japan), Takuro Sato (Waseda University, Japan)	75
<i>Multi-domain Software Defined Network Provisioning</i> Franciscus Xaverius Ari Wibowo (RMIT University, Australia), Mark A. Gregory (RMIT University, Australia)	81

Session 6: Security

<i>Blockchain-Based Implementation for Financial Product Management</i> Bihuan Chen (GF Securities, P.R. China), Zhixiong Tan (South China University of Technology, P.R. China), Wei Fang (GF Securities, P.R. China)	88
<i>Power Allocation and Outage Analysis for Cognitive Radio with Jamming Signal under Primary Secrecy Outage Constraint</i> Dae-Kyo Jeong (Hanyang University, Korea), Dongwoo Kim (Hanyang University, Korea)	91
<i>Security network policy enforcement through a SDN framework</i> Andrea Melis (University of Bologna, Italy), Davide Berardi (Università di Bologna, Italy), Franco Callegati (Università di Bologna, Italy), Marco Prandini (University of Bologna, Italy)	97

Session 8: MANET and VANET

<i>Evaluating the Performance of QoS Algorithms in Realistic MANETs</i> Ameer Arsalan (The University of Adelaide, Australia), Hung Xuan Nguyen (University of Adelaide, Australia), Andrew Coyle (University of Adelaide, Australia)	101
<i>PEGADyn: A Cluster-Based Energy Efficient Routing Protocol for Ad Hoc Networks</i> David Osemeojie Airehrour (Auckland University of Technology, New Zealand), Emmanuel Ndashimye (Auckland University of Technology, New Zealand), Vinojitha Raqhaven (Nelson Marlborough Institute of Technology, New Zealand), Abdullahi Baffa Bichi (Bayero University Kano, Nigeria)	107
<i>A Scalable and Efficient PKI Based Authentication Protocol for VANETs</i> Miraj Asqhar (Deakin University, Australia), Robin Doss (Deakin University, Australia), Lei Pan (Deakin University, Australia)	113
<i>Context-Aware Mobile Edge Computing in Vehicular Ad-Hoc Networks</i> Zachary W Lamb (University of Cincinnati, USA), Dharma P Agrawal (University of Cincinnati, USA)	116

Session 7: Transmission

<i>Analysis of the effects of multiple reflection paths on high speed VLC system performance</i> Muhammad Towfiqur Rahman (Monash University Malaysia, Malaysia), Masduzzaman Bakaul (Senior Lecturer, Malaysia)	123
<i>Outage Capacity Analysis for Ambient Backscatter Communication Systems</i> Siwen Xing (University of Sydney, Australia), Zihuai Lin (University of Sydney, Australia), Ming Ding (Data 61, Australia)	129
<i>A Study on Fiber-Optic Relaying Scheme using Spatial Modulation for MIMO transmissions</i> Ikuya Kitamura (Osaka Institute of Technology, Japan), Hong Zhou (Osaka Institute of Technology, Japan), Kazuo Kumamoto (Osaka Institute of Technology, Japan), FengPing Yan (Beijing Jiaotong University, P.R. China)	135
<i>Optimization of LED Layout to Improve Uniformity of Illumination and SNR for Indoor Visible Light Communication</i> Quanrun Chen (Chinese Academy of Sciences, P.R. China), Tao Zhang (Chinese Academy of Sciences, P.R. China), Weibo Zheng (Chinese Academy of Sciences, P.R. China)	139

Session 10: Wireless

<i>Channel-based Rate Selection for Commodity RFID Networks</i> Jiajia Guo (University of Science and Technology of China, P.R. China), Caidong Gu (Suzhou Vocational University, P.R. China), Si Chen (Simon Fraser University, Canada), Hongwei Du (University of Science and Technology of China, P.R. China), Xiaoxiao Wang (University of Science and Technology of China, P.R. China), Jihong Yu (Beijing Institute of Technology/ Simon Fraser University, P.R. China), Wei Gong (University of Science and Technology of China, P.R. China)	142
<i>An Enhanced K-means Clustering Algorithm with Non-Orthogonal Multiple Access (NOMA) for MMC Networks</i> Emerson Cabrera (Macquarie University, Australia), Rein Vesilo (Macquarie University, Australia)	148
<i>Analysis of Interference Mitigation in Heterogeneous Cellular Networks using Soft Frequency Reuse and Load Balancing</i> Muhammad Sajid Haroon (GIK Institute of Engineering Sciences and Technology, Pakistan), Ziaul Haq Abbas (GIK Institute of Engineering Sciences and Technology, Pakistan), Ghulam Abbas (GIK Institute of Engineering Sciences & Technology, Pakistan), Fazal Muhammad (City University of Science and Information Technology, Peshawar, Pakistan)	156
<i>Energy-Detection performance for SIMO Cognitive Radio Systems with Selection Combining over κ-μ Shadowed Fading Channels</i> Mohammed Aloqlah (Dubai Women's College, UAE, Jordan), Reem Alzubaidi (Yarmouk University, Jordan)	162

Session 9: IoT

<i>RF Energy Harvesting and Information Transmission in IoT Relay Systems based on Time Switching and NOMA</i> Ashish Rauniyar (University of Oslo, Norway), Paal E. Engestad (Oslo and Akershus University College, University of Oslo/UNIK and FFI, Norway), Olav Norvald Østerbø (Telenor Corporate Development, Norway)	168
<i>Multiple Intermittent Controllers for IoT Home Automation</i> Tyler Steane (RMIT University, Australia), Pj Radcliffe (RMIT University, Australia)	175
<i>CamThings: IoT Camera with Energy-Efficient Communication by Edge Computing based on Deep Learning</i> Jaebong Lim (Pusan National University, Korea), Juhee Seo (Pusan National University, Korea), Yunju Baek (Pusan National University, Korea)	181
<i>S-MANAGE Protocol For Software-Defined IoT</i> Chau Nguyen (University of Technology, Sydney, Australia), Doan B Hoang (University of Technology Sydney, Australia)	187
<i>Situational and Adaptive Context-Aware Routing for Opportunistic IoT Networks</i> Jaime Galán-Jiménez (University of Extremadura, Spain), Javier Berrocal Olmeda (University of Extremadura, Spain), José García-Alonso (University of Extremadura, Spain), Carlos Canal (University of Málaga, Spain), Juan Manuel Murillo Rodriguez (University of Extremadura, Spain)	193

Session 11: Wireless

<i>Radio-Frequency Emitter Localisation Using a Swarm of Search Agents</i> Bradley R Fraser (Defence Science and Technology Group & The University of Adelaide, Australia)	199
<i>Wi-Fi Based Device-free Microwave Ghost Imaging Indoor Surveillance System</i> Ruichen Luo (University of Sydney, Australia), Ziqian Zhang (the University of Sydney, Australia), Xiaopeng Wang (University of Sydney, Australia), Zihuai Lin (University of Sydney, Australia)	205
<i>A Reinforcement Learning Based User Association Algorithm for UAV Networks</i> Qinazhi Li (University of Sydney, Australia), Ming Ding (Data 61, Australia), Chuan Ma (University of Sydney, Australia), Chang Liu (University of Sydney, Australia), Zihuai Lin (University of Sydney, Australia), Ying-Chang Liang (University of Electronic Science and Technology of China, P.R. China)	211
<i>NC-MapCast: Network Coding based Multi-Attribute Profile-Cast in Mobile Opportunistic Networks</i> Di Zhang (Beijing University of Posts and Telecommunications, P.R. China), Huadong Ma (Beijing University of Posts and Telecommunications, P.R. China), Dong Zhao (Beijing University of Posts and Telecommunications, P.R. China), Lei Kuang (Beijing University of Posts and Telecommunications, P.R. China)	217

Session 13: General

<i>Joint Design of Relay-User Selection in Direct-link Energy Harvesting Relay Networks</i> Chenchen Liu (CETC, P.R. China), Jinq Zhao (CETC, P.R. China), Jiayi Zhou (CETC, P.R. China), Zhengyu Zhang (CETC, P.R. China), Weilong Ren (CETC38 China Electronic Technology Group Corporation, P.R. China)	223
---	-----

<i>Bit Rate and Task Scheduling in Cloud Computing for Multimedia Big Data</i> Chae Y. Lee (KAIST, Korea), Byeongok Choi (KAIST, Korea)	227
<i>Comparison of learning techniques for prediction of customer churn in telecommunication</i> Sarbjeeet Singh (Panjab University, Chandigarh, India), Manpreet Singh (UIET, Panjab University, Chandigarh, India), Nadesh Seen (UIET, Panjab University, Chandigarh, India), Sakshi Kaushal (Panjab University, India), Harish Kumar (Panjab University, India)	232
<i>Performance Analysis of Polling Mechanism in WBAN</i> Khalid Hasan (Griffith University, Australia), Khandakar E Ahmed (Victoria University, Australia), Kamanashis Biswas (Griffith University, Australia)	237

Session 12: Wireless

<i>Context-Aware and Energy-Efficient Protocol for the Distributed Wireless Sensor Networks</i> Da-Ren Chen (National Taichung University of Science and Technology, Taiwan), Ming-Yang Hsu (National Taichung University of Science and Technology, Taichung, Taiwan)	241
<i>Detection of Primary User Emulation Attack in Sensor Networks</i> Md Rana (University of Engineering and Technology, Bangladesh), Mazed Rayhan Shuvo (ECE, Bangladesh)	247
<i>Beam Detection Analysis for 5G mmWave Initial Acquisition</i> Mahbuba Ullah (University of Texas, USA)	253
<i>Proximity Coordinated Random Access (PCRA) for M2M Applications in LTE-A</i> Jason Brown (University of Southern Queensland, Australia), Jamil Y Khan (The University of Newcastle, Australia)	261

Session 16: Quality and Performance

<i>Cloud Applications Consolidation through Context Information and Heuristic Optimization</i> Alessandro Carrega (CNIT, Italy), Matteo Repetto (CNIT, Italy)	264
<i>Towards information modeling for a QoS-aware support in the lifecycle of virtual networks</i> Gladys Diaz (University of Paris 13 & L2TI, Institut Galilee, France), Michelle Sibilla (University of Toulouse 3 - Paul Sabatier & Institut de Recherche en Informatique de Toulouse, France), Noémie Simoni (Telecom-Paristech, France)	272
<i>Are Internet Tunnels Worthwhile?</i> Habiba Akter (Queen Mary University of London, United Kingdom (Great Britain)), Chris Phillips (Queen Mary University of London, United Kingdom (Great Britain))	278
<i>Sleep-based Resource Allocation Algorithm for Inter-Femto Interference Mitigation</i> Weilong Ren (CETC38 China Electronic Technology Group Corporation, P.R. China), Letian Li (University of Science and Technology of China, P.R. China), Chenchen Liu (CETC, P.R. China), Yao Yanjun (University of Science and Technology of China, P.R. China), Shuo Wang (No. 38 Research Institute China Electronics Technology Group Corporation, P.R. China)	284
<i>Performance Comparison of WhatsApp versus Skype on Smart Phones</i> Nayankumar Patel (Griffith University, Australia), Swapnil Patel (Griffith University, Australia), Wee Lum Tan (Griffith University, Australia)	290

Session 15: Security

<i>LSTM for Anomaly-Based Network Intrusion Detection</i> Kaushik Roy (North Carolina A&T State University, USA), Sara Althubiti (North Carolina A&T State University, USA)	293
<i>Blockchain in IoT Security: A survey</i> Fahad Alkurdi (University of Canberra, Australia), Ibrahim Elqendi (Canberra University, Australia), Kumudu S Munasinghe (University of Canberra, Australia), Dharmendra Sharma (University of Canberra, Australia), Abbas Jamalipour (University of Sydney, Australia)	296
<i>Feature-Selection based PMU Placement for Detection of Faults in Power Grids</i> Rana Alhalaseh (RWTH Aachen University, Germany), Halil Alper Tokel (RWTH Aachen University, Germany), Subhodeep Chakraborty (RWTH Aachen University, Germany), Gholamreza Alirezaei (RWTH Aachen University, Germany), Rudolf Mathar (RWTH Aachen University, Germany)	300
<i>Security threat probability computation using Markov Chain and Common Vulnerability Scoring System</i> Ngoc LE (University of Technology Sydney, Australia), Doan B Hoang (University of Technology Sydney, Australia)	306

Session 14: Transport

Towards an Unified Multi-service Ethernet Transport Network(ETN)

Qichang Chen (Huawei Technologies Corp., P.R. China), Rixin Li (Huawei Technologies Co., LTD, P.R. China),
Hongbiao Zhanq (Huawei Technologies Corp., P.R. China), Shuai Xiao (Huawei Technologies Corp., P.R. China),
Qiwen Zhong (Huawei Technologies, P.R. China), Desheng Sun (Huawei Technologies Corp., P.R. China), Lehong
Niu (Huawei Technologies Corp., P.R. China), Li Ding (Huawei Technologies Corp., P.R. China), Sen Zhang (Huawei,
P.R. China) 318

HIDTN: Hybrid DTN and Infrastructure Networks for Reliable and Efficient Data Dissemination

Yasser Mawad (Universität zu Lübeck, Germany), Stefan Fischer (University of Lübeck, Germany) 324

Virtualized oneM2M System Architecture in Smartfactory Environments

Chanqyong Um (Sungkyunkwan University, Korea), Jaehyeong Lee (Sungkyunkwan University, Korea), Jongpil
Jeong (Sungkyunkwan University, Korea) 332

Integrating Routing Schemes and Platform Autonomy Algorithms for UAV Ad-hoc & Infrastructure based networks

Oqbonnaya Anicho (Liverpool Hope University, United Kingdom (Great Britain)), Philip B Charlesworth (Liverpool
Hope University, United Kingdom (Great Britain)), Gurvinder Baicher (Liverpool Hope University, United Kingdom
(Great Britain)), Atulya K Nagar (Liverpool Hope University, United Kingdom (Great Britain)) 338

Iterative Decision-Directed Receiver for the Mitigation of Side-Effect Modulation in indoor VLC applications

Mohammed Mansoor Ahmed Mohammed (Monash University, Australia), Cuiwei He (Monash University, Australia),
Jean Armstrong (Monash University, Australia) 343

Keynote

Advances in microwave photonic signal processing for 5G and IoT

Robert Minasian (University of Sydney, Australia) 349

Session 17: Traffic Management

On Emptying Small Satellite Networks with In-Network Data Aggregation

Luyao Wang (Beijing University of Technology, P.R. China), Kwan-Wu Chin (University of Wollongong, Australia) 353

Data Ferry Flocking for Bulk Information Transfer Under Ferry Buffer Constraints

Bradley R Fraser (Defence Science and Technology Group & The University of Adelaide, Australia) 361

Redundancy Management for Safety-Critical Applications with Time Sensitive Networking

Maryam Pahlevan (University of Siegen, Germany), Roman Obermaisser (University of Siegen, Germany) 367

Session 19: Security

Performance Evaluation of Machine Learning Algorithms in Apache Spark for Intrusion Detection

Kaushik Roy (North Carolina A&T State University, USA) 374

A Hierarchical Intrusion Detection System using Support Vector Machine for SDN Network in Cloud Data Center

Kashinath Basu (Oxford Brookes University, United Kingdom (Great Britain)), Muhammad Younas (Oxford Brookes
University, United Kingdom (Great Britain)) 380

Experiments and Proofs in Web-service Security

Dawood Sallem Hussian Sheniar (University of Southern Queensland & Thi-Qar University, Australia), Ron Addie
(University of Southern Queensland, Australia), Shahab Abdulla (University of Southern Queensland, Australia),
Nabeel Hadaad (Southern Queensland, Australia), David Martin (University of Southern Queensland, Australia) 386

Session 18: Video and Virtual Reality

<i>Coefficient of Throughput Variation as Indication of Playback Freezes in Streamed Omnidirectional Videos</i> Viktor Kelkkanen (Blekinge Institute of Technology, Sweden), Markus Fiedler (Blekinge Institute of Technology, Sweden)	392
<i>Enabling Efficient and High Quality Zooming for Online Video Streaming using Edge Computing</i> Ayub Bokani (Central Queensland University, Australia), Jahan Hassan (Central Queensland University, Australia), Salil S Kanhere (UNSW Sydney, Australia)	398
<i>A Test-bed for Studies of Temporal Data Delivery Issues in a TPCAST Wireless Virtual Reality Set-up</i> Viktor Kelkkanen (Blekinge Institute of Technology, Sweden), Markus Fiedler (Blekinge Institute of Technology, Sweden)	404

Session 22: SDN and General

<i>Enhancing Quality of Experience of VoIP Traffic in SDN based End-hosts</i> Anees Al-Najjar (University of Queensland, Australia), Siamak Layeghy (The University of Queensland, Australia), Marius Portmann (University of Queensland, Australia), Jadwiga Indulska (The University of Queensland, Australia)	407
<i>Towards a viable business model for collaborative use of unlicensed frequency bands in densely populated areas</i> Frank den Hartog (University of New South Wales & DoVes Research, Australia), Koen Dittich (Erasmus University Rotterdam, The Netherlands), Jan de Nijs (TNO, The Netherlands)	415
<i>Clustering-based Handover and Resource Allocation Schemes for Cognitive Radio Heterogeneous Networks</i> Mahyar Shirvanimoghaddam (University of Sydney, Australia), Shahriar Shirvani Moghaddam (Shahid Rajaei Teacher Training University (SRTTU), Iran), Ameneh Habibzadeh (Shahid Rajaei Teacher Training University, Tehran, Iran)	421
<i>Comparison of Two Sharing Modes for a Proposed Optical Enterprise-Access SDN Architecture</i> Xiaoyu Wang (University of Virginia, USA), Xiao Lin (Fuzhou University, P. R. China, P.R. China), Weiqiang Sun (Shanghai Jiaotong University, P.R. China), Malathi Veeraraghavan (University of Virginia, USA)	427

Session 21: General

<i>Joint Mode Selection and Resource Allocation for Relay-Assisted Device-to-Device Networks</i> Narayat Putjaika (King Mongkut's University of Technology Thonburi, Thailand), Phond Phunchongharn (King Mongkut's University of Technology Thonburi, Thailand), Khajonpong Akkarajitsakul (King Mongkut's University of Technology Thonburi, Thailand), Unchalisa Taetragool (King Mongkut's University of Technology Thonburi, Thailand)	435
<i>Towards Prediction of Power Consumption of Virtual Machines for Varying Loads</i> Humaira Abdul Salam (University of Genoa, Italy & TUHH, Germany), Franco R. Davoli (University of Genoa & National Inter-University Consortium for Telecommunications (CNIT), Italy), Alessandro Carrega (CNIT, Italy), Andreas Timm-Giel (Hamburg University of Technology, Germany)	441
<i>R2Lab Testbed Evaluation for Wireless Mesh Network Experiments</i> Farzaneh Pakzad (The University of Queensland, Australia), Marius Portmann (University of Queensland, Australia), Thierry Turetli (INRIA & Université Côte d'Azur, France), Thierry Parmentelat (Inria, France), Mohamed Naoufal Mahfoudi (Université Cote d'Azur Inria Sophia Antipolis, France), Walid Dabbous (INRIA, France)	447
<i>Experimental Evaluation of LoRaWAN in ns-3</i> Furqan Hameed Khan (The University of Queensland, Australia), Marius Portmann (University of Queensland, Australia)	453

Session 20: Wireless

<i>Rescue Mission Enhancement through Ambulance-to-Vehicle Communications</i> Chakkaphong Suthaputchakun (Bangkok University, Thailand), Yue Cao (Northumbria University, United Kingdom (Great Britain))	461
<i>A New Result on Rearrangeable 3-Stage Clos Networks</i> Satoru Ohta (Toyama Prefectural University, Japan)	467
<i>An Integrated mHealth and Vehicular Sensor Based Alarm System</i> James Kang (Melbourne Polytechnic, Australia), Sitalakshmi Venkatraman (Melbourne Polytechnic, Australia)	473

Cloud Enabled Solution for Privacy Concerns in Internet of Medical Things

Nazmus Shaker Nafi (VIT, Australia), R. Rathnayake (Sabaraqauwa University of Sri Lanka, Australia), Sajeewani Maddumage (Victoria Institute of Technology, Australia), Mark A. Gregory (RMIT University, Australia) 479