2018 International Conference on Advanced Technologies for **Communications (ATC 2018)**

Ho Chi Minh City, Vietnam 18-20 October 2018



IEEE Catalog Number: CFP18ATC-POD **ISBN:**

978-1-5386-6543-5

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:	
ISBN (Print-On-Demand):	
ISBN (Online):	
ISSN:	

CFP18ATC-POD 978-1-5386-6543-5 978-1-5386-6542-8 2162-1020

Additional Copies of This Publication Are Available From:

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



Table of Contents

Mes	sage from the ATC'18 General and TPC Chairs xiii
Exe	cutive Committeexv
Tec	nnical Program Committeexvi
Add	itional Reviewersxxx
Key	note Abstractxxxi
Co	mmunications: 1
	• A Low Inter-Code Interference Walsh-Hadamard Code Division Multiplexing for Helicopter Satellite Communications
	Toshiharu Kojima (The University of Electro-Communications, Japan), Genta Muto (The University of Electro- Communications, Japan) 1
	• Simple UE Transmission Power Control for Bidirectional Full-Duplex Communications in Cellular Networks
	Hiroto Yamamoto (Mie University, Japan), Sunisa Sanpan (Mie University, Japan), Kazuo Mori (Mie University, Japan), Kosuke Sanada (Mie University, Japan) 5
	• Non-Orthogonal Multiple Access with Coordinated Transmission Aided by Buffers in End User and Relay
	Yunsung Choi (Hanyang University, Korea), Dongwoo Kim (Hanyang University, Korea) 10
	Precoded Dual-Polarized Spatial Modulation Over Correlated Fading Channels
	Mutlu Koca (Bogazici University, Turkey), Negin Kazemipourleilabadi (Bogazici University, Turkey), Hikmet
	Sari (NJUPT & Sequans, France) 15
	 Amplified Backscattering in RFID Communications with Energy Harvesting Tags
	Denizhan Unalan (Bogazici University, Turkey), Mutlu Koca (Bogazici University, Turkey), Hakan Deliç
	(Bogazici University, Turkey) 21
Sig	nal Processing: 1
	• Connversion of the Vietnammese Grammar into Sign Language Structure using the Example-Based Machine Translation Algorithm
	Luyl-Da Quach (Tay Do University, Vietnam), Chi-Ngon Nguyen (Can Tho University & Dean of the College of
	Engineering, Vietnam) 27
	• forest height estimation from PolInSAR image using coherence set and cancellation of scattering mechanisms
	Ky Dinh (Le Qui Don Technical University, Vietnam), Pham Nghia (Le Qui Don Technical University, Vietnam),
	An Hung (Le Qui Don Technical University, Vietnam), Hang Minh (Le Qui Don Technical University, Vietnam) 32
	• Modified Three-stage algorithm for forest height estimation using Polarimetric SAR Interferometry Image
	Minh Xuan (Le Qui Don Technical University, Vietnam), Pham Nghia (Le Qui Don Technical University,
	Vietnam), Yen Hoang Thi (Le Quy Don Technical University, Vietnam), Thanh Nguyen (Le Qui Don Technical
	· · · · · · · · · · · · · · · · · · ·

• Deep Learning for Human Visual Attention Recognition Using Transfer Learning

Nam Vu (Posts and Telecommunications Institute of Technology, Vietnam), Cuong Pham (Post & Telecom. Institute of Technology, Vietnam), Huong M. Nguyen (Posts and Telecommunications Institute of Technology, Vietnam) 42

	Dang Ninh Tran (Blekinge Institute of Technology, Sweden), Hans-Juergen Zepernick (Blekinge Institute of	
	Technology, Sweden), Thi My Chinh Chu (Blekinge Institute of Technology, Sweden)	
ten	na and Propagation	
• A E	esign of Circularly Polarized Array Antenna for X-Band CubeSat Satellite Communication	
	Nguyen Khac Kiem (Hanoi University of Science and Technology, Vietnam), Phong Nguyen Duy (Hanoi	••••
	University of Science and Technology, Vietnam), Le Hoang (Soongsil University, Korea), Tuan Anh Le Tron	g
	(Hanoi University of Science and Technology, Vietnam), Linh Ho Manh (Hanoi University of Science and	
	Technology, Vietnam), Bui Thi Thu Hien (HUI, Vietnam), Chien Ngoc Dao (Hanoi University of Science and	l
	Technology, Vietnam)	
• Imp	roved Forward Backward Method with Multiple Correction Vectors for Layered Random Rough Surfaces of	
	Exponential Correlation Functions	
	Vinh Pham (Ho Chi Minh city University of Technology, Vietnam & Technische Universitat Darmstadt,	
	Germany), Dung Trinh (Ho Chi Minh City University of Technology, Vietnam), Tuan Do-Hong (Ho Chi Min	ıh
	City University of Technology, Vietnam), Conor Brennan (Dublin City University, Ireland)	
• Cor	npact Diversity Multi-band Antennas Using for Low Power Communication Standards	
	Le Huy Trinh (University of Information and Technology & Vietnam National University, Vietnam),	
	Minh Hoang Le (Ho Chi Minh University of Technology, Vietnam), Nguyen Vu Truong	
	(Institute of Applied Mechanics and Informatics, Vietnam), Fabien Ferrero	
	(University Nice Sophia Antipolis, CNRS, LEAT & CREMANT, France)	
• Des	ign of Miniaturized and Tunable Antenna by Integrating BST Thin Film Varactor	
	Hung Viet Nguyen (Post and Telecommunications Institute of Technology & IETR, Université de Rennes 1,	
	Vietnam), Ala Sharaiha (Université de Rennes 1 & IETR, France)	
• Fol	led Patch Antenna on Paper for RF Energy Harvesting and Sensing Applications	
	Erika Vandelle (Universite Grenoble Alpes, France), Do Hanh Ngan Bui (Université de Grenoble-Alpes, Fran	С
	Gustavo Ardila-Rodriguez (Université Grenoble Alpes, France), Simon Hemour (Université de Bordeaux,	
	France), Ke Wu (Ecole Polytechnique (University of Montreal) & Center for Radiofrequency Electronics Res	ea
	of Quebec, Canada), Tan Phu Vuong (Grenoble INP, France)	
mm	unications: 2	
• Des	ign of automatic irrigation system for greenhouse based on LoRa technology	
	Van Anh Vu (Hanoi University of Science and Technology, Vietnam), Tuan Christian Truvant (University of	

• FPGA Implementation of Wireless LAN System for Factory Automation

Tran Thi Thao Nguyen (Kyushu Institute of Technology, Japan), Yuhei Nagao (Kyushu Institute of Technology, Japan), Tatsumi Uwai (Kyushu Institute of Technology, Japan), Nana Sutisna (Kyushu Institute of Technology, Japan), Masayuki Kurosaki (Kyushu Institute of Technology, Japan), Hiroshi Ochi (Kyushu Institute of Technology, Japan), Sai Baiko (Daiichi Institute of Technology, Japan, Japan) 78

Cergy Pontoise, Vietnam), Thanh Dang Bui (Hanoi University of Science and Technology, Vietnam), Dong Cong Trinh (Hanoi University of Science and Technology, Vietnam)

72

Performance Evaluation of 802.11ah Physical Layer Phase Encryption for IoT Applications	
Dai-Long Hoang (Nara Institute of Science and Technology, Japan), Thi Hong Tran (Nara Institute of Scie	nce and
Technology (NAIST), Japan), Yasuhiko Nakashima (Nara Institute of Science and Technology, Japan)	84
• An Accurate Time Diversity Combining with a Novel Channel Estimation for Helicopter Satellite Communication	ns
Daijiro Sato (The University of Electro-Communications, Japan), Toshiharu Kojima (The University of Electro-Communications, Japan), Toshiharu	ectro-
Communications, Japan)	89
Parallel Group Detection Approach for Massive MIMO systems	
Thanh-Binh Nguyen (Le Quy Don Technical University, Vietnam), Minh-Tuan Le (MobiFone R&D Cente	er,
MobiFone Corporation, Vietnam), Vu-Duc Ngo (Hanoi University of Science and Technology, Vietnam),	
Van-Giao Nguyen (Le Quy Don Technical University, Vietnam)	94
Signal Processing: 2	
Modulation Recognition using Wavelet-assisted Convolutional Neural Network	
Qianwen Zhang (Beijing Information Science and Technology University, P.R. China), Zhan Xu (Beijing	
Information Science and Technology University, P.R. China), Peiyue Zhang (Beijing Information Science	and
Technology University, P.R. China)	100
• Fixed-Point Implementation of Convolutional Neural Networks for Image Classification	
Chun Yan Lo (Hong Kong Polytechnic University, Hong Kong), Francis C.M. Lau (The Hong Kong Polyt	echnic
University, Hong Kong), Chiu Wing Sham (The University of Auckland, New Zealand)	105
Gender Identification of Imperfect Flowers Using Image Classification	
Rohan de Silva (CQUniversity Sydney, Australia), Pavithra Senanayake	
(Ayoma Business Solutions, Sri Lanka)	110
• A novel blind STO estimation for UW-GFDM systems	
Siva Prasad (National Institute of Technology Warangal & National Institute of Technology Warangal, Inc	lia),
Mani V V (National Institute of Technology Warangal, India)	115
Artificial Intelligence Based Adaptive GOP Size Selection for Effective Wyner-Ziv Video Coding	
Huu-Tien Vu (Post and Telecommunications Institute of Technology, Vietnam), Thao Nguyen Thi Huong	(Posts
and Telecommunications Institute of Technology, Vietnam), Huy Phi (Posts and Telecommunications Insti	itute of
Technology, Vietnam), Xiem HoangVan (Vietnam National University & University of Engineering and	
Technology, Vietnam)	120
Microwave Engineering	
Wideband Unit-cell for Linearly Polarized X-band Transmitarray Applications	
Tuyen Nguyen (Ho Chi Minh City International University, Vietnam), Nguyen Binh Duong (International	
University, Vietnam), Van-Su Tran (International University, HCMC VNU, Vietnam), Linh Mai (Internati	onal
University of Viet Nam, Vietnam), Le Huy Trinh (University of Information and Technology & Vietnam	
National University, Vietnam)	125
Design of An Independently Biased Cascode GaN HEMT Microwave Power Amplifier	
Luong Duy Manh (Le Quy Don Technical University, Vietnam), Nguyen Huy Hoang (Le Quy Don Techni	cal
University, Vietnam), Ta Chi Hieu (Le Quy Don Technical University, Vietnam), Duong Bach Gia (VNU	
University of Engineering and Technology, Vietnam)	129

Reflectometer with Complete Error Correction	
Khoa Huynh (Frankfurt University of Applied Sciences, Germany), Gernot Zimmer (Frankfurt University	' of
Applied Sciences, Germany)	133
• Application of RSSI to ground penetrating radar using ultra wideband technology	
Nguyen Huyen (Le Quy Don Technical University, Vietnam), Pham Thanh Hiep (Le Quy Don Technical	
University, Vietnam)	137
	157
An array of antipodal Vivaldi antenna with genetic optimization	
Vinh Phuong Cam (International University, VNU HCMC, Vietnam), Van-Su Tran (International University)	sity,
HCMC VNU, Vietnam), Nguyen Binh Duong (International University, Vietnam)	142
nmunications: 3	
Probabilistic Communication in Car Platoons	
Tam Ninh (National Academy of Education Management, Vietnam), Hung Tran (Malardalen University,	Sweden),
Nils Henning Müllner (Mälardalen University, Sweden)	146
Outage Analysis in Wireless-Powered CCRN Networks with Ambient Backscattering	
Charles Kabiri (University of Rwanda, Rwanda), Emmanuel Ntirenganya (University of Rwanda, Rwanda	a) 152
• Performance Analysis of Hybrid Energy Harvesting AF Relaying Networks over Nakagami-m Fading Channels	
Hung Ha Duy (Faculty of Electrical and Electronics Engineering, Ton Duc Thang University, HCMC, Vie	etnam,
Vietnam), Dac-Binh Ha (Duy Tan University, Vietnam), Jaroslav Zdralek (VSB – Technical University of	f
Ostrava, Czech Republic), Miroslav Voznak (VSB - Technical University of Ostrava, Czech Republic)	157
Energy Efficient Full-Duplex Multicell Multi-User MIMO Networks	
Nguyen Xinh (Ho Chi Minh University of Technology, VNU-HCM, Vietnam, Vietnam), Ha H Kha (Ho C	Chi Minh
City University of Technology, VNU-HCM, Vietnam)	163
• Demonstration of effect of oversampling on jitter removal for Multitaper GFDM system using SDR	
Siva Prasad (National Institute of Technology Warangal & National Institute of Technology Warangal, In-	dia).
Mani V V (National Institute of Technology Warangal, India)	168
nal Processing: 3	
High Throughput and Low Cost Memory Architecture for Full Search Integer Motion Estimation in HEVC	174
Nguyen Thang (HUST, Vietnam), Dinh Vu (KAIST, Vietnam)	174
K-SVD Dictionary Learning Applied in Clinical EEG Compressed Sensing	
Phuong Thi Dao (Auckland University of Technology, New Zealand), Xue Jun Li (Auckland University o	of
Technology, New Zealand), Anthony Griffin (Auckland University of Technology, New Zealand), Hung I	Ngoc Do
(International University, Vietnam)	179
 Iris-based Recognition using Modified Convolutional Neural Network 	
Thuong Le-Tien (Hochiminh city University of Technology, Vietnam), Phan Xuan Hanh (HCMUT, Vietn	
Nguyen-Duy (Ho Chi Minh City University of Technology, Vietnam), Le Ba Loc (HCMUT, Vietnam)	184
An Improved Blind Watermarking Technique Against JPEG Compression Attack	
Ngo Tuan Phong (HANU, Vietnam), Hung Quang Ta (Hanoi University & Faculty of Information Techno	ology,
Vietnam)	189

Performance Improvement of IM-DD Optical OFDM System Using A-law Companding Transform Ngo-Thi-Thu- Trang (Posts and Telecommunications Institute of Technology, Vietnam), Trung Hieu Bui (Posts and Telecommunications Institute of Technology, Vietnam), Nhan Nguyen (Posts and Telecommunications Institute of Technology, Vietnam) 203 Hardware Implementation of A Non-RLL Soft-decoding Beacon-based Visible Light Communication Receiver Duc-Phuc Nguyen (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan), Thi Hong Tran (Nara Institute of Science and Technology (NAIST), Japan), Huu-Thuan Huynh (Ho Chi Minh City - University of Science, Vietnam), Yasuhiko Nakashima (Nara Institute of Science and Technology, Japan) 208 Demonstration of A Visible Light Receiver Using Rolling-Shutter Smartphone Camera Tuan-Kiet Tran (University of Science - Ho Chi Minh City, Vietnam), Duc-Phuc Nguyen (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan), Thi Hong Tran (Nara Institute of Science and Technology (NAIST), Japan), Huu-Thuan Huynk (Ho Chi Minh City - University of Science - Ho Chi Minh City, Vietnam), Duc-Phuc Nguyen (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan), Thi Hong Tran (Nara Institute of Science and Technology (NAIST), Japan), Huu-Thuan Huynh (Ho Chi Minh City - University of Science, Vietnam), Yasuhiko Nakashima (Nara Institute of Science and Technology, Japan) 214 Development of a QoS Provisioning Capable Cost-Effective SDN-based Switch for IoT Communication Quang Huy Nguyen (Posts and Telecommunications Institute of Technology, Vietnam), Ngoc Ha Do (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of
• Dualband-wavelength demultiplexer based on the nanoplasmonic MIM waveguides Tai Nguyen Van (HUST, Vietnam), Do Tuan (Ha Noi University of Science and Technology, Vietnam), Hung Nguyen Tan (Danang Uni. of Science & Technology, Vietnam), Cao Dung Truong (Posts and Telecommunications Institute of Technology & Faculty of Electronics Engineering, Vietnam), Bac Hoai Dang (PTIT, Vietnam) 198 • Performance Improvement of IM-DD Optical OFDM System Using A-law Companding Transform Ngo-Thi-Thu- Trang (Posts and Telecommunications Institute of Technology, Vietnam), Trung Hieu Bui (Posts and Telecommunications Institute of Technology, Vietnam) 202 • Hardware Implementation of A Non-RLL Soft-decoding Beacon-based Visible Light Communication Receiver Duc-Phuc Nguyen (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan), Thi Hong Tran (Nara Institute of Science and Technology (NAIST), Japan), Huu-Thuan Huynh (Ho Chi Minh City - University of Science, Vietnam), Yasuhiko Nakashima (Nara Institute of Science and Technology, Japan) 203 • Demonstration of A Visible Light Receiver Using Rolling-Shutter Smartphone Camera Tuan-Kiet Tran (University of Science - Ho Chi Minh City, Vietnam), Duc-Phuc Nguyen (Nara Institute of Science and Technology, Japan), Thi Hong Tran (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan), Thi Hong Tran (Nara Institute of Science and Technology, Japan), Thi Hong Tran (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science
Tai Nguyen Van (HUST, Vietnam), Do Tuan (Ha Noi University of Science and Technology, Vietnam), Hung Nguyen Tan (Danang Uni. of Science & Technology, Vietnam), Cao Dung Truong (Posts and Telecommunications Institute of Technology & Faculty of Electronics Engineering, Vietnam), Bac Hoai Dang (PTIT, Vietnam) 198 • Performance Improvement of IM-DD Optical OFDM System Using A-law Companding Transform Ngo-Thi-Thu- Trang (Posts and Telecommunications Institute of Technology, Vietnam), Trung Hieu Bui (Posts and Telecommunications Institute of Technology, Vietnam), Nhan Nguyen (Posts and Telecommunications Institute of Technology, Vietnam) 203 • Hardware Implementation of A Non-RLL Soft-decoding Beacon-based Visible Light Communication Receiver Duc-Phuc Nguyen (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan), Thi Hong Tran (Nara Institute of Science and Technology (NAIST), Japan), Huu-Thuan Huynh (Ho Chi Minh City - University of Science, Vietnam), Yasuhiko Nakashima (Nara Institute of Science and Technology, Japan) 208 • Demonstration of A Visible Light Receiver Using Rolling-Shutter Smartphone Camera Tuan-Kiet Tran (University of Science - Ho Chi Minh City, Vietnam), Duc-Phuc Nguyen (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan), Thi Hong Tran (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan), 208 • Demonstration of A Visible Light Receiver Using Rolling-Shutte
Nguyen Tan (Danang Uni. of Science & Technology, Vietnam), Cao Dung Truong (Posts and Telecommunications Institute of Technology & Faculty of Electronics Engineering, Vietnam), Bac Hoai Dang (PTIT, Vietnam) 198 • Performance Improvement of IM-DD Optical OFDM System Using A-law Companding Transform Ngo-Thi-Thu- Trang (Posts and Telecommunications Institute of Technology, Vietnam), Trung Hieu Bui (Posts and Telecommunications Institute of Technology, Vietnam), Nhan Nguyen (Posts and Telecommunications Institute of Technology, Vietnam) 203 • Hardware Implementation of A Non-RLL Soft-decoding Beacon-based Visible Light Communication Receiver 203 • Hardware Implementation of A Non-RLL Soft-decoding Beacon-based Visible Light Communication Receiver 203 • Hardware Implementation of A Non-RLL Soft-decoding Beacon-based Visible Light Communication Receiver 203 • Lenhology, Japan), Thi Hong Tran (Nara Institute of Science and Technology (NAIST), Japan), Huu-Thuan Huynh (Ho Chi Minh City - University of Science, Vietnam), Yasuhiko Nakashima (Nara Institute of Science and Technology, Japan) 208 • Demonstration of A Visible Light Receiver Using Rolling-Shutter Smartphone Camera 7uan-Kiet Tran (University of Science - Ho Chi Minh City, Vietnam), Huo-Thuan Huynh (Ho Chi Minh City - University of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan), Thi Hong Tran (Nara Institute of Science and Technology (NAIST), Japan), Huu-Thuan Huynh (Ho Chi Minh City - University of Science, Vietnam), Yasuhiko Nakashima (Nara Institute of Science and Technology, Japan) 214 • Development of a QoS Pr
Telecommunications Institute of Technology & Faculty of Electronics Engineering, Vietnam), Bac Hoai Dang (PTIT, Vietnam) 198 • Performance Improvement of IM-DD Optical OFDM System Using A-law Companding Transform 198 • Performance Improvement of IM-DD Optical OFDM System Using A-law Companding Transform 198 • Ngo-Thi-Thu- Trang (Posts and Telecommunications Institute of Technology, Vietnam), Trung Hieu Bui (Posts and Telecommunications Institute of Technology, Vietnam), Nhan Nguyen (Posts and Telecommunications Institute of Technology, Vietnam) 203 • Hardware Implementation of A Non-RLL Soft-decoding Beacon-based Visible Light Communication Receiver Duc-Phuc Nguyen (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan), Thi Hong Tran (Nara Institute of Science and Technology (NAIST), Japan), Huu-Thuan Huynh (Ho Chi Minh City - University of Science, Vietnam), Yasuhiko Nakashima (Nara Institute of Science and Technology, Japan) 208 • Demonstration of A Visible Light Receiver Using Rolling-Shutter Smartphone Camera 208 • Demonstration of A Visible Light Receiver Using Rolling-Shutter Size and Technology, Japan), Thi Hong Tran (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan), Thi Hong Tran (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan), Thi Hong Tran (Nara Institute of Science and Technology (NAIST), Japan), Huu-Thuan Huynh (Ho Chi Minh City - University of Science - Ho Chi Minh City, Vietnam), Huo-Thuan Huynh (Ho Chi Minh City -
(PTIT, Vietnam) 198 • Performance Improvement of IM-DD Optical OFDM System Using A-law Companding Transform Ngo-Thi-Thu- Trang (Posts and Telecommunications Institute of Technology, Vietnam), Trung Hieu Bui (Posts and Telecommunications Institute of Technology, Vietnam), Nhan Nguyen (Posts and Telecommunications Institute of Technology, Vietnam) 203 • Hardware Implementation of A Non-RLL Soft-decoding Beacon-based Visible Light Communication Receiver 203 • Hardware Implementation of A Non-RLL Soft-decoding Beacon-based Visible Light Communication Receiver 203 • Duc-Phuc Nguyen (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan), Thi Hong Tran (Nara Institute of Science and Technology (NAIST), Japan), Huu-Thuan Huynh (Ho Chi Minh City - University of Science, Vietnam), Yasuhiko Nakashima (Nara Institute of Science and Technology, Japan) 208 • Demonstration of A Visible Light Receiver Using Rolling-Shutter Smartphone Camera Tuan-Kiet Tran (University of Science - Ho Chi Minh City, Vietnam), Duc-Phuc Nguyen (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan) 214 • Development of a QoS Provisioning Capable Cost-Effective SDN-based Switch for IoT Communication 214 • Development of a QoS Provisioning Capable Cost-Effective SDN-based Switch for IoT Communications Institute of Technology, Vietnam), Ngoc Ha Do (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology,
Performance Improvement of IM-DD Optical OFDM System Using A-law Companding Transform Ngo-Thi-Thu- Trang (Posts and Telecommunications Institute of Technology, Vietnam), Trung Hieu Bui (Posts and Telecommunications Institute of Technology, Vietnam), Nhan Nguyen (Posts and Telecommunications Institute of Technology, Vietnam) 203 Hardware Implementation of A Non-RLL Soft-decoding Beacon-based Visible Light Communication Receiver Duc-Phuc Nguyen (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan), Thi Hong Tran (Nara Institute of Science and Technology (NAIST), Japan), Huu-Thuan Huynh (Ho Chi Minh City - University of Science, Vietnam), Yasuhiko Nakashima (Nara Institute of Science and Technology, Japan) 208 Demonstration of A Visible Light Receiver Using Rolling-Shutter Smartphone Camera Tuan-Kiet Tran (University of Science - Ho Chi Minh City, Vietnam), Duc-Phuc Nguyen (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan), Thi Hong Tran (Nara Institute of Science and Technology, Iapan), Thi Hong Tran (Nara Institute of Science and Technology, Iapan), 214 Development of a QoS Provisioning Capable Cost-Effective SDN-based Switch for IoT Communication Quang Huy Nguyen (Posts and Telecommunications Institute of Technology, Vietnam), Ngoc Ha Do (Posts and Telecommunications Institute of Technology, Vietnam), Ngoc Ha Do (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of
Ngo-Thi-Thu- Trang (Posts and Telecommunications Institute of Technology, Vietnam), Trung Hieu Bui (Posts and Telecommunications Institute of Technology, Vietnam), Nhan Nguyen (Posts and Telecommunications Institute of Technology, Vietnam) 203 • Hardware Implementation of A Non-RLL Soft-decoding Beacon-based Visible Light Communication Receiver 203 • Hardware Implementation of A Non-RLL Soft-decoding Beacon-based Visible Light Communication Receiver 203 • Hardware Implementation of A Non-RLL Soft-decoding Beacon-based Visible Light Communication Receiver 203 • Duc-Phuc Nguyen (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan), Thi Hong Tran (Nara Institute of Science and Technology (NAIST), Japan), Huu-Thuan Huynh (Ho Chi Minh City - University of Science, Vietnam), Yasuhiko Nakashima (Nara Institute of Science and Technology, Japan) 208 • Demonstration of A Visible Light Receiver Using Rolling-Shutter Smartphone Camera 208 • Demonstration of A Visible Light Receiver Using Rolling-Shutter Smartphone Camera 208 • Demonstration of A Visible Light Receiver Using Rolling-Shutter Smartphone Camera 208 • Demonstration of Science and Technology (NAIST), Japan), Huu-Thuan Huynh (Ho Chi Minh City - University of Science - Ho Chi Minh City, Vietnam), Duc-Phuc Nguyen (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan) 214 • Development of a QoS Provisioning Capable Cost-Effective SDN-based Switch for IoT Communication 208
and Telecommunications Institute of Technology, Vietnam), Nhan Nguyen (Posts and Telecommunications Institute of Technology, Vietnam) 203 • Hardware Implementation of A Non-RLL Soft-decoding Beacon-based Visible Light Communication Receiver Duc-Phuc Nguyen (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan), Thi Hong Tran (Nara Institute of Science and Technology (NAIST), Japan), Huu-Thuan Huynh (Ho Chi Minh City - University of Science, Vietnam), Yasuhiko Nakashima (Nara Institute of Science and Technology, Japan) 208 • Demonstration of A Visible Light Receiver Using Rolling-Shutter Smartphone Camera Tuan-Kiet Tran (University of Science - Ho Chi Minh City, Vietnam), Duc-Phuc Nguyen (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan), Thi Hong Tran (Nara Institute of Science and Technology (NAIST), Japan), Huu-Thuan Huynh (Ho Chi Minh City - University of Science, Vietnam), Yasuhiko Nakashima (Nara Institute of Science and Technology, Japan) 214 • Development of a QoS Provisioning Capable Cost-Effective SDN-based Switch for IoT Communication Quang Huy Nguyen (Posts and Telecommunications Institute of Technology, Vietnam), Ngoc Ha Do (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of
Institute of Technology, Vietnam) 203 • Hardware Implementation of A Non-RLL Soft-decoding Beacon-based Visible Light Communication Receiver Duc-Phuc Nguyen (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan), Thi Hong Tran (Nara Institute of Science and Technology (NAIST), Japan), Huu-Thuan Huynh (Ho Chi Minh City - University of Science, Vietnam), Yasuhiko Nakashima (Nara Institute of Science and Technology, Japan) 208 • Demonstration of A Visible Light Receiver Using Rolling-Shutter Smartphone Camera 208 • Demonstration of A Visible Light Receiver Using Rolling-Shutter Smartphone Camera 208 • Demonstration of A Visible Light Receiver Using Rolling-Shutter Smartphone Camera 208 • Demonstration of A Visible Light Receiver Using Rolling-Shutter Smartphone Camera 208 • Demonstration of A Visible Light Receiver Using Rolling-Shutter Smartphone Camera 208 • Demonstration of A Visible Light Receiver Using Rolling-Shutter Smartphone Camera 208 • Development of Science and Technology (NAIST), Japan), Huu-Thuan Huynh (Ho Chi Minh City - University of Science, Vietnam), Yasuhiko Nakashima (Nara Institute of Science and Technology, Japan) 214 • Development of a QoS Provisioning Capable Cost-Effective SDN-based Switch for IoT Communication 208 • Development of a QoS Provisioning Capable Cost-Effective SDN-based Switch for IoT Communication 214 • Development of a QoS Provisioning Capable
Hardware Implementation of A Non-RLL Soft-decoding Beacon-based Visible Light Communication Receiver Duc-Phuc Nguyen (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan), Thi Hong Tran (Nara Institute of Science and Technology (NAIST), Japan), Huu-Thuan Huynh (Ho Chi Minh City - University of Science, Vietnam), Yasuhiko Nakashima (Nara Institute of Science and <u>Technology, Japan)</u> 208 Oemonstration of A Visible Light Receiver Using Rolling-Shutter Smartphone Camera Tuan-Kiet Tran (University of Science - Ho Chi Minh City, Vietnam), Duc-Phuc Nguyen (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan), Thi Hong Tran (Nara Institute of Science and Technology (NAIST), Japan), Huu-Thuan Huynh (Ho Chi Minh City - University of Science, Vietnam), Yasuhiko Nakashima (Nara Institute of Science and Technology, Japan) 214 Oevelopment of a QoS Provisioning Capable Cost-Effective SDN-based Switch for IoT Communication Quang Huy Nguyen (Posts and Telecommunications Institute of Technology, Vietnam), Ngoc Ha Do (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of
Duc-Phuc Nguyen (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan), Thi Hong Tran (Nara Institute of Science and Technology (NAIST), Japan), Huu-Thuan Huynh (Ho Chi Minh City - University of Science, Vietnam), Yasuhiko Nakashima (Nara Institute of Science and Technology, Japan) • Demonstration of A Visible Light Receiver Using Rolling-Shutter Smartphone Camera Tuan-Kiet Tran (University of Science - Ho Chi Minh City, Vietnam), Duc-Phuc Nguyen (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan), Thi Hong Tran (Nara Institute of Science and Technology (NAIST), Japan), Huu-Thuan Huynh (Ho Chi Minh City - University of Science, Vietnam), Yasuhiko Nakashima (Nara Institute of Science and Technology, Japan) • Development of a QoS Provisioning Capable Cost-Effective SDN-based Switch for IoT Communication Quang Huy Nguyen (Posts and Telecommunications Institute of Technology, Vietnam), Ngoc Ha Do (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecom
Duc-Phuc Nguyen (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan), Thi Hong Tran (Nara Institute of Science and Technology (NAIST), Japan), Huu-Thuan Huynh (Ho Chi Minh City - University of Science, Vietnam), Yasuhiko Nakashima (Nara Institute of Science and Technology, Japan) • Demonstration of A Visible Light Receiver Using Rolling-Shutter Smartphone Camera Tuan-Kiet Tran (University of Science - Ho Chi Minh City, Vietnam), Duc-Phuc Nguyen (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan), Thi Hong Tran (Nara Institute of Science and Technology (NAIST), Japan), Huu-Thuan Huynh (Ho Chi Minh City - University of Science, Vietnam), Yasuhiko Nakashima (Nara Institute of Science and Technology, Japan) • Development of a QoS Provisioning Capable Cost-Effective SDN-based Switch for IoT Communication Quang Huy Nguyen (Posts and Telecommunications Institute of Technology, Vietnam), Ngoc Ha Do (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecom
 and Technology, Japan), Thi Hong Tran (Nara Institute of Science and Technology (NAIST), Japan), Huu-Thuan Huynh (Ho Chi Minh City - University of Science, Vietnam), Yasuhiko Nakashima (Nara Institute of Science and Technology, Japan) Demonstration of A Visible Light Receiver Using Rolling-Shutter Smartphone Camera Tuan-Kiet Tran (University of Science - Ho Chi Minh City, Vietnam), Duc-Phuc Nguyen (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan), Thi Hong Tran (Nara Institute of Science and Technology (NAIST), Japan), Huu-Thuan Huynh (Ho Chi Minh City - University of Science, Vietnam), Yasuhiko Nakashima (Nara Institute of Science and Technology, Japan) Development of a QoS Provisioning Capable Cost-Effective SDN-based Switch for IoT Communication Quang Huy Nguyen (Posts and Telecommunications Institute of Technology, Vietnam), Ngoc Ha Do (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam),
Technology, Japan) 208 • Demonstration of A Visible Light Receiver Using Rolling-Shutter Smartphone Camera Tuan-Kiet Tran (University of Science - Ho Chi Minh City, Vietnam), Duc-Phuc Nguyen (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan), Thi Hong Tran (Nara Institute of Science and Technology (NAIST), Japan), Huu-Thuan Huynh (Ho Chi Minh City - University of Science, Vietnam), Yasuhiko Nakashima (Nara Institute of Science and Technology, Japan) 214 • Development of a QoS Provisioning Capable Cost-Effective SDN-based Switch for IoT Communication Quang Huy Nguyen (Posts and Telecommunications Institute of Technology, Vietnam), Ngoc Ha Do (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommu
Technology, Japan) 208 • Demonstration of A Visible Light Receiver Using Rolling-Shutter Smartphone Camera Tuan-Kiet Tran (University of Science - Ho Chi Minh City, Vietnam), Duc-Phuc Nguyen (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan), Thi Hong Tran (Nara Institute of Science and Technology (NAIST), Japan), Huu-Thuan Huynh (Ho Chi Minh City - University of Science, Vietnam), Yasuhiko Nakashima (Nara Institute of Science and Technology, Japan) 214 • Development of a QoS Provisioning Capable Cost-Effective SDN-based Switch for IoT Communication Quang Huy Nguyen (Posts and Telecommunications Institute of Technology, Vietnam), Ngoc Ha Do (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommu
 Tuan-Kiet Tran (University of Science - Ho Chi Minh City, Vietnam), Duc-Phuc Nguyen (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan), Thi Hong Tran (Nara Institute of Science and Technology (NAIST), Japan), Huu-Thuan Huynh (Ho Chi Minh City - University of Science, Vietnam), Yasuhiko Nakashima (Nara Institute of Science and Technology, Japan) 214 Development of a QoS Provisioning Capable Cost-Effective SDN-based Switch for IoT Communication Quang Huy Nguyen (Posts and Telecommunications Institute of Technology, Vietnam), Ngoc Ha Do (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications I
 Tuan-Kiet Tran (University of Science - Ho Chi Minh City, Vietnam), Duc-Phuc Nguyen (Nara Institute of Science and Technology, Japan), Dinh-Dung Le (Nara Institute of Science and Technology, Japan), Thi Hong Tran (Nara Institute of Science and Technology (NAIST), Japan), Huu-Thuan Huynh (Ho Chi Minh City - University of Science, Vietnam), Yasuhiko Nakashima (Nara Institute of Science and Technology, Japan) 214 Development of a QoS Provisioning Capable Cost-Effective SDN-based Switch for IoT Communication Quang Huy Nguyen (Posts and Telecommunications Institute of Technology, Vietnam), Ngoc Ha Do (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications I
 (Nara Institute of Science and Technology (NAIST), Japan), Huu-Thuan Huynh (Ho Chi Minh City - University of Science, Vietnam), Yasuhiko Nakashima (Nara Institute of Science and Technology, Japan) 214 Development of a QoS Provisioning Capable Cost-Effective SDN-based Switch for IoT Communication Quang Huy Nguyen (Posts and Telecommunications Institute of Technology, Vietnam), Ngoc Ha Do (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology)
Science, Vietnam), Yasuhiko Nakashima (Nara Institute of Science and Technology, Japan) 214 • Development of a QoS Provisioning Capable Cost-Effective SDN-based Switch for IoT Communication Quang Huy Nguyen (Posts and Telecommunications Institute of Technology, Vietnam), Ngoc Ha Do (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of Technolo
 Development of a QoS Provisioning Capable Cost-Effective SDN-based Switch for IoT Communication Quang Huy Nguyen (Posts and Telecommunications Institute of Technology, Vietnam), Ngoc Ha Do (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of
Quang Huy Nguyen (Posts and Telecommunications Institute of Technology, Vietnam), Ngoc Ha Do (Posts and Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of
Telecommunications Institute of Technology, Vietnam), Hai Chau Le (Posts and Telecommunications Institute of
Technology Vietnem)
Technology, Vietnam) 220
etworks: 1
• PRP: A High-Performance Routing Protocol for Mobile Ad-Hoc Networks
Vu Khanh Quy (Hung Yen University of Technology and Education, Vietnam), Nguyen Dinh Han (Hung Yen
University of Technology and Education, Vietnam), Nguyen Tien Ban (Posts and Telecommunications Institute of
Technology, Vietnam) 226
A Scheduler for Time Slotted Channel Hopping Networks supporting QoS Differentiated Services
Kieu-Ha Phung (Hanoi University of Science and Technology, Vietnam), Huong Thu Truong (Hanoi University
of Science and Technology, Vietnam), Kris Steenhaut (Vrije Universiteit Brussel & Imec, Belgium), Dung Dao
(Hanoi University of Science and Technology, Vietnam), Tuong Vu (Ha Noi University of Science and
Technology, Vietnam), Pham Van Tien (HUST, Vietnam), Thang Nguyen (Hanoi University of Science and
Technology, Vietnam) 232
 A High Performance and Longer Lasting Network Lifetime Routing Protocol for MANETs

ix

 Vu Khanh Quy (Hung Yen University of Technology and Education, Vietnam), Nguyen Tien Ban (Posts and

 Telecommunications Institute of Technology, Vietnam), Nguyen Dinh Han (Hung Yen University of Technology

 and Education, Vietnam)
 237

• A Comparative Performance Study of RPL with Different Topologies and MAC Protocols	
Minh-Thanh Vo (International University, Vietnam), Linh Mai (International University of	f Viet Nam, Vietnam).
Huy Tran (VNU-International University, Vietnam)	242
Next Hop Node Selection in Private UAV Networks	
Rohan de Silva (CQUniversity Sydney, Australia)	248
cial Session #1	
• Secure performance evaluation of the cognitive wireless network using Harvest-to-Jam Protocol Co-channel Interference	with
Pham Minh Quang (Posts and Telecommunications Institute of Technology in Hochiminh	City, Vietnam), Tran
Trung Duy (Posts and Telecommunications Institute of Technology, Vietnam), Thien Thar	•
City University of Transport, Vietnam)	253
• Security versus Reliability Study for Multi-hop Cognitive M2M Networks With Joint Impact of Ir and Hardware Noises	nterference Constraint
Nam Pham (Ho Chi Minh City University of Technology and Education & Industrial Univ	ersity of Ho Chi Minh
City, Vietnam), Ca V. Phan (Ho Chi Minh City University of Technology and Education, V	2
Tuan (University of Ulsan, Korea), Tran Trung Duy (Posts and Telecommunications Instit	
Vietnam), Vo Nguyen Quoc Bao (Posts and Telecommunications Institute of Technology,	
 Performance Analysis of Energy Harvesting Two-Way Decode-and-Forward Relay Networks wit Nakagami-\$m\$ Fading Channels 	h Power Beacon over
Nguyen Anh Tuan (RFD, Vietnam), Vo Nguyen Quoc Bao (Posts and Telecommunication	s Institute of
Technology, Vietnam), Kien Truong (Posts & Telecommunications Institute of Technolog	y, Vietnam) 265
• Internal Reciprocity Calibration for TDD Massive MIMO: An Algorithm and Experimental Resu	lts
Quy Van Dang (Viettel Network Technologies Center, Vietnam), Le Thanh Bang (Viettel,	Vietnam), Kien Truong
(Posts & Telecommunications Institute of Technology, Vietnam)	270
Transmit Antenna Selection by Group Combination Precoding In Massive MIMO System	
Van-Khoi Dinh (Le Quy Don Technical University, Vietnam), Minh-Tuan Le (MobiFone I	R&D Center, MobiFone
Corporation, Vietnam), Vu-Duc Ngo (Hanoi University of Science and Technology, Vietna	am), Ta Chi Hieu (Le
Quy Don Technical University, Vietnam)	276
ctronics: 1	
• The Merged Clock Gating Architecture For Low Power Digital Clock Application On FPGA	
Huan Minh Vo (Ho Chi Minh University of Technology and Education, Vietnam)	282
Optimized Layer Architecture for Layered LDPC Code Decoder	
Longyu Ma (The University of Auckland, New Zealand), Chiu Wing Sham	

Low-complexity Check Node Processing for Trellis Min-max Nonbinary LDPC Decoding

 Huyen Pham Thi (National Laboratory of Information Security, Vietnam & Inha University, Korea), Hung Dao

 Tuan (National Laboratory of Information Security, Ha Noi, Viet Nam, Vietnam), Le Dinh Trang Dang (Le Quy

 Don Technical University, Vietnam), Hanho Lee (Inha University, Korea), Tho Nguyen Huu (Le Quy Don

 Technical University, Vietnam)

 292

Calibration of Conductivity Sensor using Combined Algorithm Selection and Hyperparameter Optimization: A Case Study	
Tien-Dung Nguyen (International University VNU HCMC, Vietnam), Sang Thi Thanh Nguyen (International	
University, VNU-HCMC, Vietnam), Nhat-Tan Le (International University VNU HCMC, Vietnam)	296

An Energy Efficient AES Encryption Core for Hardware Security Implementation in IoT Systems
 Dao Hiep (Le Quy Don Technical University, Vietnam), Van-Phuc Hoang (Le Quy Don Technical University, Vietnam), Van-Lan Dao (Le Quy Don Technical University, Vietnam), Xuan-Tu Tran (VNU University of Technology and Engineering, Vietnam)

301

337

Networks: 2

Zhang Hao Goh (National University of Singapore, Singapore), Hichang Cho (National University of	f Singapore,
Singapore), Pengxiang Li (National University of Singapore, Singapore)	305
Optimal Desired Trajectories of UAVs in Private UAV Networks	
Rohan de Silva (CQUniversity Sydney, Australia), Sandaruvan Rajasinghage (CQUniversity, Austra	lia) 310
• A Survey of Webpage Access Prediction	
Da Thon Nguyen (University of Economics and Law, VNU-HCM, Vietnam), Hanh Tan (PTIT, Vietn	nam), Duy
Hoang Pham (PTIT, Vietnam)	315
Dynamic Threading to Improve Embedded Software Performance in IoT Devices Using MQTT Protocol	
Pham Van Huong (Academy of Cryptography Techniques, Vietnam), Phuc Bui Huu (VNU Universit	ty of
Engineering and Technology, Vietnam), Pham Van Quang (Academy of Cryptography Techniques, V	Vietnam),
Nguyen Quang Linh (Academy of Cryptography Techniques, Vietnam)	321
An auto-scaling VM game approach for multi-tier application with Particle swarm optimization algorithm in	n Cloud
computing	
Khiet Bui (Ho Chi Minh City University of Technology & Thu Dau Mot University, Vietnam), Mai	Lam (Posts
and Telecoms Institute of Technology Ho Chi Minh City, Vietnam), Nguyen Khac Chien (The Peopl	e's Police
University, Vietnam), Ho Hung (Thu Dau Mot University, Vietnam), Pham Tran Vu (Ho Chi Minh C	City
University of Technology, Vietnam), Cong Hung Tran (Posts and Telecoms Institute of Technology,	Vietnam) 326
Issuing and Verifying Digital Certificates with Blockchain	
Trong-Thua Huynh (Posts and Telecommunications Institute of Technology, Vietnam)	
Trung Tru Huynh (Posts & Telecommunications Institute of Technology, Vietnam), Dang Khoa Pha	m (Posts
& Telecommunications Institute of Technology, Vietnam), Anh Khoa Ngo (Seoul National Universit	v. Korea) 332

Special Session #1

• On Performance Evaluation of Non-Orthogonal Multiple Access schemes in Coordinated Direct with Partial Relay Selection

Huynh Hoa (Posts and Telecommunications Institute of Technology, Vietnam), X. Quynh Nguyen (The State Council for Science and Technology Policy of Vietnam, Vietnam), Vo Nguyen Quoc Bao (Posts and Telecommunications Institute of Technology, Vietnam)

• Evaluation of Outage Probability and Harvested Energy for User Selection Methods in Random Wireless Networks	
Nguyen Thi Yen Linh (PTITHCM, Vietnam), Tran Trung Duy (Posts and Telecommunications Institute	
of Technology, Vietnam), Vo Nguyen Quoc Bao (Posts and Telecommunications Institute	
of Technology, Vietnam)	344
An Energy Efficiency Cluster-based Multi-hop Routing Protocol in Wireless Sensor Networks	
Thong Nhat Tran (Posts and Telecommunications Institute of Technology, Vietnam), Nguyen Toan Van (Hong	gik
University, Korea), Vo Nguyen Quoc Bao (Posts and Telecommunications Institute of Technology, Vietnam),	
Beongku An (Hongik University, Korea)	349
• Security-Reliability Analysis of Power Beacon-Assisted Multi-hop Relaying Networks Exploiting Fountain Codes w	ith
Hardware Imperfection	
Dang The Hung (Le Quy Don Technical University, Vietnam), Tran Trung Duy (Posts and Telecommunicatio	ns
Institute of Technology, Vietnam), Trinh Do Quoc (Military University of Science and Technology, Vietnam),	Vo
Nguyen Quoc Bao (Posts and Telecommunications Institute of Technology, Vietnam), Tan Hanh (Posts and	
Telecommunications Institute of Technology, Vietnam)	354
• Full-Duplex Relay System with Energy Harvesting: Outage and Symbol Error Probabilities	
Dung Le The (Chungbuk National University, Korea), Ba Cao Nguyen (Le Quy Don Technical University,	
Vietnam), Hoang Tran Manh (Faculty Telecommunication, Vietnam), Seong Gon Choi (Chungbuk National	
University, Korea)	360
Mixed-domain analog frontend circuit design for power-efficient multi-channel sensor systems Ippei Akita (Advanced Industrial Science and Technology (AIST), Japan), Takayuki Okazawa (Toyohashi	
University of Technology, Japan)	366
• Efficient Test Generation Framework for Analog LSI with Behavior Model	
Yuichi Miyazawa (Tokyo Denki University, Japan), Satoshi Komatsu (Tokyo Denki University, Japan)	372
Time-Domain Approach for Analog Circuits: Fine-Resolution TDC and Quick-Start CDR Circuits	
Tetsuya lizuka (University of Tokyo, Japan), Kunihiro Asada (University of Tokyo, Japan)	376
• How FD-SOI is revolutionizing next-gen microelectronics: IoT, automotive and mobile connectivity applications	
Bich-Yen Nguyen (SOITEC, USA), Walter Schwarzenbach (Soitec, France), Manuel Sellier (Soitec, France),	
Phillippe Flatrress (Soitec, France), Guillaume Besnard (Soitec, France), Christophe Girard (Soitec, France),	
Christophe Maleville (Soitec, France)	382
• ASIC Coprocessor for 254-bit Prime-Field Pairing based on General Purpose Arithmetic Unit on Quadratic Extension	L
Field	
Hiromitsu Awano (The University of Tokyo, Japan), Makoto Ikeda (University of Tokyo Japan, Japan)	387
Pulse Leakage Cancellation Technique for Integrated Microwave Wide-band Sensing Applications	
Nguyen Ngoc Mai-Khanh (The University of Tokyo & VLSI Design and Education Center (VDEC), Japan),	
Kunihiro Asada (University of Tokyo, Japan)	393