

# CONFERENCE PROGRAM

## Monday, December 16

**Monday, December 16 9:00 - 9:05 (Australia/Brisbane)**

### Conference Opening

Prof. Tadeusz Wysocki (Tad), University of Nebraska-Lincoln

**Monday, December 16 9:05 - 10:40 (Australia/Brisbane)**

### Wireless Communications

**Chair: Prof. Tadeusz Wysocki (Tad)**

9:05 *Hybrid AF-DF Relaying for NOMA UAV Systems*

Thi My Chinh Chu and Hans-Juergen Zepernick (Blekinge Institute of Technology, Sweden)

9:28 *Multiple UAV Deployment Optimization for Maximising Communication Coverage over Wide Areas*

Qiwei Yang and Iain B. Collings (Macquarie University, Australia); Stephen Hanly (School of Engineering, Macquarie University, Australia)

9:52 *Multibeam Tracking for Future Multi-User Communications Employing Generalized Joined Coupler Matrix*

Charles Guo (UNSW, Australia); Qingqing Cheng (Queensland of University Technology, Australia); Jinhong Yuan (University of New South Wales, Australia)

10:16 *Resource Scheduling in mm-Wave Communications*

Kimia Hamouleh Kheirollah Pour and Iain B. Collings (Macquarie University, Australia); Stephen Hanly (School of Engineering, Macquarie University, Australia)

**Monday, December 16 10:40 - 11:00 (Australia/Brisbane)**

### Coffee Break

**Monday, December 16 11:00 - 12:30 (Australia/Brisbane)**

### Network Security

**Chair: Dr. Konstantin Kapinchev**

11:00 *Securing AODV against Wormhole Attacks through ARP*

Shansong Huang and Raad Raad (University of Wollongong, Australia); Faisal EM Tubbal (University of Wollongong, Australia & The Libyan Center for Remote Sensing and Space Science, Libya); Nidhal Odeh, Sining Liu and Wajid Ali Khan (University of Wollongong, Australia)

11:22 *Ensemble Based Detection Model for DDoS Attacks in SDNs Using Advanced Feature Selection*

Abdussalam Alashhab Alashhab (Universiti Teknologi PETRONAS, Malaysia); Aisha Edrah (UWO, Canada); Mohd Soperi Mohd Zahid and Md Siddikur Rahman (Universiti Teknologi PETRONAS, Malaysia)

11:45 *An Algorithm for Enhancing Privacy-Utility Tradeoff in the Privacy Funnel and Other Lift-based Measures*

Mohammad Amin Zarrabian (ANU, Australia); Parastoo Sadeghi (University of New South Wales, Australia)

12:07 *Internet of Things Anomaly Detection Enhancement using GAN-based Data Augmentation*

Christopher Weng Leong Wong, Min Wang, Md. Farhad Hossain and Kumudu S Munasinghe (University of Canberra, Australia)

**Monday, December 16 12:30 - 13:30 (Australia/Brisbane)**

**Lunch**

**Monday, December 16 13:30 - 15:00 (Australia/Brisbane)**

**AI for Communications**

**Chair: Dr. Mojtaba Mahdavi**

13:30 *Multi Step Temporal Spectrum Occupancy Prediction Using Deep Learning*

Niranjana Radhakrishnan (Royal Melbourne Institute of Technology (RMIT), Australia); Sithamparanathan Kandeepan and Xinghuo Yu (RMIT University, Australia); Gianmarco Baldini (Joint Research Centre - European Commission, Italy)

13:48 *Automatic Radar Signal Detection and FFT Estimation using Deep Learning*

Akila Pemasiri (Queensland University of Technology, Australia); Fraser A Williams (Queensland University of Technology & Revolution Aerospace, Australia); Ethan Goan and Simon Denman (Queensland University of Technology, Australia); Terrence L Martin (Revolution Aerospace & Queensland University of Technology, Australia); Clinton Fookes (Queensland University of Technology, Australia); Zifeng Huang (Queensland University of Technology & Revolution Aerospace, Australia)

14:06 *Deep Learning-based Blind Estimation for the Number of Users in Multi-User DSSS Systems*

Yooncheol Choi, Dongyeong Kim and Dongweon Yoon (Hanyang University, Korea (South))

14:24 *Evaluation of Translation Layers for Deep-Learning Channel Modelling*

Simon M. Rosenzweig and Saeed Ur Rehman (Flinders University, Australia); Paulo E. Santos (Flinders University, Australia & PrioriAnalytica, Australia); Ismail Shakeel (Defence Science and Technology Group, Australia)

14:42 *Neural-Network-Assisted Multi-Dimensional Constellation Design for Downlink NOMA Systems*

Benjamin Ng, Chan-Tong Lam and K. L. Eddie Law (Macao Polytechnic University, Macao); Marilia Curado and Edmundo Monteiro (University of Coimbra, Portugal)

**Monday, December 16 15:00 - 15:30 (Australia/Brisbane)**

**Coffee Break**

**Monday, December 16 18:30 - 20:00 (Australia/Brisbane)**

**Cocktail Party**

## Tuesday, December 17

**Tuesday, December 17 9:00 - 9:50 (Australia/Brisbane)**

**Keynote Presentation:**

Processing in Memory for Wireless Signal Processing Chains: Principles, Selected Use Cases, and Challenges

*Dr. Mojtaba Mahdavi, Ericsson, Sweden*

**Tuesday, December 17 10:00 - 10:40 (Australia/Brisbane)**

**Antennas**

**Chair: Prof. Tadeusz Wysocki (Tad)**

10:00 *Experimental Validation of Multi-feed Resonant Cavity Antenna for mm-Wave Communication*

Khushboo Singh (University of Technology Sydney, Australia & Macquarie University, Australia); Ronald Mulinde (Defence Science and Technology Group, Australia); Manik Attygalle (DST Group Edinburgh, Australia); Dush Thalakituna and Karu Esselle (University of Technology Sydney, Australia)

10:20 *An X-band Reflectarray for Deep-Space CubeSat Transmission Utilizing Consumer-Grade Material*

Josiah M Adonis (University of Wollongong, Australia)

**Tuesday, December 17 10:40 - 11:00 (Australia/Brisbane)**

**Coffee Break**

**Tuesday, December 17 11:00 - 12:30 (Australia/Brisbane)**

**Communication Theory**

**Chair: TBA**

11:00 *Iterative Colored Noise Cancellation For Overloaded MIMO Systems With Precoding Based on Equal Gain Transform*

Satoshi Denno, Takumi Sugimoto and Yafei Hou (Okayama University, Japan)

11:18 *A Tensor-Array Approach To Direction-Of-Arrival And Cyclic Frequency Detection For Cyclostationary Signals*

Songsri Sirianunpiboon and Stephen D Howard (Defence Science and Technology Group, Australia); Douglas Cochran (Arizona State University, USA)

11:36 *RNTI Recovery Optimization Utilizing Modified Polar Decoding and Syndrome Matching*

Christopher J Richards, John C. McEachen and Murali Tummala (Naval Postgraduate School, USA)

11:54 *The Algebra Of Coherence And The Detection Of Almost Cyclostationary Processes*

Songsri Sirianunpiboon and Stephen D Howard (Defence Science and Technology Group, Australia); Douglas Cochran (Arizona State University, USA)

12:12 *Investigation on Variable Coding Rate and Code Length for Relaxed Polar Codes*

Nobuhiko Miki (Kagawa University, Japan); Tatsunori Obara (NTT DOCOMO, INC., Japan); Satoshi Nagata (NTT DoCoMo, Inc., Japan); Satoshi Suyama (NTT DOCOMO, INC., Japan)

**Tuesday, December 17 12:30 - 13:30 (Australia/Brisbane)**

**Lunch**

**Tuesday, December 17 13:30 - 15:00 (Australia/Brisbane)**

**Medical applications**

**Chair: TBA**

13:30 *Enhancing Neural Network Performance for Medical Data Analysis through Feature Engineering*

Nadieh Moghadam and Vahraz Honary (University of San Diego, USA); Soudeh Khoubrouy (California State University San Marcos, USA)

13:52 *AI-Based Primary Diagnosis of Ocular Health via Smartphone*

Houssam Hammoud, Mohammad Yaman Al Aref, Mayar Al Jabouli, Mohamad Hammoud, Wessam Shehieb and Kamran Arshad (Ajman University, United Arab Emirates)

14:15 *Automated Deep Learning Models for Medical Image Segmentation and Denoising*

Chilukamari Rajesh (VIT-AP University, India); Ravichandra Sadam (National Institute of Technology Warangal, India); Sushil Kumar (NIT Kurukshetra, India)

14:37 *Real Time Monitoring and Prediction of Electromagnetic Compatibility Over Internet of Medical Things Using Kalman Filter Algorithm*

Omar Gatera (University of Rwanda & UR-CST, Rwanda); Chiedza Hwata (University of Rwanda, Rwanda); Egas Armando (University of Rwanda & Eduardo Mondlane University, Rwanda); Kambombo Mtonga (University of Rwanda & African Center of Excellence in Internet of Things (ACEIoT), Rwanda); Twizere Celestin (University of Rwanda, Rwanda); Gerard Rushingabigwi (African Center of Excellence in IoT, University of Rwanda, Rwanda)

**Tuesday, December 17 15:00 - 15:30 (Australia/Brisbane)**

**Coffee Break**

**Tuesday, December 17 19:00 - 22:00 (Australia/Brisbane)**

**Banquet**

## Wednesday, December 18

**Wednesday, December 18 9:00 - 10:30 (Australia/Brisbane)**

**Signal processing for multimedia**

**Chair: TBA**

9:00 *A Low-Complexity and High-Quality Reconstruction Algorithm for Terahertz Single-Pixel Imaging*

Chieh-Li Wang and Yuan-Hao Huang (National Tsing-Hua University, Taiwan)

9:18 *Development and Deployment of a Distributed D2D System for Supporting Water Quality Monitoring*

Huan-Bang Li and Takeshi Matsumura (National Institute of Information and Communications Technology, Japan); Choe Peng Leo, Kok Hwa Yu and Kin Sam Yen (Universiti Sains Malaysia, Malaysia)

9:36 *Diffusion Denoising Watermark Removal Models to Attack Invisible Image Watermarks*

Hannes Mareen (Ghent University - Imec & IDLab, Belgium); Kobe De Meulenaere (Ghent University - Imec, Belgium); Peter Lambert (Ghent University - imec & IDLab, Belgium); Glenn Van Wallendael (Ghent University - Imec, Belgium)

9:54 *Implementation of Image and Video Upscaling Methods on Development Boards*

Thi My Chinh Chu (Blekinge Institute of Technology, Sweden); Yong Yao (DozeroTech AB, Sweden); Siamak Khatibi, Hans-Juergen Zepernick and Fatemeh Tavakoli (Blekinge Institute of Technology,

Sweden); Momin Jamil (Harman/Becker Automotive Systems GmbH, Germany); Rolf Esslinger (Harman Becker Automotive Systems GmbH, Sweden)

10:12 *Reproducing the acoustic velocity vectors in a circular listening area*

Jiarui Wang (Australian National University, Australia); Jihui Aimee Zhang (University of Southampton, United Kingdom (Great Britain)); Thushara D. Abhayapala and Prasanga Samarasinghe (Australian National University, Australia)

**Wednesday, December 18 10:30 - 11:00 (Australia/Brisbane)**

**Coffee Break**

**Wednesday, December 18 11:00 - 12:30 (Australia/Brisbane)**

**Implementations**

**Chair: Dr. Konstantin Kapinchev**

11:00 *Fully Autonomous In-Situ Surveying with Multi-Year Battery Lifetime*

Brendan J. Mackenzie and Mengyao Liu (DistriNet, KU Leuven, Leuven, Belgium); Ashok Samraj Thangarajan (Nokia Bell Labs, Cambridge, United Kingdom); Jorgos Coenen (Research[x]Design, KU Leuven, Leuven, Belgium); Sam Michiels (DistriNet, KU Leuven, Leuven, Belgium); Sandy Claes (Intermedia, LUCA School of Arts, Brussels, Belgium); Danny Hughes (DistriNet, KU Leuven, Leuven, Belgium); Andrew Vande Moere (Research[x]Design, KU Leuven, Leuven, Belgium)

11:18 *Multidimensional Filter Bank Design using In Memory Computing*

Mojtaba Mahdavi (Ericsson, Sweden)

11:36 *Achievable Data Rate Improvement Analysis of a THz Multiple RIS-Assisted Factory System Based on Ray Tracing*

Higo Silva (Instituto Federal Da Paraíba, Brazil); Ruan Gomes (IFPB, Brazil); Hugerles S. Silva (University of Brasilia, Brazil); Felipe Augusto Pereira de Figueiredo (INATEL, Brazil); Rausley Adriano Amaral de Souza (National Institute of Telecommunications (INATEL), Brazil & The University of Sydney, Australia)

11:54 *A Deep Learning Approach to Recognizing New Thai Currency Using Transfer Learning for Visually Impaired Individuals*

Irfan Ahmad (Maynooth University, Ireland); Abubakar Sharif (James Watt School of Engineering, University of Glasgow United Kingdom); Aneeka Azmat (Institute of Information Systems and Application National Tsinghua University, Taiwan); Muhammad Usman Jamil (School of Mechanical and Electrical Engineering, Chuzhou University Chuzhou, China)

12:12 *Stock Market Crash Forecasting Using an Assembly of Deep Learning Classifiers*

Nick Smith, Richardt H Wilkinson, Du Yong Kim and Margaret Lech (RMIT University, Australia)

**Wednesday, December 18 12:30 - 13:30 (Australia/Brisbane)**

## Lunch

**Wednesday, December 18 13:30 - 15:00 (Australia/Brisbane)**

### Communication systems

**Chair: Prof. Nobuhiko Miki**

13:30 *Investigating the Effects of Intentional Interference on Conventional and Spread Spectrum Systems*

André Antônio Anjos (Universidade Federal de Uberlândia - Campus Patos de Minas, Brazil); Murilo Pereira dos Reis (Universidade Federal de Uberlândia, Brazil); Rausley Adriano Amaral de Souza (National Institute of Telecommunications (INATEL), Brazil & The University of Sydney, Australia)

13:52 *Cooperative Spectrum Sensing in TV White Space Scenarios with Fading and Impulsive Noise*

André Antônio Anjos (Universidade Federal de Uberlândia - Campus Patos de Minas, Brazil); Diogo C. Arvelos (Universidade Federal de Uberlândia - Campos Patos de Minas, Brazil); Luís M. A. Borges (Universidade Federal de Uberlândia - Campos Patos de Minas, Brazil); Yonghui Li (University of Sydney, Australia); Rausley Adriano Amaral de Souza (National Institute of Telecommunications (INATEL), Brazil & The University of Sydney, Australia)

14:15 *Network Performance Analysis of Starlink: A Proliferated Low Earth Orbit Satellite Internet System*

Aaron Wong (Naval Postgraduate School & University of California, Davis, USA); Victor Buhl, John C. McEachen and Sean Kennedy (Naval Postgraduate School, USA); James McEachen (United States Air Force, USA)

14:37 *A Topology-inspired, FastICA-like Method for the Efficient Unmixing of Constant Modulus Signals*

Sean Kennedy, Murali Tummala and John C. McEachen (Naval Postgraduate School, USA)

**Wednesday, December 18 15:00 - 15:30 (Australia/Brisbane)**

### Coffee Break

**Wednesday, December 18 15:30 - 17:00 (Australia/Brisbane)**

### Applications

**Chair: Prof. Hans-Jürgen Zepernick**

15:30 *Standardization Steps for FAS in 6G Networks*

Paulo Rodrigo de Moura (University of Brasília & Anatel, Brazil); Alexandre C. Moraes (Agência Nacional de Telecomunicações, Brazil); Hugerles S. Silva and Ugo Dias (University of Brasilia, Brazil); Felipe Augusto Pereira de Figueiredo (INATEL, Brazil); Rausley Adriano Amaral de Souza (National Institute of Telecommunications (INATEL), Brazil & The University of Sydney, Australia)

15:52 *Evaluation of the Effectiveness of Technical Indicators*

Tuba Islam and Konstantin Kapinchev (University of Greenwich, United Kingdom (Great Britain))

16:15 *An Improved IoT Device Fingerprinting via Enhanced Feature Selection*

Mariam Munsif Mir (Griffith University, Nathan Campus, Australia); Mohammad Awrangjeb (School of Information and Communication Technology (ICT) Griffith University, Australia); Wee Lum Tan (Griffith University, Australia); Ali Zia (Machine Learning & Artificial Intelligence-Future Science Platforms, CSIRO, Australia)

16:37 *A Low-Cost, Off-the-Shelf Prototyping Platform for Molecular Communications Research*

Vinuri Piyathilake, Asanka P. Sayakkara and Kenneth M Thilakarathna (University of Colombo School of Computing, Sri Lanka); Randil Pushpananda and Lasanthi De Silva (University of Colombo, Sri Lanka); Kasun Karunanayaka and Oshani E. Wickramasinghe (University of Colombo School of Computing, Sri Lanka); Vishmina Obeysekera (University of Colombo, Sri Lanka); Gayathri Purage (University of Colombo School of Computing, Sri Lanka)