2021 30th Wireless and Optical Communications Conference (WOCC 2021)

Taipei, Taiwan
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Thursday, October 7 9:00 - 9:20

Opening Ceremony

Room: The Lecture Hall

Chair: Sea-Fue Wang (National Taipei University of Technology, Taiwan)

Thursday, October 7 9:20 - 10:00

Keynote Speech I

Optical Wireless Communication based on Visible Laser Diode Lighting
Prof. Gong-Ru Lin (National Taiwan University)

Room: The Lecture Hall

Optical wireless communication (OWC) based on visible laser-diode white-lighting module has emerged as an intriguing technology with supplementary data transmission functionality to fulfill with the need of wired and wireless access network coverage in the near future. In this talk, different kinds of the multi-color visible laser diodes and light-emitting-diodes with modularized package will be introduced to enable both white lighting and visible wavelength division multiplexing (VWDM) functions. The significant developing progress on the VWDM using visible laser diode sources is overviewed and expected for compact free-space white-lighting communication toward 40-100 Gbit/s toward VWDM wireless access network for indoor, outdoor, and vehicle communications.

Thursday, October 7 10:00 - 10:40

Keynote Speech II

Cognitive Wireless Networks: Designing Applications and Developing Testbeds
Prof. Edward Coyle (Georgia Institute of Technology)

Room: The Lecture Hall

As wireless applications become more widespread and sophisticated, optimal manage- ment of their access to the finite RF-spectrum becomes essential. This is a very ambitious task that will require, among other things: applications that can adapt rapidly to policy decisions, software defined radios and networks capable of rapidly implementing these decisions, and management and scheduling algorithms that can sense and adapt quickly to a changing environment. Before such systems can be widely adopted they must be prototyped and thoroughly tested. These are the goals of our projects at Georgia Tech, where we have been developing a large-scale testbed for the wireless networks of the future. In this talk, we describe this testbed - our university's football stadium - and the work that we have underway on the design of both future wireless applications and the systems for monitoring spectrum usage for fixed and mobile devices. Two Vertically Inte- grated Project (VIP) teams are involved in this effort and are crucial to achieving the scale and reliability necessary for this work to be

successful.

Thursday, October 7 11:00 - 11:30

Keynote Speech III

5G Innovations & Applications
President Chee Ching (Far EasTone Telecommunications Co., Ltd.)
Room: The Lecture Hall

Thursday, October 7 11:30 - 12:10

Keynote Speech IV

Deep Learning Platform for B5G Mobile Network
President Han-Chieh Chao (National Dong Hwa University)
Room: The Lecture Hall

The 3G and 4G mobile communications had been developed for many years. The 5G mobile communication is scheduled to be launched in 2020. In the future, a wireless network is of various size of cells and different type of communication technologies, form- ing a special architecture of Heterogeneous Networks (HetNet). Under the complex network architecture, interference and handover problems are critical challenges in access network. How to efficiently manage small cells and to choose an adequate access mechanism for the better quality of service is a vital research issue. Traditional network architecture can no longer support existing network requirements. It is necessary to develop a novel network architecture. Therefore, this keynote speech will share a solution of deep learning-based B5G mobile network which can enhance and improve communication performance through combing some specific technologies. e.g., deep learning, fog computing, cloud computing, cloud radio access network (C-RAN) and fog radio access network (F-RAN).

Thursday, October 7 13:30 - 15:00

B-1: Deep Learning for Wireless Communication Networks

Room: 301
Chair: Tan-Hsu Tan (National Taipei University of Technology, Taiwan)

13:30 *QAM Signal Classification and Timing Jitter Identification Based on Eye Diagrams and Deep Learning...1*

Alhussain Almarhabi, Hatim Alhazmi and Abdullah Samarkandi (Stevens Institute of Technology, USA); Mofadal Alymani (Shaqra University, Saudi Arabia); Mohsen H. Alhazmi and Yu-Dong Yao (Stevens Institute of Technology, USA)

13:48 *Modulation Classification in a Multipath Fading Channel Using Deep Learning:*

16QAM, 32QAM and 64QAM...6

Abdullah Samarkandi, Alhussain Almarhabi and Hatim Alhazmi (Stevens Institute of Technology, USA); Mofadal Alymani (Shaqra University, Saudi Arabia); Mohsen H. Alhazmi and Yu-Dong Yao (Stevens Institute of Technology, USA)

14:06 *Cooperative Deep Learning-Based Uplink Distributed Fair Resource Allocation for Aerial Reconfigurable Intelligent Surfaces Wireless Networks...11*

Wei-Ting Chen (National Yang Ming Chiao Tung University, Taiwan); Cheng-Sen Huang (National Dong Hwa University, Taiwan); Li-Chun Wang (National Chiao Tung University, Taiwan)

14:24 *A Study of Neural Network Receivers in OFDM Systems Subject to Memoryless Impulse Noise...16*

Der-Feng Tseng and Che-Shien Lin (National Taiwan University of Science and Technology, Taiwan)

14:42 *Prediction of THz Absorption and Inverse Design of Graphene-Based Metasurface Structure Using Deep Learning...21*

Erfan Dejband, Jyun-Wei Li, Peng-Chun Peng and Tan-Hsu Tan (National Taipei University of Technology, Taiwan)

F-1: Internet Application and Service

Room: 302

Chair: Chuan-Chi Lai (Feng Chia University, Taiwan)

13:30 *Performance Assessment for different SDN-Based Controllers...24*

I-Shyan Hwang (Yuan-Ze University, Taiwan); Elaiyasuriyan Ganesan (Yuan ze University, Taiwan); Mohammad Sheikh and Razat Kharga (Yuan Ze University, Taiwan)

13:48 *A Machine Learning Approach for CQI Feedback Delay in 5G and Beyond 5G Networks...26*

Andson M Balieiro and Kelvin Lopes Dias (Federal University of Pernambuco, Brazil); Paulo Guarda (Motorola Mobility, Brazil)

14:06 *Improving Routing Protocol for Low-Power and Lossy Networks over IoT Enviroment...31*

Khalid A. Darabkh and Muna R. Al-Akhras (The University of Jordan, Jordan); Ala Khalifeh (German University of Jordan, Jordan)

14:24 *A Systematic Resource Management for VR Streaming on MECs...36*

Yu-Syuan Jheng, Min-Li Wu and Ta-Wei Yang (National Taiwan University, Taiwan); Cheng-Fu Chou (NTU, Taiwan); Ing-Chau Chang (National Changhua University of Education, Taiwan)

14:42 *Task scheduling approaches for fog computing...38*

Lina Benchikh (University of Algerie, Algeria); Lemia Louail (University of Sétif 1 & Faculty of Sciences, Algeria)

O-1: Optical Communications and Photonics I

Room: 303

Chair: Jiun-Yu Sung (National Taiwan University of Science and Technology, Taiwan)

13:30 *Impulse Response and Noise Figure of a 50-Gbps O-band Ge p-i-n Waveguide Photodiode with High Responsivity...43*

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13:48 *High-Baud-Rate 32-QAM OFDM Single-arm and Dual-arm Encoded Silicon Mach-Zehnder Modulator...46*

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14:06 *High thermal stability of 850 nm VCSELs with enhanced mask margin up to 85 °C for 100G-SR4 Operation...49*

Hao-Tien Cheng, Yun-Cheng Yang and Chao-Hsin Wu (National Taiwan University, Taiwan)

14:24 *Analysis of the spectral dependent microwave characteristics of 1.3 μm DFB Laser at different temperatures...54*

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14:42 *40 Gb/s × 8 WDM Bi-directional Transmission in 100 GHz Channel Spacing using Dispersion Compensating Fiber...58*

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Room: 304

Chair: Chih-Lin Hu (National Central University, Taiwan)

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Po-Hao Chang (National Dong Hwa University, Taiwan)

13:48 *Radio Resource Allocation for 5G Networks Using Deep Reinforcement Learning...66*

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14:06 *Design of a DRX Sleep Scheduling Scheme with Carrier Aggregation in 3GPP Heterogeneous Cellular Networks...70*

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14:24 *Strategy-Proof Beam-Aware Multicast Resource Allocation Mechanism...75*

Pan-Yang Su, Yi-Yun Li and Hung-Yu Wei (National Taiwan University, Taiwan)

14:42 *5G Edge Computing Experiments with Intelligent Resource Allocation for Multi-Application Video Analytics...80*

Tzu-Hsuan Chao, Jian-Han Wu, Yao Chiang and Hung-Yu Wei (National Taiwan University, Taiwan)

Thursday, October 7 15:30 - 17:00

B-2: Big Data Applications (I)

Room: 301

Chair: Sheng-Ming Wang (National Taipei University of Technology, Taiwan)

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Yan-Ann Chen (Yuan Ze University, Taiwan)

15:52 *Data-driven Spatial Features Analysis Using Share of Voice in Commercial Area...87*

Sheng-Ming Wang and Winston Yang (National Taipei University of Technology, Taiwan)

16:15 *Adaptive Blocksize for IoT Payload Data on Fabric Blockchain...92*

Chuan-Ming Liu (National Taipei University of Technology, Taiwan); Badigineni Mukesh Kumar (National Taipei University of Technology & Applied Computing Laboratory, Taiwan); Shang Wen Lu (National Taipei University of Technology, Taiwan)

16:37 *Highly Efficient Indexing Scheme for k-Dominant Skyline Processing over Uncertain Data Streams...97*

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O-2: Optical Communications and Photonics II

Room: 303

Chair: Jiun-Yu Sung (National Taiwan University of Science and Technology, Taiwan)

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15:48 *Using Machine Learning and Light Spatial Sequence Arrangement for Copying Positioning Unit Cell to Reduce Training Burden in Visible Light Positioning (VLP)...106*

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16:06 *Impact of Artificial Seawater and Turbulence Factors on Underwater Optical Wireless Communication...110*

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16:24 *3D-printed mold-assisted U-shaped optical fiber sensor for displacement sensing...115*

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16:42 *Data-Driven Symbol Definition for Color Shift Keying in Screen Camera Communications...118*

Alex Cartagena Gordillo (Universidad Nacional Tecnologica de Lima Sur, Peru)

W-2: Communication Technique

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Chair: Guo-Ming Sung (National Taipei University of Technology, Taiwan)

15:30 *Multi-agent Learning based Anti-jamming Communications Against Cognitive Jammers...122*

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16:37 *Geographic Routing with Two-Hop Movement Information in Mobile Opportunistic Networks...137*

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Friday, October 8

Friday, October 8 9:00 - 10:30

B-3: Big Data Applications (II)

Room: 204

Chair: Chi-Chang Chang (ChungShan Medical University, Taiwan)

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10:00 *Activity Recognition Based on FR-CNN and Attention-Based LSTM Network...146*

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Room: 303

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9:00 *Employing Telecom Fiber Cables as Sensing Media for Road Traffic Applications...150*

Ming-Fang Huang (NEC Laboratories America); Chaitanya Narisetty, Milad Salemi and Ting Wang (NEC Laboratories America, USA)

9:45 *Design and spectral reconstruction assisted by intelligent algorithms for high-resolution Fourier transform spectrometer...153*

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O-4: Invited Talks

Room: 303

Chair: Peng-Chun Peng (National Taipei University of Technology, Taiwan)

10:45 Beyond Octave-Spanning Supercontinuum Generation of Optical Vortices in Ring-Core Photonic Crystal Fiber...195

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11:22 Various microcavity lasers monolithically grown on planar on-axis Si (001) substrates...197

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Chair: Jen-Yeu Chen (National Dong Hwa University, Taiwan)

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Friday, October 8 13:00 - 14:30

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Room: 303

Chair: Ho-Ting Wu (National Taipei University of Technology, Taiwan)

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13:18 *Secrecy Energy Efficiency Maximization for UAV Enabled Communication Systems...240*

Qingcheng Tao (Shenzhen University, China)

13:36 *Learning from UAV Experimental Results for Performance Modeling of Reconfigurable Intelligent Surface Flying Platform...245*

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Friday, October 8 14:45 - 16:00

F-3: Emerging Network Architecture and System (II)

Chair: Chien-Hung Lai (National Taipei University of Technology, Taiwan)

O-6: Optical Communications and Photonics IV

Room: 303

Chair: Peng-Chun Peng (National Taipei University of Technology, Taiwan)

W-6: RIS-enabled UAV Communications (Invited session)

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