2021 4th International Conference on Signal Processing and Information Security (ICSPIS 2021)

Dubai, United Arab Emirates
24 – 25 November 2021

Additional Copies of This Publication Are Available From:

Time	Elsewhere

Wednesday, November 24

Time	Elsewhere
09:00-09:30	OC: Opening Ceremony: Dr. Eesa Bastaki (Conference Chair) Welcome Speech, Dr. Fatima Taher (IEEE UAE Chair) Welcome Speech, Prof. Wathiq Mansoor (TPC Chair) Conference Briefing
09:30-10:30	KN1: Keynote Speech: Wireless Autonomous Sensing for Inspecting the Blockage and Leakage within the Sewer Infrastructure in Urban Areas
10:30-10:45	CB: Coffee Break
10:45-12:15	PD: Panel Discussion: The Role of AI in Signal Processing and Information Security
12:15-13:15	LB: Lunch Break
13:15-14:45	S1: Session 1
14:45-15:00	CB: Coffee Break
15:00-16:30	S2: Session 2

Thursday, November 25

Time	Elsewhere
09:30-10:30	KN2: Keynote Speech: Physical Layer Security: Latest Trends, Threats, and Countermeasures
10:30-10:45	CB: Coffee Break
10:45-12:15	S3: Session 3
12:15-13:15	LB: Lunch Break
13:15-14:45	S4: Session 4
14:45-15:00	CS: Awards and Closing Ceremony

Wednesday, November 24 9:00 - 9:30 (Asia/Dubai)

OC: Opening Ceremony: Dr. Eesa Bastaki (Conference Chair) Welcome Speech, Dr. Fatima Taher (IEEE UAE Chair) Welcome Speech, Prof. Wathiq Mansoor (TPC Chair) Conference Briefing

Dr. Eesa Bastaki (Conference Chair), Dr. Fatima Taher (IEEE UAE Chair), Prof. Wathiq Mansoor (TPC Chair)

Wednesday, November 24 9:30 - 10:30 (Asia/Dubai)

KN1: Keynote Speech: Wireless Autonomous Sensing for Inspecting the Blockage and Leakage within the Sewer Infrastructure in Urban Areas

Prof. Raed A Abd-Alhameed
This keynote speech includes: • Overview of Sewer and gully blockages. • A low-cost and power-efficient wireless sensor networking. • Monitoring the water level of the gully pot. • Develop a prototype system. • Develop a radio transceiver, data acquisition board and an acoustic sensor probe. • A field trial of the proposed system was carried out. • A typical inner-city urban environment is discussed. • New work: Passive UHF RFID Tags for Energy Efficient Liquid Level Detection Applications. • New work: IETG Industry and sensors to manholes.

Wednesday, November 24 10:30 - 10:45 (Asia/Dubai)

CB: Coffee Break

Wednesday, November 24 10:45 - 12:15 (Asia/Dubai)

PD: Panel Discussion: The Role of AI in Signal Processing and Information Security

Prof. Raed Abd-Alhameed (University of Bradford, UK), Prof. Huseyin Arslan (University of South Florida, USA), Dr. Tarek Taha (Dubai Future Foundation, UAE)

Wednesday, November 24 12:15 - 13:15 (Asia/Dubai)

LB: Lunch Break

Wednesday, November 24 13:15 - 14:45 (Asia/Dubai)

S1: Session 1

13:15 *Artificial Intelligence Induced Multi-Level Attention States Recognition from Brain Using EEG Signal...1*

Sricheta Parui, Deborsi Basu, Wathiq Mansoor and Uttam Ghosh

13:30 *Deep Neural Networks Based Approach for Pothole Detection...5*

Anup Pandey, Rahat Iqbal, Saad Amin, Tomasz Maniak, Vasile Palade and Charalampos Karyotis

13:45 *3D Expansion of SRCNN for Spatial Enhancement of Hyperspectral Remote Sensing Images...9*

Nour Aburaed, Mohammed Q. Alkhatib, Stephen Marshall, J. Zabalza and Hussain Al-Ahmad

14:00 *Protection and Authentication of Dubai Digital Elevation Model Using Hybrid Watermarking Technique...13*

Mina Al-Saad, Nour Aburaed, Alavikunhu Panthakkan, Saeed Al Mansoori and Hussain Al-Ahmad

14:15 *Moving Objects Segmentation in Infrared Scene Videos...17*

Marwa Chendeb El Rai, Mina Al-Saad, Muna Darweesh, Saeed Al Mansoori, Hussain Al-Ahmad and Wathiq Mansoor

14:30 *Geometric Validation Algorithms for DMSAT-1...21*

Haritha Harikrishnan, Alya AlMaazmi, Alavikunhu Panthakkan, Saeed Al Mansoori and Hussain Al-Ahmad

Wednesday, November 24 14:45 - 15:00 (Asia/Dubai)

CB: Coffee Break

Wednesday, November 24 15:00 - 16:30 (Asia/Dubai)

S2: Session 2

Chair: Claude Fachkha

15:00 *Attacks on Permissioned Blockchain for IoT...25*
Deepa Pavithran, Enrico Angeles, Charles Shibu and Munavwar Shaikh

15:15 *Design of a Blockchain Enabled Secure Vehicle-To-Vehicle Communication System...29*
Debashis Das, Sourav Banerjee, Pushpita Chatterjee, Uttam Ghosh, Wathiq Mansoor and Utpal Biswas

15:30 *Attribute Sharing Systems of the Star Type...33*
Mitsuru Tada

15:45 *Efficient Machine Learning Model for Hardware Trojan Detection on Register Transfer Level...37*
Fajar Wijitrisnanto, Sarwono Sutikno and Septafiansyah Dwi Putra

16:00 *Power Analysis in Hamming Weight Model: Attacking IoT Encryption Devices...41*
Septafiansyah Dwi Putra, Arwin Datumaya Wahyudi Sumari, Imam Asrowardi and Eko Subyantoro

16:15 *VowPass: Novel Method to Generate Secure and Memorable Passwords...45*
Abdulrahman Alhamed and Sajal Bhatia

Thursday, November 25

Thursday, November 25 9:30 - 10:30 (Asia/Dubai)

KN2: Keynote Speech: Physical Layer Security: Latest Trends,

Threats, and Countermeasures

Prof. Huseyin Arslan

Abstract: Today's wireless services and systems have come a long way since the rollout of the conventional voice-centric cellular systems. The demand for wireless access in voice and multi-media applications has increased tremendously. The trend on the variety and the number of mobile devices along with the mobile applications will certainly continue beyond 5G, creating a wide range of technical challenges. One of the biggest challenges is the security of the communication beyond the classical crypto based approaches which secure the information. In this talk, security aspects of the physical communication and also physical signal which is called Physical Layer Security (PHY Security) will be discussed. Latest trends, threats, and techniques to improve the security of the physical signal will be discussed. The tentative outline of the talk will be as follows:

• Wireless Communication trends, requirements • Importance of secure communication • Classification of communication security • PHY security: Communication and REM • PHY security: Eavesdropping, Spoofing & Jamming • Anti-jamming capable communication • Cross-layer security • Secure communication & other advanced radio access technologies • Case- studies: a- Security in URLLC (URLL & Secure communication) b- Security in vehicular network (V2V and V2I) c- Security in NOMA d- Security in LIS

Thursday, November 25 10:30 - 10:45 (Asia/Dubai)

CB: Coffee Break

Thursday, November 25 10:45 - 12:15 (Asia/Dubai)

S3: Session 3

Chair: Mohammed Q. Alkhatib

10:45 *Metaheuristic Approaches to Facility Location Problems: A Systematic Review...49*

Mohammed Al-Haidary, Mhd Alaa Ajlouni, Manar Abu Talib, Sohail Abbas, Qassim MH Nasir and Essa Basaeed

11:00 *Designing an Elderly Virtual Caregiver Using Dialogue Agents and WebRTC...53*

Sinan Chen and Masahide Nakamura

11:15 *Effective Airplane Detection in High Resolution Satellite Images Using YOLOv3 Model...57*

Saeed Al Mansoori, Alavikunhu Panthakkan and Abdulla AlHammadi

11:30 *Explorative & Predictive Analysis of Covid-19 in US and Its Impact on US Presidential Election...61*

Dhanya Melazhiyath Gopinathan, Megha Murali, Mahesh Kannath, Saeed Al Mansoori and Alavikunhu Panthakkan

11:45 *Drone Swarms: Task Planning and Assignment Based on Multi Traveling Salesmen Problem...65*

Alia Almuhairi, Amal Juma Albalooshi, Reem Khalid Abdulrahman, Hind Folad, Maryam Malalla Abdulaziz, Wathiq Mansoor, Mohammad Kamel Daradkeh and Shadi Atalla

12:00 *Evaluating Convolutional Neural Networks for No-Reference Image Quality Assessment...68*

Theodore Polyzos, Kyriakos Apostolidis, Ioannis Grigoriadis and George A Papakostas

Thursday, November 25 12:15 - 13:15 (Asia/Dubai)
LB: Lunch Break
Thursday, November 25 13:15 - 14:45 (Asia/Dubai)
S4: Session 4

Chair: Diana Dawoud

13:15 *Information Processing and Digital Communication in a Modular Satellite...72*

Mohammed E Eshaq, MSc, Ibrahim Al-Midfa, Eisa Al-Shamsi, Zakareyya

Al-Shamsi, Shadi Atalla, Saeed Al Mansoori and Hussain Al-Ahmad

13:30 *Low-Complexity Detection Scheme for P-Orthogonal Transmission Method...76*
Diana Dawoud, Fabien Héliot, Muhammad Ali Imran and Rahim Tafazolli

13:45 *Thermal Aware Routing Protocols in WBAN...80*
Navneet Kaur, Deeksha Gupta, Ripty Singla, Anuj Bharadwaj, Kavita Verma and Wathiq Mansoor

14:00 *Evaluation of Key-Based Physical Layer Security Systems...84*
Tasnim Nazzal and Husameldin Mukhtar

14:15 *Optimum e-Healthcare Resource Provisioning Using Network Slicing Approach for Future 5G Networks...88*
Deborsi Basu, Vikram Krishnakumar, Sricheta Parui, Wathiq Mansoor and Uttam Ghosh

14:30 *Intra Cluster Based Energy Efficient PSO-GA Routing Protocol in WSN...92*
Sowjanya Ramisetty, Kavita Verma, Sahil Verma and Wathiq Mansoor

Thursday, November 25 14:45 - 15:00 (Asia/Dubai)
CS: Awards and Closing Ceremony