

# **2020 3rd International Conference on Signal Processing and Information Security (ICSPIS 2020)**

**Dubai, United Arab Emirates  
25 – 26 November 2020**



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Wednesday, November 25

Wednesday, November 25 9:00 - 9:30 (Asia/Dubai)

OC: Opening Ceremony

Dr. Eesa Bastaki (Conference Chair), H.E. Dr. Mohammed Al-Mualla (Invited Speech), Dr. Fatima Taher (IEEE UAE Chair), Prof. Wathiq Mansoor (TPC Chair)

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

KN1: Keynote Speech: The Superior Neuron Model

Prof. Moncef Gabbouj, FIEEE

Abstract: Operational Neural Networks (ONNs) are new generation network models targeting to address two major drawbacks of conventional Convolutional Neural Networks (CNNs): the homogenous network configuration and the "linear" neuron model that can only perform linear transformations over previous layer outputs. ONNs can perform any linear or non-linear transformation with a proper combination of "nodal" and "pool" operators. This is a great leap towards expanding the neuron's learning capacity in ONNs, requiring the use of a single nodal operator for all synaptic connections of every neuron. This restriction has recently been lifted by introducing a superior neuron called the "generative neuron" where each nodal operator can be customized during the training in order to maximize learning. As a result, the network is able to self-organize the nodal operators of its neurons' connections. Self-Organized ONNs (Self-ONNs) composed with superior generative neurons can achieve diversity even with a compact configuration. We shall explore several signal processing applications of neural network models equipped with the superior neuron.

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

CB: Coffee Break

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

PD: Panel Discussion: COVID-19 and Signal Processing & Information Security Research

Prof. Ahmad Al-Shimaa (Sharjah University), Engr. Saeed Al-Mansoori (MBRSC), Mr. Qitang Liu (Huawei), Dr. Rocky Termanini (Cybersecurity Consulting), Prof. Hussain Al-Ahmad (Moderator)

Wednesday, November 25 12:15 - 13:15 (Asia/Dubai)

LB: Lunch Break

Wednesday, November 25 13:15 - 15:15 (Asia/Dubai)

S1: Session 1

Chairs: Amjad Gawanmeh, Christine Markarian

**13:15 Introducing a Mobile App to Increase Cybersecurity Awareness in MENA.....1**

[Hadeel Mohammed Jawad](#) and Samir Tout

**13:30 A Microservices Architecture for ADS-B Data Security Using Blockchain.....5**

[Haitham Abu Damis](#), Dina Shehada, Claude Fachkha, Amjad Gawanmeh and Jamal Al-Karaki

**13:45 Trusted Security Model for IDS Using Deep Learning.....9**

[Khalid Makdi](#)

**14:00 Digital Forensics and Investigations of the Internet of Things: A Literature Review.....13**

[Shehanaz Amiroon](#) and Claude Fachkha

**14:15 Performance Evaluation of a Lightweight IoT Authentication Protocol.....17**

Dina Shehada, Amjad Gawanmeh, Claude Fachkha and Haitham Abu Damis

**14:30 Digital Forensic Analysis of Files Using Deep Learning.....21**

Mohammed Al Neaimi, Hussam Al Hamadi, Chan Yeun and M. Jamal Zemerly

**14:45 Image Encryption Based on Chua Chaotic Oscillator.....25**

Farah Ali AlMutairi and Talal Bonny

**15:00 A New Chaos-Based-Cryptosystem for Voice Encryption.....29**

Wafaa Al Nassan and Talal Bonny

Wednesday, November 25 15:15 - 15:30 (Asia/Dubai)

CB: Coffee Break

Wednesday, November 25 15:30 - 17:30 (Asia/Dubai)

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Chairs: Sabina Abdul Hadi, Saad Amin

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**15:45 Skin Cancer Classification Model Based on VGG19 and Transfer Learning.....37**

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Shahrokh Sani

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Yashbir Singh, Deepa S and Wathiq Mansoor

Thursday, November 26

Thursday, November 26 9:30 - 10:30 (Asia/Dubai)

KN2: Keynote Speech: Fingerprinting by Design: Authentication and Security

Prof. Brian M. Sadler, FIEEE

Abstract: Fingerprints are commonly understood as traits that uniquely identify an individual, an object, or a message, and can be exploited to detect and prevent impersonation, fraud, or unlawful duplication. In this talk we consider the intentional introduction of fingerprints to provide security in wireless communications. This addresses the fingerprint design, and its embedding into a communications waveform, so that it has several desired properties including stealth, security, and predictable performance. The framework draws on communications, signal processing, cryptographic hashing, and information theory, enabling control of performance trade-offs by design. Privacy and security analysis quantify the limited ability of an eavesdropper to detect and estimate the fingerprint or to impersonate a legitimate user. Fingerprints provide a message, and a secret codebook design is described that enables secure side-channel communications through fingerprint coding.

Thursday, November 26 10:30 - 10:45 (Asia/Dubai)

CB: Coffee Break

Thursday, November 26 10:45 - 12:45 (Asia/Dubai)

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Chairs: Diana Dawoud, Rida Gadhafi

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[Jose Rugeles](#) and Edward Guillen

Thursday, November 26 12:45 - 13:45 (Asia/Dubai)

LB: Lunch Break

Thursday, November 26 13:45 - 15:00 (Asia/Dubai)

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Thursday, November 26 15:00 - 15:30 (Asia/Dubai)

[CS: Awards and Closing Ceremony](#)