



# IEEE CIVEMSA 2020

IEEE INTERNATIONAL CONFERENCE ON COMPUTATIONAL  
INTELLIGENCE & VIRTUAL ENVIRONMENTS FOR  
MEASUREMENT SYSTEMS AND APPLICATIONS

JUNE 22-24, 2020 – TUNIS, TUNISIA



## 2020 CONFERENCE PROGRAM

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# Welcome Message from the Chairpersons

On behalf of the steering and organizing committees, it is our great pleasure to welcome you to the twenty-fifth annual IEEE International Conference on Computational Intelligence and Virtual Environments for Measurement Systems and Applications (IEEE CIVEMSA 2020), held in Tunis, Tunisia, on June 22, 2020.

This conference is co-sponsored by the IEEE Computational Intelligence and IEEE Instrumentation and Measurement Societies. It focuses on all aspects of computational intelligence, virtual environments and human-computer interaction technologies for measurement systems and related applications. We believe that the organizing and steering committees have put together a very exciting and interesting program. This latter includes peer-reviewed papers that highlight standpoints on some latest recent advances to address some critical computational intelligence challenges for signal and image processing, intelligent measurement, human-machine interaction, virtual reality systems, and industrial applications. Additionally, to acknowledge excellence and merit in a conference paper candidate, we organized an IEEE Best Paper Award and a Student Paper Competition, from the IEEE co-sponsors societies, based on paper novelty, clearness, ingenuity and groundbreaking research in the respective area.

We believe that the keynote speaker topic shelters a highly relevant set of materials that we trust will bring some conference participants to share viewpoints and thoughts on this topic. We hope the conference will foster and discuss opportunities and challenges in using computational intelligence and virtual environments breakthroughs aiming to the advancement of instrument performance and measurement capabilities, and all related applications in a broad spectrum of areas. To promote interaction and discussion in the audience, sufficient time is allocated to presenters not only to introduce their achievements, but also to engage in extended discussions with the participants.

IEEE has been monitoring the developing COVID-19 outbreak. The safety and well-being of all conference participants is our priority. After studying and evaluating the recent announcements, guidance, and news released by relevant national departments, we are sorry to announce that CIVEMSA 2020 will be held as a virtual event.

In spite of the lack of a physical location, we hope you will find IEEE CIVEMSA 2020 a challenging and productive experience, celebrating the twenty fourth-year anniversary of this conference, since its inception in 1996 as “*IEEE Workshop on Emerging Technologies for Instrumentation and Measurement*”.

**Honorary Chairs** Vincenzo Piuri, *Università degli Studi di Milano, Italy*  
Emil M. Petriu, *University of Ottawa, Canada*

**General Chairs** Adel M. Alimi, *University of Sfax, Tunisia*  
Habib M. Kammoun, *University of Sfax, Tunisia*

**Program Chairs** Olfa Kanoun, *Technical University of Chemnitz, Germany*  
Angelo Genovese, *Università degli Studi di Milano, Italy*  
Ilhem Kallel, *University of Sfax, Tunisia*

# **IEEE CIVEMSA 2020 Organizers**

## **Honorary Co-Chairs**

Vincenzo Piuri, Università degli Studi di Milano, Italy

Emil M. Petriu, University of Ottawa, Canada

## **General Co-Chairs**

Adel M. Alimi, University of Sfax, Tunisia

Habib M. Kammoun, University of Sfax, Tunisia

## **Program Co-Chairs**

Olfa Kanoun, Technical University of Chemnitz, Germany

Angelo Genovese, Università degli Studi di Milano, Italy

Ilhem Kallel, University of Sfax, Tunisia

## **Local Arrangement Chair**

Hela Lajmi, University of Gabes, Tunisia

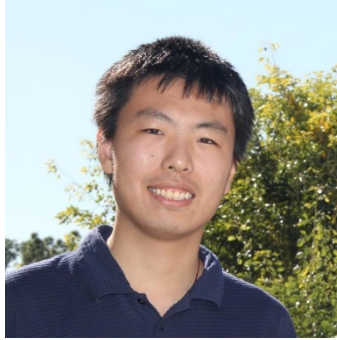
Mohamed Neji, University of Sfax, Tunisia

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## Keynote Speaker



**Qingpeng Zhang**

**Title: Modelling the transmission of infectious diseases on social networks**

### **Abstract**

Social contact of people can be naturally modelled as social networks, which represents the platform for the transmission of infectious diseases, such as HIV, influenza, and novel coronavirus (COVID-19). A good understanding of how infectious diseases transmit on social networks can provide critical insights into how to effectively control the epidemic. Given the complex structure of social networks, it is not an easy task. In this talk, I will introduce this exciting research area, and present our work on modelling and simulating the transmission of HIV on multilayer social networks, and the optimization approach to identifying the best subset of individuals in the social network for interventions. We will also introduce our preliminary research on the modelling of COVID-19 in multilayer social networks.

### **Speaker's Bio**

**Qingpeng Zhang** received the B.S. degree in Automation from Huazhong University of Science and Technology in 2009, and the M.S. degree in Industrial Engineering and the Ph.D. degree in Systems and Industrial Engineering with a minor in Management Information Systems from The University of Arizona, in 2011 and 2012, respectively. Prior to joining CityU, he worked as a Postdoctoral Research Associate with The Tetherless World Constellation, Department of Computer Science at Rensselaer Polytechnic Institute. He also worked at the Pacific Northwest National Laboratory and Chinese Academy of Sciences in the summer of 2011 and 2010, respectively. Currently, he is an assistant professor with the School of Data Science at CityU since 2018. During 2014-2018, he was with the Department of Systems Engineering and Engineering Management, where he is still an affiliate member.

His research interests include social informatics and healthcare data analytics, complex networks, social computing, data mining and semantic web.

## Program Schedule – Monday, June 22

<b>8:00 – 8:15</b>	<b>Opening Session</b>
<b>8:15 – 9:30</b>	<b>Keynote Speaker</b>
<b>9:45 - 10:00</b>	<b>Break</b>
<b>10:15 - 10:30</b>	<b>Comparison of Lidar Point Cloud Features in Railway Environment</b>
<b>10:45 - 11:00</b>	<b>On Approximating the Non-negative Rank: Applications to Unsupervised Image Reduction</b>
<b>11:15 - 11:30</b>	<b>Novel Approach Using Deep Learning for Intrusion Detection and Classification of the Network Traffic</b>
<b>11:45 - 12:00</b>	<b>Deep Learning of Attitude in Children's Emotional Speech</b>
<b>12:15 - 12:30</b>	<b>Factors contributing to CT scan usability</b>
<b>2:45 - 13:00</b>	<b>Surface Electrical Impedance Myography Measurements for Recognition of Numbers in American Sign Language</b>
<b>13:15 - 13:30</b>	<b>Four Sensors Bracelet for American Sign Language Recognition based on Wrist Force Myography</b>
<b>13:45 - 14:00</b>	<b>Wireless Sensor Network Calibration for PM10 Measurement</b>
<b>14:15 - 14:30</b>	<b>Smart App for Personal Dosimeter</b>
<b>14:45 - 15:00</b>	<b>Smart Systems and The Internet of Things (IOT) for Waste Management</b>
<b>15:15 - 15:30</b>	<b>Three Tiered Visual-Inertial Tracking and Mapping for Augmented Reality in Urban Settings</b>
<b>15:45 - 16:00</b>	<b>Real Time Data Communication for Intelligent Extended Reality Applications</b>

# Monday, June 22

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**8:00 – 8:15**

**Welcome Message**

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**8:15 – 9:30**

**Keynote**

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**9:45 - 10:00**

**Break**

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**10:15 - 10:30**

**Comparison of Lidar Point Cloud Features in Railway Environment**

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**Comparison of Lidar Point Cloud Features in Railway Environment**

Yixuan Geng (Beijing Jiaotong University, China); Zhipeng Wang (Tutor, China); Limin Jia and Yong Qin (State Key Laboratory of Rail Traffic Control and Safety, China)

**10:45 - 11:00**

**On Approximating the Non-negative Rank: Applications to Unsupervised Image Reduction**

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**On Approximating the Non-negative Rank: Applications to Unsupervised Image Reduction**

Mohanad Abukmeil, Stefano Ferrari, Angelo Genovese and Vincenzo Piuri (Università degli Studi di Milano, Italy); Fabio Scotti (Universita' degli Studi di Milano, Italy)

**11:15 - 11:30**

**Novel Approach Using Deep Learning for Intrusion Detection and Classification of the Network Traffic**

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**Novel Approach Using Deep Learning for Intrusion Detection and Classification of the Network Traffic**

Shahbaz Ahmad (National University of Science and Technology (NUST), Pakistan); Fahim Arif (National University of Science and Technology, Pakistan); Zabeeh Ullah (National University of Science and Technology (NUST), Islamabad, Pakistan); Naima Iltaf (National University of Sciences and Technology, Pakistan)

**11:45 - 12:00**

**Deep Learning of Attitude in Children's Emotional Speech**

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**Deep Learning of Attitude in Children's Emotional Speech**

Stavros Ntalampiras (Università degli studi Milano, Italy)



# Monday, June 22

**12:15 - 12:30**

## **Factors contributing to CT scan usability**

### **Factors contributing to CT scan usability**

Saad Aldoihi (ENSTA & King Abdulaziz City for Sciences and Technology (KACST), France); Omar Hammami (ENSTA ParisTech, France)

**12:45 - 13:00**

## **Surface Electrical Impedance Myography Measurements for Recognition of Numbers in American Sign Language**

### **Surface Electrical Impedance Myography Measurements for Recognition of Numbers in American Sign Language**

Rim Barioul (Technische Universität Chemnitz, Germany & CEM Research Laboratory at the National School of Engineer of Sfax, Tunisia); Ayat AlQudah (Jordan University of Science & Technology, Jordan); Bilel Ben Atitallah (Technische Universität Chemnitz & National Engineering School of Sfax, Germany); Dhouha Bouchaala (Technische Universität Chemnitz, Germany & Digital Research Center of Sfax, Tunisia); Olfa Kanoun (Chemnitz University of Technology, Germany)

**13:15 - 13:30**

## **Four Sensors Bracelet for American Sign Language Recognition based on Wrist Force Myography**

### **Four Sensors Bracelet for American Sign Language Recognition based on Wrist Force Myography**

Rim Barioul (Technische Universität Chemnitz, Germany & CEM Research Laboratory at the National School of Engineer of Sfax, Tunisia); Sameh Fakhfakh (ENIS, Tunisia); Houda Ben Jmaa Derbel (University of Sfax, Tunisia); Olfa Kanoun (Chemnitz University of Technology, Germany)

**13:45 - 14:00**

## **Wireless Sensor Network Calibration for PM10 Measurement**

### **Wireless Sensor Network Calibration for PM10 Measurement**

Marco Carratù and Matteo Ferro (University of Salerno, Italy); Jan Lundgren and Mattias O'Nils (Mid Sweden University, Sweden); Vincenzo Paciello (University of Salerno & DIn Università Degli studi di Salerno, Italy); Paolo Sommella (University of Salerno, Italy)

**14:15 - 14:30**

## **Smart App for Personal Dosimeter**

### **Smart App for Personal Dosimeter**

Alessandra Scarcelli and Alberto Amato (Politecnico di Bari, Italy); Antonella Giove (Polytechnic of Bari, Italy); Rita Dario (AOU Policlinico di Bari Italy, Italy); Domenico Soldo (MyHermes Srl & Politecnico di Bari, Italy); Alessandro Quarto (MYHERMES Srl & AeFLab - Politecnico di Bari, Italy); Vincenzo Di Lecce (Politecnico di Bari, Italy)

## Monday, June 22

**14:45 - 15:00**

### **Smart Systems and The Internet of Things (IOT) for Waste Management**

#### **Smart Systems and The Internet of Things (IOT) for Waste Management**

Claude-Noel Tamakloe and Elena Rosca (Ashesi University, Ghana)

**15:15 - 15:30**

### **Three Tiered Visual-Inertial Tracking and Mapping for Augmented Reality in Urban Settings**

#### **Three Tiered Visual-Inertial Tracking and Mapping for Augmented Reality in Urban Settings**

Thomas Calloway (University of Massachusetts in Lowell, USA); Dalila B. Megherbi (University of Massachusetts, Lowell, USA)

**15:45 - 16:00**

### **Real Time Data Communication for Intelligent Extended Reality Applications**

#### **Real Time Data Communication for Intelligent Extended Reality Applications**

Ahmet Köse, Aleksei Tepljakov and Eduard Petlenkov (Tallinn University of Technology, Estonia)