



5th Cyber Security In Networking Conference - CSNet'21

Technical Sponsors



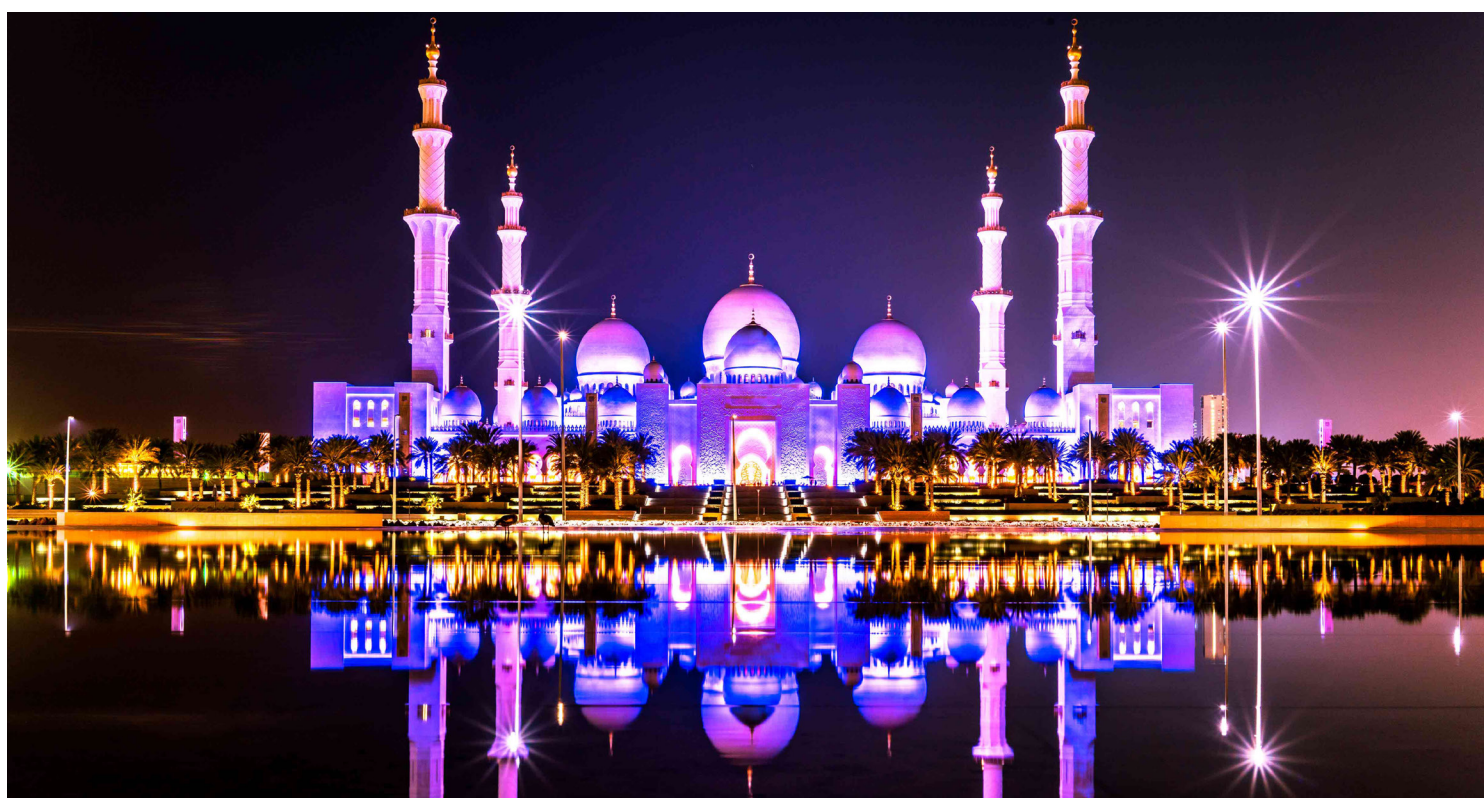
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DNAC



Program CSNet 2021

Time (GST)	Tuesday, Oct 12	Wednesday, Oct 13	Thursday, Oct 14
10:00		<u>Tutorial</u>	
11:00	Opening Ceremony		Demo Papers Session
11:15			
11:30	<u>Keynote #1</u>		
12:00		Invited Talk I	Invited Talk II
12:30	Lunch Break	Lunch Break	Lunch Break
14:00	Technical Session #1 Blockchain I	Technical Session #3 Artificial Intelligence and Cybersecurity I	Technical Session #5 Attack techniques and detection
15:20	Coffee Break	<u>Keynote #2</u>	<u>Keynote #3</u>
15:40	Technical Session #2 Blockchain II		
16:20		Coffee Break	Coffee Break
16:40		Technical Session #4 Blockchain II	Technical Session #6 Artificial Intelligence and Cybersecurity II
17:00			
17:20	Closing & Awards		
20:00	Gala dinner		





CSNet 2021 Welcome Message

Welcome from the Chairs of CSNet 2021

It is our great pleasure to welcome you to the 5th International Conference on Cyber Security in Networking (CSNet 2021), which will take place from 12th October to 14th October 2021 in Abu Dhabi, UAE as a Hybrid Conference allowing in-person and remote participation.

Since its creation in 2017, CSNet has been a premier annual conference that covers advances in the area of Cybersecurity.

Our objective is to seek participation from academic researchers and doctoral students, but also from industry and any other government and independent institutions to discuss the latest advances in the cybersecurity area. The novelty this year is that we open several tracks in the cybersecurity area. Each track will be managed by a specialized researcher to cover advanced topics in the area of the track. CSNET 2021 will offer to its attendees a variety of attractive sessions, including technical presentations, keynotes, and demonstrations.

CSNet 2021 will accommodate an attractive technical program that features:

Three Keynotes

- *Conciling privacy rights with security needs*, by **Maryline Laurent** (Télécom SudParis, France)
- *End-2-End Security and Resilience in Cyber-Physical and Autonomous Systems*, by **Shreekant (Ticky) Thakkar** (Chief Researcher at Technology Innovation Institute, UAE)
- *Why doesn't cybersecurity work?*, by **Solange Ghernaouti** (Swiss Cybersecurity Advisory & research Group, University of Lausanne)

Tutorial

- *Trust on Wheels – Towards Trust Management in the Internet of Vehicles*, by **Adnan Mahmood** (Postdoctoral Research Fellow, Department of Computing, Macquarie University, Australia)

Invited Talks

- *Security on Drones Swarm Communication: Trends and challenges*, by **Martin Andreoni** (TII, UAE)
- *The Internet of Edges : a new solution for cybersecurity*, by **Khalidoun Al Agha** (Paris-Saclay University and Green Communications, France)

Six Technical Sessions and one Demo Session

CSNet 2021 is technically sponsored by the IEEE Communications Society and organized by DNAC and Zayed University. We are indebted to the members of the Organizing Committee who helped us preparing an excellent program involving international leading experts. We duly thank all authors who submitted their research work to the conference as well as the international experts who provided high-quality reviews, allowing us to select the best technical contributions.

We wish that all attendees of CSNet 2021 will benefit from very fruitful discussions and excellent presentations of innovative research ideas.

We are deeply honored to organize CSNet 2021 in Abu Dhabi, UAE and we are looking forward to meeting you either in person or virtually!



Frédéric Cuppens
(Polytechnique Montreal,
Canada)



Ahmad Samer Wazan
(Zayed University, UAE)



Omar Alfandi
(Zayed University, UAE)



CSNet 2021 Keynote Speakers

**Maryline Laurent**

(Télécom SudParis, France)

"Conciling privacy rights with security needs"

Maryline Laurent is Full Professor with Télécom SudParis, Institut Polytechnique de Paris. After taking the lead of the research team R3S (Network, Systems, Services, Security) of the CNRS SAMOVAR lab in 2013 for 7 years, she currently heads the RST department (Telecommunication Networks and services) of Télécom

SudParis.

She is co-founder of the multidisciplinary research chair of Institut Mines-Télécom "Values and Policies of Personal Information". She is also associate editor of Annals of Telecommunication journal and Security and Communication Networks. She is editor of several books including "Digital Identity Management" and guest editor of several special issues in the privacy area.

She has supervised 20 Ph.D. theses and she has published more than a hundred papers in highly ranked international journals and conferences. Her research topics are related to network security and privacy mechanisms, including protocols and functions, applied to clouds, the Internet of Things, and identity management. She is expert for European Commission (H2020), and French ANR research agency.

Abstract: *Privacy is regularly violated by states to keep control and power, by platforms to make money, and develop their business... On the other end, security is needed, e.g. for tracking down criminals, harassers, for thwarting terrorism attacks. Moreover, the original purpose for which a technological solution is developed is often diverted to serve other purposes and interests, which are generally not in favor of privacy, e.g. face recognition to detect the non-wearing of mask, or worse to identify individuals as part of an ethnic group.*

This keynote addresses the positioning of privacy vs security, in terms of rights and needs and scientific properties. Discussions are then conducted about the technologies able to conciliate privacy rights with security needs, and the idea to lock the originally intended uses of a solution by the technologies to ensure that no diversion is possible. An introduction to the multidisciplinary Institut Mines-Telecom chair Values and policies of personal information is also presented with several covered research topics and results.

**Shreekant (Ticky) Thakkar**

(Technology Innovation Institute, UAE)

"End-2-End Security and Resilience in Cyber-Physical and Autonomous Systems"

Dr. Shreekant (Ticky) Thakkar is Chief Researcher at the Secure Systems Research Centre at the Technology Innovation Institute (TII), a cutting-edge UAE-based scientific research centre. He is responsible for carrying out advanced research that makes the planet safer and more secure, with a focus on providing end-to-end security and resilience in cyber-physical and autonomous systems.

Dr. Thakkar's career is punctuated by industry firsts and successes that have strengthened revenue, profit, and competitive advantage for Fortune 500 firms, as well as start-ups and entrepreneurial divisions.

Dr. Thakkar is a hands-on leader with an invaluable blend of strategy development and tactical execution; an implementer and dedicated "doer" who delivers corporate vision by building, leading, mentoring and supporting highly effective, diverse, and collaborative advanced development, engineering/ software engineering teams across different geographies.

Before taking on his current role, Dr. Thakkar was Chief Scientist and Executive Vice President of Engineering and Technology at DarkMatter, a cyber-security leader based in the UAE. In this capacity, he was instrumental in developing an engineering organization of 500 people from a startup team in four geographical locations, delivering two generations of innovative secure smartphones and applications, and a secure VPN appliance that contributed significantly to the company's annual revenue.

In prior roles in the United States, he served as Chief Solutions Architect at Qualcomm Data Technologies, and as the Chief Technology Officer in the Personal Computing Group, and as Vice President and Fellow at HP's Emerging Computing Lab.

Earlier in his career, he completed 21 years at Intel Corporation in roles including Intel Fellow and Chief Systems Architect – Mobile Systems Technologies.

Dr. Thakkar holds a PhD and an MSc, both in Computer Science, from the University of Manchester (UK). He also earned a BSc in Computer Science and Statistics from University College London. He holds more than 83 patents and has published 31 technical papers and over 4,700 citations in Google Scholar.

Abstract: *Cyber-Physical and Autonomous Systems have become the only solution to manage the increasingly prevalent Internet of Things (IoT) ecosystems, in areas such as smart cities, transportation, and surveillance, where devices can number in the hundreds of thousands. The scale and control of these systems are beyond human ability, where unsupervised connectivity potentially exposes an alarming number of security vulnerabilities with potential catastrophic impacts on citizens, cities, or even national infrastructures if compromised.*

At TII's SSRC, we have created a fully autonomous system that manages a swarm of drones to carry out dedicated missions. This system has built into it end-to-end security and resilience – designed from basic building blocks – and this is pervasive throughout the whole system. The talk will describe the research and development that we are undertaking with our academic and industry partners to achieve this vision.

Many different technologies are used including machine learning, trusted execution environments, hypervisors, hardware root of trust, functional encryption to protect privacy, secure (including mesh) communications, and hardened software stacks (including secure development methodologies). All our building blocks are built on open-source hardware and software with total transparency and modularity to ensure that security is pervasive.

Our goal is to enable new usage models in Cyber-Physical and Autonomous Systems that enhance the lives of people with confidence in safety. This keynote will describe the challenges and opportunities in enabling security and resilience in such systems.



Solange Ghernaouti
(Swiss Cybersecurity Advisory & research Group,
University of Lausanne)

"Why doesn't cybersecurity work?"

Solange Ghernaouti, director Swiss Cybersecurity Advisory and Research Group, professor of the University of Lausanne is an active independent cybersecurity advisor, an influential analyst and a regular media commentator. She offers strategic and practical advice, targeted research, and education in Cybersecurity, Cybercrime, Cyberdefence, Cyberpower and Artificial Intelligence related issues.

Solange holds a PhD in Computer Science & Telecommunication (Paris VI University), is a former auditor of the Institute of Advanced Studies in National Defence. She has authored more than 300 publications and thirty books including "Cyberpower: Crime, Conflict and Security in Cyberspace" (translated in China). Professor Ghernaouti is Chevalier de la Légion d'Honneur, a member of the Swiss Commission for UNESCO, a member of the Swiss Academy of Sciences and has been recognised by the Swiss press as one of the outstanding women in professional and academic circles.

Abstract: *The news regularly reports incidents and problems related to poor cybersecurity. It is clear that the measures put in place are not sufficiently effective to counter risks and cyberattacks.*

Looking at the reasons for cybersecurity failures in a holistic way allows us to better understand the situations faced by individuals, organizations, and States and to propose perspectives and levers of action to contribute to making cybersecurity efficient and effective for all.

CSNet 2021 Tutorial



Adnan Mahmood
(Macquarie University, Australia)

"Trust on Wheels – Towards Trust Management in the Internet of Vehicles"

Adnan Mahmood is a Postdoctoral Research Fellow with the Department of Computing, Macquarie University, Australia. Before moving to Macquarie University, Adnan has spent a considerable number of years in diverse academic and research settings of the Republic of Ireland (where he has carried research on a project funded under the auspices of the Science Foundation Ireland Research Centre for Future Networks and Communications), Malaysia, Pakistan, and People's Republic of China. Adnan, over the years, has produced several publications in the form of refereed book chapters, journal articles, and conference papers. He further serves on the Technical Program Committees of several reputed international conferences. Adnan's research interests include, but are not limited to, the Internet of Things, the Internet of Vehicles, trust management, software-defined networking, cloud computing, edge/fog computing, and next-generation heterogeneous wireless networks. He is a member of the IEEE, IET, and the ACM.

Abstract: *The aim of this tutorial is to bring forth the essence of the notion of 'trust' in the context of the Internet of Vehicles (IoV) along with highlighting salient trustworthiness attributes which are indispensable for ascertaining the trust of a particular vehicle in an IoV network. In addition to the same, issues around optimally aggregating the trust attributes for ascertaining an accurate trust score of a vehicle and challenges pertinent to both static and dynamic thresholds are employed for determining if a vehicle is categorized as trustworthy or untrustworthy in nature would be discussed.*

The tutorial would also highlight several sorts of malicious attacks which could adversely impact a trust-based IoV network along with their respective mitigation techniques. Open research challenges in the subject domain would be discussed too. By the end of this short tutorial, the audience would be equipped with the necessary skill set which would subsequently allow them to do critical thinking for devising intelligent trust models on their own.





CSNet 2021 Program - Tuesday, October 12

11:15-11:30 Opening Ceremony

11:30-12:30 Keynote 1: Conciling privacy rights with security needs

Maryline Laurent (Télécom SudParis, France)
Chaired by: Farkhund Iqbal (Zayed University, UAE)

12:30-14:00 Lunch Break

14:00-15:20 TS 1: Blockchain I

Chaired by: Asad Khattak (Zayed University, UAE)

Innovative Countermeasures to Defeat Cyber Attacks Against Blockchain Wallets

Pascal Urien (Telecom Paris, France)

C4M: A Partition-Robust Consensus Algorithm for Blockgraph in Mesh Network

David Cordova Morales (LIP6, France); Pedro B. Velloso (Universidade Federal do Rio de Janeiro (UFRJ), France & LIP6, Sorbonne Université, France); Alexandre Laube (Université Pierre et Marie Curie, France); Thi Mai Trang Nguyen (Sorbonne Université & LIP6, France); Guy Pujolle (Sorbonne University & Green Communications, France)

A Secure Blockchain-Based Architecture for the COVID-19 Data Network (Short Paper)

Darine Al-Mohtar (Lebanese University, Faculty of Technology, Lebanon); Amani Ramzi Daou (Lebanese University Faculty of Technology, Lebanon); Nour El Madhoun (EPITA Engineering School, France); Rachad Maallawi (France)

15:20-15:40 Coffee Break

15:40-17:00 TS 2: Blockchain II

Chaired by: Farkhund Iqbal (Zayed University, UAE)

Blockchain-Based Authentication and Registration Mechanism for SIP-Based VoIP Systems

Murwan Abdelrazig Abubakar (Edinburgh Napier University, United Kingdom (Great Britain)); Zakwan Jarouchah (Edinburgh Napier University & School of Computing, United Kingdom (Great Britain)); Ahmed Y Al-Dubai and Bill Buchanan (Edinburgh Napier University, United Kingdom (Great Britain))

State of the Art: Cross Chain Communications

Pedro B. Velloso (Universidade Federal do Rio de Janeiro (UFRJ), France & LIP6, Sorbonne Université, France); David Cordova Morales (LIP6, France); Thi Mai Trang Nguyen (Sorbonne Université & LIP6, France); Guy Pujolle (Sorbonne University, France)

20:00 Gala Dinner

CSNet 2021 Program - Wednesday, October 13

10:00-12:00 Tutorial: Trust on Wheels – Towards Trust Management in the Internet of Vehicles

Adnan Mahmood (Department of Computing, Macquarie University, Sydney, Australia)

Chaired by: Guy Pujolle (Sorbonne University, France)

12:00-12:30 Invited Talk I: Security on Drones Swarm Communication: Trends and challenges

Martin Andreoni (TII, UAE)

Chaired by: Liza Ahmad (Zayed University, UAE)

12:30-14:00 Lunch Break

14:00-15:20 TS 3: Artificial Intelligence and Cybersecurity

Chaired by: Abdul Kadhim Hayawi (Zayed University, UAE)

Authenticating IDS Autoencoders Using Multipath Neural Networks

Raphaël Larsen (IMT Atlantique, France); Marc-Oliver Pahl (IMT Atlantique, France & Technical University of Munich, Germany)

Mitigation of Poisoning Attack in Federated Learning by Using Historical Distance Detection

Zhaosen Shi, Xuyang Ding, Fagen Li, Yingni Chen and Canran Li (University of Electronic Science and Technology of China, China)

Advances in ML-Based Anomaly Detection for the IoT (Short Paper)

Christian Lübken (Technical University of Munich, Germany); Marc-Oliver Pahl (IMT Atlantique, France & Technical University of Munich, Germany)

15:20-16:20 Keynote 2: End-2-End Security and Resilience in Cyber-Physical and Autonomous systems

Shreekanth (Ticky) Thakkar (TII, UAE)

Chaired by: Ahmad Samer Wazan (Zayed University, UAE)

16:20-16:40 Coffee Break

16:40-17:05 TS 4: Network Security

Chaired by: Nour El-Madhoun (EPITA, France)

Inferring Legacy IoT Device Behavior over a Layer 2 TLS Tunnel

Rodrigo Caldas (FEUP & INESC TEC, University of Porto, Portugal); Carlos Novo (INESC TEC, University of Porto, Portugal); Ricardo Morla (INESC Porto and Faculty of Engineering, University of Porto, Portugal); Luis Cruz, Antonio Carvalho and David Campelo (Bosch Security and Safety Systems, Portugal)



CSNet 2021 Program - Thursday, October 14

11:00-12:00 Demo Papers Session

Chaired by: Asad Khattak (Zayed University, UAE)

Real Time Detection of Social Bots on Twitter Using Machine Learning and Apache Kafka

Eiman Alothali (United Arab Emirates University, United Arab Emirates); Hany Alashwal (United Arab Emirates University & College of Information Technology, United Arab Emirates); Motamen Salih (American University of Sharjah, United Arab Emirates); Abdul Kadhim Hayawi (Zayed University, United Arab Emirates)

Blockchain-Based Secure CIDS Operation

Imran Makhdoom (University of Technology Sydney, Australia); Abdul Kadhim Hayawi (Zayed University, United Arab Emirates); Mohammed Kaosar (Murdoch University, Australia); Sujith Samuel Mathew (Zayed University, United Arab Emirates); Mohammad Mehedy Masud (United Arab Emirates University & College of Information Technology, United Arab Emirates)

AI Based Login System Using Facial Recognition

Asad Khattak, Siem Girmay and Faniel Samsom (Zayed University, United Arab Emirates)

12:00-12:30 Invited Talk II: The Internet of Edges : a new solution for cybersecurity

Khalidoun Al Agha (Paris-Saclay University and Green Communications, France)

Chaired by: Fatima Alharbi (Zayed University, UAE)

12:30-14:00 Lunch Break

14:00-15:20 TS 5: Attack techniques and detection

Chaired by: Mohammed Badra (Zayed University, UAE)

Incremental Code Updates Exploitation as a Basis for Return Oriented Programming Attacks on Resource-Constrained Devices

Abdelaziz Saad (IHP GmbH & Brandenburg University of Technology Cottbus-Senftenberg, Germany); Kai Lehniger (IHP GmbH, Germany); Peter Langendoerfer (IHP Microelectronics, Germany)

Forensic Analysis of the Cisco WebEx Application

Zainab Khalid (National University of Science and Technology, Pakistan); Farkhund Iqbal and Mohammed Hussain (Zayed University, United Arab Emirates); Faouzi Kamoun (ESPRIT, Tunisia); Liaqat Ali (Air University, Pakistan)

Modelling Evasive Malware Authoring Techniques (Short Paper)

Mathew Nicho Nicho and Maitha Alkhateri (Zayed University, United Arab Emirates)

15:20-16:20 Keynote 3: Why doesn't cybersecurity work?

Solange Ghernaouti (Swiss Cybersecurity Advisory & research Group, University of Lausanne, Switzerland)

Chaired by: Asad Khattak (Zayed University, UAE)

16:20-16:40 Coffee Break

16:40-17:20 TS 6: Artificial Intelligence and Cybersecurity II

Chaired by: Mohammed Badra (Zayed University, UAE)

Intrusion Detection Systems in In-Vehicle Networks Based on Bag-Of-Words

Gianmarco Baldini (Joint Research Centre – European Commission, Italy)

Classification of Malicious and Benign Websites by Network Features Using Supervised Machine Learning Algorithms (Short Paper)

Sanaa Kaddoura (Zayed University, United Arab Emirates)

17:20-17:30 Closing ceremony/Award

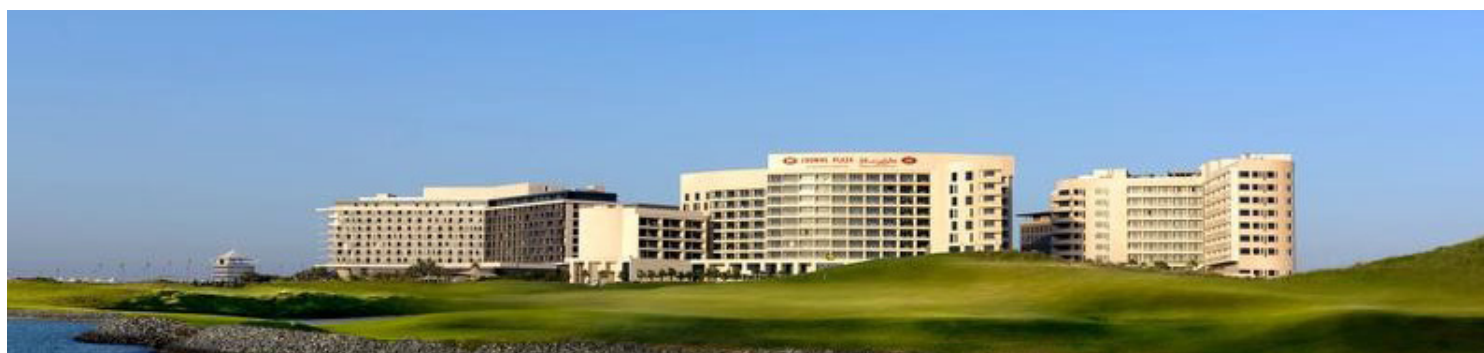




CSNet 2021 Venue

The conference will take place at

Crowne Plaza Hotel
Yas Island, Abu Dhabi,
United Arab Emirates





Executive Chairs:



Abdelmalek Benzekri
(IRIT, Université Paul Sabatier, Toulouse, France)



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(Polytechnique Montreal, Canada)



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(Zayed University, UAE)



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TPC Chairs:



Monther Aldwairi
(Zayed University, UAE)



Mohamad Badra
(Zayed University, UAE)



Michele Nogueira
(Federal University of Minas Gerais, Brazil)

Tracks Chairs:

Track 1: Cyber Security in Vehicular Networks



Nadjib Aitsaadi
(UVSQ – Paris Saclay, France)

Track 2: Cyber Security of Virtual infrastructures



Romain Laborde
(IRIT, France)



Makan Pourzandi
(GFTL ER Security, Canada)

Track 3: Blockchain



Rida Khatoun
(Polytechnic Institute of Paris, France)

Track 4: Cyber Security of Critical Infrastructures



Marc-Oliver Pahl
(IMT-Atlantique, France)

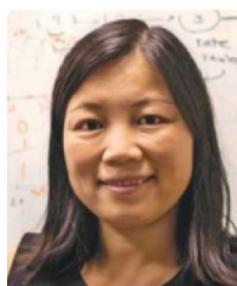


Track 5: Network security



Jérôme François
(INRIA Nancy Grand Est, France)

Keynotes Chairs:



Carol Fung
(Virginia Commonwealth University, USA)



Munir Majdalawieh
(Zayed University, UAE)

Track 6: Usability-Security track



Philippe Palanque
(Paul Sabatier University, France)



Fatima AlHarbi
(Zayed University, UAE)

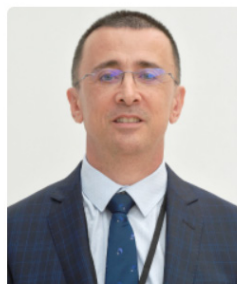
Track 7: Forensic track



Jenny Torres
(Escuela Politécnica Nacional, Ecuador)



Farkhund Iqbal
(Zayed University, UAE)



Joao Negreiros
(Zayed University, UAE)



Mohammad Amin Kuhail
(Zayed University, UAE)

Tutorial Chairs:

Track 8: Cyber Security for the Navy



Jiang Shengming
(Shanghai Maritime University, China)



Abdul Kadhim Hayawi
(Zayed University, UAE)



Asad Khattak
(Zayed University, UAE)

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Publication Chairs:



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(EPITA, France)



Fatma Taher
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Mohammed Hussain
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Aziza Lounis
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Publicity Chairs:

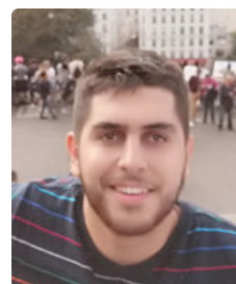


Liza Ahmad
(Zayed University, UAE)



Thi-Mai-Trang Nguyen
(Sorbonne University, France)

Web & Broadcasting Chair:



Elia Kallas
(DNAC, France)



Jiang Shengming
(Shanghai Maritime University, China)





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Fen Zhou (IMT Lille Douai, Institut Mines-Télécom, University of Lille,
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Jason Zurawski (Energy Sciences Network, USA)

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Samia Bouzeffrane (CNAM, France)

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.



Notes

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