

# IEEE DRCN 2024

## AGENDA

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It is our great pleasure to welcome you to the 20th edition of DRCN the “**International Conference on the Design of Reliable Communication Networks**” which will take place on **May 6-9 2024**, in Montreal, Québec, Canada.

Since its creation in 1998, DRCN has become over the years a well-established forum for scientists from both industry and academy who have interest in reliability and availability of telecommunication networks, or other resilience-related topics. The aim of the conference is to bring together people from various disciplines, ranging from engineering of survivable equipment and network technologies to network management and monitoring, through methods and models for survivable and robust network design.

The conference program will put together many different activities, including keynotes from outstanding speakers, technical sessions with regular and demo papers, co-located workshops in topics within the conference field, tutorials is highly interesting topics and panel discussions. The DRCN 2024 conference is technically Co-Sponsored by the IEEE Communications Society.

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**DRCN 2024**



Monday, May 6 2024

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9:30AM - 10:30AM

## Keynote 1

### **Using Machine Learning in Network Security: A New Investigation of Adversarial Evasion Attacks**

Dr. Ashraf Matrawy

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10:30AM - 10:45AM

## COFFEE BREAK

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10:45AM - 12:30PM

## Workshop 1

### **Toward a Secure Healthcare Ecosystem: A Convergence of Edge Analytics, Blockchain, and Federated Learning**

*Elarbi Badidi (UAE University, United Arab Emirates); Hanane Lamaazi (CIT, UAE University, United Arab Emirates); Omar El Harrouss (UAEU, United Arab Emirates)*

### **Satisfying Least Privilege through Database Decomposition**

*Fabrizio Baiardi (Università di Pisa, Italy); Cosimo Comella (Garante Protezione Dati Personali, Italy); Vincenzo Sammartino (Università di Pisa & UNIPI, Italy)*

### **Use case of ML-Algorithm to effectively detect malignant breast tumors without compromising medical data privacy**

*Antonios Ntib (Technische Universität Braunschweig & AEGIS IT RESEARCH, Germany); Panagiotis Katrakazas (Zelus PC & National Technical University of Athens, Greece); Evangelia Panourgias (National and Kapodistrian University of Athens, Greece); Vassilis Prevelakis (Technische Universität Braunschweig, Greece)*

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12:30PM - 1:30PM

## LUNCH BREAK

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1:30PM - 2:45PM

## Workshop 2

## **An Exemplification of Decisions of Machine Learning Classifiers to Predict Handover in a 5G/4G/3G Cellular Communications Network**

*Ashraf A Tahat (Princess Sumaya University for Technology, Jordan); Farah Wahhab (Mobile Access Network Engineering, Orange Jordan Telecom Group, Jordan); Talal A. Edwan (The University of Jordan, Jordan)*

## **LEO Satellite Constellations with 5G and 6G Networks for Enhanced IoT and PV System Performance**

*Ali Bostani, Amir Baniamerian, Ashraf A Zaher, Mohammad Alshammari*

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6:00PM - 8:00PM

### **Welcome Reception**

 *faculty lounge, 4th floor*

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Tuesday, May 7 2024

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9:15AM - 9:30AM

### **Opening remarks**

*Dean Mourad Debbabi*

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9:30AM - 10:30AM

*Chair: Pin Han Ho*

### **Keynote 2**

#### **A Framework for Robustness-Resilience of Network**

*Prof. dr. Ir. Piet Van Mieghem*

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10:30AM - 10:45AM

### **COFFEE BREAK**

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10:45AM - 12:30PM

*Session chair: Dimitrios Manias*

### **SDN and NFV**

#### **On the Impact of Flooding Attacks on 5G Slicing with Different VNF Sharing Configurations**

*Abdulaziz Abdulghaffar; Mohammed Mahyoub; Ashraf Matrawy*

#### **Towards Robust Slice Control in SDN Enabled WiFi based IoT Networks**

*Dawid Kulikowski; Kamran Zia; Alessandro Chiumento; Paul Havinga*

#### **Multi-Objective Optimization for Managing Disruption Risk in SDN (Invited)**

*Sara Taghavi Motlagh, Amin Ibrahim and Shahram Shah Heydari (University of Ontario Institute of Technology, Canada); Khalil El-Khatib (Ontario Tech University, Canada)*

**Normal and Resilient Mode FPGA-based Access Gateway Function Through P4-generated RTL**

*Mostafa Abbasmollaei; Tarek Ould-Bachir; Yvon Savaria  
Normal and Resilient Mode FPGA-based Access Gateway Function Through P4-generated RTL  
Mostafa Abbasmollaei; Tarek Ould-Bachir; Yvon Savaria*

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12:30PM - 1:30PM

**LUNCH BREAK**

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1:30PM - 2:30PM

**Keynote 3**

*Chair: Abdelhak Bentaleb*

**Understanding the Role of Peer-to-Peer Networks in Blockchain Technology**

*Dr. Jeremy Clark*

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2:30PM - 3:30PM

*Session chair: Teresa Gomes*

**Network Survivability and Reliability 1**

**Robust Virtual Network Function Optimization Under Post-Failure Uncertainty: Classical & Quantum Computing**

*Mahzabeen Emu; Salimur Choudhury; Kai Salomaa*

**Analytical approximation for ATTR with respect to node removals**

*Fenghua Wang; Jinyi Zou; Robert E. Kooij*

**Probabilistic Fault-Tolerant Robust Traffic Grooming in OTN-over-DWDM Networks**

*Dimitrios M Manias; Joe Naoum-Sawaya; Abbas Javadtalab; Abdallah Shami*

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3:30PM - 3:45PM

**COFFEE BREAK**

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3:45PM - 5:00PM

## Tutorial 1

### How to design a reliable network - the 3GPP design process

*Dr. Alf Zugenmaier*

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5:00PM - 6:00PM

*Session chair: Ashraf Matrawy*

## Security and AI - 1

### **BETAC: Bidirectional Encoder Transformer for Assembly Code Function Name Recovery (Invited)**

*Guillaume Breyton, Mohd Saqib and Benjamin C. M. Fung (McGill University, Canada); Philippe Charland (Defence R&D Canada - Valcartier, Canada)*

### **Towards Intent-Based Network Management: Large Language Models for Intent Extraction in 5G Core Networks (Invited)**

*Dimitrios M Manias, Ali Chouman and Abdallah Shami (Western University, Canada)*

### **Using AI to Detect Android Malware Families (Invited)**

*Saed Alrabaee (United Arab Emirates University, United Arab Emirates); Mousa Al-kfairy (Zayed University, United Arab Emirates); Mohammad M Bany Taha (American University of Madaba, Jordan & AUM, Jordan); Omar Alfandi (Zayed University, United Arab Emirates); Fatma Taher (Dubai, UAE & Zayed University, United Arab Emirates); Ahmed Hashem El Fiky (VERN' University of Applied Sciences, Egypt)*

Wednesday, May 8, 2024

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9:30AM - 10:30AM

*Chair: Chadi Assi*

## Keynote 4

**The Disruptive Side of 6G: NTN (Non-Terrestrial Networks)**

*Dr. Halim Yanikomeroglu*

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10:30AM - 10:45AM

## COFFEE BREAK

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10:45AM - 11:45AM

*Chair: Khalil El Khatib*

## Network Survivability and Reliability 2

**Analytical Model for Assessing Unavailability in Middleboxes with Multiple Backup Servers under Shared Protection**

*Naohide Wakuda; Nozomi Kita; Ryuta Shiraki; Eiji Oki*

**Advancing Network Survivability and Reliability: Integrating XAI-Enhanced Autoencoders and LDA for Effective Detection of Unknown Attacks**

*Fatemeh Stodt; Fabrice Theoleyre; Christoph Reich*

**Dynamic Restoration Assessment in Partially Upgraded Networks from the C to the C+L bands**

*Soheil Hosseini; Ignacio de Miguel; Oscar González de Dios; Noemí Merayo; Juan Pedro Fernández-Palacios; Ramón J. Durán Barroso*

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11:45AM - 12:45PM

*Chair: Fadi Alzhouri*

## Vehicular/IoT Networking

**Application of HFrFT-OFDM to IEEE 802.11bd Performance Enhancement for Vehicle-to-vehicle Communication in High Speed Conditions**

*Mohammad Reza Mousavi; Stephan Ludwig*

**BNART: A Novel Centralized Traffic Management Approach for Autonomous Vehicles (Invited)**

*Dariush Ebrahimi (Wilfrid Laurier University, Canada); Govind Sudarshan (Lakehead University, Canada); Fadi Alzhouri (Concordia University, Canada)*

**High-Availability in IoT Applications through Dual Connectivity: Integrating LoRaWAN and NB-IoT**

*Manuel Utsch; Björn Böckling; Wolfgang Kiess; Thomas Bauschert; Andreas Baumgartner; Sebastian Baumgartner*

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12:45PM - 2:00PM

**LUNCH BREAK**

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2:00PM - 3:30PM

*Session chair: Teresa Gomes*

**Tutorial 2**

**Unveiling the Potential of the PiOT Simulation System**

*Dr. Brunilde Sansò*

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3:30PM - 3:45PM

**COFFEE BREAK**

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3:45PM - 5:00PM

*Session Chair: Chadi Assi*

**Cellular Technologies**

**Combined Airspace and Non-Terrestrial 6G Networks for Advanced Air Mobility**

*Aunas Manzoor; Mustafa Ozger; Dominic A. Schupke; Cicek Cavdar*

**DDPG-Based Link Adaptation for Direct Air-to-Underwater Optical Communication Under Noisy CSI Conditions (Invited)**

*Imene Romdhane and Ziyaur Rahman (Ecole de Technologie Supérieure, Canada); Georges Kaddoum (ETS Engineering School, University of Québec, Canada)*

**Imperfect SIC for NOMA Communications Under Nakagami-m Fading: Comparison of RIS and Relay**

*Jinyuan Gu; Mingxing Wang; Wei Duan; Lei Zhang; Huaiping Zhang*

## Reliability Assurance in RIS-assisted 6G Campus Networks

*Ehsan Tohidi; Max Franke; Cao Vien Phung; Naveed Ali Khan KaimKhani; André C Drummond; Stefan Schmid; Admela Jukan; Slawomir Stanczak*

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## Banquet

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Thursday, May 9, 2024

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9:30AM - 10:30AM

*Chair: Jun Yan*

### Keynote 5

**Navigating Future Horizons: Exploring the potential of Quantum Computing and Quantum Machine Learning in Communication Networks**

*Dr. Soumaya Cherkaoui*

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10:30AM - 10:45AM

### COFFEE BREAK

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10:45AM - 11:45AM

*Session Chair: Nathalie Wehbe*

### Security and AI - 2

**On the Impact of the RPL Decreased Rank Attack on 6TiSCH Networks**

*Mohammed Mahyoub; Sazzad Hossain; Ashraf Matrawy*

**Covert Communication by Exploiting Error-Correcting Codes**

*Alon Marzin; Moshe Schwartz; Michael Segal*

**Advancing Network Resilience through Data Mining and AI in Cybersecurity**

*Nusrat Samia; Sajal Saha; Anwar Haque*



11:45AM - 12:45PM

*Session Chair: Sandra  
Cespedes*

## AI and Web Technologies

### **QUICwand: A Machine Learning Optimization-based Hybrid Defense Approach Against QUIC Flooding Attacks**

*Y A Joarder and Carol J Fung*

### **(GWO-Boosted Multi-Attribute Client Selection for Over-The-Air Federated Learning**

*Maryam Ben driss; Essaid Sabir; Halima Elbiaze;  
Abdoulaye Diallo; Mohamed Sadik*

### **BML<sup>^</sup>3: Accurate Bandwidth Measurement for QoE Optimization in Low Latency Live Streaming**

*Abdelhak Bentaleb; Sarra Hammoudi*

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12:45PM - 2:00PM

## LUNCH BREAK

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2:00PM - 3:30PM

### Tutorial 3

#### **5G security: an overview**

*Dr Makan Pourzandi*

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3:30PM - 3:45PM

## COFFEE BREAK

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3:45PM - 4:45PM

*Session Chair: Mohammad  
Sayed*

## Network Survivability and Reliability 3

### **Fault-tolerant Network Design for Bounded Delay Data Transfer from PMUs to Control Center**

*Arunabha Sen; Christopher Sumnicht; Suli Adeniyee; Dev  
Dipak Patel; Sandipan Choudhuri*

### **On Board-level Failure Localization in Optical Transport Networks Using Graph Neural Network**

*Yan Jiao; Pin-Han Ho; Xiangzhu Lu; János Tapolcai; Limei  
Peng*

### **Optimal and Reliable Routing for Multicast Sessions in WDM Networks**

*Maria Samonaki; Carmen Mas-Machuca*

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## Wrap-UP