People's Democratic Republic of Algeria
Ministry of Higher Education and Scientific Research
Setif 1 University - Ferhat ABBAS
Faculty of Sciences

2024 INTERNATIONAL CONFERENCE ON INFORMATION AND COMMUNICATION TECHNOLOGIES FOR DISASTER MANAGEMENT

ICT-DM 2024

November 19th–21st 2024

https://ict-dm2024.univ-setif.dz/

LRSD

Laboratory of Networks and Distributed Systems

Welcome Message from the General Chairs

Houssem Mansouri
Setif 1 University, Algeria

Soufiene Djahel
Coventry University, UK

Welcome to the 2024 International Conference on Information and Communication Technologies for Disaster Management (ICT-DM) in its 9th edition, taking place for the first time in the beautiful and historic city of Setif. ICT-DM has firmly established itself as a premium venue for the dissemination of revolutionary state of art knowledge and technologies pertaining to Disaster Management. Since its inception, it has been offering a stimulating, live environment for discussing new research directions, discoveries and results among professionals from industry and academia along with policy makers and it has been nurturing fruitful exchange of ideas and positive critics among ICT and Disaster Management experts.

After eight previous successful editions held in different countries starting in Algiers (2014, Algeria), passing by Rennes (2015, France), Vienna (2016, Austria), Munster (2017, Germany), Sendai (2018, Japan), Paris (2019, France), Hangzhou (2021, China), and Cosenza (2023, Italy), the ninth edition of ICT-DM has landed in Setif.

In this edition, we have made the best possible arrangements to make ICT-DM 2024 a very successful event. Through the dedication of the organizing committee members and the support of more than 80 TPC member, we have selected, after a very rigorous review process, a number of high-quality and high-impact papers for presentation at the conference.

Program

19th November 2024, Tuesday		
08:30 - 17:00	Registration	Reception Hall
09:00 - 09:30	Opening Ceremony	Room 1
09:30 - 10:30	Keynote 1	Room 1
10:30 - 11:00	Coffee Break	Lobby
11:00 - 12:40	Tutorial 1	Room 1
11:00 - 12:40	Technical Session 1	Room 2
12:40 - 14:00	Lunch	Lobby
14:00 - 15:00	Keynote 2	Room 1
15:00 - 15:30	Coffee Break	Lobby
15:30 - 17:10	Technical Session 2, 3 and 4	Room 1, 2 and 3
20th November 2024, Wednesday		
08:30 - 17:00	Registration	Reception Hall
09:00 - 10:00	Keynote 3	Room 1
10:00 - 10:30	Coffee Break	Lobby
10:30 - 12:10	Tutorial 2	Room 1
10:30 - 12:10	Technical Session 5	Room 2
12:10 - 13:30	Lunch	Lobby
13:30 - 14:30	Keynote 4	Room 1
14:30 - 15:00	Coffee Break	Lobby
15:00 - 16:40	Technical Session 6 and 7	Room 1 and 2
19:00 - 22:00	Banquet & Award Ceremony	Bayazid Hotel
21st November 2024, Thursday		
08:30 - 11:00	Registration	Reception Hall
09:30 - 10:30	Keynote 5	Room 1
10:30 - 11:00	Coffee Break	Lobby
11:00 - 12:40	Tutorial 3	Room 1
11:00 - 12:40	Technical Session 8 and 9	Room 2 and 3
12:40 - 13:00	Closing Ceremony	Room 1
13:00 - 14:00	Lunch	Lobby
14:00 - 18:00	Visit to Local Attraction (TBC)	Djémila

Keynote 1

Performance of IoT Gateways and Edge Servers in the Presence of Cyber-Attacks

Erol Gelenbe

Polish Academy of Sciences, Polish

19th November 2024, Tuesday (09:30-10:30), Room 1

Session Chair: Yassine Hadjadj-Aoul, University of Rennes 1, France

ABSTRACT

Gateway Servers for the IoT and the Internet of Vehicles (IoV) must meet stringent Security and Quality of Service (QoS) requirements, including cyberattack protection, low delays and low packet loss, to offer secure real-time data exchange for human and vehicle safety, and efficient road traffic management. Therefore, it is vital to protect these systems from cyberattacks with adequate Attack Detection (AD) and Mitigation. Such attacks often also include packet Floods that impair QoS of the networks and Gateways, and even impede the Gateways' capability to carry out AD. Thus, this keynote first evaluates these effects using system measurements during Flood attacks. It then shows how a Smart Quasi-Deterministic Policy Forwarder (SQF) at the entrance of the Gateway can regulate the incoming traffic to ensure that the Gateway supports the AD to operate in a timely manner during an attack. Since Flood attacks also create substantial packet backlogs, we also propose a novel Adaptive Attack Mitigation (AAM) system that is activated after an attack is detected, to dynamically sample the incoming packet stream and determine whether the attack is continuing, and also drop batches of packets at the input to reduce the effects of the attack. The AAM is designed to

a cost function that includes the sampling overhead, and the cost of lost benign packets. We show experimentally that the Optimum AAM approach is effective in mitigating attacks, and present theoretical and experimental results that validate the proposed approach.

BIOGRAPHY

Prof. Erol Gelenbe, FIEEE'86, FACM'01, FIFIP'19, FRSS'20 is Professor in the Institute of Theoretical & Applied Informatics, Polish Academy of Sciences since 2017, and currently leads research on Cybersecurity & Performance Analysis, funded by the EU Horizon DOSS Project. Awarded the ACM SIGMETRICS 2008 Life-Time Award for pioneering theoretical and experimental work on computer and network system performance, Erol graduated from the Middle East Technical University (Ankara), holds a PhD from New York University (1970) and the Doctor of Science Degree from Sorbonne University (1973) in Paris. He was elected Fellow of the French National Academy of Technologies, Foreign Fellow of the National Science Academies of Belgium and Poland, Fellow of the Turkish Science Academy, and Honorary Fellow of the Science Academy of Hungary and of the Islamic Academy of Sciences, he has received three "honoris causa" doctorates from the University of Roma II (Italy) in 1996, Bogazici University, Istanbul (Turkey) in 2004, and the University of Liege (Belgium) in 2006. Recipient of scientific prizes in France, Turkey, US, UK, and Iran, he graduated 95 PhDs, and has held chaired professorships at leading institutions including Univ. of Liege (Belgium) in 1974-79, Univ. Paris-Saclay (France) in 1979-86, University Paris-Descartes (France) in 1986-1992, NJIT (USA) in 1992-93, Duke University (USA) in 1993-98, University of Central Florida (USA) in 1998-03, and Imperial College (UK) in 2003-20. Participating actively in EU Research Programs since 2003, including FP5, FP6, FP7, H2020, he was funded in the USA by NSF and ONR, and by EPSRC in the UK. He was awarded French honors of Chevalier de la Legion d'Honneur (2015) and Commandeur du Mérite (2019), Italy awarded him Commendatore al Merito della Repubblica (2005) and Grande Ufficiale della Stella d'Italia (2007), and Belgium Awarded him Commandeur de l'Ordre de la Couronne (2022). He recently received the Best Paper Awards at IEEE MASCOTS 2023 (Oct. 16, 2023) and IEEE Trustcom 2023 (Nov. 2, 2023).

Keynote 2

Connectivity Management in Unmanned Aerial Vehicular Networks for Safety-Critical Missions and Operations

Saadi Boudjit

LITIS Lab, University of Rouen Normandy, France

19th November 2024, Tuesday (14:00-15:00), Room 1

Session Chair: Nadjet Kamel, Setif 1 University, Algeria

ABSTRACT

Unmanned Aerial Vehicles (UAVs), commonly known as drones, were originally designed for military purposes. However, with advances in technology such as battery miniaturization and the standardization of communication technologies, smaller and more affordable UAVs have recently become available. These developments have enabled a wide range of civilian applications, from search-and-rescue operations to aerial photography. Many of these applications are made possible through fleets of cooperative UAVs that exchange data via multi-hop communication, enabling them to cover larger areas. However, fleets of UAVs often face frequent link failures due to their dynamic and sparse linear network architecture. In this talk, I will highlight some popular applications of UAV networks and introduce some routing solutions focusing on maintaining network connectivity to meet the real-time demands of safety-critical scenarios.

Keynote 2

BIOGRAPHY

Prof. Saadi Boudjit is member of the LITIS Lab at the university of Rouen Normandy. He used to be associate professor at the university Sorbonne Paris Nord and was a research fellow with Telecom ParisTech. He received his Ph.D degree in Computer Science from INRIA Paris where he also served as an expert engineer for 3 years. Saadi is working on wireless ad hoc architectures and was involved in several national and international research projects (QNRF NPRP8-140-2-065, THD, SoundDelta, R2M, IPANEMA, PRIMA, ... etc). He is the initiator and Co-chair of ACM MobileHealth workshop and involved in the organisation of other similar events (IEEE WiMob, IEEE ISNCC, ...). He also acted or still acts as TPC member of several IFIP, ACM and IEEE conferences and workshops (HealthCom, MobileHealth, ICC, Globecom, CAMAD, WCNC, WONS, VTC, DCOSS, ...). His research interests include wireless networks, parallel and distributed computing, protocols and architecture design for mobile ad hoc networks, wireless sensor networks, vehicular networks, and eHealth systems.

Keynote 3

Rare Event Simulation: Theory and Practice

Bruno Tuffin

INRIA, University of Rennes 1, France

20th November 2024, Wednesday (09:00-10:00), Room 1

Session Chair: Rahim Kacimi, IRIT, Paul Sabatier University, France

ABSTRACT

Since rare events are unlikely to occur, one may think that their probability evaluation may be neglected. Though the consequences of such events may be dramatic in many areas. Examples are a catastrophic failure in a transport system or in a nuclear power plant, the failure of an information processing system in a bank, or in the communication network of a group of banks, leading to financial losses, etc. Being able to evaluate the probability of rare events is therefore a critical issue.

Monte Carlo simulation methods are used to analyze rare events. This presentation will present the challenges, difficulties, and the mathematical tools available for the efficient simulation of rare events. Importance sampling and splitting will be presented along with an exposition of how to apply these tools to a variety of fields ranging from performance and dependability evaluation of complex systems, typically in computer science or in telecommunications. Recent issues related to quantile estimation and the link with extreme values will also be discussed.

Keynote 3

BIOGRAPHY

Prof. Bruno Tuffin received his PhD degree in applied mathematics from the University of Rennes 1, France, in 1997 and spent 8 months at Duke University. Since then, he has been with INRIA in Rennes and is leading the Ermine team since 2022. His research interests include developing Monte Carlo and quasi-Monte Carlo simulation techniques for the performance evaluation of telecommunication systems and telecommunication-related economical models. Overall, he has published close to two hundred papers and has written or co-written four books: Rare Event Simulation using Monte Carlo Methods, John Wiley & Sons in 2009, La simulation Monte Carlo, Editions Hermès in 2010, Telecommunication Network Economics: From Theory to Applications published by Cambridge University Press in 2014 and From Net Neutrality to ICT Neutrality, Springer, 2022. He is currently Area Editor for INFORMS Journal on Computing and Associate Editor for ACM Transactions on Modeling and Computer Simulation and Queuing Systems.

Keynote 4

Big data analytics for Natural Disaster Management

Ioannis Pitas

Department of Informatics, Aristotle University of Thessaloniki, Greece

20th November 2024, Wednesday (13:30-14:30), Room 1

Session Chair: Saadi Boudjit, University of Rouen Normandy, France

ABSTRACT

Natural Disaster Management (NDM, e.g., for wildfires, floods) can be greatly improved by automating precise semantic 3D mapping and disaster evolution prediction to achieve NDM goals in near-real-time. To this end, many heterogeneous extreme data sources must be analyzed and fused: smart drone and in-situ sensors, remote sensing data, topographical data, meteorological data/predictions and geosocial media data (text, image and videos). The lecture focus is on the extreme nature of the data, due to their varying resolution and quality, very large volume and update rate, different spatiotemporal resolutions and acquisition frequencies, real-time needs and multilingualism. Extreme data analytics can help developing an integrated, ground-breaking NDM platform, focusing on real-time semantic extraction from multiple heterogeneous data modalities and sources, on-the-fly construction of a meaningful semantically annotated 3D disaster area map, prediction of disaster evolution and improved communication between service providers and end-users, through automated process triggering and response recommendations. Semantic analysis computations will be distributed across the edge-to-cloud continuum, in a federated manner, to minimize latency. Extreme data analytics will be performed

in a trustworthy and transparent way, by greatly advancing state-of-the-art AI and XAI approaches. The constantly updated 3D map and the disaster evolution predictions will form the basis for an advanced, interactive, Extended Reality (XR) interface, where the current situation will be visualized and different response strategies will be dynamically evaluated through simulation by NDM personnel. An innovative, scalable and efficient implementation platform will provide precise NDM support, based on extreme data analytics.

BIOGRAPHY

Prof. Ioannis Pitas, IEEE fellow, IEEE Distinguished Lecturer, EURASIP fellow, received the Diploma and PhD degree in Electrical Engineering, both from the Aristotle University of Thessaloniki (AUTH), Greece. Since 1994, he has been a Professor at the Department of Informatics of AUTH and Director of the Artificial Intelligence and Information Analysis (AIIA) lab. He served as a Visiting Professor at several Universities. His current interests are in the areas of computer vision, machine learning, autonomous systems, intelligent digital media, image/video processing, human-centred computing, affective computing, 3D imaging and biomedical imaging. He has published over 970 papers, contributed to 46 books in his areas of interest and edited or (co-)authored another 15 books. He has also been member of the program committee of many scientific conferences and workshops. In the past he served as Associate Editor or co-Editor of 23 international journals and General or Technical Chair of 5 international conferences. He delivered 129 keynote/invited speeches worldwide. He co-organized 38 conferences and participated in technical committees of 291 conferences. He participated in 75+ R&D projects, primarily funded by the European Union and is/was principal investigator in 47 such projects. He is the coordinator of the Horizon Europe R&D project TEMA, AUTH principal investigator in H2020 R&D projects Aerial Core, AI4Media one of the 4 H2020 ICT48 AI flagship projects and Horizon Europe R&D projects AI4Europe, SIMAR. He is chair of the International AI Doctoral Academy (AIDA). He was chair and initiator of the IEEE Autonomous Systems Initiative. He has 37300+ citations to his work and h-index 92+. According to research he is ranked first in Greece and 319 worldwide in the field of Computer Science (2022).

Keynote 5

The Journey Toward Self-Adaptive Security Where Are We?

Zonghua Zhang

CRSC R&D Institute, PRC, China

21st November 2024, Thursday (09:30-10:30), Room 1

Session Chair: Soufiene Djahel, Coventry University, UK

ABSTRACT

Although self-adaptive security is recognized within the cybersecurity community, it remains largely conceptual, lacking sound theoretical foundations, practical implementations, and widely accepted evaluation metrics. This talk aims to offer a comprehensive overview, covering algorithms, techniques, models, and architectures. By examining case studies, we will highlight key challenges and gaps. The goal is to encourage deeper research collaboration between academia and industry to effectively address potential threats in the emerging AI era.

Keynote 5

BIOGRAPHY

Prof. Zonghua Zhang is working on secure and dependable digitalization of intelligent railway transportation. He was previously with Huawei Paris Research Center, where he led a team dedicated to building resilient and trustworthy autonomous driving networks (ADN) by developing robust, adaptive and generalized AI- enabled solutions. Before diving into the industry, Zonghua has spent nearly 16 years in academia at different institutions (Professor at IMT, Researcher at NICT, INRIA, JAIST, University of Waterloo). He holds an HDR diploma (UPMC, France) in computer science, and a Ph.D. Degree (JAIST, Japan) in information science. He has been actively working at the intersections of cyber security, networking, and applied machine learning. Zonghua has contributed, as either PI or key contributor, to more than a dozen national and international research projects, with the topics ranging from anomaly detection, root cause analysis, and network forensics, to trust management, and eventually to autonomic cyber defense. These research projects have led to the publication of 100+ research articles in well-recognized international journals and conferences.

Tutorial 1

The Advances in Graph Neural Networks Meet Cybersecurity

Ahlem Drif

Department of Computer Science, Setif 1 University, Algeria

19th November 2024, Tuesday (11:00-12:40), Room 1

Session Chair: Sarra Cherbal, Setif 1 University, Algeria

ABSTRACT

Graph Neural Networks are a powerful and versatile class of Deep learning models that have revolutionized the way we approach problems involving relational data. They are highly influential models that have shown great success in a variety of domains. From airline flights to recommender systems to disaster management to neuronal interactions in the brain to cybersecurity, graphs are ubiquitous in the real world. Graph Neural Networks (GNNs) have emerged as a powerful tool in cybersecurity, particularly for tasks like vulnerability identification and intrusion detection. By leveraging graph structures, GNNs can capture the complex relationships within data, making them effective in learning representations from graph-structured data for cyber defense. GNN models address the limitations of machine learning and deep learning approaches by providing a more robust and abstract view of systems, essential for understanding structural patterns of attacks and vulnerabilities. In this tutorial, researchers and students will explore and master various graph embedding methods through hands-on exercises. They will gain insights into the strategies for mastering how to implement GNNs, achieving high accuracy in representing graph data, and swiftly deploying effective solutions. By completing this tutorial, the attendees will gain a solid understanding of the subject, both theoretically and practically.

Tutorial 1

BIOGRAPHY

Dr. Ahlem Drif is an Associate Professor/Researcher in the Computer Sciences Department of Ferhat Abbas University of Sétif 1 (UFAS), Algeria. She has engineering degree in Advanced Information Systems (2002) and Magister degree in Computer Science (2006) from University of Sétif. She hold a Ph.D from UFAS, under the supervision of Ex-Professor Abdellah Boukerram and Professor Silvia. Giordano, Department of Innovative Technologies - SUPSI - Switzerland. She received the university accreditation (HDR) in 2021. With over 14 years of research experience, Dr. Ahlem Drif's primary area of expertise lies in Data Sciences; encompassing Intelligent Trajectory applications, Deep learning, Recommender Systems, AI in Medicine, Explainable XAI for Healthcare, and Social Computing based LLM. She published more than 40 peer-reviewed research articles in international journals and conferences. She serves as a reviewer for many international journals and conferences.

Tutorial 2

Hands-On Network Slicing Optimization: A Graph Neural Network Perspective

Yassine Hadjadj-Aoul

IRISA, University of Rennes 1, France

20th November 2024, Wednesday (10:30-12:10), Room 1

Session Chair: Zibouda Aliouat, Setif 1 University, Algeria

ABSTRACT

Network slicing has emerged as one of the most crucial technologies for achieving full network automation. By dividing a physical network into multiple virtual slices, each tailored to meet specific service requirements, network slicing allows operators to manage complex, heterogeneous services over shared infrastructure. However, the management and optimization of these slices present a significant challenge due to the dynamic nature of the network and the need for real-time adaptation to diverse service demands. This complexity is often challenging for traditional optimization methods that do not scale or adapt efficiently as network conditions change. Recent advances in machine learning, especially reinforcement learning, hold much promise for automatic resource management. Nevertheless, these approaches ignore the rich underlying graph structure associated with network slicing, which negatively affects their efficiency and generalization capabilities. This tutorial introduces Graph Neural Networks (GNNs) as a powerful tool to overcome these limitations and handle in an effective way graph-structured data inherent to network slicing. By leveraging GNNs, we optimize the

placement of virtual services and resource allocation, making the automation of network slices both scalable and adaptive. It will also provide practical insights into how GNNs can be applied to solve real-world network slicing challenges, alongside a discussion of opportunities and limitations of these methods. Further, this tutorial will provide future research directions that may help unlock the full potential of GNNs in driving network automation for 5G and beyond networks.

BIOGRAPHY

Prof. Yassine Hadjadj Aoul is currently working as a full professor at the University of Rennes 1, France, where he is also a member of the IRISA Laboratory and the INRIA project-team Dionysos. He received a B.Sc. In computer engineering with high honors from Mohamed Boudiaf University, Oran, Algeria, in 1999. Dr. Hadjadj received his Master's and Ph.D. degrees in computer science from the University of Versailles, France, in 2002 and 2007, respectively. He obtained the qualification to direct research (HDR) in 2021. He was an associate professor at the University of Rennes from 2009 to 2022. He was an assistant professor at the University of Versailles from 2005 to 2007, where he was involved in several national and European projects such as NMS, IST-ATHENA, and IST-IMOSAN. He was also a post-doctoral fellow at the University of Lille 1 and a research fellow, under the EUFP6 EIF Marie Curie Action, at the National University of Dublin (UCD), where he was involved in the DOM'COM and IST-CARMEN projects, which aim at developing mixed Wi-Fi/WiMAX wireless mesh networks to support carrier grade services. His main research interests concern the fields of wireless networking, multimedia streaming architectures and protocols, congestion control protocols and QoS provisioning, and satellite and space communications. Dr. Hadjadj has been on the technical program committee of different IEEE conferences, including Globecom, ICC, VTC, PIMRC and IWCMC. His work on multimedia and wireless communications has led to more than 50 technical papers in journals and international conference proceedings.

Tutorial 3

Critical Role of Social Media in Improving Public Safety

Said Nabil Abu Aita

Arab Institute for Safety Sciences

21st November 2024, Thursday (11:30-12:40), Room 1

Session Chair: Fouzi Semchedine, Setif 1 University, Algeria

ABSTRACT

As public safety continues to evolve, each disaster or emergency presents unique challenges for emergency management and response teams. A core focus remains the timely dissemination of accurate information to help communities prepare, mitigate, respond, and recover effectively. The scope of crisis communication has undergone significant transformations, especially with the rise of the Internet and social media platforms. As a result, the use of social media in public safety during crises has become a subject of increasing discussion among professionals. This study aims to examine the role of social media platforms such as Facebook, Twitter, and other private or governmental platforms in supporting protection and safety efforts during crises. The research focuses on how these platforms can serve as crucial communication tools to enhance public resilience and reduce risks during critical situations. A combination of quantitative and qualitative research methods was employed to investigate the impact of social media during emergencies. The study used 200 questionnaires and conducted two interviews-one with a social media expert and another with a public safety official. Statistical analysis of the data revealed that social media platforms, both private and

governmental, play a key role in guiding the dissemination of safety information. The results indicate that 30% of respondents consider social media platforms essential in spreading information about various crises, with Facebook being the most widely used (53% of respondents). The speed and credibility of social media in delivering news, updates, and alerts during crises were highlighted as particularly effective, with 57% of respondents noting that social media pages deliver news faster than traditional sources, with high reliability.

BIOGRAPHY

Dr. Said Nabil Abu Aita is an experienced security and crisis management professional with over 16 years of expertise in disaster risk reduction (DRR), emergency response, and security operations. Currently serving as a Security Operations Assistant at the United Nations Department of Safety and Security (UNDSS) in Gaza, he ensures the safety of UN and humanitarian staff through risk assessment, incident monitoring, and security coordination. Said has also worked as a consultant on numerous projects, providing training and developing safety plans for organizations in Gaza, Egypt, and Lebanon. His training programs cover risk management, emergency preparedness, climate change adaptation, and occupational safety, totaling over 1,000 hours in the past five years. He holds a Doctorate in Crisis Management, a Master's in Crisis and Disaster Management, and certifications in security and safety management. Said has contributed to several international conferences and publications, including a book on disaster management and research on COVID-19 preparedness in conflict zones.

Technical Session 1

Risk Assessment and Cyber Security Approaches for Disaster Management (1/2)

19th November 2024, Tuesday (11:00-12:40), Room 2

Session Chair: Rahim Kacimi, IRIT, Paul Sabatier University, France

1. **On Achieving Cyber Resilience in Digitalized Rail Transit Control Systems (Invited Paper):** Weihong Ma, CRSC R&D Institute, China / Hongxue Chen, CRSC R&D Institute, China / Zhicheng Huang, Peking University, China / Xiaoya Hu, CRSC R&D Institute, China / Qiao Li, CRSC R&D Institute, China / Zonghua Zhang, CRSC R&D Institute, China / Ping Wang, Peking University, China.

2. **Reducing Systemic Risks in Humanitarian Aid Work with Guided Network Topology:** Sujoy Das, UET, Dekha, Bangladesh / Sadia Sharmin, UET, Dekha, Bangladesh / Saidur Rahman, UET, Dekha, Bangladesh.

3. **Enhancing Face Detection: A Dual Model Approach with Modified VGG16 Layer:** Achour Achroufene, University of Bejaia, Algeria / Lynda Raid, University of Bejaia, Algeria / Manel Tazibet, University of Bejaia, Algeria.

4. **An Explainable CNN-based Intrusion Detection System for Enhanced Smart Grid Security:** Chahrazed Benrebbouh, Setif 1 University, Algeria / Houssem Mansouri, Setif 1 University, Algeria / Sarra Cherbal, Setif 1 University, Algeria / Soufiene Djahel, Coventry University, UK / Djihad Arrar, Setif 1 University, Algeria.

5. **Fine-tuning CNN for Enhanced Security in WSN-Based Forest Fire Detection:** Rafika Saadouni, Setif 1 University, Algeria / Amina Khacha, Setif 1 University, Algeria / Chirihane Gherbi, Setif 1 University, Algeria / Yasmine Harbi, Setif 1 University, Algeria / Zibouda Aliouat, Setif 1 University, Algeria / Saad Harous, University of Sharjah, UAE.

Technical Session 2

Risk Assessment and Cyber Security Approaches for Disaster Management (2/2)

19th November 2024, Tuesday (15:30-17:10), Room 1

Session Chair: Soufiene Djahel, Coventry University, UK

1. **Towards a Zero Trust Based Hybrid Access Control Model for Medical Data:** Colin Wilcox, Manchester Metropolitan University, UK / Kristopher Welsh, Manchester Metropolitan University, UK / Soufiene Djahel, Coventry University, UK / Nicholas Costen, Manchester Metropolitan University, UK / Vasileios Giagos, Essex University, UK.

2. **Robust Group Authentication Using Quantum Cryptography and Smart Contract for IoMT:** Rachida Hireche, Setif 1 University, Algeria / Houssem Mansouri, Setif 1 University, Algeria / Yasmine Harbi, Setif 1 University, Algeria / Al-Sakib Khan Pathan, United International University, Dhaka, Bangladesh.

3. **Evaluation of the Human-Robot-Interaction Dynamic Under Mental Fatigue Constraints in Search and Rescue Operations:** Jordan Morrow, Missouri University of Science and Technology, USA / Maciej Zawodniok, Missouri University of Science and Technology, USA.

4. **Secure SDN-based IoT Networks for Drought Management: Mitigating DDoS Attacks with Machine Learning:** Selma Amrani, Setif 1 University, Algeria / Khedidja Medani, Setif 2 University, Algeria / Chirihane Gherbi, Setif 1 University, Algeria.

Technical Session 3

IoT and Wireless Communications for Disaster Management (1/2)

19th November 2024, Tuesday (15:30-17:10), Room 2

Session Chair: Yasmine Harbi, Setif 1 University, Algeria

1. **Managing Congestions at Multiple Intersections During Disasters with Chronological Coordination of Intelligent Traffic Light Management:** Rafik Zerroug, Setif 1 University, Algeria / Zibouda Aliouat, Setif 1 University, Algeria / Adel Alti, Setif 1 University, Algeria.

2. **Assessing Potential of UAV-Based Increase in Urban Disasters Communication on Traffic Congestion Mitigation:** Damian Wlodarczyk, University of Galway, Ireland / Takfarinas Saber, University of Galway, Ireland.

3. **Quad-Band Millimeter Wave Monopole MIMO Antenna Loaded with a Defected Ground Plane For 5G Applications:** Abdelmaoula Bouaza, National Polytechnic School, Algeria / Massinissa Belazzoug, BBA University, Algeria / Idris Messaoudene, BBA University, Algeria / Rachida Touhami, USTHB, Algeria / Abdul Jabbar, University of Glasgow, UK / Masood Ur-Rehman, University of Glasgow, UK / Smail Tedjini, University Grenoble Alpes, France / Naeem Ramzan, University of the West of Scotland, UK.

4. **Flood Prediction Based on the Fuzzy Subset Data Fusion Approach:** Achour Achroufene, University of Bejaia, Algeria / Baya Ait Moula, University of Bejaia, Algeria.

Technical Session 4

AI/ML and Big Data Analytics for Disaster Management (1/3)

19th November 2024, Tuesday (15:30-17:10), Room 3

Session Chair: Abdelaziz Lakhfif, Setif 1 University, Algeria

1. **Improved Binarized Statistical Image Features for MRI Brain Tumor Identification and Classification:** Hafida Chellakh, BBA University Algeria / Abdelouahab Moussaoui, Setif 1 University, Algeria / Abdelouahab Attia, BBA University, Algeria.

2. **Automating Hazard-Specific Ontology Construction: Methodological Advancements through Ontology Learning Techniques from Disaster-Related Knowledge Bases:** Sundos Nasser Said Al Subhi, Georgia State University Atlanta, USA / Chetan Tiwari, Georgia State University Atlanta, USA / Armin R. Mikler, Georgia State University Atlanta, USA.

3. **Multi-objective SMA for Medical Supply Delivery Using Drones and Generative AI in Post-disasters:** Celia Khelfa, USTHB, Algeria / Habiba Drias, USTHB, Algeria / Ilyes Khennak, USTHB, Algeria.

4. **Leveraging Machine Learning Models for Food Security and Crisis Management in Algeria:** Tahar Mehenni, University of M'sila, Algeria / Hadil Bouti, University of M'sila, Algeria / Fatma Zohra Zerrouak, University of M'sila, Algeria.

5. **Holistic Modeling and Multi-Objective Optimization of Emergency Ambulance Dispatching:** Naila Aziza Houacine, USTHB, Algeria / Celia Khelfa, USTHB, Algeria / Habiba Drias, USTHB, Algeria / Chaima Allaf, USTHB, Algeria / Aya Boutkedjirt, USTHB, Algeria.

Technical Session 5

Crowdsourcing and Social Media for Disaster Management (1/1)

20th November 2024, Wednesday (10:30-12:10), Room 2

Session Chair: Fouzi Harrag, Setif 1 University, Algeria

1. **Vocabulary Cross-Contamination between Entertainment Content and Disaster-Related Social Media Posts:** Yutaka Morino, Kansai University, Japan / Mitsunori Matsushita, Kansai University, Japan / Hiroyuki Fujishiro, Hosei University, Japan.

2. **Trust-Aware Disaster Image Classification using Monte Carlo Dropout Integrated with Graph Convolutional Networks and Deep Feature Extraction:** Ouissem Touameur, Setif 1 University, Algeria / Fouzi Harrag, Setif 1 University, Algeria / Ladjel Bellatreche, LIAS/ISAE-ENSMA, France.

3. **Assessment of Post-Disaster Concerns using Social Network Analysis and Machine Learning: A Study of 2018 Palu Disaster:** Tyanita Puti Marindah Wardhani, Hasanuddin University, Indonesia / Subhajyoti Samaddar, Kyoto University, Japan / Hirokazu Tatano, yoto University, Japan / Zulkifli Tahir, Hasanuddin University, Indonesia / Sudip Roy, Centre of Excellence in Disaster Mitigation and Management, India.

4. **Towards Useful Event Detection and Sentiment Analysis of OSN for Disaster Management:** Malika Noui, Setif 1 University, Algeria / Abdelaziz Lakhfif, Setif 1 University, Algeria / Mohamed Amin Laouadi, Setif 1 University, Algeria.

5. **Enhancing Forest Fire Detection and Emergency Response Using Crowdsourcing and Smartphone Sensors:** Abdessalam Mohammed Hadjkouider, University of Ouargla, Algeria / Yesin Sahraoui, National Higher School of AI, Algeria / Chaker Abdelaziz Kerrache, University of Laghouat, Algeria.

Technical Session 6

IoT and Wireless Communications for Disaster Management (2/2)

20th November 2024, Wednesday (15:00-16:40), Room 1

Session Chair: Mohand Yazid Saidi, Sorbonne Paris Nord University, France

1. **On End-to-End Protection of Service Function Chain (Invited Paprer):** Mohand Yazid Saidi, Sorbonne University, France.

2. **Flood Disaster Management using SADM-SmartObject: An Agent-Based IoT Framework for Sensing, Data Classification, and Decision Making:** Adil Chekati, Constantine 2 University, Algeria / Meriem Riahi, University of Tunis Montfleury, Tunisia / Faouzi Moussa, University of Tunis ElManar, Tunisia.

3. **On the Controller Placement Problem: a New SD-IoT Topology for the Algerian Network:** Raid Boudi, University Center of Mila, Algeria / Mohammed Lalou, University of Bourgogne Dijon, France / Nardjes Bouchemal, University Center of Mila, Algeria.

4. **DVEMD: A V2V-based emergency message dissemination scheme for IoV:** Hamza Boudaoud, USTHB, Algeria / Thamazgha Irnatene, USTHB, Algeria / Hayet Zerrouki, USTHB, Algeria / Doukha Zouina, USTHB, Algeria / Moussaoui Samira, USTHB, Algeria.

5. **Performance Evaluation of Multi-Connectivity for Massive-URLLC in Emergency Scenarios:** Alex Piccioni, University of L'Aquila, Italy / Andrea Marotta, University of L'Aquila, Italy / Piergiuseppe Di Marco, University of L'Aquila, Italy / Fabio Graziosi, University of L'Aquila, Italy.

Technical Session 7

AI/ML and Big Data Analytics for Disaster Management (2/3)

20th November 2024, Wednesday (15:00-16:40), Room 2

Session Chair: Chirihane Gherbi, Setif 1 University, Algeria

1. **Forest Fire Segmentation Metrics and Algorithms:** Pavlos Dinopoulos, Aristotle University of Thessaloniki, Greece / Christos Papaioannidis, Aristotle University of Thessaloniki, Greece / Matthaios Tzimas, Aristotle University of Thessaloniki, Greece / Ioannis Pitas, Aristotle University of Thessaloniki, Greece.

2. **Secured Forest Fire Prediction Using Blockchain and CNN Transformers:** Boubakeur Annane, Setif 1 University, Algeria / Abderrahim Lakhel, Setif 1 University, Algeria / Adel Alti, Setif 1 University, Algeria.

3. **Precision Diagnosis in Pandemics: Machine Learning and Cough Sound Analysis for COVID-19:** Iyad Chehili, USTHB, Algeria / Skander Hamdi, Setif 1 University, Algeria.

4. **Flooded House Detection for Natural Disaster Management:** Aristidis Pavlidis, Aristotle University of Thessaloniki, Greece, Christos Papaioannidis, Aristotle University of Thessaloniki, Greece, Ioannis Pitas, Aristotle University of Thessaloniki, Greece.

5. **Implicit Sentiment Analysis of Hotel Comments for Disaster Management: A Comparative Study of Machine Learning, Deep Learning, and BERT Models:** Djihad Arrar, Setif 1 University, Algeria / Nadjet Kamel, Setif 1 University, Algeria / Allaoua Refoufi, Setif 1 University, Algeria.

Technical Session 8

Beyond 5G and Towards 6G applications for Disaster Management (1/1)

21st November 2024, Thursday (11:00-12:40), Room 2

Session Chair: Djamila Mechta, Setif 1 University, Algeria

1. **Fuzzy-MADDPG based Multi-UAV Cooperative Search in Network-limited Environments:** Liang Zhao / Zihang Gao / Ammar Hawbani, Shenyang Aerospace University, China / Wei Zhao, Anhui University of Technology, China / Chaojin Mao / Na Lin, Shenyang Aerospace University, China.

2. **Intelligent Handover Triggering Mechanism in Wi-Fi Networks via Adaptation-based Reinforcement Learning:** Nian Ding / Celimuge Wu / Yangfei Lin / Zhaoyang Du, The University of Electro-Communications, Japan / Wugedele Bao / Ha Si, Hohhot Minzu Colleg, China.

3. **Telecom Intelligent Connection and Capability Orchestration for Disaster Response and Recovery:** Shoufeng Wang / Ye Ouyang, AsiaInfo Technologies, China / Fan Li / Xuan Chen / Lexi Xu, China Unicom, China / Jianchao Guo / Zhongke Zhang / Lianhua Zhang / Sen Bian / Xidong Wang / Zhidong Ren / Rongxing He, AsiaInfo Technologies, China.

4. **Multi-dimensional Visual Fusion: Open-Pit Mine Safety Video Summarization Approach Based on Attention Mechanism and Dynamic Feature Fusion:** Zhiping Yi, Guangxi Industrial Design Group Co., Ltd., China / Qi Wang, Hunan University Changsha, China / Ziji Ma, Hunan University Changsha, China / Xun Shao, Toyohashi University of Technology, Japan.

5. **Towards Efficient Task Offloading in Disaster Areas: A Constrained RL-based Approach (Invited Paper):** Yupeng Wang / Jinbo He / Haiyong Shi / Weizhen Han / Bingyi Liu, Wuhan University of Technology, China.

Technical Session 9

AI/ML and Big Data Analytics for Disaster Management (3/3)

21st November 2024, Thursday (11:00-12:40), Room 3

Session Chair: Houssem Mansouri, Setif 1 University, Algeria

1. **SECA-Net: A Lightweight Spatial and Efficient Channel Attention for Enhanced Natural Disaster Recognition:** Skander Hamdi, Setif 1 University, Algeria / Abdelouahab Moussaoui, Setif 1 University, Algeria / Mafaza Chabane, Setif 1 University, Algeria / Ayoub Laouarem, Setif 1 University, Algeria / Mohamed Berrimi, Setif 1 University, Algeria / Mourad Oussalah, University of Oulu, Finland.

2. **Deep Learning in Managing SARS-CoV-2 Pandemic, Variant Prediction and Driver Mutation Identification: Case Study in Setif, Algeria:** Madjda Akacha, Setif 1 University, Algeria / Abdelhalim Khenchouche, Setif 1 University, Algeria / Imene Zenbout, Constantine 2 university, Algeria / Mounira Amrane, Setif 1 University, Algeria.

3. **Beyond Deep Learning: A Two-Stage Approach to Classifying Disaster Events and Needs:** Mafaza Chabane, Setif 1 University, Algeria / Fouzi Harrag, Setif 1 University, Algeria / Khaled Shaalan, The British University in Dubai, UAE.

4. **Multitask Fake News Detection in Arabic Language using AraELECTRA Model: COVID-19 Case Study:** Meriem Sellami, Setif 1 University, Algeria / Ramzi Hadrouk, Setif 1 University, Algeria / Sofiane Chelghoum, Setif 1 University, Algeria / Ramzi Badache, Setif 1 University, Algeria / Nadjet Kamel, Setif 1 University, Algeria / Abdelazziz Lakhfif, Setif 1 University, Algeria.

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Track 4: Beyond 5G and Towards 6G applications for Disaster Management

- Xun Shao. Toyohashi University of Technology, Japan
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Track 5: AI/ML and Big Data Analytics for Disaster Management

- Avishek Nag, University College Dublin, Ireland
- Nadjet Kamel, Setif 1 University, Algeria
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Track 6: Crowdsourcing and Social Media for Disaster Management

- Kutub Thakur, New Jersey City University, USA
- Fouzi Harrag, Setif 1 University, Algeria
- Nurilla Avazov, Inland Norway University of Applied Sciences, Norway

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- Mohiuddin Ahmed, Edith Cowan University, Australia
- Chirihane Gherbi, Setif 1 University, Algeria
- Michael Jones, Manchester Metropolitan University, UK

Work in Progress Track

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