

2023



**COMMUNICATIONS SYSTEMS INTEGRATION
AND MODELING TECHNICAL COMMITTEE**

CSIM-TC

NEWSLETTER

May 2023

Luca Foschini (Chair)
Jonathan Rodriguez (Vice-chair)
Petros Spachos (Secretary)

1. Table of Contents

2. About CSIM 3

3. Awards/Distinctions for CSIM members..... 4

4. Past Events 6

5. Ongoing Research Projects/Grants 7

6. Upcoming Events..... 10

7. Special Issues organized by CSIM members..... 21

2. About CSIM

The Communications Systems Integration and Modeling technical committee focuses its activities on simulation, analytical tools and measurement of communications links and networks. CSIM has been sponsoring activities on traffic modeling, performance and integration of next generation wireless and wireline networks.

CSIM sponsors its traditional workshop CAMAD, as well as special issues in the IEEE Communications Magazine and in the IEEE Journal on Selected Areas in Communications. CSIM is very active in ICC and in GLOBECOM and was one of the co-founders of MILCOM. CSIM has its roots on the Communications Systems Engineering technical committee and its past chairs are:

2023-now – Luca Foschini
2021-2023 – Nizar Zorba
2018-2021 – Burak Kantarci
2015-2018 – Christos Verikoukis
2013-2015 – Stefano Giordano
2011-2013 – Harry Skianis
2009-2011 – Fabrizio Granelli
2007-2009 – Pascal Lorenz
2005-2007 – Nelson L.S. da Fonseca
2002-2005 – Mike Devetsikiotis
2000-2002 – Mohammad Ilyas
1999-2000 – Hussein Mouftah
1996-1999 – Guy Omydar
1994-1996 – Bill Tranter

For more information: <http://csim.committees.comsoc.org/>

3. Awards/Distinctions for CSIM members

Kapal Dev, PhD, Senior Member, IEEE

Assistant Lecturer, Munster Technological University Ireland.

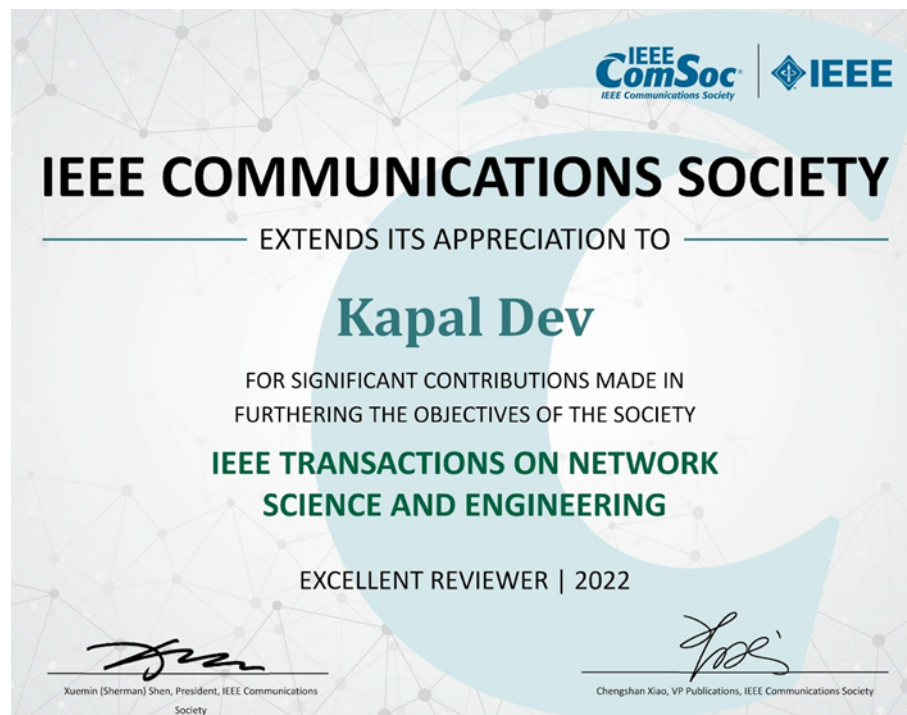
- “Survey on 6G Frontiers: Trends, Applications, Requirements, Technologies and Future Research” is among the 5th most popular article in IEEE Open Journal of the Communications Society from last 18 months.
- 2022 IEEE Communication Society Outstanding Young Researcher Award for Europe, Middle-East, and Africa (EMEA) Region.



- 2022 Irish Research Council Research Ally Prize



- Excellent Reviewer 2022 from IEEE ComSoc journal "IEEE Transactions on Network Science and Engineering"



- Awarded as [Funded Investigator \(FI\)](#) at one of top European communication networks research centres-- CONNECT, Trinity College Dublin (TCD) funded by Science Foundation.

4. Past Events

- Damla Turgut, Inducted into the Inaugural class of the "Pledge of the Computing Professional", May 5, 2023
- Damla Turgut, IEEE Distinguished Lecture "Communication, computation, and privacy trade-off in machine learning for smart environments," hosted by IEEE Benelux Chapter, Ghent, Belgium, April 6, 2023
- Damla Turgut, IEEE Distinguished Lecture "When homes are too smart for their own good: physical and computational modeling of smart homes," hosted by IEEE Student Branch & IEEE AP/COM/MTT Student Chapter at KU Leuven, , Leuven, Belgium, April 4, 2023
- Damla Turgut, Invited talk "Communication, computation, and privacy trade-off in machine learning for smart environments," at UC Louvain, Belgium, April 7, 2023
- Damla Turgut,, Keynote talk "Growing the Community in Tech ", NCWIT Aspirations in Computing Award Ceremony, University of Central Florida, Orlando, April 15, 2023
- Damla Turgut, Panelist at N2Women event at IEEE PerCom'23, Atlanta, March 14, 2023
- Damla Turgut, Mentor at Joint WICE/YP Mentoring event at IEEE GC'22, Rio De Jenario, Brazil, December 5, 2022
- Damla Turgut, Invited talk "Increasing the participation of women and minorities in STEM at a large metropolitan university, " at Women in Communications Engineering (WICE) Workshop in IEEE Latin-American Conference on Communications, Rio De Jenario, Brazil, November 30, 2022

5. Ongoing Research Projects/Grants

BRAIN: Explainable and robust AI for integration in next generation networked systems

Web: <https://networks.imdea.org/projects/brain-explainable-and-robust-ai-for-integration-in-next-generation-networked-systems/>

Financed by: Ministry of Sciences and Innovation PID2021-128250NB-I00

Duration: September 2022 to August 2025

Contact: Marco FIORE, Principal Investigator for IMDEA Networks, Claudio FIANDRINO, Principal Investigator for IMDEA Networks

Abstract: The BRAIN project will contribute to making this vision of 6G as a network augmented via pervasive artificial intelligence a reality, by addressing the two main roadblocks. On the one hand, existing AI models employed for network management are black boxes, and their complete lack of transparency is a clear barrier for adoption: here, BRAIN aims at proposing new AI tools for network management that are explainable and trustworthy by design and specifications on robustness that allow to benchmark existing AI models. On the other hand, the disruptive softwarization of the network architecture has opened new opportunities for a deep integration of AI into the future 6G infrastructure that have yet to be explored: here, BRAIN will investigate novel approaches for the design, implementation and evaluation of in-band network intelligence, i.e., AI models that run directly into the user-plane programmable switches, operating at line rate over the transiting data traffic, and laying the foundations to a truly AI-native 6G network.

CLOUDSTARS: Cloud Open Source Research Mobility Network

by Maria A. Serrano, Angelos Antonopoulos (Nearby Computing, Spain), Pedro Garcia and Vanesa Ruana (URV, Spain)

Web: <https://cloudstars.eu/>

Twitter: https://twitter.com/cloudstars_2023

CLOUDSTARS presents a joint research programme in the fields of Cloud computing and AI technologies. CLOUDSTARS pursues innovation in the Cloud infrastructures to support the next generation of low-latency, high-performance complex workloads. CLOUDSTARS also pursues high innovation in the Cloud, making the best application of artificial intelligence techniques and AI models with automatic adaptation to the computing resources.

The main objectives of CLOUDSTARS are:

- **Development and benchmarking of open-source technologies to advance the next generation cloud infrastructure**, where it will play a vital role the development of new container technologies, as well as elastic and low-latency storage for ephemeral data, efficient resource management of hardware accelerators (GPUs, FPGAs and smartNICs) and networking.
- **Design and benchmarking of novel cloud and edge serverless middleware to leverage the advances in the cloud infrastructure**, which pivots upon all sorts of containerized technologies such as Function-as-a-Service (FaaS)

platforms, serverless containers, and event-based orchestration to open the serverless execution model to HPC and analytics workloads. The project will also explore how the platform should protect and govern data throughout its lifecycle.

- **Application of novel machine learning techniques (e.g., statistical and deep learning) for managing containerized cloud systems**, involving the infrastructure and configuration of executions and services, and the optimization of data analytics platforms over serverless middleware and container infrastructures. The project will also explore the interplay between Edge and Cloud for enabling a diverse range of AI-enabled applications.

We note that CLOUDSTARS will also conduct standardization activities in industrial open-source projects such as those encompassed by the Cloud Native Computing Foundation (CNCf), namely, Kubernetes, Istio, or Knative, to mention a few, and contribute to thriving open-source communities such as Apache Spark and Dask, or Lithops. The project will make public all the contributions to the different open-source projects and contribute to the European digital sovereignty and European standards such as Gaia-X.

CLOUDSTARS, started in January 2023 and commissioned to run until December 2026, is a Horizon Europe Marie Skłodowska-Curie Action (MSCA) project, funded by the European Commission with a total budget of € 1.3 million. CLOUDSTARS is a Staff Exchange program that allows the mobility and exchange of researchers between academia and industrial institutions. Specifically, the project consortium consists of: Universitat Rovira i Virgili (Spain) Coordinator; Barcelona Supercomputing Center (Spain); Universidad de Murcia (Spain); Technische Universität München (Germany); Julius-Maximilians- Universität Würzburg (Germany); Stichting VU (Netherlands); Akademia Górniczo-Hutnicza im. Stanisława Staszica w Krakowie (Poland); Università Degli Studi di Trento (Italy); Technische Universität Wien (Austria); IBM Israel - Science and Technology LTD (Israel); Nearby Computing SL (Spain); Instituto de Engenharia De Sistemas e Computadores (Portugal); Zürcher Hochschule Für Angewandte Wissenschaften (Switzerland); Università della Svizzera Italiana (Italy); and Imperial College of Science, Technology and Medicine (United Kingdom).



Funded by
the European Union

CloudSkin: Adaptive virtualization for AI-enabled Cloud-edge Continuum

by Vanessa Ruana (URV, Spain), Maria A. Serrano (Nearby Computing, Spain), and Marc Sanchez-Artigas (URV, Spain)

Web: <https://cloudskin.eu/>

Twitter: <https://twitter.com/cloudskin2023>

As of today, 80% of the data processing and analysis occurs in cloud data centers, and only 20% of processing occurs at the edge. CloudSkin aims to design a cognitive

cloud continuum platform to fully exploit the available Cloud-edge heterogeneous resources, finding the “sweet spot” between the cloud and the edge, and smartly adapting to changes in application behaviour via AI. CloudSkin three main innovations are the following:

1. The CloudSkin platform will leverage AI/ML to optimize workloads, resources, energy, and network traffic for a rapid adaptation to changes in application behavior and data variability, re-configuring the “sweet spot” between the cloud and the edge in the face of the rapid varying conditions;
2. The CloudSkin platform will also help users to achieve “stack identity” across the Cloud-edge continuum, whereby the same (legacy) software stacks (e.g., MPI programs) running in data centers can seamlessly run at remote edges. The development of a new lightweight, portable virtualization abstraction will be paired with the development of new confidential abstractions to protect data while it is in use; and
3. CloudSkin will also contribute to prepare the needed infrastructure to integrate the new virtualized execution abstractions into the virtual resource continuum, particularly, for those Cloud-edge applications composed of small tasks with fast data access and sharing requirements.

CloudSkin technology will be demonstrated with four use cases, from four different domains:

- **5G automotive** - Orchestration of edge apps with matching cloud performance and the creation of AI video-analytics.
- **Metabolomics** - Edge/on-premise batch analytics and reduction of cloud offloading for Hybrid Metaspace.
- **Surgery** - Real-time edge video analytics with dynamic resource allocation and Private Deep & Federated Learning at the edge.
- **Agriculture IoT** - Dynamic cloud offloading to match detail level and creation of an IoT-based agriculture data space.

CloudSkin, started in January 2023 and commissioned to run until December 2025, is a Horizon Europe project funded by the European Commission with a total budget of € 3.4 million. It brings together a strong consortium of major ICT, industry and academic stakeholders to set the direction for the new “cognitive continuum for the cloud and edge.

Specifically the project consortium consists of: Universitat Rovira i Virgili (Spain) Coordinator; Barcelona Supercomputing Center (Spain); Technische Universitaet Dresden (Germany); Nearby Computing SL (Spain); Alterna Tecnologias SL (Spain); European Molecular Biology Laboratory (Germany); KIO Networks Espana SA (Spain); Deutsches Krebsforschungszentrum Heidelberg (Germany); Tradia Telecom SA (Spain); EMC Information Systems International Unlimited Company (Ireland); IBM Research GmbH (Switzerland); Imperial College of Science Technology and Medicine (UK).



Funded by
the European Union

6. Upcoming Events

Enhanced network techniques and technologies for the Industrial IoT to Cloud continuum

IIoT-NETs – a SIGCOMM 2023 workshop

September 10 - 14, 2023



Web: <https://conferences.sigcomm.org/sigcomm/2023/workshop-iiotnets.html>

Call for Papers

All types of industries, such as production, shipping, agriculture, manufacturing verticals, and utilities such as railways, energy grids, and self-driving or remote driving infrastructure, have identified opportunities in automating process control applications and the monitoring of remote operations. The promising growth in connected equipment and machines (Industrial IoT) underscores the importance and the need for remote process control systems and remote monitoring operations. The use of cloud technologies improves the coordination of the control processes and the applications. To support this we need enhanced network techniques and technologies, plus architectures and frameworks for this Industrial IoT to Cloud continuum, providing the foundation for a fast expanding Operations and Process Control applications.

Emerging Operational Technology traffic profiles require the capabilities of wide-area, large-scale deterministic, and time-sensitive networks. These traffic patterns emerging from the monitoring operations and the process control applications requires enhanced networks with specialized techniques, technologies, and attributes that are both non-interfering and non-disruptive. These networks are reliable and present deterministic behaviours for seamless machine-to-machine communication, compared to general-purpose networks which are commonly for human-to-software interaction. The outcomes and outputs of these control applications are so critically dependent on having high-quality network performance that most industry operators have yet to venture into controlling devices beyond a local site.

While there is a clear requirement to use cloud native technologies, there are many technical problems to solve to enable distributed process control and monitoring functions over the cloud. We plan to feature research and other activities to bridge gaps between the cloud operators, industrial network operators, and network service providers, and to overcome the issues of transitioning from fully local operation to cloud. This raises a number of interesting questions:

- Related to the forwarding aspects: how to describe a command structure in a process control so that network forwards it gracefully; how cloud-native

process control services will be deployed and generalized given that the traffic profiles vary for each controller and field-device pair; how to leverage and incorporate virtualized infrastructure with deterministic networks and multi-tenant support.

- How management views evolve for cloud-centric processes: how to define, monitor, observe, discover, and respond to faults in the system and control of machines and field devices; how does cloud-to-edge-to-field device connectivity get managed.

Finally, such networks are not operated by network experts, instead, industrial process engineers or application developers would need to deal with deployment and maintenance of such networks, and would need to express their network requirements in a programmable and standard manner. Thus, auto-provisioning and interactions across the different infrastructures should be considered.

The goal of the workshop is to feature recent research and initiatives related to (a) architectures and frameworks for the Industrial IoT to Cloud continuum, (b) providing the foundation for Operations and Process Control applications and emerging traffic profiles, and (c) industrial network operations, with all things related to remote field-device communication using enhanced network techniques and technologies. The contributors are encouraged to bring forth novel use-cases, presenting their work which solves and highlights challenges in industrial process control automation, and which helps build a research and user community to explore and bridge the gaps between industrial and network operators.

The “Enhanced network techniques and technologies for the Industrial IoT to Cloud continuum” workshop aims at bringing cloud, network operators, and industrial network experts together with the intention of synthesizing a unified architectural view on how to evolve from closed industrial systems to cloud-native. This workshop also solicits work on use-cases, design principles, techniques, implementations, and experience insights that address the workshop objectives.

Topics of Interest

- Architectures and frameworks for the Industrial IoT to Cloud continuum
- Application interface to networks that support industrial processes
- Challenges in supporting virtualized controller over WAN/cloud
- Cloud based and virtualized Programmable Logic Controllers (PLC)
- Real-time cloud-based process control challenges and solutions
- Cloud-oriented multi-site connectivity for process automation
- Network challenges in supporting industrial digital twins. Coordination between physical infrastructures and application specific digital twins
- Programmable data-plane techniques for remote operations and control
- Security, reliability and safety in open industrial networks
- Distributed Monitoring and Telemetry techniques
- Cloud-converged feedback control loops
- Use of decentralization such as Distributed Ledger Technologies (DLT) for improving trust

Important Dates

- June 11, 2023 Submission deadline
- July 2, 2023 Acceptance notification
- July 16, 2023 Camera-ready deadline
- September 10, 2023 Workshop

Workshop Organizing Committee

General Chairs

- Kiran Makhijani, Futurewei USA
- Stuart Clayman, University College London, UK

Technical Program Co-Chairs

- Richard Li, Futurewei, USA
- Luca Foschini, University of Bologna, Italy
- Marc-Oliver Pahl, IMT Atlantique, France

International Conference on Intelligent Metaverse Technologies & Applications (iMETA2023)

18-20 September 2023 | Tartu, Estonia



Web: <https://imeta-conference.org/>

Scope

Over the years, technology has advanced significantly, and the creation of the virtual environments (i.e., metaverse) is one of the latest innovations that is set to revolutionize how we interact, process, and connect our real-life to other lives. With the metaverse, we are presented with a new realm that blurs the lines between the physical and digital world, providing a new space for communication, commerce, services, and entertainment.

The International Conference on Intelligent Metaverse Technologies & Applications (iMeta) is to bring together leading researchers, academics, and industry experts to explore the various aspects of the distributive metaverse, including its technologies, applications, and implications for various industries. Attendees can expect to

participate in exciting keynote speeches, panel discussions, and presentations on cutting-edge research field.

Throughout the conference, there will be ample opportunities for attendees to network, share their knowledge, and collaborate on future initiatives that will drive the development of the metaverse forward. We are confident that iMeta conference will inspire new ideas, foster innovation, and spark collaborations that will push the boundaries of the metaverse and its potential to change the world as we know it.

The metaverse is a complex system that requires careful planning, design, and implementation to function correctly. The iMeta conference will delve into several key areas related to communication, computing, and systems within the metaverse. Communication is a fundamental aspect of the metaverse, allowing users to interact with one another, share information, and collaborate on tasks. Computing is also essential for the metaverse advancements and to function effectively. Topics such as distributed computing, cloud computing, and edge computing are to be revisited within the metaverse realm.

Overall, the iMETA conference aims to provide attendees with comprehensive understanding of the communication, computing, and system requirements of the metaverse. Through keynote speeches, panel discussions, and presentations, attendees will have the opportunity to engage with leading experts and learn about the latest developments and future trends in the field. The conference will also provide ample opportunities for networking, sharing knowledge, and collaborating with others in the metaverse community.

Topics

Researchers are encouraged to submit original research contributions in all major areas, which include, but not limited to:

1. AI
 - AI-driven virtual characters and NPCs in the metaverse
 - AI-powered content creation and curation in the metaverse
 - Natural Language processing and conversational AI in the metaverse
 - Machine learning and data analytics in the metaverse
 - AI-based user modeling and personalization in the metaverse
 - AI-powered virtual assistants and concierges in the metaverse
 - Metaverse data privacy and protection in AI-driven applications
 - AI and machine learning for metaverse security and fraud prevention
 - AI-driven virtual economy and financial systems in the metaverse
 - AI and machine learning for metaverse optimization and performance
2. Security and Privacy
 - Identity and access management in the metaverse
 - Secure communication protocols in the metaverse
 - Cybersecurity threats and vulnerabilities in the metaverse
 - Metaverse data privacy and protection
 - Digital asset security in the metaverse
 - Metaverse platform security and audit ability
 - Compliance and regulatory issues in the metaverse
 - Intellectual property rights and copyright in the metaverse

- Fraud and scam prevention in the metaverse
- Trust and reputation systems in the metaverse
- 3. Networking and Communications
 - Multi-modal communication in the metaverse (e.g., text-based chat, audio- based communication, video conferencing, haptic feedback)
 - Network architecture and protocols for the metaverse (e.g., P2P networks, client- server networks, mesh networks)
 - Metaverse network optimization and performance
 - Network interoperability and standardization in the metaverse
 - Cloud computing and edge computing for the metaverse
 - Low-latency and high-bandwidth networks for the metaverse
 - Metaverse content delivery networks (CDNs)
 - Network security and privacy in the metaverse
 - Blockchain-based networks in the metaverse
 - The impact of 5G and beyond on the metaverse
- 4. Systems and Computing
 - Distributed computing for the metaverse (e.g., blockchain, distributed ledgers, P2P networks)
 - Cloud computing and edge computing for the metaverse
 - Metaverse system architecture and design
 - Metaverse software engineering and development
 - Metaverse content creation and distribution systems
 - Metaverse data management and analysis
 - Metaverse optimization and performance
 - System interoperability and standardization in the metaverse
 - Artificial intelligence and machine learning in the metaverse
 - The impact of quantum computing on the metaverse
- 5. Multimedia and Computer Vision
 - Immersive multimedia technologies in the metaverse (e.g., 3D graphics, animation, sound, video)
 - Computer vision and visual recognition in the metaverse (e.g., object detection, facial recognition, gesture recognition)
 - Natural language processing and voice recognition in the metaverse
 - Virtual and augmented reality technologies in the metaverse
 - Metaverse content creation and distribution (e.g., virtual fashion, virtual real estate, virtual goods)
 - Virtual and augmented reality advertising in the metaverse
 - Metaverse content curation and recommendation systems
 - Multimodal interaction and communication in the metaverse
 - Metaverse accessibility and inclusivity
 - Metaverse user-generated content (UGC) and moderation
- 6. Immersive Technologies and Services
 - Virtual and augmented reality technologies and applications in the metaverse
 - Immersive audio technologies and services in the metaverse
 - Haptic feedback and touch technologies in the metaverse
 - Metaverse accessibility and inclusivity through immersive technologies and services
 - Spatial computing and tracking in the metaverse

- Metaverse virtual events and conferences through immersive technologies and services
 - Immersive educational and training through immersive technologies and services
 - Metaverse entertainment and gaming through immersive technologies and services
 - Immersive advertising and marketing in the metaverse
 - The future of immersive technologies and services in the metaverse
7. Storage and Processing
- Distributed storage and processing technologies for the metaverse (e.g., content delivery networks, P2P networks, edge computing)
 - Metaverse data management and analysis
 - Metaverse content creation and distribution systems
 - Metaverse data privacy and protection
 - Metaverse optimization and performance
 - Metaverse storage and processing for AI and machine learning applications
 - Metaverse storage and processing for immersive technologies and services
 - Metaverse storage and processing for multimedia and computer vision applications
 - Metaverse storage and processing for communication and networking technologies
 - The impact of new storage and processing technologies (e.g., quantum computing) on the metaverse

There are three categories of submission (References included in the page limit).

- **Long papers:** 7-8 pages. Overlength papers will be rejected without review.
- **Short papers:** 5-6 pages.
- **Focused Survey:** Up to 10 pages.
- **Poster papers:** 1-2 pages (undergraduate).

Important dates

Paper Submission

- Papers due: **May 10, 2023**
- Short paper/poster due: June 10, 2023
- Acceptance notification: July 10, 2023
- Camera-ready paper due: July 31, 2023

Workshop/Tutorial

- Proposal due: May 1, 2023
- Acceptance notification: May 10, 2023
- Workshop paper submission: June 10, 2023
- Author notification: July 10, 2023
- Camera-ready paper due: July 31, 2023

**THE FIFTH INTERNATIONAL CONFERENCE ON BLOCKCHAIN
COMPUTING AND APPLICATIONS (BCCA 2023)**
in Conjunction with KUWAIT FINTECH AND BLOCKCHAIN SUMMIT 2023
24–26 October, 2023 – Kuwait City, Kuwait



Web: <https://bcc-conference.org/>

CALL FOR PAPERS

Blockchain is a revolutionary technology in decentralized systems that enables secure decentralized transaction processing while ensuring data privacy and authenticity. It is now playing a significant role in several areas such as the Internet of Things, supply-chain management, manufacturing, cyber-physical systems, healthcare systems, and much more. Unlike centralized transaction processing solutions, blockchain uses a distributed ledger mechanism to record data transactions on multiple devices, this will prevent data breach, identity theft, and a plethora of cyber-related attacks, in essence, leading to a sustainability in data privacy and security. This conference aims to attract work of both researchers and practitioners in the area of cyber-security to share and exchange their experiences and research studies in both academia and industry in the field of blockchain.

Researchers are encouraged to submit original research contributions in all major areas, which include, but not limited to:

- **Track 01: Artificial Intelligence and Machine Learning**
 - Blockchain based artificial Intelligent Systems applications in Computers and Communications
 - Blockchain based AI and Robotics Technologies
 - Blockchain based AI and cloud computing
 - Blockchain based Economic paradigms and game theory
 - Blockchain based Machine and Deep Learning of Knowledge
 - Blockchain based Distributed Knowledge and Processing
 - Blockchain based Humans-Agents Interactions / Human-Robot Interactions
- **Track 02: IoT and Cyber-Physical Systems**
 - Blockchain-based IoT Applications and Services
 - Blockchain-based security for the Internet of Things and cyber-physical systems
 - Blockchain-based Internet of Things architectures and protocols
 - Blockchain in Cyber Physical Systems (CPS)
 - Blockchain-based application in Intelligent Manufacturing: Industrial Internet of Things,

- Blockchain and Secure Critical Infrastructure with Industry 4.0
- Intelligent manufacture and management
- Consensus and mining algorithms suited for resource-limited IoTs
- Blockchain-based Controlled mobility and QoS
- Blockchain-based energy optimization techniques in WSN
- Blockchain-based Software defined networks
- **Track 03: Big Data**
 - Blockchain in Data Fusion
 - Blockchain Analytics and Data mining
 - Distributed data store for blockchain
 - Distributed transaction for blockchain
 - Blockchain based Data Science and Data Engineering
 - Protocols for management and access using blockchains
 - Blockchain architectures tailored for domain-specific applications
- **Track 04: Security and Privacy on the Blockchain**
 - Authentication and authorization in Blockchain
 - Applications of blockchain technologies in digital forensic
 - Privacy aspects of blockchain technologies
 - Blockchain-based threat intelligence and threat analytics techniques
 - Blockchain-based open-source tools
 - Forensics readiness of blockchain technologies
 - Blockchain Attacks on Existing Systems
 - Blockchain Consensus Algorithms
 - Blockchain-based Intrusion Detection/Prevention
 - Security and Privacy in Blockchain and Critical Infrastructure
 - Attacks on Blockchain and Critical Infrastructure
 - Blockchain and Secure Critical Infrastructure with Smart Grid
- **Track 05: Metaverse and Digital Twin**
 - Blockchain in the metaverse
 - Blockchain in the digital twin
 - NFT Applications and protocols
 - Edge computing for Internet of Metaverse
 - Network security of the metaverse
 - Digital twin and Metaverse privacy
 - Consensus and mining algorithms suited for the metaverse
 - Blockchain-based Controlled mobility and QoS in the metaverse
 - Cybersecurity in the metaverse
- **Track 06: Blockchain Research & Applications for Innovative Networks and Services**
 - State-of-the-art of the Blockchain technology and cybersecurity
 - Blockchain-based security solutions of smart cities infrastructures
 - Blockchain in connected and autonomous vehicles (CAV) and ITS)
 - Blockchain Technologies and Methodologies
 - Recent development and emerging trends Blockchain
 - New models, practical solutions and technological advances related to Blockchain
 - Theory of Blockchain in Cybersecurity
 - Applications of blockchain technologies in computer & hardware security
 - Implementation challenges facing blockchain technologies

- Blockchain in social networking
- Performance metric design, modeling and evaluation of blockchain systems
- Network and computing optimization in blockchains
- Experimental prototyping and testbeds for blockchains

SPECIAL TRACK IMPORTANT DATES

- Submission Deadline: **15-June-2023**
- Notification of Acceptance: 31-July-2023
- Submission of Camera-ready: 1-September-2023

MAIN TRACK IMPORTANT DATES (CLOSED)

- Submission Deadline: ~~15-April~~ **3-May-2023 (Firm and Final)**
- Notification of Acceptance: 10-June-2023
- Submission of Camera-ready: 1-September-2023

IEEE CyberSciTech / PICom / DASC / CBDCom 2023
Abu Dhabi, UAE



Web: <https://icnetlab.org/cyber-science2023/index.html>

Call For Papers - IEEE CyberSciTech 2023 Tracks and Topics

Track 1: Cyberspace Theory & Technology

Cyberspace Property, Structure & Models
Cyber Pattern, Evolution, Ecology & Science
SDN/SDS, 5G/6G, Vehicle & Novel Network
Cloud, Fog, Edge & Green Computing

Big Data Analytics, Technology & Service
Infrastructures for Smart City/Country

Track 2: Cyber Security, Privacy & Trust

Cyber Security, Safety & Resilience
Cyber Crime, Fraud, Abuse & Forensics
Cyber Attack, Terrorism, Warfare & Defense
Cyber Privacy, Trust & Insurance
Blockchain, DLT Techniques & Applications
Post-quantum Cryptography

Track 3: Cyber Physical Computing & Systems

Cyber Physical Systems & Interfaces
Cyber Physical Dynamics & Disaster Relief
Cyber Manufacturing & Control
Embedded Systems & Software
Autonomous Robots & Vehicles
Internet of Things (IoT) & Smart Systems

Track 4: Cyber Social Computing & Networks

Social Networking & Computing
Computational Social Science
Crowd Sourcing, Sensing & Computing
Cyber Culture, Relation, Creation & Art
Cyber Social Right, Policy, Laws & Ethics
Cyber Learning, Economics & Politics

Track 5: Cyber Intelligence & Cognitive Science

Cyber/Digital Brain & Artificial Intelligence
Hybrid & Hyper-connected Intelligence
Affective/Mind Cognition & Computing
Brain/Mind Machine Interface
Intelligent Multimedia Technology

Track 6: Cyber Life & Wellbeing

Important dates

Workshop/SS Proposal Due: May 15, 2023

Workshop/SS Proposal Notification: May 17, 2023

Main Conference Papers

Paper Submission Due: 1 July, 2023

Authors Notification: 15 September, 2023

Camera-ready Submission: 30 September, 2023

IEEE Future Networks World Forum
13-15 November 2023 // Baltimore, MD, USA
Imagining the Network of the Future



TOPICS OF INTEREST

Our goal is to foster collaboration and knowledge-sharing among academic researchers, industrial practitioners, and professionals working in this exciting and emerging field of research. We invite individuals from diverse backgrounds to share their innovative ideas, latest findings, and perspectives on potential use cases, open research problems, technical challenges, and solution methods in this context. Topics will include but not limited to:

- Spectrum sharing and allocation in future networks
- Spectrum sensing techniques for cognitive radio networks
- Dynamic spectrum access in future networks
- AI/ML techniques for spectrum management
- Interference management in shared spectrum networks
- Spectrum efficiency in future networks
- Policy and regulatory issues related to spectrum management in future networks
- Coexistence of different wireless technologies in shared spectrum environments
- Spectrum auction mechanisms for future networks
- Spectrum pricing models in future networks
- Spectrum measurement and monitoring techniques in future networks
- Spectrum database management for dynamic spectrum access
- Spectrum aggregation techniques in future networks

IMPORTANT DATES

Symposium Paper Submission: 21 July 2023

Symposium Paper Acceptance Notification: 1 September 2023

Camera-Ready Submission: 15 September 2023

7. Special Issues organized by CSIM members

1) Zero Trust Security Methods for Wireless Networks

IEEE Wireless Communications

Guest Editors:

Moayad Aloqaily – MBZUAI, UAE

Helen Paik – University of New South Wales Sydney, Australia

William Tessaro Lunardi – Technology Innovation Institute, TII, UAE

Cihan Tunc – University of North Texas, USA

He Fang – Soochow University, China

Scope: Wireless networks have evolved significantly over time, enabling a wide range of advanced services and applications in various areas, including communications, healthcare, industry, and transportation. These applications have a tremendous impact on our daily lives, making us overly dependent on wireless technologies, hence, emphasizing the need for security. Wireless networks are vulnerable to a wide range of security threats and attacks that can compromise the confidentiality, integrity, and availability of data. The complexity of these threats increases exponentially as the current wireless network infrastructure evolves, such that security attacks target network resources, confidential data, and exploit user privacy. For this reason, new security models are highly needed to overcome these threats and provide a secure environment for wireless applications.

Zero trust is a contemporary security model that provides a new cybersecurity strategy to eliminate implicit trust. It assumes that all users, devices, applications, and their network traffic, internal and external, are untrusted and should be continuously verified and validated at every stage of a digital interaction before granting admission to network resources. Zero trust can be applied to various applications of wireless networks as it is able to protect against unauthorized access. This alliance can be seen in diverse methods, including network segmentation, multi-factor authentication, device security, and autonomous continuous monitoring. Implementing zero trust methods for wireless networks can be challenging due to the lack of experience in this area, its integration with existing system complexity, and its enduring maintenance. These challenges increase with the complexity of the used technology as new advanced attacks can be designed allowing for the exploitation of wireless network resources.

The purpose of this Special Issue (SI) is to elaborate on and emphasize the key aspects of zero-trust methods for wireless networks, understanding the principles of Zero Trust Security and how they can be applied to wireless networks, and implementation of Zero Trust Security in wireless networks - best practices and challenges. It welcomes original research and innovative solutions on the above subjects as well as case studies that explore the potential exploitation of zero trust security and its applications in wireless technology. Research may cover and focus on either the fundamental methodological studies or the use-case and application demonstrations.

Topics of interest include, but are certainly not limited to:

- Zero trust techniques, architectures, and models.
- Network segmentation and micro-segmentation.
- Zero-trust networks and modeling.
- Decentralized zero trust models.
- AI-based zero trust models.
- Advanced authentication mechanisms using zero trust.
- Identity and access management using zero trust.
- Zero trust-enabled continuous monitoring and detection.
- Advanced risk assessment and management using zero trust.
- Machine learning and zero trust security in wireless networks.
- Zero trust in mobile and satellite networks; and in the metaverse.
- Zero trust in cloud/edge computing.
- Cyberattacks in zero-trust environments.
- Implementation of zero-trust security in wireless networks.
- Scalability of zero trust.
- Evaluation of zero trust deployment models for wireless networks.
- Zero trust in various areas for wireless network applications.
- Integration of zero trust with other security measures.
- Industry efforts on zero trust techniques.
- Understanding the standards of Zero Trust Security and wireless networks.
- Network and energy overheads of zero trust techniques.

Important Dates

- Manuscript Submission Deadline: **1 August 2023**
- Initial Decision Date: **1 October 2023**
- Revised Manuscript Due: **1 November 2023**
- Final Decision Date: **1 December 2023**
- Final Manuscript Due: **1 February 2024**
- Publication Date: **April 2024**

2) Open Radio Access Networks: Architecture, Challenges, Opportunities, and Use Cases in Vehicular Networks

IEEE Transactions on Vehicular Technology

Cellular vehicle-to-everything (C-V2X) was introduced to support autonomous driving through 5G and beyond networks. C-V2X leverages cellular network infrastructure to integrate vehicle-to-network, vehicle-to-pedestrian, vehicle-to-infrastructure, and vehicle-to-vehicle communications. It has been suggested that Open RAN can be used to achieve the latency requirements essential to realize C-V2X as it achieves real-time optimization through the use of AI in Near real-time RAN Intelligence Controller (Near-RT RIC). The Open RAN will allow the access to historical traffic data or acquisition of data from vehicles. The data will then be transferred to Near-RT RIC for detecting network anomalies while maintaining reliable communication, which is essential for realizing autonomous driving. Open RAN also supports non-real-time RAN intelligent controller (Non-RT RIC)

that allows more complex ML workflows such as policy-based feature extraction and optimization to guide vehicles when real-time acquisition is not available. Open RAN provides support for edge cloud, i.e. Open Cloud that helps to interface the Near-RT RIC with Open RAN central unit's user and control plane. Together, the Open RAN and C-V2X are considered to be the key-enabling technologies for achieving low-latency in autonomous vehicular communication networks.

The scope of this special issue is to highlight key research problems along with solid technical solutions for the development and testing of networks based on the Open RAN vision, for the adoption of open APIs, interfaces, standards in 5G network architectures, the integration of AI and ML workflows, coexistence with proprietary virtual RAN (vRAN) alternatives, developing performance measurement metrics, and dealing with vertical and horizontal flexibility for vehicular networks. Furthermore, the special issue will also focus on the Open RAN standards and architecture for the evolution of 5G to 6G, and O-RAN-based intelligent techniques for service orchestration, resource allocation and management, and O-RAN commercial use-cases.

This special issue will seek technical, empirical, and conceptual papers that could offer practical and novel solutions concerning the following topics in the context of Open RAN and its integration with CV2X, but not strictly limited to:

- AI/ML methods for Near-RT RIC for Traffic Monitoring
- Design of Policy-based methods for Non-RT RIC for Autonomous Driving
- Simulation and Modeling of Open Cloud and C-V2X
- Improving reliability and lower latency of Autonomous driving using Open RAN
- Designing Access Traffic Steering, Switching, and Splitting (ATSSS) functions for Near-RT RIC
- Designing user plane functions for Open cloud. • Routing data of autonomous vehicles to user plane functions via Open cloud.
- Computational Offloading for autonomous vehicles using Open RAN.
- AI/ML methods to minimize age of processing for autonomous vehicles using Open RAN
- Communication Planning Approach for predicting offloading delay.
- Privacy-Preserving AI/ML methods for vehicular networks in Open RAN
- Virtualization and Scaling techniques for C-V2X
- Simulation and Modeling of Fronthaul and Open Interfaces
- Distributed Cloud Architectures based on Service Management and Orchestrators (ONAP, OSM), Kubernetes, and OpenStack
- Coexistence of Open RAN with vRAN and cRAN in C-V2X
- Boosting Disaggregation functionalities in C-V2X through AI/ML workflows

- Enhancing Openness and Opportunities for non-top vendors with Digital Twins
- Design of Test-bed architectures.

Deadlines

- Paper submission: 31 May 2023
- First round of review notification: 31 August 2023
- First Revision Submission deadline: 15 October 2023 • Notification of final decision: 15 December 2023
- Final Manuscript Submission Deadline: 30 December 2023
- Publication: Q1 2024

Guest Editors

- Kapal Dev, Munster Technological University, Ireland, (Email: Kapal.dev@ieee.org)
- Chih-Lin I, China Mobile Research Institute, China (Email: icl@chinamobile.com)
- Vuk Marojevic, Mississippi State University, USA (Email: vuk.marojevic@msstate.edu)
- Sunder Ali Khowaja, University of Sindh, Pakistan, (Email: sandar.ali@usindh.edu.pk)
- Shao-Yu Lien, National Chung Cheng University, Taiwan (Email: sylien@ccu.edu.tw)
- Yue Wang, Samsung Electronics, UK (Email: yue2.wang@samsung.com)

3) Technologies for beyond 5G networking

Scientific Reports

Currently 5G capabilities are well established; however, due to the increasing demand imposed by modern society through e.g. virtual and augmented reality, and ubiquitous mobile communications, further advances are desirable. In the past few years, there has been much effort from the engineering community to develop solutions that will lead to the next generation of mobile wireless communication, with a particular interest in millimeter and terahertz waves. Next generation mobile communication technologies are expected to dramatically increase the speed and bandwidth of our networks, enabling larger and faster information transfer and interconnectedness.

This Collection welcomes research resulting in developments in technologies beyond 5G networking.

Editors

- Domenico Ciuonzo,
- Kapal Dev
- Toktam Mahmoodi
- Shouhuai Xu

Submission deadline: 24 August 2023

4) Computing Continuum and Federated Learning for Smart Cities

Elsevier ComNet journal

Computing continuum is the infrastructure connecting the Internet of Things (IoT), the edge, and the high-performance cloud. Federated learning is a distributed machine learning approach that preserves the privacy of users. IoT plays a tremendous role in improving smart cities, affecting in different ways with its numerous applications in enhancing public transformation, reducing traffic congestion, creating cost-effective municipal services, keeping citizens safe and healthier, reducing energy consumption, and reducing pollution. Nevertheless, the huge volume of information gathered, processed, and transmitted to support these smart city applications call for new solutions for increasing their sustainability and the citizens' privacy. Currently, most of these applications are cloud-based to be able to compute all the sensed information. In addition, new paradigms such as fog or edge computing or, even, the cloud-to-thing continuum (distributed clouds) are being used, first, to get computation resources closer to the data source and, second, to reduce the data traffic and the network overhead. New methods and mechanisms are required to effectively manage the software, infrastructure, and networking dimensions affected by deploying distributed IoT applications. AI-enabled computing continuum is a research area that can help in these directions to define techniques for efficient management of the infrastructure and the network for the deployment of distributed IoT applications. In addition, collaborative smart city applications should also address issues related to the security and privacy of all the shared data. Distributed blockchain networks can also improve many aspects ranging from database immutability to anonymity of payments.

Guest editors:

- **Dr. Pericle Perazzo, PhD**, University of Pisa, Pisa, Italy
- **Dr. Javier Berrocal, PhD**, University of Extremadura, Cáceres, Spain
- **Dr. Burak Kantarci, PhD**, University of Ottawa, Ottawa, Canada
- **Dr. Luca Foschini, PhD**, University of Bologna, Bologna, Italy
- **Dr. Massimo Villari, PhD**, University of Messina, Sicily, Italy

Timeline:

- **Submission Open Date** *20/04/2023
- **Final Manuscript Submission Deadline** *20/10/2023
- **Editorial Acceptance Deadline** *20/02/2024