2020

COMMUNICATIONS SYSTEMS INTEGRATION AND MODELING TECHNICAL COMMITTEE

CSIM-TC

NEWSLETTER

May 2020

Burak Kantarci (Chair)
Nizar Zorba (Vice-chair)
Angelos Antonopoulos (Secretary)

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1. 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 bi-annual 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:

2018- now – 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/

2. Awards/Distinctions for CSIM members

CSIM best paper awards (2018 edition)

CSIM TC has extended the **best paper award (for 2018) to 3 papers** (2 journals and 1 conference paper) by CSIM members in IEEE GLOBECOM 2019 in Hawaii. In particular, the **Best Journal Paper Award** has been extended to two papers:

1) M. Mezzavilla, M. Zhang, M. Polese, R. Ford, S. Dutta, S. Rangan, M. Zorzi, **End-to-End Simulation of 5G mmWave Networks**, IEEE Communications Surveys & Tutorials, 2018

2) Zhenyu Zhou, Junhao Feng, Bo Gu, Bo Ai, Shahid Mumtaz, Jonathan Rodriguez, Mohsen Guizani, **When Mobile Crowd Sensing Meets UAV: Energy-Efficient Task Assignment and Route Planning,** IEEE Transactions on Communications, 2018

The **Best Conference Paper Award** has been extended to:

1) Paolo Castagno, Vincenzo Mancuso, Matteo Sereno, Marco Ajmone Marsan, **A Simple Model of MTC in Smart Factories,** IEEE INFOCOM 2018

The eligibility rules for the nominations were as follows:

The paper must appear in print in a peer-reviewed journal or a peer-reviewed conference proceedings (other than in the ICC and Globecom CQRM symposiums) in 2018, i.e., from January 1, 2018 to December 31, 2018, and AT LEAST one of the co-authors must be a CSIM TC member (please see here how to become a member: http://csim.committees.comsoc.org/subscribe/).

The specific technical content of the nominated paper is expected to have a clear connection to the general theme of communication systems integration and modeling. The nominated paper needs to show originality and substantial technological impact or potential technological impact on both the theory and the practice of network and communication systems integration and modeling. Please refer to the CSIM TC website for more information about the covered topics: http://csim.committees.comsoc.org/

Best Paper Award in IEEE GLOBECOM 2019 - CQRM Symposium

The paper "**The Impact of Human Mobility on Edge Data Center Deployment in Urban Environments**" by P. Vitello, A. Capponi, C. Fiandrino, G. Cantelmo, and D. Kliazovich, was awarded the **Best Paper Award** in the **CQRM Symposium** of the IEEE GLOBECOM that took place in Hawaii, USA. The abstract of the paper is as follows:

Abstract: Multi-access Edge Computing (MEC) brings storage and computational capabilities at the edge of the network into so-called Edge Data Centers (EDCs) to better low-latency applications. To this end, effective placement of EDCs in urban

environments is key for proper load balance and to minimize outages. In this paper, we specifically tackle this problem. To fully understand how the computational demand of EDCs varies, it is fundamental to analyze the complex dynamics of cities. Our work takes into account the mobility of citizens and their spatial patterns to estimate the optimal placement of MEC EDCs in urban environments in order to minimize outages. To this end, we propose and compare two heuristics. In particular, we present the mobility-aware deployment algorithm (MDA) that outperforms approaches that do not consider citizens mobility. Simulations are conducted in Luxembourg City by extending the CrowdSenSim simulator and show that efficient EDCs placement significantly reduces outages.

Professor Erol-Kantarci selected for 2019 list of N2Women: Stars in Computer Networking and Communications

Melike Erol-Kantarci, CSIM member and Associate Professor of Electrical Engineering and Computer Science, was selected for the 2019 list of "N2Women: Stars in Computer Networking and Communications".

An expert on wireless communications, AI-enabled networks, smart grid and electric vehicles, Dr. Erol-Kantarci is also a Tier 2 Canada Research Chair in AI-enabled Next-Generation Wireless Networks. Her pioneering work in smart grid communications has received several awards and recognition. She has co-edited two books and delivered many invited talks around the globe.

The related list of researchers may be found here: https://n2women.comsoc.org/10-women-in-networkingcommunications-that-you-should-know/2019-n%c2%b2women-stars-in-computer-networking-and-communications/

Congratulations Dr. Melike Erol-Kantarci!

3. Past Events

"AI-enabled Wireless Networks Towards 6G" Tutorial by Melike Erol-Kantarci and Medhat Elsayed

Event: Ottawa-AI Alliance workshop
Date: 28 November 2020

Dr. Melike Erol-Kantarci and her student Mr. Medhat Elsayed delivered the tutorial "AI-enabled Wireless Networks Towards 6G" at the at Ottawa-AI Alliance workshop on November 28th. The 3-hour workshop had a large attendance from academia and industry. The tutorial focused on machine learning techniques and their applications in next generation networks. It is well-known that the heterogeneous demands coming various vertical industries call for efficient utilization of network resources. Artificial intelligence, or more specifically machine learning algorithms stand as promising tools to intelligently manage the networks such that network efficiency, reliability, robustness goals are achieved and quality of service demands are satisfied. The opportunities that arise from learning the environment parameters, under varying behavior of the wireless channel, positions "AI-enabled 5G and 6G" superior to preceding generations of wireless networks. The tutorial This tutorial started with an overview of the state-of-art in machine learning algorithms and their applications to wireless networks. It included discussions on challenges and open issues both in terms of AI algorithms and their applicability to various functions of wireless networks. These discussions are put into perspective considering the recent 5G NR Release 15 as well as further discussions on Release 16.

"Robotics Research in the Machine Learning and Deep Learning Paradigm" Technical Talk by Prof. G. C. Nandi

Date: 17 December 2019

A technical talk was **organized by Nitin Gupta**, CSIM member and Assistant Professor, Department of Computer Science and Engineering, National Institute of Technology, Hamirpur, Himachal Pradesh, India on the topic "Robotics Research in the Machine Learning and Deep Learning Paradigm" in association with IEEE Communication Society-Delhi Chapter. The talk was delivered by Prof. G. C. Nandi, Professor (HAG), Indian Institute of Information Technology, Allahabad Founder Chairperson, IEEE-Robotics and Automation Society Chapter, UP Section, on 17 Dec, 2019. Further, Nitin Gupta also summarized the audience about activities of IEEE Communication Society, Delhi Chapter.

"Bridging Artificial and Adversarial Intelligence for Secure Non-dedicated Sensing in Smart Spaces" Invited Talk by CSIM-TC Chair Burak Kantarci

Date: 28 November 2019

An invited talk was delivered by CSIM Chair Burak Kantarci in Ottawa AI Alliance Workshop. Dr. Kantarci discussed the potential of Adversarial AI to model and design malicious behaviour in smart spaces monitored by non-dedicated sensors, and will continue with presenting the potential of AI-backed solutions to detect and prevent cyber threats in non-dedicated sensor networks.

4. Book Publications

Dr. Rehmani's Book published by CRC Press, Taylor and Francis Group.

Dr. Muhammad Maaz Rehan (COMSATS University, Pakistan) and Dr. Mubashir Husain Rehmani (Cork Institute of Technology, Ireland) have published a book on "**Blockchain-enabled Fog and Edge Computing: Concepts, Architectures and Applications**" by CRC Press, Taylor and Francis Group. It is available online for pre-order and will be shipped in hardback after July 2020.

Link 1: https://www.routledge.com/Blockchain-enabled-Fog-and-Edge-Computing-Concepts-Architectures-and/Rehan-Rehmani/p/book/9780367457358

Link 2: https://www.taylorfrancis.com/books/9781003034087

This comprehensive book unveils the working relationship of blockchain and the fog/edge computing. The contents of the book have been designed in such a way that the reader will not only understand blockchain and fog/edge computing but will also understand their co-existence and their collaborative power to solve a range of versatile problems.

The first part of the book covers fundamental concepts and the applications of blockchain-enabled fog and edge computing. These include: Internet of Things, Tactile Internet, Smart City; and E-challan in the Internet of Vehicles. The second part of the book covers security and privacy related issues of blockchain-enabled fog and edge computing. These include, hardware primitive based Physical Unclonable Functions; Secure Management Systems; security of Edge and Cloud in the presence of blockchain; secure storage in fog using blockchain; and using differential privacy for edge-based Smart Grid over blockchain.

5. Ongoing Research Projects/Grants

MonB5G: Distributed management of Network Slices in beyond 5G
by A. Antonopoulos (CTTC, Spain) and C. Verikoukis (CTTC, Spain)

Web: https://www.monb5g.eu/
Twitter: https://twitter.com/monb5g
LinkedIn: https://www.linkedin.com/company/monb5g

MonB5G aims at deploying a novel autonomous management and orchestration mechanism framework by heavily leveraging distribution of operations together with state-of-the-art Artificial Intelligence (AI) based mechanisms. The developed system is based on a hierarchical approach that allows the flexible and efficient management of network tasks, while at the same time, introduces a diverse set of centralization levels through an optimal adaptive assignment of monitoring, analysis, and decision-making tasks. The MonB5G approach focuses on the design of a hierarchical, fault-tolerant, automated data driven network management system that incorporates security as well as energy efficiency as key features, in order to orchestrate a massive number of parallel network slices and significantly higher types of services in an adaptive and zero-touch way.

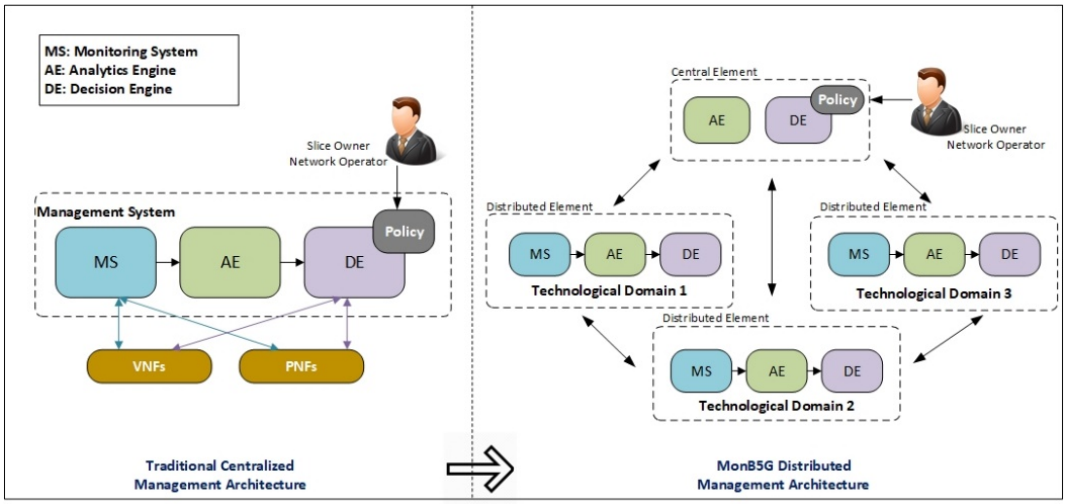


Figure 1 MonB5G vision

Specific Objectives
To achieve the overall objective of MonB5G, a series of specific objectives have been specified:
O1: Devise a distributed management plane to handle the deployment of a massive number of network slices
O2: Define network slice service-level KPIs that consider not only a single Virtual Network Function (VNF), but all the network slice components, i.e., VNFs, Physical Network Functions (PNFs) and networking components
O3: Devise data-driven management system components (i.e., Monitoring System, Analytics Engine, Decision Engine), based on SoA federated learning AI techniques
O4: By combining the Intent-based policy definition and the cognitive management entities, MonB5G will target multi-domain zero-touch network configuration of sliced 5G and beyond networks

O5: Define decision algorithms tailored to the Radio Access Network (RAN). The envisioned decisions should allow to update the RAN configuration, when the latter is detected as the root cause of network slice performance degradation or when considered necessary to meet the heterogeneous performance requirements of multiple coexisting slices
O6: Elaborate advanced security schemes and plans to empower secure smart network slice LCM
O7: Provide AI-assisted techniques to optimize energy efficiency in all technological domains (i.e., Cloud, RAN, Core and Multi-access Edge Computing)
O8: Dissemination, standardisation and exploitation of technologies developed in the MonB5G project. Special focus is given to push the solutions regarding the cognitive Analytics and Decision Engines to ETSI ZSM and ENI bodies

Demos and Proof-of-Concept

Proof of Concept 1: Zero Touch Network and Service Management with end-to-end SLAs	
Experimental Scenarios (ESs)	
ES1: Zero-Touch multi-domain service management with e2e SLAs	ES2: Elastic e2e slice management
Key Performance Indicators (KPIs)	
• Reduce the number of SLA performance violations by **20%** • Improve network energy efficiency by a **factor of 10** • Reducing Static Slicing overhead will result in **30%** higher utilization (will be achieved with dynamic reconfiguration techniques) • Compared to Static Slicing, demonstrate the **same or better SLA tolerances (or risk of missing SLAs)** when dynamic slicing techniques are used • **10x** reduction in signaling / monitoring overhead with the use of federation techniques	
Proof of Concept 2: AI-assisted policy-driven security monitoring and enforcement	
Experimental Scenarios (ESs)	
ES1: Attack identification and mitigation	ES2: Robustness of learning algorithms in the face of attacks
Key Performance Indicators (KPIs)	
• **10x** faster identification of security attack/anomaly • **10x** faster attack remediation and reconfiguration in the order of **10s** • End to end slice availability **> 99%** • Per slice component availability **> 99.999%** • Slice isolation: **<5%** performance degradation during attacks on coexisting slices. **Full protection** against cross-slice confidentiality and traffic steering attacks at the mobile edge • False positive rate in attack classification below **1%** • Learning robustness: Precision, recall, fall-out, Area Under Curve values above/below specific thresholds vs. specific ratios of misreporting slice components	

MonB5G has received funding from the European Union's Horizon Research and Innovation programme under Grant Agreement No 871780*

NSERC Funding to Expand Research on 5G Security

by A. Matrawy (Carleton University)

Carleton University's Ashraf Matrawy (CSIM member) has received funding from TELUS and the Natural Sciences and Engineering Research Council of Canada (NSERC) as part of the Collaborative Research and Development (CRD) grants program for his work on secure network slicing for 5G services.

Matrawy's research focuses on 5G security, a major strength in research at Carleton. The project received $510,000 cash and provides $150,000 of in-kind contributions. Future network services will rely on a 5G infrastructure. This infrastructure is critical for many Internet service providers (ISPs), including TELUS. As a leading managed security services provider and a major component of Canada's national critical infrastructure, TELUS will work with Carleton on this initiative to strengthen the 5G network and reinforce Canada's leading role in mobility security.

"5G technology goes beyond being a new cellular communication technology — it is an important infrastructure tool that supports a variety of industries," said Matrawy, professor in the School of Information Technology. "Security in this new context is very important."

Traditional security concerns may not hold true in a 5G environment that embraces a large number of access points to increase coverage and capacity. The result is an expanded collection of points where a system could be compromised. This exposes the network core to a greater risk of attack. The impact of attacks may be higher due to the scale of the 5G network and the higher data rates available to both users and attackers.

Network slicing allocates a portion of a network to users based on their needs, whether they are an individual or a company. This is key to providing flexible, scalable and on-demand solutions for a vast array of services using 5G networks. Given the nature of 5G architecture, security challenges related to slicing will exist while trying to meet the strict requirements in ultra-low-latency and device-to-device communications.

Matrawy will study techniques and strategies to mitigate risks associated with network slicing in 5G networks. He will follow a risk-mitigation approach and will rely on creating new threat models and defence and traffic management techniques. This research will be instrumental in shaping security strategy for critical information infrastructure operators such as TELUS.

6. Upcoming Events

IEEE International Workshop on Computer Aided Modeling and Design of Communication Links and Networks (CAMAD)
14-16 September 2020 – Virtual Conference

IEEE CAMAD™ IEEE International Workshop on Computer Aided Modeling and Design of Communication Links and Networks
14-16 September 2020 // Virtual Conference

Website: https://camad2020.ieee-camad.org/

Scope: This year IEEE CAMAD will focus on Communication and Experimentation aspects of 5G, Industrial IoT for Industry 4.0, and beyond. IEEE CAMAD will be hosting Workshops and Special Sessions, bringing together a diverse group of scientists, engineers, manufacturers and providers to exchange and share their experiences and new ideas focusing on research and innovation results in the 5G and Industrial IoT domains. In addition to contributed papers, the conference will also include keynote speeches that will be announced soon.

Topics: IEEE CAMAD is soliciting papers describing original work, unpublished and not currently submitted for publication elsewhere, on topics including, but not limited to, the following:

- Wireless PHY layers for 5G: design, analysis, and optimization
- Wireless MAC protocols for 5G: design, analysis, and optimization
- 5G IoT networks, Platforms, Integration and Services
- Industrial IoT
- IT/OT convergence in Industry 4.0
- 5G Multitenant Networks and End-to-End Network slicing
- Adaptive content distribution in on-demand services
- Backhaul/fronthaul for multi-tier ultra-dense heterogeneous small cell networks
- Cognitive and Cooperative Communications
- Commercial and Societal Impact of Networks, Data, and Adaptive Services
- Context and location-aware wireless services and applications
- Cross-layer design for massive MIMO and multiuser MIMO networks
- Circular economy for ICT
- Software-Defined Networking (SDN) Architectures and Networks
- Machine-Learning and Artificial Intelligence
- Efficient integration of multiple novel 5G air interfaces
- Energy efficiency and Energy harvesting in wireless networks
- Mobile big data and network data analytics
- Mobile Edge and Fog Computing Systems
- Mobile Social Networks
- Mobile Crowd Sensing
- Security, Privacy and Trust by Design
- Indoor localization
- Mobility, location, and handoff management
- Multimedia QoS, and traffic management

- Multiple access in machine-to-machine communication
- Network estimation techniques
- Optical Communications & Fiber Optics for 5G
- Quality of Experience: Framework, Evaluation and Challenges
- Smart Grids: Communication, Modeling and Design
- Testbed, experiments and prototype implementations of systems & Services for 5G
- Ultra low-latency and ultra high-reliability
- Validation of Simulation Models with Measurements
- Wireless body area networks and e-health services
- Wireless broadcast, multicast and streaming

Submission Guidelines: Prospective authors are invited to submit a full paper with a maximum paper length of six (6) pages including results, figures and references without incurring additional page charges (maximum 1 additional page with over length page charge for an additional fee, if accepted), in the standard IEEE two-column conference format. Papers should be submitted via EDAS using the following link: https://edas.info/newPaper.php?c=27371. Papers submitted to the conference, must describe original unpublished work that has not been submitted for publication elsewhere. All submitted papers will be reviewed by at least three TPC members, and all accepted and presented papers will be included in the conference proceedings and IEEE digital library. Please note that for every accepted contribution, at least one person must register for the conference and present. Accepted papers not presented in the conference will be excluded from the proceedings.

Important Dates
Paper Submission Deadline: **20 May 2020**
Author Notification: **3 July 2020**
Camera Ready: **31 July 2020**

General Chairs

Stefano Giordano, University of Pisa, Italy
Luca Foschini, University of Bologna, Italy

Technical Program Chairs

Rosario Giuseppe Garroppo, University of Pisa, Italy
Melike Erol Kantarci, University of Ottawa, Canada

1st Workshop on Experimentally-driven 5G Research Business, Applications & Developments (5G-ReBuilD – ACM MobiCom 2020 Workshop)
25 September 2020, London, U.K.

Website: http://www.netmode.ntua.gr/rebuild20/
Submission link: https://easychair.org/conferences/?conf=5grebuild2020

Scope: In the last few years, significant effort has been initiated by national and international bodies, e.g., by the European Commission, in order to build and utilize experimental, commercial 5G and mobile communications testbed facilities, with the penultimate goal to promote experimentally-driven research on 5G and wireless/mobile networks. The longer-term goal is to enable faster and cost-effective technology realizations and adoption of related business models. Taking into account these initiatives, 5G-ReBuilD will be one of the first attempts to collect original contributions and early results of experimentally-driven research over such 5G facilities and bring together researchers, engineers, software developers and market analysts in a forum dedicated to the use of wireless experimental platforms for 5G research, adoption and business value creation.

The workshop will be especially interested in results tested and validated over extensive and sustainable 5G experimental platforms, e.g., those developed under the umbrella of the 5G-PPP and Internet 2 initiatives. Specifically, results of 5G trials on transport, smart cities, healthcare, smart industries, aquaculture/agriculture, etc., will be targeted. More theoretic but experimentally tested and validated 5G solutions will be also accepted, streamlining a faster development of the theory into technological novelty. Furthermore, the workshop will accept contributions on technology readiness evaluation results and business approach validations over 5G infrastructures, facilitating multi-lateral discussions on 5G experimentation and technology evolution, while bringing together experts from different disciplines. 5G-ReBuild aims at faster and cost-efficient 5G realizations through works focusing on tangible results.

The topics of interest include, but are not limited to:

- 5G platforms for vertical sector experimentation
- 5G trials on healthcare applications
- 5G trials on transport applications
- 5G trials on aquaculture applications
- 5G trials on smart cities, ports, and factories
- 5G trials on tourism, media & entertainment
- 5G trials on UAV applications

- 5G trials on green energy-saving applications
- 5G trials on railway applications
- Network monitoring tools for 5G trials
- Measurement tools for 5G trials
- Trials over 5G-PPP infrastructures
- Experimental SDN solutions for 5G applications
- Experimentation with flexible and programmable RAN
- Experimentation with massive MIMO Communications
- Experimentation with applications of machine learning and adaptive techniques for 5G
- Testing of eMBB/URLLC/mMTC applications in 5G
- 5G New Radio (NR) testing
- Slice dimensioning techniques for 5G applications
- Multi-Access Edge Computing (MEC) applications
- Energy efficient network design and protocols for 5G
- Open source tools for 5G network emulation
- Virtualization of resources in 5G experimental testbeds
- End-to-end (E2E) network slicing in 5G networks
- Multi-domain/Multi-tenant 5G network management
- Business approach validations over 5G infrastructures
- Validation of standards over 5G infrastructures

Submissions: For instructions on the manuscript layout, please visit: https://sigmobile.org/mobicom/2020/. The papers can be submitted in: https://easychair.org/conferences/?conf=5grebuild2020. Selected papers will be invited to submit an extended version of their work through a fast-track process in **Elsevier Computer Networks journal (IF: 3.030).**

Important Dates

Submission Deadline: May 15, 2020
Notification of acceptance: July 1, 2020
Camera-ready papers: July 31, 2020

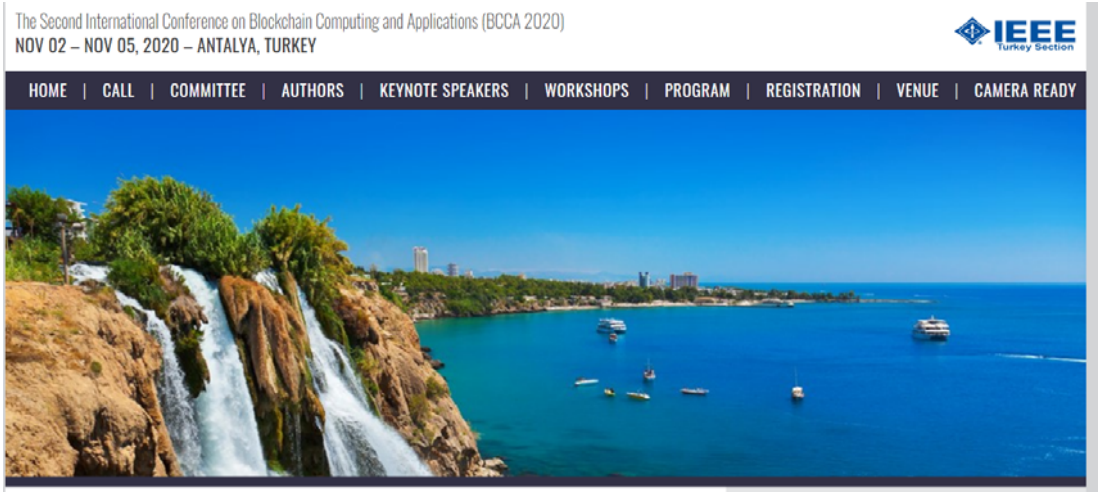
GENERAL CHAIRS
Symeon Papavassiliou, National Technical University of Athens, Greece
Panagiotis Demestichas, University of Pireaus, Greece

TECHNICAL PROGRAM CHAIRS
Vasileios Karyotis, Ionio University, Greece
Haesik Kim, VTT, Finland

PUBLICITY CHAIRS
Angelos Antonopoulos, CTTC, Spain
Meng Lu, Dynniq, The Netherlands

LOCAL-ARRANGEMENTS CHAIR
Faouzi Bouali, University of Surrey, U.K.

2nd International Conference on Blockchain Computing and Applications (BCCA 2020)
2-5 November 2020, Antalya, Turkey



Scope: As a revolutionary technology, Blockchain provides a practical solution to enable a secure and decentralized public ledger that a huge plethora of exciting new technology applications in several areas, such as the Internet of Things (IoT), Cyber-Physical Systems, Manufacturing, Supply-Chain, etc. Blockchain technology has infiltrated all areas of our lives, from manufacturing to healthcare and beyond. Cybersecurity is an industry that has been significantly affected by this technology and maybe more so in the future. Blockchain Technology is defined as a decentralized system of distributed registers that are used to record data transactions on multiple computers. The reason this technology has gained popularity is that you can put any digital asset or transaction in the blocking chain, the industry does not matter. Blockchain technology can be used to prevent any data breach, identity theft, cyber-attacks or criminal acts in transactions. This ensures that data remains private and secure. The main goal of this workshop is to encourage both researchers and practitioners to share and exchange their experiences and recent studies between academia and industry in the Blockchain field.

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**
- **Track 02: IoT and Cyber-Physical Systems**
- **Track 03: Big Data**
- **Track 04: Security and Privacy on the Blockchain**
- **Track 05: Blockchain Research & Applications for Innovative Networks and Services**

Important Dates

- Paper submission deadline: **May 25th, 2020**

- Notification of paper acceptance: August 15th, 2020
- Submission of camera-ready papers due: September 10th, 2020

General Co-Chair

- Salil Kanhere, UNSW Sydney, Australia
- Öznur Özkasap, Koç University, Turkey

Program Co-Chairs

- Moayad Aloqaily, Carleton University, Canada
- Rasheed Hussain, Innopolis, Russia
- Ali Dorri, Queensland University of Technology (QUT), Brisbane, Australia

2nd Workshop on Smart Building and Internet of Things (SBIoT)

Conference website: https://globaliotsummit.org/
Workshop website: https://globaliotsummit.org/wp-content/uploads/2020/02/CfP-SBIoT2-@-GIoTS-2020.pdf
EDAS submission link:
https://giots20.edas.info/newPaper.php?c=26896&track=100263

The Internet of Things (IoT) enables network objects of the most diverse types to dynamically cooperate and make their resources available in order to reach a common goal. Such a paradigm is currently revolutionizing a variety of fields, facilitating and improving human life and work. Among them are Smart Buildings, which take advantage of the pervasive presence of embedded and smart devices to monitor and to remotely control key equipment within buildings. In such an intelligent environment, major goals are to improve the comfort and quality of life of people and to provide decision-support tools in order to aid users in making cost-effective decisions when utilizing electrical energy.
Smart Buildings integrate autonomy and adaptive control and are considered as the next generation of buildings that contribute in enabling Smart Cities. Smart Buildings link automation, sustainable development, information technology, security, industrial controllers and communications (among other systems) to achieve an optimal level of comfort and energy consumption. As the indoor environment is being increasingly digitized, traditional building automation processes are rapidly reshaping to build the next revolution. Indeed, IoT will be one of the founding pillars of Society 5.0, a super-smart people-centric society in which both economic prosperity and resolution of societal challenges are achieved.

The main challenge of Society 5.0 is to develop people-centric applications, where the presence of intelligent tools can augment the capabilities of the objects in constructing a relationship with users and exploit the user profile to construct personalized services; moreover, it is important to define methodologies and algorithms to analyze and exploit the context in which users live and work.
Based on these considerations, the objective of this workshop is to highlight recent research, development, and evaluation of novel systems in Smart Building scenarios. We are seeking for original, previously unpublished work, addressing key issues and challenges in this area.
Potential topics include, but are not limited to:

- Active and Collaborative Sensing in Smart Building
- Behavioral and Energy Consumption Analytics
- Implementation of Social IoT for Smart Building
- IoT applications, systems, and testbeds for Smart Building
- IoT-enabled indoor revolutions: Industry 4.0 and Society 5.0 in Smart Buildings
- Models of context and context awareness
- IoT for Smart Building devices and accessibility
- New design paradigms in human-machine interaction for Smart Building
- Cloud and mobile cloud architectures supporting Smart Building through IoT
- Privacy-preserving data processing techniques
- Big data, analytics, and signal processing for Smart Building enabled by an IoT approach
- People-centric applications in Smart Building
- Algorithms, architectures and platforms for Active and Assisted Living
- Safety and Security preservation in Smart Building
- Indoor location and guidance applications

Submission Guidelines
The submission guidelines valid for the workshop are the same as for the GIoTS. They can be found at https://globaliotsummit.org/call-for-papers-2020/.
Papers must be submitted through EDAS at https://giots20.edas.info/newPaper.php?c=26896&track=100263.

Workshop Co-Chairs
Virginia Pilloni, University of Cagliari, Italy
Michele Nitti, University of Cagliari, Italy
Sanja Lazarova-Molnar, University of Southern Denmark, Denmark
Important Dates
Paper submission: **15 March 2020**
Notification of Acceptance: **15 April 2020**
Camera-Ready Paper Submission: **30 April 2020**

IEEE IoT Vertical and Topical Summit for Tourism (IoT-VTST'20)

Conference website: https://sardinia2020.iot.ieee.org/
EDAS submission link: https://edas.info/newPaper.php?c=27138

The IoT Vertical and Topical Summit on Tourism (IoT-VTST'20), which is held jointly with the CNIT International Workshop on Connected Societies, will bring together global professionals from industry, public sector, and research community in the beautiful island of Sardinia, Italy on 8-9 September 2020.
The choice of the theme "Hospitality Industry 4.0" is motivated by the fact that the tourism sector is a major source of revenue for most countries. Notably, the Italian cultural heritage includes the largest number of sites declared by UNESCO as World Heritage Sites. However, more than a third of Italian institutions that belong to the cultural sector—which attracts tourists—do not use innovative technologies to enhance the visiting experience and best leverage touristic resources. Accordingly, the Summit is designed to foster dialogue amongst professionals from the industry, the public sector, and the research community from all over the world to improve the adoption of the IoT technologies in this Tourism sector.
The Summit is accepting proposals for Key Talks, Panels, and Technical Papers describing original research within, but not limited to, following areas:

- **Personalizing the Tourism Experience**: context and situation aware services, self-forming services, affective IoT, Quality of Experience, privacy, smart museums/digital heritage
- **Improving the Transport Services for Tourists**: connected vehicles, intelligent transport, Mobility as a Service, ticketing, vehicle sharing services
- **IoT and Tourist Hospitality**: IoT multimedia and societal impacts, energy efficiency and comfort management, accommodation sharing services, identity management
- **Digital Tools for Tourism**: Augmented/Virtual Reality, cloud/edge computing, crowdsensing/crowdsourcing, Artificial Intelligence/machine learning
- **Enabling a More Accessible Tourism**: enabling barrier-free destinations, developing assistive technologies, inclusive tourism experience, user-aware services

Submission Guidelines
The submission guidelines are available at https://sardinia2020.iot.ieee.org/authors/.
Key talk and panel proposals must be submitted via email to the Technical Program Chair Michele Nitti at michele.nitti.it@ieee.org.
Papers must be submitted through EDAS at
https://edas.info/newPaper.php?c=27138.

Important Dates
Paper submission: **2 May 2020**
Notification of Acceptance: **15 June 2020**
Camera-Ready Paper Submission: **10 July 2020**

2020 CNIT International Workshop on Connected Societies (CSOC 2020)

Conference website: http://csoc2020.cnit.it/
EDAS submission link: https://edas.info/newPaper.php?c=27138&track=101724

The Internet of Things (IoT) enables network objects of the most diverse types to dynamically cooperate and make their resources available in order to reach a common goal. Such a paradigm is currently revolutionizing a variety of fields, facilitating and improving human life and work. Indeed, IoT will be one of the founding pillars for a connected society, a super-smart people-centric society in which both economic prosperity and resolution of societal challenges are achieved.
The main challenge of a connected society is to develop people-centric applications, where the presence of intelligent tools can augment the capabilities of the objects in constructing a relationship with users and exploit the user preferences to construct personalized services. This leads to a variety of conflicting requirements and technical challenges for the development of a connected society: on the one side, it is required that the mechanisms to retrieve information, distribute content and manage knowledge are improved; on the other side, it is essential to deal with data protection, privacy, and access control. Moreover, it is important to define methodologies and algorithms to analyze and exploit the context in which users live and work.
Contributions are solicited on all advanced research issues in these contexts, and particularly on (but not limited to) the following topics:

- **Human-centric and context-aware IoT, including societal impacts and sustainable development**: mostly related to active and collaborative sensing, models of context and context awareness, IoT solutions to promote accessibility, people-centric applications, location-aware systems and services, Quality of Service (QoS) and Quality of Experience (QoE)
- **Next generation IoT architectures**: mainly focused on cloud- and fog-based networking, cloud and mobile cloud architectures, implementation of Social IoT solutions, new design paradigms in human- machine interaction, Information-centric Networking (ICN), big data, analytics and Artificial Intelligence (AI), signal processing enabled by an IoT approach

- **Advanced wireless communications and networks**: Sigfox, LoRa, 5G, narrowband IoT, Software Defined Networking (SDN), Software Defined Radio (SDR) and Cognitive Radio networks, knowledge-defined networking
- **Applications, services and real implementations**: contributions coping with IoT applications, systems, and testbeds for connected society, Active and Assisted Living, smart factories and Industry 4.0, smart grid and energy management, smart environments, Intelligent Transportation Systems, Tactile Internet
- **Security, privacy and data protection**: mainly related to Intrusion Detection Systems, malware detection, multimedia forensics, privacy-preserving data processing techniques, safety and security preservation

Submission Guidelines
The submission guidelines are available at http://csoc2020.cnit.it/authors/.
Papers must be submitted through EDAS at
https://edas.info/newPaper.php?c=27138&track=101724.

Important Dates
Paper submission: **2 May 2020**
Notification of Acceptance: **15 June 2020**
Camera-Ready Paper Submission: **10 July 2020**

10th Workshop on Management of Cloud and Smart City Systems (MoCS 2020)

Website: https://mocs20.gforge.uni.lu/

The last years have witnessed a permanent change of vision of cloud systems. Nowadays, the most important stakeholders such as private companies, public agencies, research communities and citizens rely on the cloud for a number of purposes, stemming from sharing hardware infrastructures to software, data, and sensing services.

The services designed for complex scenarios like Multi-Access Edge Computing (MEC), smart cities, and the upcoming Industry 4.0, pave the path for a new era of the cloud. The complexity of human dynamics in a city can be better analyzed by

decentralizing the infrastructure, integrating and opening the data and sharing the services. The MEC paradigm, standardized by ETSI, is a key enabling technology for upcoming 5G networks, whereby applications and network functions are hosted in edge cloud data centers. By being closer to the end-user, besides better supporting low-latency applications, MEC systems are a candidate architecture for such a decentralized, context-aware infrastructure. Through sensing as a service processes, crowd-sensed data is made available to the cloud stakeholders. Some of them like citizens become data contributors, customers and service consumers at the same time. Despite such a rapid (re-)evolution of cloud systems, it remains unclear whether current solutions are able to support these emergent application scenarios. In this context, artificial intelligence (AI) and machine learning (ML) can provide deeper knowledge of the behavior of edge systems to shape the development of autonomic orchestration and networking.

The MoCS workshop started following the "cloud" stream 9 years ago. The focus of the 10th MoCS edition is in the convergence of cloud paradigm in form of MEC to support low-latency, context-aware applications for complex scenarios like smart cities and learning-driven approaches for urban planning.

Topics of interest include, but are not limited to the following:

- Application of cloud/edge and MEC systems to smart cities services;
- Models for context-aware crowdsensing techniques at urban-level scale;
- Integration of cloud/edge systems and mobile crowdsensing systems through Human-enabled Edge Computing (HEC) paradigm;
- Edge data center deployment in urban environments to support low-latency applications;
- ML- and AI-based approaches for edge computing services;
- AI-driven models, architectures, and frameworks for edge computing;
- Experiences on the (re)use of open platforms for cloud-integrated smart cities services;
- Design and evaluation tools for scalability and efficient resource allocation in smart cities;
- Design and application of cloud/edge technologies to Intelligent Transport Systems (ITS);
- Vehicular cloud architectures for provisioning of smart cities services;
- Adaptive solutions for scalable, maintainable, cost-effective cloud management and services provision;
- Models and paradigms for the management of cloud/MEC services within/between data centres (intra- /inter-domain) and their deployment in urban environment;
- Application of ML techniques to cloud/edge-based smart city applications;
- Cloud/edge-based automation tools applied to robotic science for smart cities;
- Pricing schemes, bargaining mechanisms and economics for trading data in cloud/edge environ- ments;
- Blockchain solutions for secure and reliable transactions between the counterparts in data sharing/trading;
- Data-driven approaches for smart transportation in urban areas;
- Software defined networks and placement of the controller in urban environments.

A selection of papers accepted to MoCS 2020 will be invited for a possible extension to be published in MDPI Electronics Special Issue: The Technologies that Disappear: 30 years after Mark Weiser's Vision

Submission Guidelines: Prospective authors are invited to submit original technical papers for publication in MoCS 2020. Manuscripts should be written in English with a maximum paper length of 6 printed pages for full papers and 4 pages for short papers. No more than 20% of short papers will be accepted. All manuscripts should adhere to the IEEE double column conference proceedings (https://www.ieee.org/conferences/publishing/templates.html). Authors are invited to submit their papers using EasyChair at https://easychair.org/my/conference?conf=ieeeiscc2020#. Papers exceeding 6 pages will not be accepted by EasyChair. At least one author of each accepted paper is required to register to the conference and present the paper. Only registered and presented papers will be included in the ISCC 2020 Proceedings and submitted for inclusion to IEEE Xplore library. The IEEE ISCC Proceedings have been indexed in the past by ISI, dblp and Scopus. This makes the ISCC Workshops publication venues with very high visibility and impact in both Computer and Communications areas. Please, contact the Workshop Organizers for any inquiry regarding the submission of manuscripts.

Important Dates

Paper Submission: May 9th, 2020
Notification of Acceptance: May 29th, 2020
Final Paper: June 8th, 2020

Workshop Chairs

Javier Berrocal, University of Extremadura, Spain
Andrea Capponi, University of Luxembourg, Luxembourg
Michele Girolami, ISTI – CNR, Italy

Special Session on "**Emerging Data-driven Approches for Network Optimization" (collocated with IEEE CAMAD 2020)**

Website: https://camad2020.ieee-camad.org/authors/special-sessions/

Scope: The foundation of 5G and beyond mobile networks lies in the convergence between networking and computing. Network functions at any layer of the protocol stack, from physical to network and transport layer, become software-based and virtualized through software-defined and network function virtualization paradigms. In 5G, the most appealing realization of such convergence is the application of artificial intelligence (AI) and machine learning (ML) to optimize network functions. The latter has generated an increasing interest from academia and industry paving the path for the transformation from the 5G paradigm "connected things" into a "connected intelligence" vision for beyond 5G and 6G mobile networks. To this end, the role of AI/ML is to support zero-touch configuration and orchestration, thereby enabling self-configuration and self-optimization of the mobile network. Mobile networks are indeed becoming increasingly complex, heterogeneous, dynamic and dense, which makes extremely hard to model correctly their behavior. Model-free

solutions that AI enable can overcome such challenge. This Special Session seeks contributions from experts in areas such as network programming, distributed systems, machine learning, data science, data structures and algorithms, and optimization to discuss the latest research ideas and results on application of AI and ML solutions to networking.

Topics of Interest: This Special Session welcomes the submission of original contributions that do not overlap with works that have been published or that are simultaneously considered for publication elsewhere. Specifically, this Special Session seeks contributions in the following major areas (indicative list, other related topics will also be considered):

• Machine learning (ML) and big data analytics in networking
• Case studies showing (dis)advantages of AI/ML techniques for networking over traditional ones
• Edge-driven data analytics and applications to smart cities
• AI/ML assisted network optimization
• Resource-efficient machine learning for mobile networks
• Measurements and analysis of network traffic for AI/ML systems
• Efficient ML data structures, algorithms and network protocols to process network monitoring data
• Approaches for privacy-aware network traffic data collection
• Architectures for federated learning and its applications to networking
• Energy-efficient federated learning
• Incentive mechanisms of federated learning
• In-network computation for next generation wireless networks

Important Dates

Paper submission deadline May 20, 2020
Paper acceptance notification July 05, 2020
Camera-ready paper July 31, 2020
Conference date September 14-16, 2020

Paper Submissions Guidelines

Prospective authors are invited to submit a full paper of not more than six (6) IEEE style pages including results, figures and references. Papers should be submitted via EDAS. Papers submitted to the conference, must describe unpublished work that has not been submitted for publication elsewhere. All submitted papers will be reviewed by at least three TPC members, while submission implies that at least one of the authors will register and present the paper at the conference. Electronic submission will be carried out through the EDAS web site at the following link: https://edas.info/newPaper.php?c=27371&track=101982 . All accepted papers will be included in the conference proceedings and IEEE digital library (http://ieeexplore.ieee.org/).

Special Session Organizers
• Claudio Fiandrino, *IMDEA Networks Institute, Spain*
• Andrea Capponi, *University of Luxembourg, Luxembourg*

7. Special Issues organized by CSIM members

1) Recent Advances on the Emerging Technologies for Connected Vehicles in Smart Cities

Transactions on Emerging Telecommunications Technologies
https://onlinelibrary.wiley.com/pb-assets/assets/21613915/SI_Proposal__NG_VANET2-1584443815037.pdf

Guest Editors:
Dr. Farhan Ahmad, Cyber Security Research Group, University of Derby, Derby, United Kingdom
Mr. Boubakr Nour, School of Computer Science and Technology, Beijing Institute of Technology, Beijing, China
Dr. Asma Adnane, Networks and System Research, Loughborough University, Loughborough, United Kingdom
Dr. Moayad Aloqaily, xAnalytics, Ottawa, ON, Canada

Scope: Last decade has witnessed a remarkable interest from both research and industrial community in the realization and development of connected vehicles, due to major advancements inVehicular Ad hoc Networks (VANET). Today, connected vehicles represent those smart and in-telligent vehicles which are equipped with various on-board sensors, communication modules, and Internet access, etc. Thus, enabling them to disseminate the generated data towards other neighbouring connected vehicles via vehicle-to-everything (V2X) communication. This results inthe realization of a wide range of safety and non-safety applications. To meet the challenges forrealizing these applications, various emerging technologies can be integrated within VANET.
Technologies including Edge/Fog Computing, Blockchain, Cloud Computing, Software De-fined Networking (SDN), 5G communication, and Information-Centric Networking (ICN) are someof the recent emerging technologies across the globe. Integrating these emerging technologies inthe VANET architecture can increase the scope of possible applications. For instance, Edge Computing can be utilized to relay messages to vehicles with minimum possible delay. Blockchain, on the other hand, can be helpful to transmit messages in a transparent way, thus providing security-by-design up to certain level. ICN, a future Internet paradigm, can be integrated within VANET due to the fact that it relies on content naming and anycast data fetching, thus, matching the databroadcasting requirement of VANET.
Although these technologies can be helpful to increase the scope of applications within VANET, however, this integration is not straight-forward. Many constraints and challenges need to be ad-dressed before making it a reality.
This special issue is aimed to disseminate and identify thoserelating areas, which can increase the efficiency of various aspects of emerging technologies withinVANET. To this end, we are seeking high quality research papers in the domain of emerging technologies including Edge/Fog Computing, Cloud Computing, Blockchain, and ICN within VANET, but are not limited to.
This special issue invites original research that investigates emerging technologies with VANET. Potential topics include but not limited to the following:

- Applications of emerging technologies (e.g., Edge/Fog Computing, Cloud Computing, 5G, Blockchain, etc.) within VANET.

- VANET over future Internet architectures.
- Novel architectures for emerging technologies based VANET.
- Efficient routing protocols for VANET applications.
- Efficient content dissemination schemes over emerging technologies based VANET.
- Energy efficiency and quality-of-service support within VANET.
- Integrating Internet-of-Things (IoT) applications within VANET.
- Security, privacy, and reliability of VANET applications using Edge Computing and Blockchain.
- Trust management schemes for VANET and emerging technologies.
- Cyber security aspects within transportation.
- Performance evaluation of Inter and Intra-vehicular communication mechanisms (i.e., vehicle-to-vehicle, vehicle-to-infrastructure, vehicle-to-sensors, vehicle-to-pedestrians) within VANET.
- Testbed and simulations for VANET applications.

Important Dates

Submission deadline: July 01, 2020
First round notification: September 01, 2020
Second round due: November 01, 2020
Final notification: January 01, 2021

2) IoT and Sensor Networks in Industry and Society

Energies
https://www.mdpi.com/journal/energies/special_issues/IoT_and_Sensor_Networks_in_Industry_and_Society

Submission deadline: 20 June 2020

Scope: In the last decade, the deployment of IoT and sensor networks have made a strong impact on many aspects of society. The seamless integration of technologies to perform sensor data generation, transmission, and processing have enabled the development of smart solutions such as Smart Cities, Smart Agriculture, and Smart Transports. As the business environment is being increasingly digitized, traditional industrial processes are rapidly reshaping to build the fourth industrial revolution, namely Industry 4.0. This will pave the way for the use of ICT as the foundations of Society 5.0, a super smart human-centric society in which both economic development and resolution of societal challenges are achieved.
This Special Issue encourages high-quality unpublished contributions on recent advances in IoT and sensor networks towards the implementation of Industry 4.0 and Society 5.0. Topics of interest for publication include but are not limited to:

- Human-centric society and quality of life improvement;
- Artificial intelligence and robots for healthcare and ambient assisted living;
- ICT for infrastructure inspection and maintenance;
- Modeling, planning, and operating industrial processes in smart manufacturing;
- IoT data analysis for smart agriculture;
- Big data analytics and social media mining;

- Safe and secured society in both cyber and physical spaces;
- Smart retail and sales management;
- Connected and autonomous vehicles;
- IoT and sensor networks for environmental monitoring.

Submission: Manuscripts should be submitted online at www.mdpi.com by registering and logging in to this website. Once you are registered, click here to go to the submission form. Manuscripts can be submitted until the deadline. All papers will be peer-reviewed. Accepted papers will be published continuously in the journal (as soon as accepted) and will be listed together on the special issue website. Research articles, review articles as well as short communications are invited. For planned papers, a title and short abstract (about 100 words) can be sent to the Editorial Office for announcement on this website.
Submitted manuscripts should not have been published previously, nor be under consideration for publication elsewhere (except conference proceedings papers). All manuscripts are thoroughly refereed through a single-blind peer-review process. A guide for authors and other relevant information for submission of manuscripts is available on the Instructions for Authors page. *Energies* is an international peer-reviewed open access semimonthly journal published by MDPI.

Guest Editors:
Daniele D. Giusto, University of Cagliari, Italy
Virginia Pilloni, University of Cagliari, Italy