IEEE CAMAD 2020 Special Session Proposal

Towards 5G and Beyond: An Era of Agile, Brisk and Perceptive Networking

Special Session Chairs
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Scope and Motivation

The advent of 5G Networking introduces significant challenges in almost every link of the network value chain. The demand for seamless connectivity, extremely low latency, high-speed data transfer and energy efficiency along with the exponential increase of interconnected devices will shape an ecosystem with such complexity that enforces the replacement of almost every current standard. In addition, backwards compatibility remains an absolute necessity, despite the introduction of new architectural paradigms which facilitate a new breed of services primarily based on M2M communication schemes and cutting-edge sensing infrastructure integration.

5G Network design aims to mitigate problems and shortcomings of today's networks, such as long service instantiation times, resource over-provisioning for meeting peak subscriber demand, dependence on obsolete and cost-ineffective hardware devices and extended manual configuration tactics which lack network awareness or operate based on self-organization principles. This intention leads to an increasing need for networking briskness and agility that can be attained via the virtualization of network processing functions, which will further enhance the proposed ecosystems' ability for self-configuration, self-organization and self-healing.

In this respect, this Special Session aims at providing a forum where researchers, engineers, and practitioners may discuss the latest advances on architectures, algorithms, abstractions, and technologies for briskness, flexibility, security and agility in contemporary network topologies.

Main Topics of Interest

For the specific Special Session, we strongly encourage submission of papers describing original work, unpublished and not currently submitted for publication elsewhere, on topics including, but not limited to, the following:

- 5G Network architectures, protocols, application programming interfaces
- Reliability, verification, resiliency, and fault management in 5G Networks
- Secure Network Coding applications and algorithms for contemporary networks
- Next Generation Small Cell Design Principles, Techniques and Guidelines
- Autonomic management technologies in 5G Networks
- Multi-access Edge Computing platform design, implementation and evaluation
- Fog Computing platform design, implementation and evaluation
- Security functions and services in contemporary networks
- Leveraging 5G Networking paradigms for IoT platforms and IoT-based services
- 5G Networking applications in Smart Cities/Environments
- Application of machine learning, big data analytics in contemporary networks
- Scalable, distributed and hierarchical controller architectures

- Software-based integration of computing, storage, and networking elements in 5G Networks
- PHY Layer enhancements for 5G Networking
- Self-configuration/optimization/healing techniques in contemporary networking
- Optimal network configuration principles in contemporary networking
- Environmentally-aware techniques for Green Networking
- New forwarding abstractions and programmability paradigms in 5G Networks
- Architectures for Cloud-native micro-services in 5G Networks
- Use and performance of container techniques
- Data and control plane conformance, interoperability, scalability, and performance studies
- Design guidelines for scalable, highly-available and modular elements for 5G Networks
- Dynamic service function chaining
- OpenStack/Open vSwitch(OVS)/OPNFV/ONOS -related research & explorations
- Service chaining/orchestration and traffic steering in NFV and SDN
- Tools for validating network services and automated deployment and management
- Applying compositional patterns for parallelism, control logic, performance, and reliability of network services
- Design of NFV and SDN-based forwarding elements
- Performance evaluation, optimization, isolation, tradeoffs with NFV workloads
- Control plane architectures and network operating systems in NFV and SDN
- NFV infrastructure architectures including hardware acceleration technologies
- NFV & SDN on public/private clouds
- Commercial models and implications for NFV and SDN ecosystems
- Heterogeneous Hardware solutions for HPC, Big Data and Advanced Analytics
- Cybersecurity frameworks for enhancing protection, privacy and robustness
- Security, privacy and trust through Blockchain and distributed ledger technology
- Blockchain applications in IoT, Cyber Physical Systems, Edge/Cloud Computing

Biography

Ilias Politis received his BSc in Electronic Engineering from Queen Marry College London, UK in 2000, his MSc in Mobile and Personal Communications from King's College London, UK in 2001 and his PhD in Multimedia Communications from the University of Patras Greece in 2009. Currently he is a Senior Researcher at the Wireless Telecommunications Lab. of the Electrical and Computer Engineering at the University of Patras, and Associate Researcher at the School of Science & Technology in the Hellenic Open University, Greece. Dr. Politis has been actively involved in all phases of H2020-MSCA-SECRET, H2020-MSCA-SONNET, H2020-RIA-EMYNOS, FP7- ICT-ROMEO, FP7-SEC-SALUS and FP7-ICT-FUTON projects, as well as, several national funded research projects, while his research interests include multimedia experience data acquisition and modelling, 3D video and multimedia networking. His is a member of the IEEE.

Christos Tselios holds a Diploma in Electrical and Electronic Engineering from the University of Patras, Greece. He joined Citrix Systems in 2012 as Senior Engineer, currently working in the Service Providers Platforms Group as Senior Researcher. In 2011 he was a visiting Researcher in Aalborg University, Denmark while between 2006 and 2008 he carried out research in Ericsson Eurolabs and RWTH University in Aachen, Germany. Since 2009 he is involved in numerous EU-funded Projects (FP7 and H2020) in both academia and industry, having several publications in peer-reviewed IEEE Conferences. Christos is a member of IEEE, ACM and the Technical Chamber of Greece.