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Special Session on
Towards ML-based efficient and secured 6G Networks

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Md Arifur Rahman holds a PhD degree in Electrical Engineering from the University of Ulsan, South Korea in 2019. His current research interests include cell-free mMIMO, cloud computing in 5G networks, multi-access edge computing, virtual radio access networks, AI application in wireless communications, digital twins, and emerging technologies in wireless communications.

Scope of the session

5G changes the landscape of mobile networks, with an evolved architecture supporting unprecedented capacity, spectral efficiency, and increased flexibility. The adoption of Edge Computing and the paradigm shift from centralized architectures (e.g., based on C-RAN) towards multiple tiers of Edge nodes and a virtualized and, possibly, cell-free RAN currently pose a lot of challenges. In this perspective, a unified and hierarchical infrastructure is essential in order to provide an intelligent management of communication, computation and storage resources, which can be further enhanced by incorporating efficient Machine-Learning (ML) algorithms. Furthermore, ML can play a significant role in the automatic monitoring and synchronization of resources, while facilitating the implementation of ground-breaking applications in network and data security/privacy and the integration of several new technologies in an efficient manner.

Prospective authors are invited to submit original and unpublished work on the following research topics related to this Special Session:

- *AI-based 5G network slicing and optimization*
- *Design and implementation of RAN architectures for disaggregated networks in B5G/6G networks*
- *Self-Driven Virtual Elastic Infrastructures via multi-objective optimization for B5G/6G networks*
- *ML – from deep learning and reinforcement learning to federated learning—for network security*
- *ML-driven slice security mechanisms in multi-tenant infrastructures in B5G/6G networks*
- *ML and Blockchain technologies for trust-less multi-tenant slicing*
- *Decentralized resource management for network slicing in B5G/6G networks*
- *ML based Anomaly Detection for 5GB/6G Networks*
- *Hardware Accelerated, ML-based data plane security and malicious traffic detection*
- *End-to-end deep learning models for wireless communication*
- *ML-driven design and optimization of modulation and coding schemes*
- *ML techniques for channel estimation, channel modeling, and channel prediction*
- *Machine learning for ultra-reliable and low latency communications*