Sustainable Communications for Renaissance

Call for Papers

Symposium on Selected Areas in Communications: Machine Learning for Communications and Networking Track

Track Co-Chairs

- **Carlo Fischione, KTH Royal Institute of Technology, Sweden, carlofi@kth.se**
- **Marwa Chafii, New York University (NYU), Abu Dhabi, marwa.chafii@nyu.edu**

Scope and Motivation

Machine learning has become a prominent and rapidly growing research topic in the field of wireless communications. The application of machine learning to wireless communication systems is expected to deeply transform wireless communication engineering. In a discipline traditionally driven by well-established mathematical models, machine learning brings along a methodology that is data-driven and carries a major shift in the way wireless systems are designed and optimized. Research in the field of machine learning for wireless communications is still at its infancy. While machine learning has already been widely applied in domains such as self-organized networks, sensing or cognitive radio, its use is only emerging or not yet fully investigated in many research areas in wireless communications and networking, and its viability for many such wireless applications continues to increase as the basic enabling technology and methods from machine learning continues to grow. The goals of this track are to provide a platform for the latest results in the field of machine learning for wireless communications and networking, shed light on the challenges and prospect of this new research field, open new perspectives, and inspire innovation. The call for papers is driven towards the needs of beyond-5G wireless networks and associated new communication concepts in which machine learning has the potential to be a true enabler. Furthermore, we encourage submissions in algorithmic developments in machine learning that are motivated by the specific constraints posed by wireless communications (e.g., low latency, massive connectivity, distributed, and coordinated architectures).

Topics of Interest

We invite submissions of unpublished work related to application of ML for wireless communications and networking. We do not restrict the type of ML techniques. A non-exhaustive list of relevant topics is given as follows:

- Machine learning driven design and optimization of modulation and coding schemes
- Machine learning techniques for channel estimation, channel modeling, and channel prediction
- Machine learning based enhancements for difficult-to-model communication channels, such as molecular, biological, multi-scale, and other non-traditional communications mediums

- Transceiver design and channel decoding using deep learning
- Machine learning for end-to-end wireless communication system design
- Machine learning driven techniques for radio environment awareness and decision making
- Machine learning for Internet of Things (IoT) and massive connectivity
- Machine learning for ultra-reliable and low latency communications (URLLC)
- Machine learning for massive MIMO, active and passive large intelligent surfaces (LIS)
- Machine learning for cell-free wireless systems
- Machine Learning for integrated communications and sensing
- Machine learning framework for joint communication and control
- Machine learning for vision-aided wireless communications
- Machine learning for positioning and location-based services
- Distributed learning approaches for distributed communications problems
- Machine learning for resource management & optimization
- Machine learning in complex network setups
- (Deep) Reinforcement Learning for self-organized networks and AP/BTS optimization
- Machine learning techniques for non-linear signal processing
- Machine learning techniques for network slicing and system coexistence
- Low-complexity and approximate learning techniques and power reduction applications
- Machine learning for edge intelligence, sensing platforms, and sense making
- Algorithmic advances in machine learning for communication systems
- Advancing the joint understanding of information theory, capacity, complexity and machine learning communications systems
- Applications of transfer learning in wireless communication
- Deep unfolding techniques for wireless networks
- Meta-learning techniques for machine learning
- Compression of neural networks for low-complexity hardware implementation
- Unsupervised, semi-supervised, and self-supervised learning approaches to communications
- Wireless transmission and protocol optimization for machine learning
- Privacy and security preserving distributed training over communications networks
- Machine learning techniques for physical layer security including fingerprinting

Important Dates

Paper Submission: 11 October 2022
Notification: 18 January 2023
Camera Ready and Registration: 15 February 2023

Important Note

The authors of selected papers from this track will be invited to submit an extended version of their work for fast-track review and possible publication in the IEEE Open Journal of the Communications Society.

How to Submit a Paper

All papers for technical symposium should be submitted via EDAS. Full instructions on how to submit papers are provided on the IEEE ICC 2023 website: https://icc2023.ieee-icc.org/