

Selected Areas in Communications Machine Learning for Communications

Symposium Co-Chairs

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Scope and Motivation

Our society is undergoing a digitization revolution, with a dramatic increase of Internet users and connected devices. Between 2020 and 2030, the number of IP connections will rise by 55% annually, reaching 607 exabytes in 2025 and 5,016 exabytes in 2030. In addition, many innovative vertical services, each with its specific requirements, will have to be supported by future wireless networks. This poses stringent performance requirements to wireless networks, going beyond current 5G communications and calls for cognitive solutions able to handle extreme network complexity while at the same time ensuring scalability and flexibility.

In this context, an emerging technology that holds the potential of becoming one of the main 6G wireless technologies is **machine learning**. Motivated by recent improvements in computing capacity and data availability, machine learning provides computerized mathematical algorithms that can learn from data and teach themselves to evolve as the data keeps changing. While being a consolidated approach in other fields of science, machine learning has emerged only recently as a framework for the design of wireless communication networks.

Topics of Interest

The Machine Learning for Communications Symposium seeks original contributions in the following topical areas, plus others that are not explicitly listed but are closely related:

- Machine learning for end-to-end wireless communication system design
- Machine learning for resource management in wireless communications
- Machine learning in complex network setups
- Machine learning for distributed designs

- Machine learning for channel acquisition
- Machine learning for fingerprinting and positioning
- Network architectures based on machine learning
- Energy efficiency of machine learning
- New methodologies for artificial neural network training and testing
- Hybrid AI-based and model-based methodologies for wireless networks
- Transfer and deep transfer learning for wireless networks
- Deep unfolding techniques for wireless networks
- Federated learning techniques for wireless networks
- Reinforcement and deep reinforcement learning for wireless networks
- Federated (deep) reinforcement learning for wireless networks
- Multi-agent (deep) reinforcement learning for wireless networks
- Meta-learning techniques for machine learning
- Applications of machine learning to 5G/6G wireless technologies
- Applications of machine learning to RIS/IRS-empowered wireless networks
- Machine learning techniques for smart radio environments
- Ultimate performance analysis of machine learning for wireless networks

Important Dates

Paper Submission: 15 April 2022 Notification: 25 July 2022 Camera Ready and Registration: 1 September 2022

How to Submit a Paper

All papers for technical symposia should be submitted via EDAS. Full instructions on how to submit papers are provided on the IEEE Globecom 2022 website: <u>https://globecom2022.ieee-globecom.org/</u>