

Workshop for GLOBECOM2019

Title: Artificial Intelligence for Next-Generations Wireless Communications

Workshop Organizers:

Prof. Guan Gui, Nanjing University of Posts and Telecommunications, Email: guiguan@njupt.edu.cn

Prof. Yun Lin, Harbin Engineering University, Email: linyun@hrbeu.edu.cn

Scope and topics of the workshop

Artificial Intelligence (AI), well known from computer science (CS) disciplines, are beginning to emerge in the wireless communications and have recently received much attention as a key enabler for future 5G and beyond wireless networks. These AI approaches including Machine Learning (ML), Deep Learning (DL) and Deep Reinforcement Learning (DRL) approaches have been gradually applied to wireless communication systems for various purposes which extensively improve the performance of wireless communication systems and users' QoE. Therefore, AI technologies have a great potential to meet the various requirements of seamless wide-area coverage, low-power massive-connections, low latency high-reliability, and many other scenarios.

Due to the new features of future communications, such as complex scenarios with unknown channel models, high speed and accurate processing requirements, traditional methods are no longer suitable which brings much more potential application of AI. Just as DL technology has become a new hotspot in the research of physical-layer wireless communications and challenges conventional communication theories. Currently DL-based methods show promising performance improvements but lack of solid analytical tools and universal network architectures. In addition to the traditional neural network-based data-driven model, the model-driven deep network model and the DRL model (i.e. DQN) which combined DL with reinforcement learning are more suitable for dealing with future communication systems which can be modelled with interpretability. Moreover, most of current studies focus on solving old problems such as estimation accuracy and resource allocation optimization in wireless communication systems. However, it is important to distinguish new capabilities created by AI technologies and rethink wireless communication systems based on AI-driven schemes. Therefore, the old theory will be supplemented and updated to a large extent when solving the old problems with the new method of AI. At the same time, the problems brought by the introduction of AI technology into communication, such as how to reduce the complexity of AI algorithm to make it suitable for lightweight devices and so on are also important directions in the future.

This workshop focuses on the state-of-the-art research of AI technologies in wireless communications. In this workshop, we invite submissions of high-quality original technical and survey papers, which have not been published previously, on AI techniques and their applications in wireless communication and signal processing.

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

- AI based technologies for next-generation wireless communications
- AI based estimation and prediction methods on PHY applications for B5G wireless communications
- AI based technologies for uRLLC
- AI based technologies for NOMA
- AI based techniques for mm-Wave massive MIMO systems
- AI based channel estimation and modelling
- AI based modulation and coding for heterogeneous networks
- AI based technologies for signal classification
- AI based unmanned aerial vehicles (UAVs) communication
- AI strategies for the physical layer security
- AI based learning schemes for resource management
- AI based optimization policies for wireless network control
- AI based cross-layer design for hierarchical IoT and space-air-ground integrated networks
- AI based communication hardware design
- Light neural network applications for portable devices with high efficiencies and low costs
- Marginal AI applications on mobile edge computing and fog computing
- Model and knowledge driven deep learning technologies
- A description of the publicity and promotion plan

Deadline for workshop paper submission: June 30, 2019
Acceptance/rejection announcement: August 15, 2019
Final workshop papers due: September 15, 2019