CALL FOR PAPERS
IEEE JOURNAL OF SELECTED TOPICS IN SIGNAL PROCESSING: DISTRIBUTED MACHINE LEARNING FOR WIRELESS COMMUNICATION

The emerging wireless networking paradigms, e.g., Internet of Things (IoT), Ad-hoc networks, Device-to-Device (D2D) communications and Unmanned Aerial Vehicle(UAV)-aided networks, are inherently distributed. Recently, machine-learning based methods have been viewed as a key enabler for future network. However, the classic centralized machine learning approaches have some inherent disadvantages that limit their practicality, such as significant signaling overhead, increased implementation complexity and high latency in dealing with communication problems. To perform mission-critical applications, such as controlling a self-driving car or sending instructions to a robotic surgeon, future wireless systems must make more quickly and reliably decisions at the network edge.

To solve this massive scalability challenge while addressing privacy, latency, reliability and bandwidth efficiency, distributed machine learning are needed and the development of advanced signal processing frameworks are required. In these frameworks, communication units/devices/nodes are capable of collaboratively building a shared learning model by taking advantage of local and global signal information, to achieve high robustness, ultra-low latency, massive connectivity, and ultra-high reliability communications. Motivated by this appealing concept, numerous research activities in advanced signal processing techniques for distributed learning were sparked. However, the field of decentralized/distributed machine learning for wireless communication is still at its infancy as there are many open theoretical and practical problems yet to be addressed, such as robustness, privacy, communication costs, convergence, complexity, etc. This special issue will focus on the latest advances in emerging distributed intelligent communication systems from the perspective of signal processing to advance its theoretical underpinnings and practical applications. Prospective authors are invited to submit high-quality, original manuscripts on topics including, but not limited to:

- Distributed learning for beyond 5G multiple carrier and multiple antenna system design
- Fundamental performance metrics and limits of distributed learning systems
- Distributed learning networks with reconfigurable intelligent surfaces
- Multiple agent reinforcement learning with game theory for access
- Distributed learning edge caching and offloading
- New deep learning architectures for distributed learning communications
- Use of block chain/tensor optimization/big data /age of information/quantum computation for distributed learning
- Testbeds and experimental evaluations of distributed learning systems

Submission Guidelines: Prospective authors should follow the instructions given on IEEE J-STSP webpages https://goo.gl/X9hBE5 and submit their manuscripts through https://mc.manuscriptcentral.com/jstsp-ieee according to the following schedule:

Submissions due: July/31/2021
First Review due: September/30/2021
Revised manuscript due: November/15/2021
Second review due: December/31/2021
Final manuscript due: January/15/2022

Guest Editors:

Ping Yang (*Lead Guest Editor*), University of Electronic Science and Technology of China, China, yang.ping@uestc.edu.cn

Octavia A. Dobre, Memorial University of Newfoundland, Canada. odobre@mun.ca

Ming Xiao, Royal Institute of Technology (KTH), Sweden, mingx@kth.se

Marco Di Renzo, CNRS & Paris-Saclay University, France, marco.direnzo@centralesupelec.fr

Jun Li, Nanjing University of Science and Technology, China, jun.li@njust.edu.cn

Tony Q. S. Quek, Singapore University of Technology and Design (SUTD), Singapore, tonyquek@sutd.edu.sg

Zhu Han, University of Houston, Texas, USA, zhan2@uh.edu