IEEE SPS Seasonal School

Networked Federated Learning:

Theory, Methods and Applications

28 March 2022 - 01 April 2022

virtual in zoom. free registration (click here); school site: (click here)

Organizers: IEEE Finland Chapter SP/CAS, IEEE Finland Chapter CSS/RAS/SMCS, IEEE Vizag Bay Chapter COMSOC/SPS

Abstract. This school teaches basic theory and practical algorithms for networked federated learning (FL) from networked data. Networked data arises in several important application domains such as pandemics or the industrial internet of things. The school consists of the following modules: **Machine Learning (ML)**; **Networks**; **Basic FL**; **Clustered FL**; **Trustworthy FL**. Each module consists of lectures and coding assignments in **Python notebooks**.

Prerequisites. We expect participants to have basic skills in Python programming (basic flow control, functions, numpy-arrays) and linear algebra (concept of vectors, matrices and their eigenvalues).

Learning Outcomes. After completing the school, participants

- are familiar with regularized empirical risk minimization (RERM)
- understand the principle of gradient descent for solving RERM
- can use graphs to represent networked data and ML models
- can apply and critically evaluate FL methods

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