Federated Learning of Things - Expanding the Heterogeneity in Federated Learning

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Plenary Talk

The Internet of Things (IoT) has revolutionized how our devices are networked, connecting multiple aspects of our life from smart homes and wearables to smart cities and warehouses. IoT's strength comes from the ever-expanding diverse heterogeneous sensors, applications, and concepts that are all centered around the core concept collecting and sharing data from sensors. Simultaneously, deep learning has changed how our systems operate, allowing them to learn from data and change the way we interface with the world. Federated learning moves these two paradigm shifts together, leveraging the data (securely) from the IoT to train deep learning architectures for performant edge applications. However, today's federated learning has not yet benefited from the scale of diversity that the IoT and deep learning sensors and applications provide. This talk explores how we can better tap into the heterogeneity that surrounds the potential of federated learning and use it to build better models. This includes the heterogeneity from device hardware to training paradigms (supervised, unsupervised, reinforcement, self-supervised).