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## Abstract

In the past few decades, machine learning has revolutionized data processing for large scale applications. Simultaneously , increasing privacy threats in trending applications led to the redesign of classical data training models. In particular, classical machine learning involves centralized data training, where the data is gathered, and the entire training process executes at the central server. Despite significant convergence, this training involves several privacy threats on participants' data when shared with the central cloud server. To this end, federated learning has achieved significant importance over distributed data training. In particular, the federated learning allows participants to collaboratively train the local models on local data without revealing their sensitive information to the central cloud server. In this paper, we perform a convergence comparison between classical machine learning and federated learning on two publicly available datasets, namely, logistic-regression-MNIST dataset and image-classification-CIFAR-10 dataset. The simulation results demonstrate that federated learning achieves higher convergence within limited communication rounds while maintaining participants' anonymity. We hope that this research will show the benefits and help federated learning to be implemented widely.

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