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Project Title: Scalable Multi-Task Federated Learning for Personalized Models

Abstract:

Federated Learning (FL) is an emerging technology that enables the training of a machine learning model without violating mobile user data privacy. Due to the growing computation power of mobile and IoT devices, it becomes increasingly feasible to store and process the data locally instead of offloading all the data and computation to the cloud.

The advantages of FL include data privacy preservation and reduced communication overhead. This project will explore and develop a scalable federated learning framework that handles critical research challenges in FL, including data heterogeneity and model heterogeneity. The project will develop novel methods by multi-task learning and personalization for managing data heterogeneity. It will support client devices with non-IID data and customize their models adaptively. Inspired by knowledge distillation, we will further develop novel FL methods that can support heterogeneous models for client devices with different capabilities.