Title: Your Data, Your Rules: Pretraining Federated Text Models

Abstract: Federated learning is a decentralized approach to training models on user devices, providing personalization and ensuring privacy by summarizing local changes and sending to the cloud the aggregated parameters from each of the local models, but never the data itself. It has been successful for training language models for NLP tasks like Next Word Prediction (NWP). The very domain of NLP has witnessed significant success due to transfer learning, with the advent of models like BERT. In this research we employ the idea of transfer learning to federated training for the NWP task and run a number of experiments demonstrating enhancements to current baselines. Specifically, we compare federated training baselines from randomly initialized models to various combinations of pretraining approaches including pretrained word embeddings and whole model pretraining followed by federated fine-tuning for NWP on Stack Overflow. We realize lift in performance using pretrained embeddings without exacerbating model training time or memory footprint. We also observe notable differences using centrally pretrained networks, especially depending on the datasets used. Our research offers effective, yet inexpensive, improvements and also paves the way for more rigorous experimentation of transfer learning techniques for federated learning.