Review of: "DEeR: Deviation Eliminating and Noise Regulating for Privacy-preserving Federated Low-rank Adaptation"

Xiaohan Xing[1]

1 Stanford University, United States

Potential competing interests: No potential competing interests to declare.

This manuscript proposes a federated finetuning framework named Deviation Eliminating and Noise Regulating (DEeR). DEeR aims to use the LoRA (Low-Rank Adaptation) technique to finetune different pre-trained foundation models for adapting to various downstream medical tasks. This task is challenging because of the aggregation deviation and the differential privacy (DP) noise amplification effect. The solution proposed in this work includes a deviation eliminator that utilizes the alternating minimization algorithm to optimize the parameters of LoRA to avoid aggregation deviation. In addition, a noise regulator is introduced to exploit two regulator factors to suppress the noise amplification effect. Both theoretical analysis and experimental investigation were performed to validate the effectiveness of this model. Experimental results on four public datasets, including classification and segmentation tasks, demonstrated its superior performance. This paper features both scientific and practical merits with a novel solution to the FL framework. The manuscript is well-written and has strong experimental results.