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Peer Review

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

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This article proposes a novel privacy-preserving federated fine-tuning framework, DEER, which adapts pre-trained base models to downstream medical tasks by combining Low-Rank Adaptation (LoRA) and Federated Learning (FL). The article provides an in-depth analysis of aggregation bias and noise amplification problems in existing methods and proposes corresponding solutions. The theoretical analysis is relatively rigorous, and the experimental section is comprehensive. However, there are still areas for further improvement.

The article offers detailed theoretical insights into aggregation bias and noise amplification issues, with a clear proof process for the theorems presented. However, some of the proofs are complex and may be difficult for readers without a strong mathematical background to understand. It is suggested to include intuitive explanations or examples to aid comprehension.

The overall structure of the article is clear and logically coherent. However, some paragraphs are quite lengthy. It is recommended to split these paragraphs appropriately to improve readability. Additionally, the generalization ability of the DEER framework across different tasks and datasets, as well as its performance in various hardware environments, could be explored further.

In summary, this article introduces an innovative federated fine-tuning framework, DEER, which achieves robust privacy protection and fine-tuning performance by addressing key challenges associated with LoRA in federated learning. While there are areas for improvement, the article holds significant academic value and promising application prospects.

Declarations

Potential competing interests: No potential competing interests to declare.

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