

Peer Review

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

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This manuscript presents a study on federated finetuning with LoRA (Low-Rank Adaptation) in the context of protecting data privacy. The paper introduces the DEeR framework, which equips every client with a noise regulator to suppress noise amplification caused by LoRA's "quadratic" architecture during local training and includes a deviation eliminator on the server side to avoid aggregation deviation. The proposed framework is evaluated through experiments, demonstrating its superiority over state-of-the-art methods.

1. While the paper briefly mentions the challenges of aggregation deviation and noise amplification when combining FL and LoRA, it could benefit from a more comprehensive discussion on the motivation behind this research. For example, providing concrete examples of how these challenges affect real-world applications, such as medical scenarios where data privacy is crucial, would strengthen the paper's introduction.
2. The paper introduces the DEeR framework but could improve the clarity of its components and how they interact. Specifically, a more detailed explanation of the deviation eliminator and noise regulator, including their mathematical formulations and how they work together to mitigate the challenges, would be helpful.
3. The paper presents experimental results demonstrating DEeR's superiority over state-of-the-art methods, but it could provide more insights into the performance and limitations of the proposed framework. For example, including a detailed analysis of the impact of different privacy

budgets on model performance and a comparison of DEeR's computational efficiency with other approaches would be beneficial.

Declarations

Potential competing interests: No potential competing interests to declare.