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Peer Review

Review of: "A Quasilinear Algorithm for Computing Higher-Order Derivatives of Deep Feed-Forward Neural Networks"

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This paper shows the outstanding performance of n-TANGENTPROP in obtaining higher order derivatives. Overall, the paper demonstrates innovation, clear structure, and potential applications. However, there are some areas that could be improved:

1. In the theorem of [32]

$$D^n f(g(t)) = \sum \frac{n!}{k_1! \cdots k_n!} (D^k f)(g(t)) (\frac{Dg(t)}{1!})^{k_1} \cdots (\frac{D^n g(t)}{n!})^{k_n}$$

According to this theorem, $D^k f$ should also be required to obtain $D^n f$, so I think the degree of acceleration depends on the selection of k, and thus the calculation speed should also be related to k. If possible, can you give the calculation time dependent on k to make the paper more rigorous?

2. This method has broad application prospects, which can be applied not only to PINN but also to other neural networks. It is hoped that more examples can be added in numerical experiments to further highlight its important role in neural networks.

Declarations

Potential competing interests: No potential competing interests to declare.

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