

Peer Review

Review of: "Hybrid Quantum Neural Networks with Amplitude Encoding: Advancing Recovery Rate Predictions"

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Chen et al. propose a hybrid quantum-classical neural network to learn a regression model on recovery rate predictions. While the authors argue the use of a hybrid architecture, they do not fully explain precisely (either in the manuscript or GitHub link, although the code is available upon request) the layers of hybrid neural network and how the data is prepared for encoding onto a quantum circuit. As such, there is no manner in which to replicate the results. My main suggestion is to add further explicit details of algorithm so the reader may obtain a more holistic view of the research. But, given the lack of novel results, the paper would be better suited as a strong conference paper. Other observations are noted below.

The authors should note not only the positives but the negatives of applying amplitude encoding. For instance, De Luca et al. ^[1] displayed the poor performance of amplitude encoding with quantum support vector machines. Also, the work of Araujo et al. ^[2] should be referenced as another option.

Finally, is there another classical regression algorithm to apply for a more robust comparison? Such as a decision tree regression. If not then please state as this would be enlightening to the reader.

References

1. [△]Gennaro De Luca, Andrew Vlastic, Michael Vitz, Anh Pham. *Empirical Power of Quantum Encoding Methods for Binary Classification*. Arxiv.
2. [△]Israel F. Araujo, Daniel K. Park, Francesco Petruccione, Adenilton J. da Silva. (2021). *A divide-and-conquer algorithm for quantum state preparation*. *Sci Rep*, vol. 11 (1). doi:10.1038/s41598-021-85474-1.

Declarations

Potential competing interests: No potential competing interests to declare.