

QMLHEP: Task III

Open Task: Please comment on quantum computing or quantum machine learning. You can also comment on one quantum algorithm or one quantum software you are familiar with. You can also suggest methods you think are good and you would like to work on.

Response: Comment on QML

Quantum Machine Learning (QML) is one of the major application areas for quantum computers and extensive research is underway to demonstrate their superiority over classical machine learning. Most of these researches focus on either creating quantum versions of classical ML algorithms to gain exponential speed-ups or using quantum computers to represent data. Though there have been many claims of achieving quantum advantages, those claims could carry positive publication bias.

In my opinion, more focus should be given on creating novel and quantum native machine learning approaches. One such approach could be creating building blocks of ML using the native properties of quantum computers, for example - creating a quantum version of classical perceptron. Breakthroughs in quantum native algorithms could lead to paradigm-shifting results.

It is also crucial to emphasize the gradual improvement of QML rather than just aiming to beat classical ML. Focusing solely on beating classical ML could limit our perspective and lead to frustration.

In conclusion, QML has a long way to go before achieving quantum advantage in commercial applications. Nevertheless, the scientific community will benefit from QML research before commercialization.