

Abstract

The merging of quantum computing and machine learning was the stuff of science fiction just a few decades ago, but now it is a natural progression in the field of quantum technology. In this project we've studied a simple quantum circuit for data classification, utilizing qubit-based data encoding and a quantum circuit ansatz with variational parameters for making predictions. The parameters have been optimized using a classical optimizer, and the model has been tested on the Iris dataset. The results show that the model is able to classify the training data with an accuracy of around 80%, but fails to classify the test data, reaching an accuracy of 50%. This illustrates the potential in quantum machine learning, as well as the need for more research in the field. Our implementation found the importance of entanglement, and how entanglement is used to great effect in quantum circuit to capture complex patterns in data.

Source code is available at <https://github.com/Jonnyigeh/FYS5419-quantum-computing/tree/main/Project%202>