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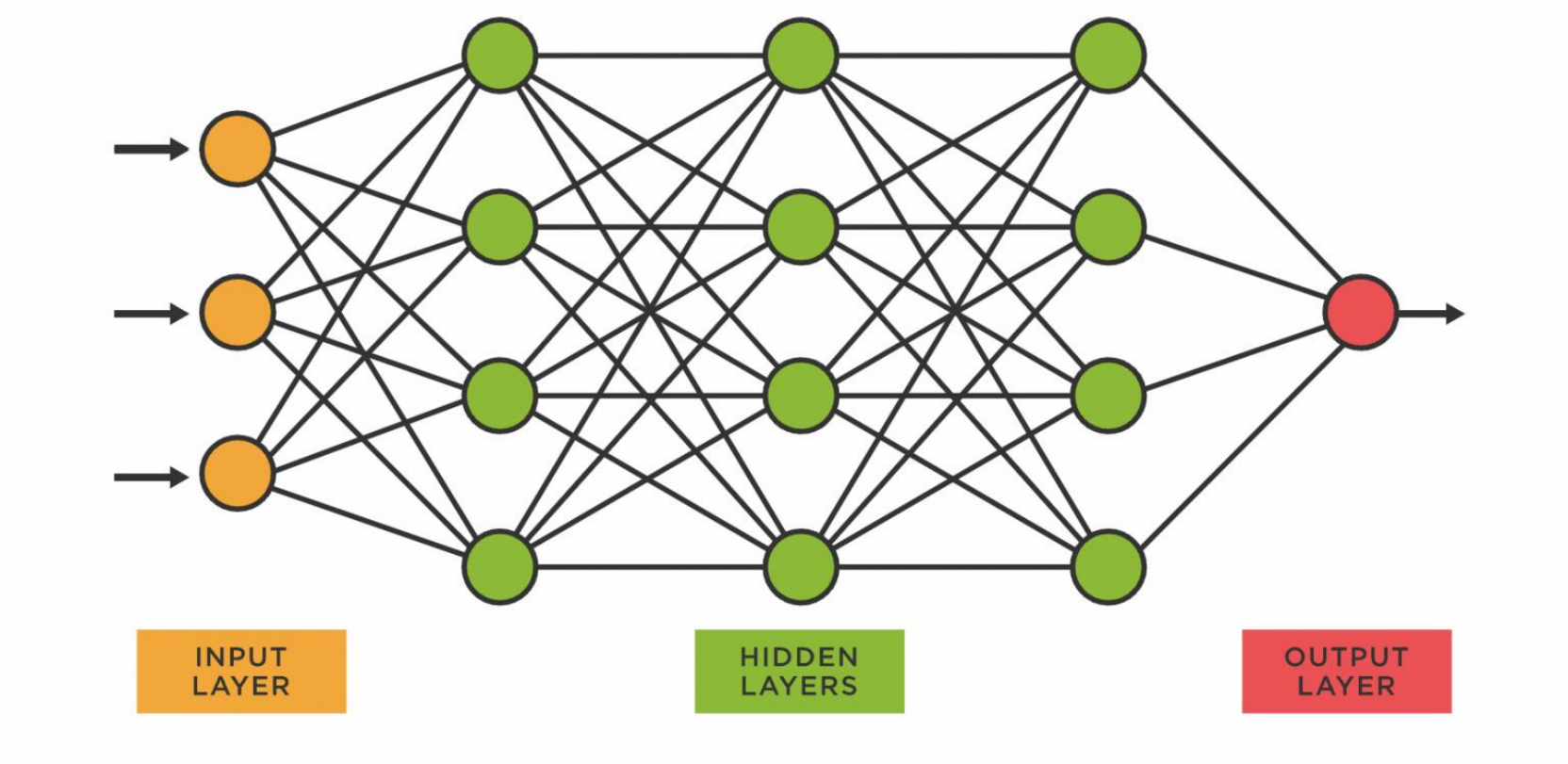
Quantum Neural Networks (QNN)

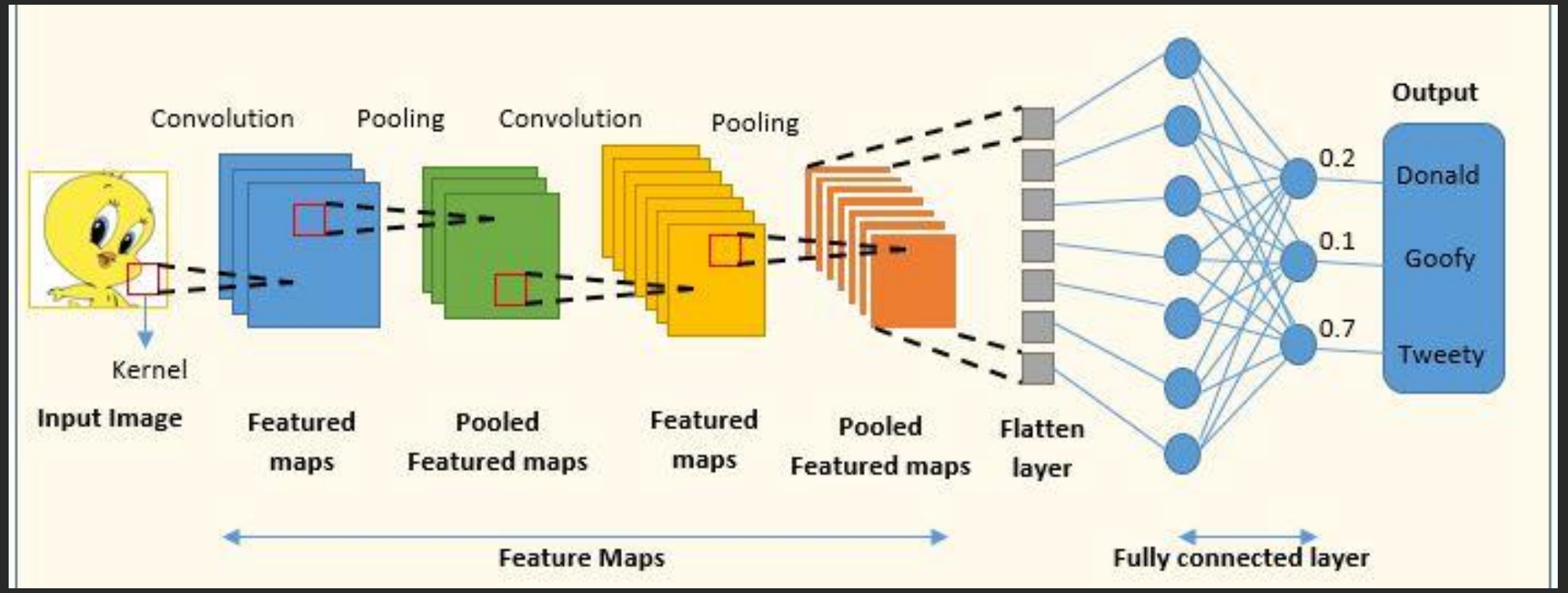
What is Neural Network

A neural network is an algorithm computers use to learn



What is Convolution Neural Network (CNN)

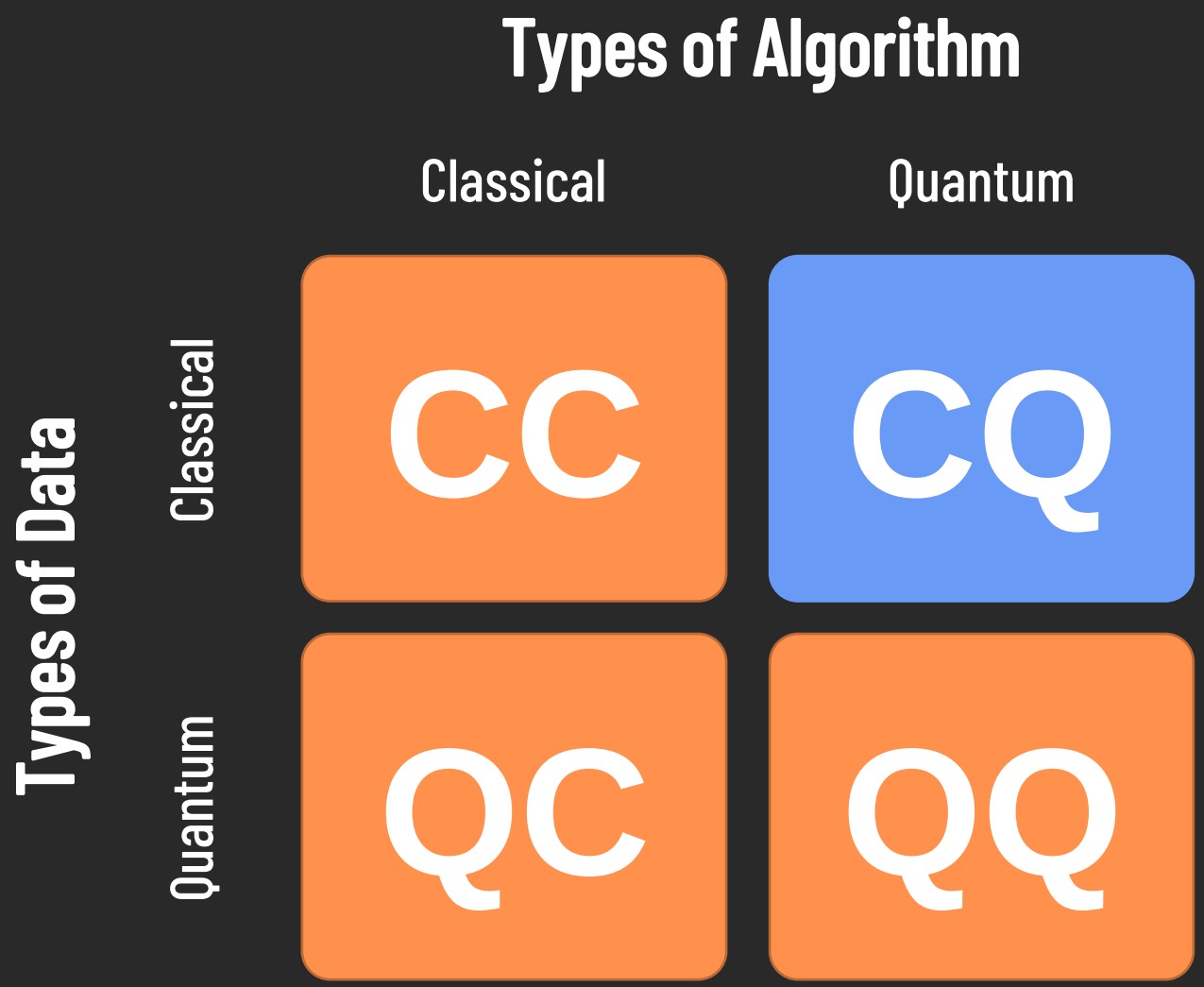
A CNN is a special type of neural network that deals with pictures



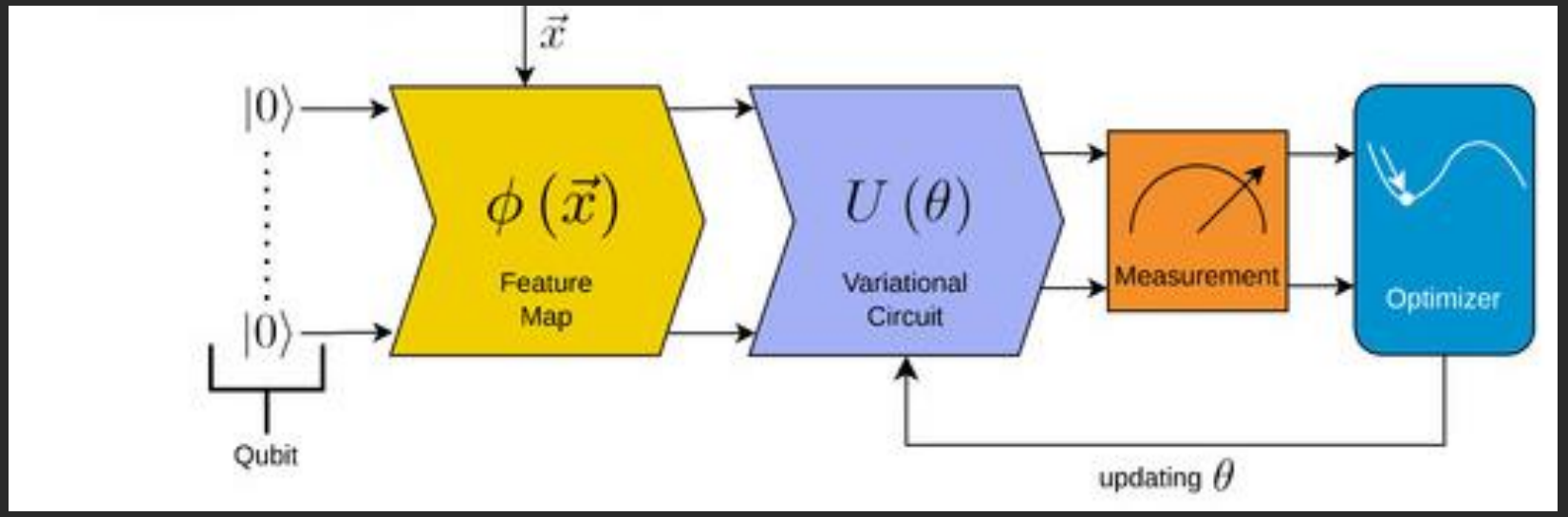
What's the Problem with the Neural Network?

It solve many problems very well, but it takes so much time and resources to be trained in some cases, specially in big data problems

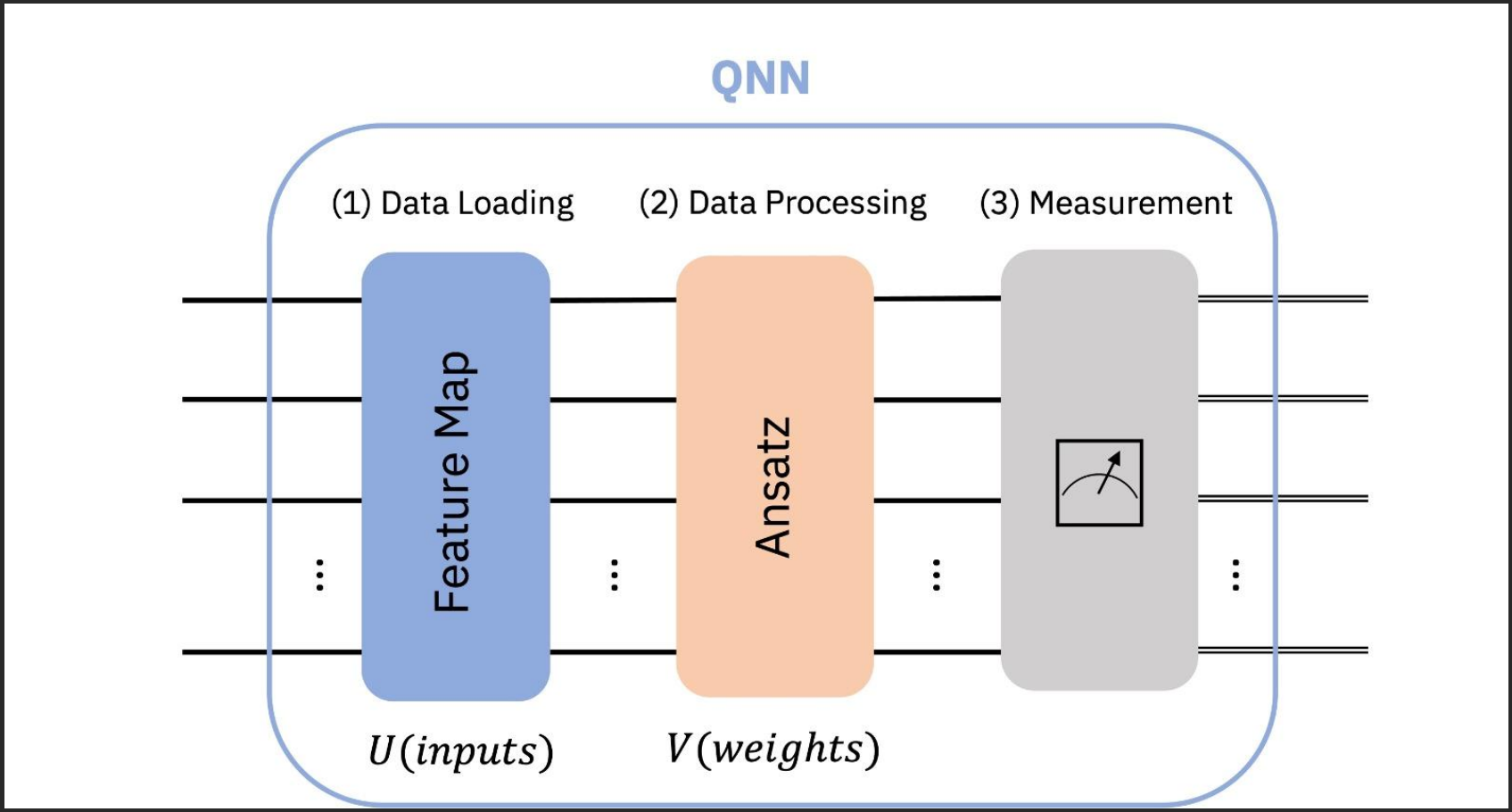
Data & Computation



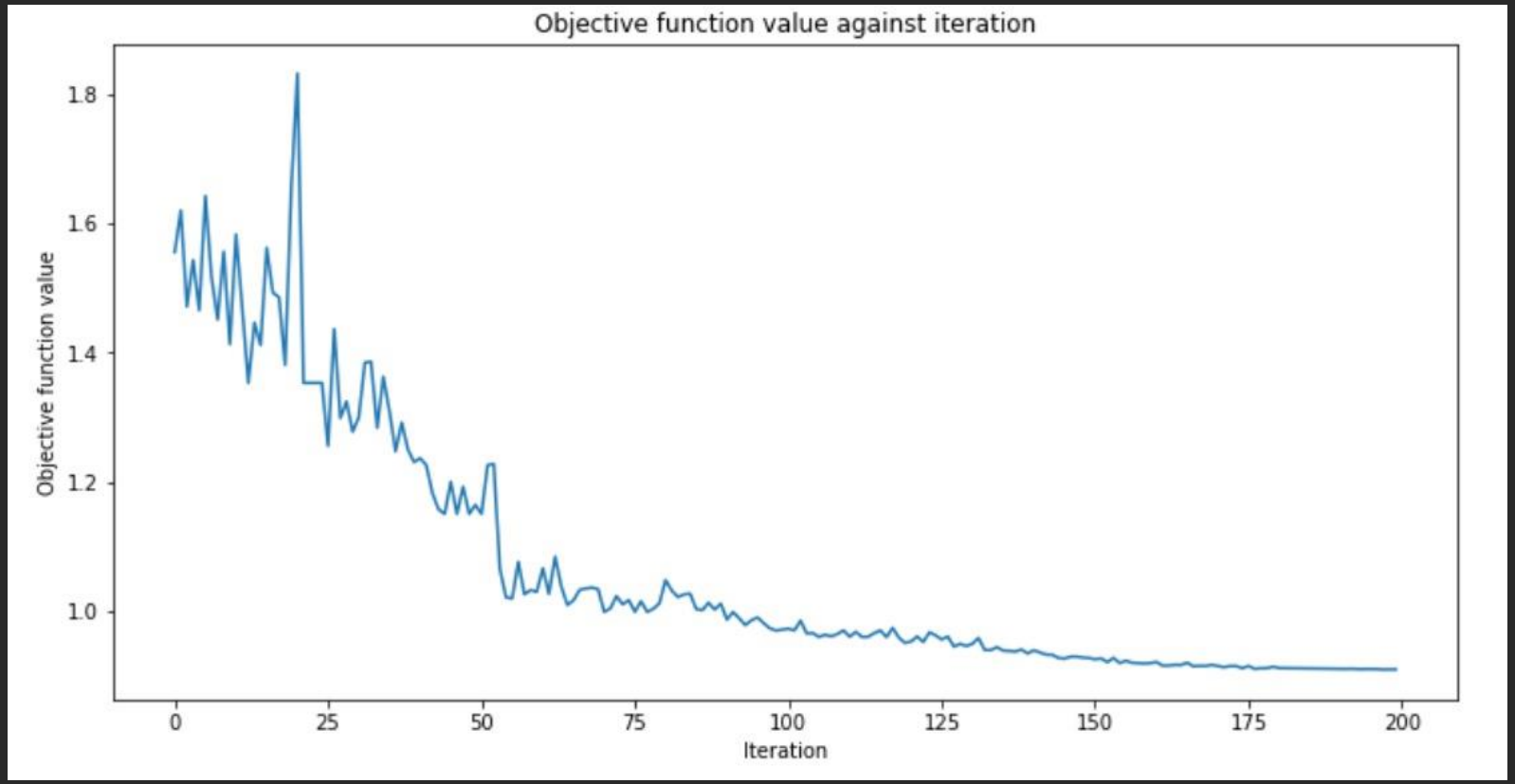
Quantum Machine Learning Mechanism



Quantum Neural Network (QNN)

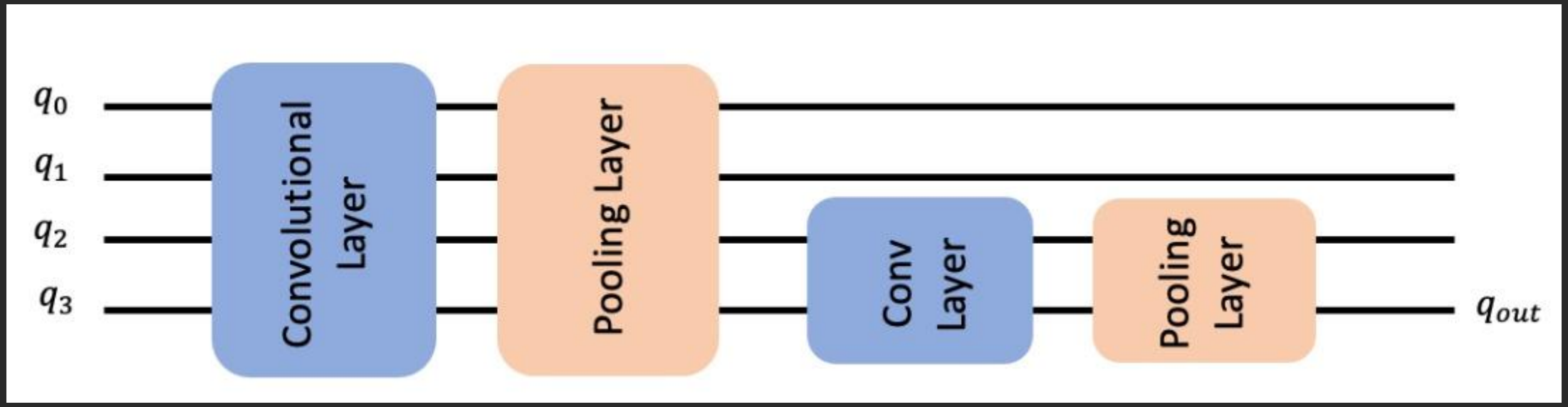


QNN Result

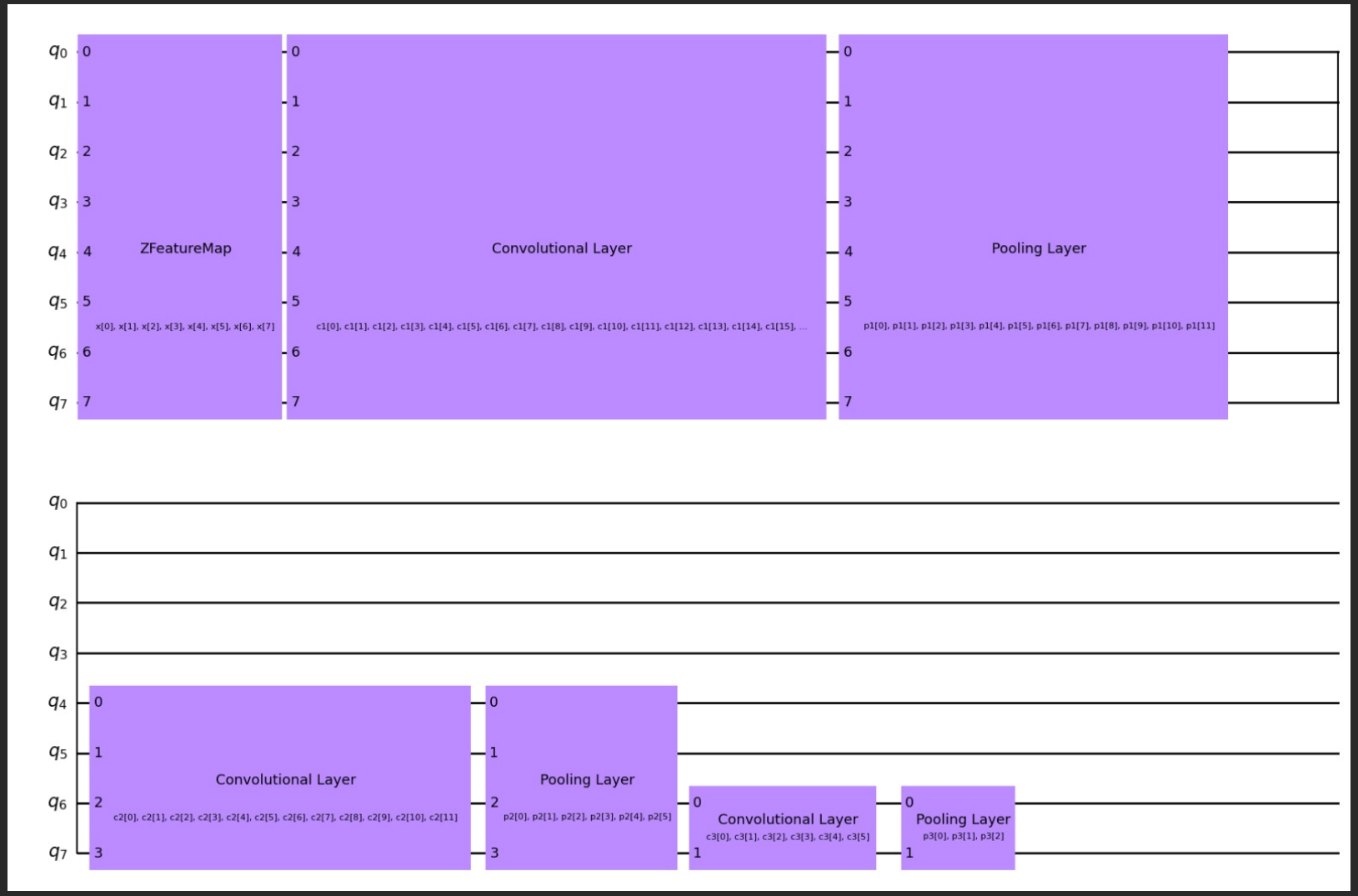


Training Accuracy	90%
Test Accuracy	90%

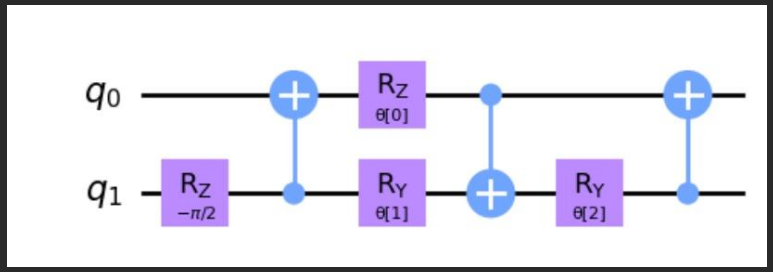
Quantum Convolution Neural Network (QCNN)



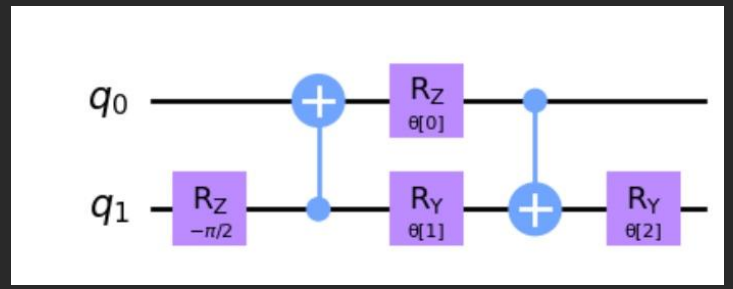
QCNN Implementation



Convolution Unitary Circuit

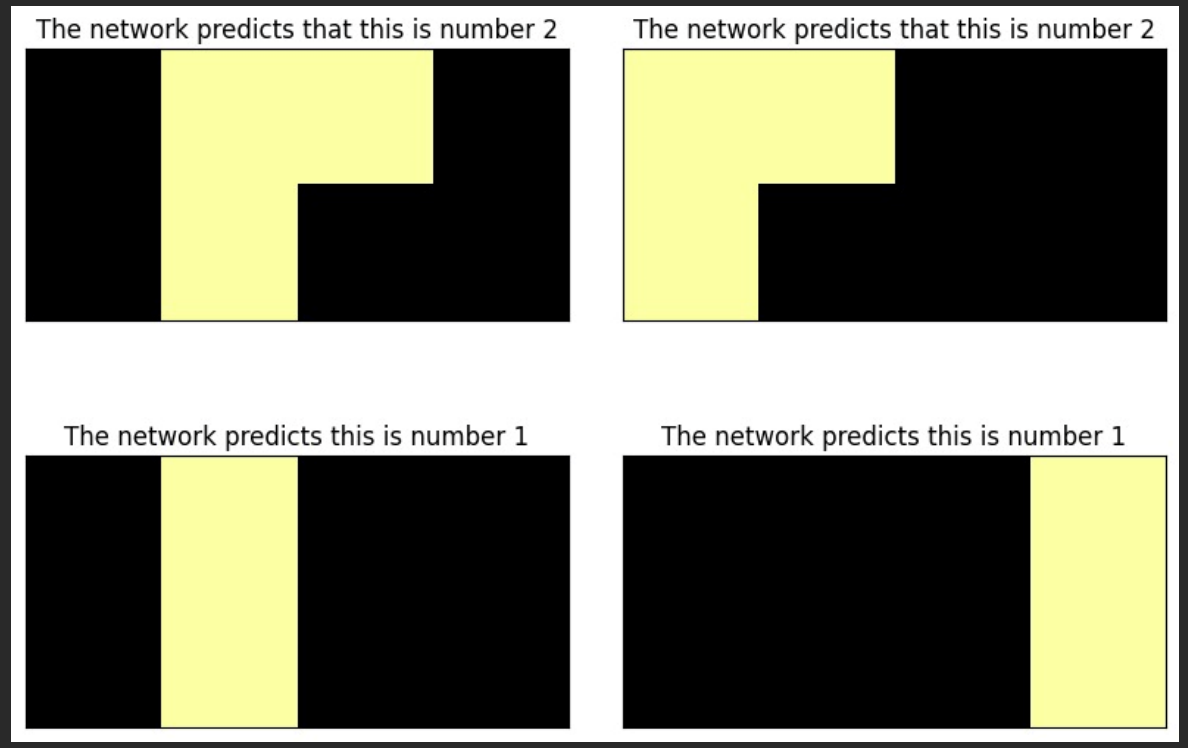


Pooling Unitary Circuit



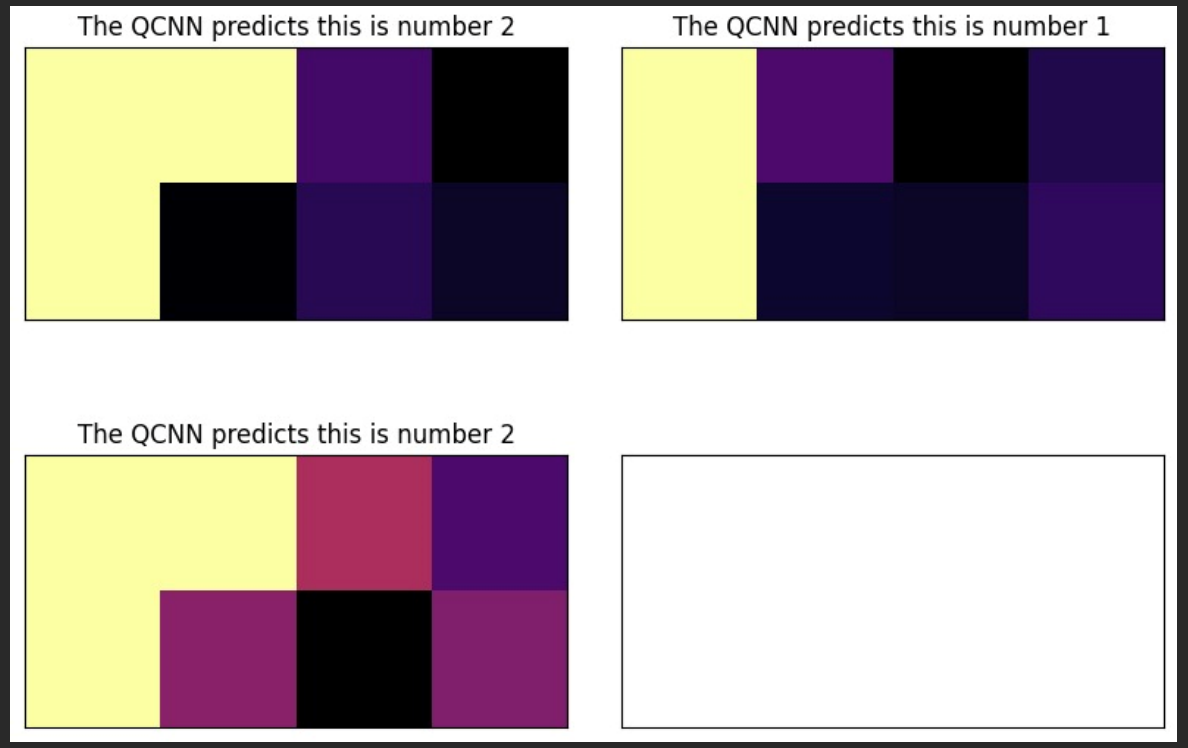
QCNN Result

The QCNN predictions for data without noise



Accuracy 100%

The QCNN predictions for data with noise



Accuracy 73.33%

Conclusion

Our Code