



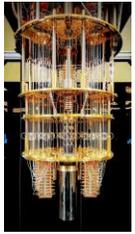
Quantum ML for Credit Card Fraud Detection (CCFD)



2025 Quantum Machine Learning REU Program

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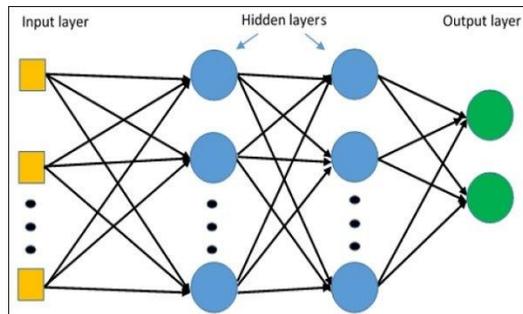
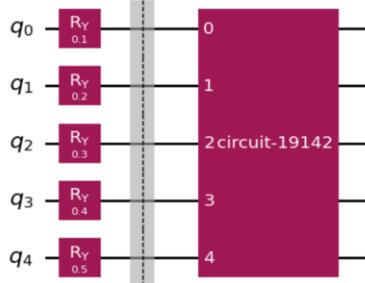
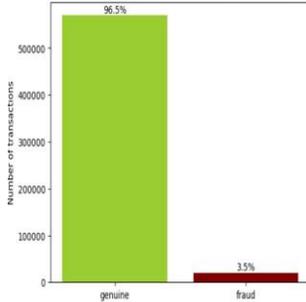
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RESEARCH BACKGROUND

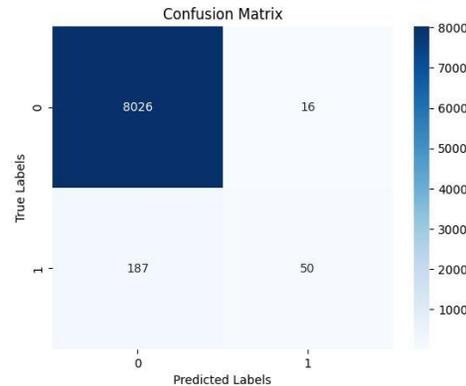
- Quantum feature extraction
- Hybrid quantum-classical model
- Uncover unique quantum correlations that increase detection accuracy

Dataset imbalance in IEEE CIS Fraud Detection Dataset

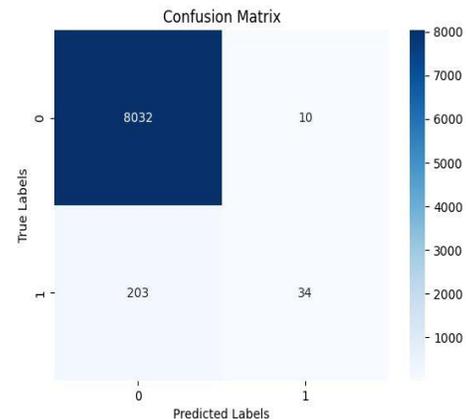


PRELIMINARY RESULTS

MLP: 3 hidden layers, 5 raw features



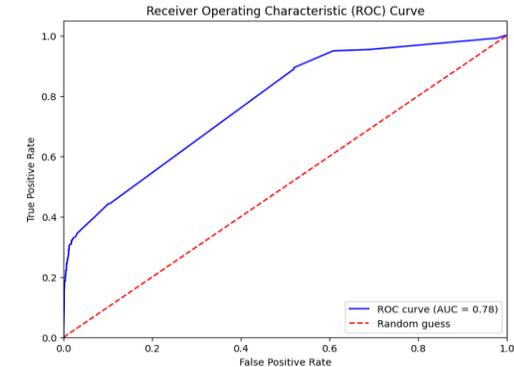
Classical AUC = 0.77



Quantum AUC = 0.78

CONCLUSIONS

- Quantum shows promise
- MLP has robustness



NEXT STEPS

- Increase quantity of data
- Improve on random ansatz
- Prune NN to reduce complexity
- Introduce randomness
 - Noise, pytorch seed

