# Quantum Positive Unlabeled Learning for PV Fault Detection

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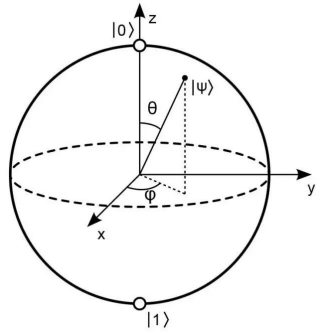
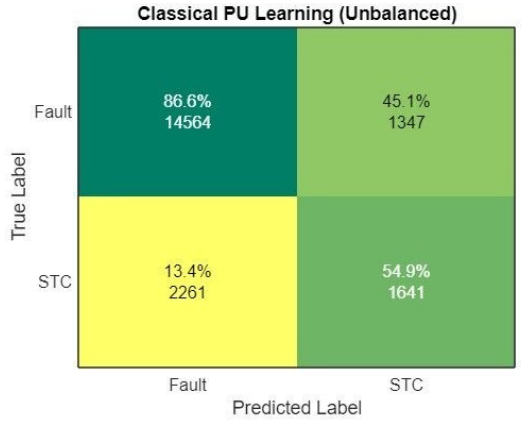
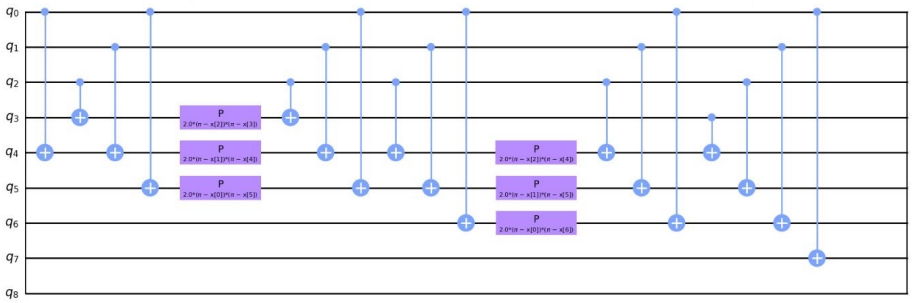
***Objective: Investigate positive unlabeled learning in a quantum environment and determine its usefulness in classifying solar fault detection***

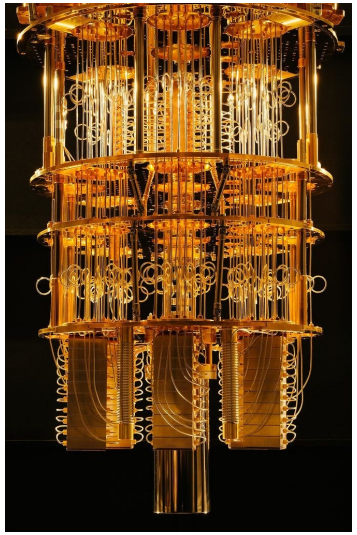



**Process:**

- ❑ Obtain partially unlabeled solar datasets from ASU solar research facility
- ❑ Preprocess data (standardization, one-hot encoding, train-test split)
- ❑ Develop optimal ML algorithm (Bagging, SVM, Deep Neural Binary Classifier )
- ❑ Process random selections of labeled and unlabeled data to get p-score
- ❑ Using p-scores, determine appropriate labels for unlabeled data
- ❑ Evaluate accuracy with known labeled datasets

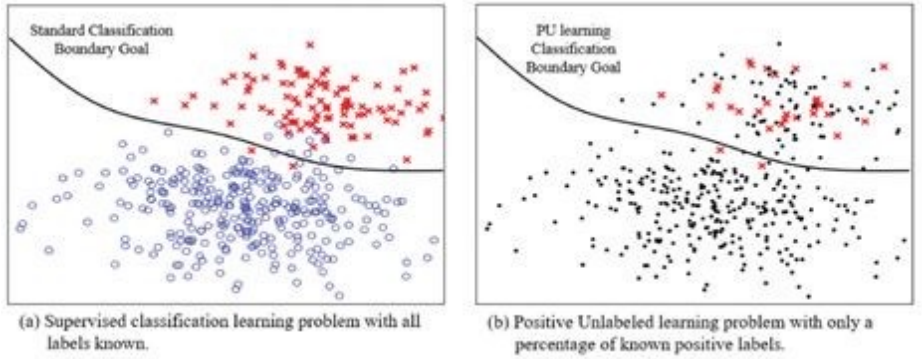


**Next Steps:**

- ❑ Investigate PU Learning using SVM's
- ❑ Integrate a quantum algorithm into current PU Learning code
- ❑ Experiment with Asymmetric Loss Function for PUL




(a) Supervised classification learning problem with all labels known.

(b) Positive Unlabeled learning problem with only a percentage of known positive labels.

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