Quantum Rings
5555 Central Ave
Boulder, CO 80301

Background

Quantum Rings is a software company devoted to building developer tools for quantum researchers. Through their **Quantum Rings SDK**, users can simulate quantum computation, executing large-scale quantum algorithms on classical hardware. Through their **Open Quantum platform**, users can access real quantum hardware from leading vendors like IonQ and Rigetti, through a unified API.

Project Description

Cloud access to quantum computers and quantum simulators is typically priced based on the amount of time required to execute a quantum circuit. However, very reliable methods exist for actually predicting the runtime of a circuit, making it difficult to provide up-front pricing to users accessing these resources.

Students will design and implement a predictive model that takes a quantum circuit and outputs estimated runtime, memory usage, and expected accuracy. They will use quantum frameworks to generate quantum datasets, analyze quantum circuits (in QASM format) to extract relevant features, and train inference models to predict these targets. This model will integrate into the Open Quantum platform, allowing Quantum Rings to properly price and allocate appropriate resources ahead of user submission.

This project sits at the intersection of quantum computing and machine learning, giving students hands-on experience in both emerging fields. Participants will gain exposure to real quantum hardware platforms and contribute to solving a core infrastructure problem in quantum cloud computing.

Desired Skillset

Required: Proficiency with Python and basic knowledge of ML and data science principles
Required: Experience with ML libraries (Tensorflow, Torch, Scikit-Learn, etc.)
Desired: Prior experience with quantum computing and/or quantum mechanics
Desired: Experience with the Quantum Rings SDK or similar frameworks (Qiskit, Cirq, etc.)

Team Size

4-5 Students

Location

Students will work remotely. Meetings will be held on Google Meet.

Intellectual Property and Non-Disclosure Agreement

Students will be required to sign a consulting services agreement with Quantum Rings, assigning ownership of work completed to Quantum Rings and outlining NDA terms.

Contact Information

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