




Deval Deliwala

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Education

Bachelors in Astrophysics & Mathematics

Aug 2022 – May 2026

University of California, Berkeley. GPA: 3.75.

Employment

Researcher at Berkeley Lab's Advanced Quantum Testbed

Fall 2024 – Present

Under Dr. Zahra Pedramrazi

Lawrence Berkeley National Lab, AQT

Modeling & Fabricating Superconducting Fluxonium Qubits

- Collaboratively developed software for masking, simulating, & fabricating fluxonium qubit systems.
- Designed scalable capacitive coupler and Josephson array topologies for multi-qubit systems.
- Simulated qubit dynamics using DRAG & Dynamical Decoupling pulse sequences w/ Qiskit and QuTiP; employed Maximum Likelihood Estimation and Bayesian inference for model selection.
- Tested elementary quantum algorithms on **physical supercooled fluxonium quantum computers**.

Undergraduate Astrophysics Researcher

Fall 2022 – Present

Under Professor Jessica Lu, Head of Astronomy

Galactic Center Group, muLab

Developed a Curve-Fitting algorithm

- Discovered positional variations of interstellar extinction towards the Galactic Center using photometric and spectral data from the James Webb Space Telescope.
- Developed an Optimized Curve Fitting (OCF) algorithm for fitting stellar datasets with 3D compound surface techniques; created comprehensive code documentation and **first-authored a paper nearing publication**.
- Collaboratively performed bootstrapping and Monte Carlo simulations to evaluate OCF robustness.
- Designed coordinate-transformation algorithms to align starlists w/ KNN and nth-order Legendre polynomials.
- Collaborated with muLab team to **present research findings** at UCB–UCLA–UCSD starcluster conferences.

Projects

ManiQ – Animation Package for Visualizing Quantum Computing

Ongoing

- Developing an animation package shadowing Manim and Qiskit to **visualize quantum circuits and states**.
- Working on implementing features for visualizing circuit/state evolution, plotting simulation results, illustrating qubit-environmental delocalization, entanglement dynamics, single-qubit Bloch Sphere rotations, etc.,
- Aiming to support educational initiatives by making **ManiQ open source** and building a web-platform.

Dynamical Decoupling (DD) Optimization Using Genetic Algorithms

Fall 2024

- Developed circuit-stitching algorithm for building DD sequences on **unique qubit wires** with correct delays.
- Implemented a genetic algorithm to build and optimize populations of DD sequences on simulated noisy and real IBM hardware for optimal error mitigation.

Novel Hypersphere-based Quantum Image Encryption Algorithm

Summer 2024

- Encoded RGB pixels onto n -dimensional wave functions in a “Hyper-Bloch sphere” using RBF interpolation.
- **Reversibly** scrambled wave functions using a sequence of idealized large-depth circuits to maximize entropy.
- Allows users to **customize** encryption level & encryption speed based on number of available qubits.

Undergraduate Quantum Mechanics Textbook

Summer 2024

- Wrote a **textbook on Quantum Mechanics** by compiling/editing my notes from university coursework.

Skills & Relevant Coursework

Languages: Python · Java · Mathematica · MATLAB · SQL · \LaTeX · SAODS9.

Libraries: IBM Qiskit, Google Cirq, Amazon Braket, PyTorch, Scikit-Learn, Scipy/Astropy/Numpy, Pandas.

Certifications: IBM – Basics of Quantum · Quantum Cryptography · 2024 Quantum Challenge Achievement.

Relevant Coursework: Quantum Mechanics, Data Structures, Algorithms, and more math/physics.