

Arnav Sharma

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EDUCATION

Master of Science in Quantum Information Science University of Southern California	Dec 2023 4.0
Bachelor of Science in Physics & Astronomy, Bachelor of Arts in Computer Science, minor in Mathematics University of Rochester	May 2022 3.83

SKILLS / TECHNOLOGIES

- Programming Languages: Python, C++, MATLAB/Simulink, Rust, Java, Typescript, HTML/CSS, Coq
- Software tools and libraries: GitHub, NumPy, SciPy
- Quantum Computing: Qiskit, Cirq, Ocean, OpenQASM; VQE, QAOA, Quantum Signal Processing, Quantum Error Correction

PROFESSIONAL EXPERIENCE

Research Intern, Quantum Information and Integrated Nanosystems May 2023-Aug 2023
MIT Lincoln Laboratory, Lexington, MA

- Implemented an algorithm for Gibbs sampling using Quantum Signal Processing and classical shadows in pyLIQTR / Cirq
- Benchmarked algorithm through scalability and resource analysis and presented results to a team of research scientists

Graduate Research Assistant, Quantum Information Sciences August 2022-present
Information Sciences Institute, Marina Del Rey, CA

- Investigating protocols for quantum information leakage detection
- Implemented operator-level VQE circuits and optimized gate parameters to model randomized systems

Software Intern, Mission Systems June 2020-August 2021
Northrop Grumman Corporation, Baltimore, MD

- Automated data flow to web application with a python script, wrote unit tests for software assurance in TypeScript
- Constructed Simulink models for vibrational gimbal dynamics to optimize line of sight stabilization
- Maintained efficiency of team through Agile methodology and utilizing JIRA for status updates

Undergraduate Research Assistant, Earth and Planetary Sciences (Nakajima Lab) September 2019-May 2022
University of Rochester, Rochester, NY

- Characterized chemical equilibration during planetary impacts by analyzing simulation data sets of more than 10^5 particles
- Broadened research team's expertise through literature reviews and discussions

Technical Assistant October 2021-May 2022
Institute for Music Leadership (Eastman School of Music), Rochester, NY

- Maintained up-to-date web content for educational products and programs using WordPress and HTML / CSS
- Ensured smooth operations by managing front desk and collaborating with a team of diverse professional backgrounds

PROJECTS

[Optimizing the Locations of Vaccine Distribution Centers in Monroe County, New York](#) Spring 2021

- Formulated a combinatorial optimization problem to determine an equitable distribution of COVID-19 vaccine centers
- Implemented a simulated quantum annealer as a potential solution using pyQUBO and OpenJij, evaluated its performance

[Scaling laws for accretion and stretching during planetary impacts and their ramifications on chemical equilibration](#) Spring 2022
(Senior Thesis)

- Senior Thesis project characterizing the deformation of impactor materials during planetary impacts
- Analyzed data from several SPH impact simulations and curve fit to scaling laws through parameter optimization

[Solving the Contact Map Overlap Problem on a Quantum Annealer](#) Fall 2022

- Implemented a QUBO representation of a protein-similarity problem on a D-Wave quantum annealer and hybrid solver
- Benchmarked performance and runtime against simulated results and classical algorithms

[Solving the Influence Maximization Problem using Quantum Computing](#) Spring 2023

- Revised a QUBO formulation for Influence Maximization/Max-Cover proposed in Dinh et al 2023
- Evaluated the ability of gate-based and annealing quantum devices to solve both the updated and original QUBOs