

# Siddharth Ganapathy

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## EDUCATION

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### University of California, Berkeley

Berkeley, CA

*B.A. in Computer Science & B.A. in Linguistics*

*Aug. 2022 – May 2026 (expected)*

- **Relevant Coursework:** CS 170 (Algorithms), EECS 127 (Optimization), CS 61B (Data Structures), CS 70 (Discrete Math), CS 61C (Computer Architecture), CS 61A (Program Structures)

## SKILLS

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**Languages:** Python, Java, C/C++, JavaScript, Swift, HTML/CSS, Scheme (Lisp), RISC-V, SQL

**Libraries:** NumPy, Pandas, scikit-learn, PyTorch, TensorFlow, Matplotlib, Qiskit, Q#, lambeq, NLTK, spaCy, OpenMP, OpenMPI

**Developer Tools/Frameworks:** Node.js, Express.js, MongoDB, Git, VSCode, IntelliJ, XCode, React/React Native, JUnit, Unit.js, Figma

## EXPERIENCE

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### Lawrence Berkeley National Laboratory

May 2024 – Present

*Quantum Computing Research Intern*

*Berkeley, CA*

- Contributing to BQSKit, an open-source compiler framework for quantum computers
- Enhancing an ML-based seeded synthesis algorithm (QSeed) using PyTorch to optimize initial configurations of unitary matrices representing circuits
- Integrating QSeed with Permutation-Aware Synthesis using quantum routing algorithms and IBM Qiskit backends for validation to improve circuit depth and gate fidelities

### UC Berkeley EECS

Sep. 2023 – Present

*Computational Game Theory Researcher*

*Berkeley, CA*

- Analyzing two-person abstract strategy board games through the development of deterministic solvers
- Helped develop a solver for Dino Dodgem that un-hashed ~39K possible moves into Win/Lose/Tie moves, as well as a Graphical User Interface (GUI) using Python
- Currently exploring database compression to support solvers for computationally-large games and helping new members develop rudimentary solvers in C

### Quantum Computing @ Berkeley

Sep. 2022 – Sep. 2023

*Quantum Natural Language Processing (QNLP) Researcher*

*Berkeley, CA*

- Helped develop a Quantum Recurrent Neural Network (QRNN) for conducting common sentiment analysis tasks
- Utilized lambeq to convert input sentences into quantum circuits to be parameterized and fine-tuned using SPSA
- Implemented QRNN cells using amplitude amplification and RUS architecture to reduce Clifford gate count, optimizing circuit performance by 10.1%
- Achieved training accuracy of 69.6% on single-parameterized cells on lambeq embedding compared to 63.9% on classical embedding

## PROJECTS

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### Carpe Scientiam | *Swift, MongoDB, JS, Node.js, Express.js, Figma*

Aug 2023 – Present

- Developing full-stack iOS mobile app for Latin learners, featuring exam prep, personalized quizzes, and word parsing w/ Latin WordNet API
- Created storyboards w/ Figma, designed front-end w/ Swift, and implemented RESTful API endpoints for server-side functionality w/ Express.js and Node.js
- Engineered backend w/ MongoDB to enable storage, retrieval, and management of quiz results and study material
- Conducting beta testing w/ TestFlight to refine user experience and app performance

### Build Your Own World (BYOW) | *Java, JUnit, IntelliJ, TileEngine*

Jun. – Aug. 2023

- Developed a 2D tile-based world exploration engine using Java
- Implemented random world generation with RandomUtils, world saving and loading with Serialization, and graphics rendering with StdDraw
- Introduced features such as mob generation/item dispersal with RandomUtils, ability to shoot, and in-game time
- Integrated rigorous tests using JUnit to evaluate core game mechanics, edge cases in world generation, and stability