Ethan Hopkins

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Computer Science undergraduate with research experience in cryptanalysis and graph algorithms

Experience

Cryptanalysis Research Assistant (Python, NumPy, h5py, galois, sklearn.cluster) **July 2025 - Present**
Center for Encrypted Functionalities at UCLA
- ➢ Codesigned a cryptanalytic attack against a public key cryptosystem proposal based on Boolean satisfiability, exploiting a previously unknown vulnerability to create a solvable linear system
- ➢ Developed a performant Python experimentation pipeline to compare non-graph, KMeans, HDBSCAN, and Spectral Clustering attack approaches on large ciphertexts (>200,000 terms)
- ➢ Improved correctness rate from 90% to >99.9% by changing from a non-graph-based exploit to a graph-clustering exploit with scikit-learn Spectral Clustering for small instance sizes

Teaching Assistant (C++, Zsh, x86 Assembly)   **June 2023 - June 2024**
UCLA Samueli Computer Science
- ➢ Taught C++, file systems, and machine code in 20-60 person weekly classes with energetically positive reviews from students for first principles teaching, approachability, and enthusiasm
- ➢ Expanded staffing as Head TA from 1 undergraduate TA to 2 per discussion section for more than 500 students, improving student access during class and office hours

Education

Bachelor of Science in Computer Science   **June 2026**
University of California, Los Angeles
- ➢ Selected classes: Automata Theory, Graph Theory, Computer System Security, AI Theory, Software Construction Lab, Quantum Programming (Graduate), Quantum Algorithms (Graduate)
- ➢ UCLA quantum programming team

Skills

Languages	Python, C/C++, Haskell, Java
Libraries/SDKs	NumPy, scikit-learn, Qiskit
Tools/Systems	Git, Zsh/Bash, x86 Assembly

Projects

Wikipathfinder (Python, Pywikibot)
- ➢ Developed a Python graph-search program with the Pywikibot API to aid players of "Wikipedia race game" (a game to travel across Wikipedia via wikilinks) by computing short paths between pages
- ➢ Compared heuristics (simple page category similarity, cosine similarity) to increase efficiency by >100x over the live English Wikipedia link graph