

# Zeke Milay

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## EDUCATION

University of California, Santa Cruz

Santa Cruz, CA

B.A. Computer Science

March 2026

### Relevant Coursework:

- Software Engineering, Systems Design, Computer Architecture, Database Systems, C/Assembly, Artificial Intelligence, Machine Learning, Algorithm Analysis, Data Structures & Algorithms, Quantum Computing, Computing on Encrypted Data, Cryptography, Linear Algebra, Probability Theory, Discrete Mathematics.

## EXPERIENCE

Associate Software Engineer

Jun. 2021 – Present

Milay Mechanical, LLC

Hayward, CA

- Engineered custom CNC machinery software, achieving a **50% reduction in annual costs (\$50k)** and increasing production throughput by 20%.
- Collaborated with a cross-functional team to architect a **data management system in C++** using OOP principles, improving labor tracking by 30% and cutting job errors by 40%.
- Developed and deployed a **web-based dashboard** to visualize real-time system data, providing stakeholders with streamlined access to operational metrics.

## PROJECTS & RESEARCH

Social Valley (React Native, Expo, JavaScript, Supabase, Stripe API, Vercel)

Nov. 2024 – Present

- Architected full-stack social platform with **47-table PostgreSQL schema** supporting challenges, livestreaming, and real-time messaging.
- Implemented secure payment processing with **Stripe, Row-Level Security** policies, and **ELO-based ranking system**.
- Built production-ready service layer integrating **Google Analytics, Resend, RevenueCat, SentryIO**, and **PostHog** APIs.

Leakage Attacks on Encrypted Databases | UC Santa Cruz under Prof. Ioannis Demertzis

Jan. - Mar. 2026

- SEAL (database layer): **ADJ-ORAM-alpha** hides which records are accessed. **ADJ-PADDING-x** pads result sizes to powers of x so the adversary can only see which bucket a result falls in, not the exact count.
- SPARTA (network layer): Deferred retrieval batches responses at a fixed rate  $k_i$  per user. **Traffic masking** sends dummy packets so the adversary cannot correlate query timing with result delivery.
- Combined: both layers run together so an adversary with full network visibility and plaintext data distribution still cannot recover queries or link users to database records below the greedy baseline.

Sample Sort (Python, Flask, Electron, scikit-learn, librosa, GitHub Actions)

Jun. 2025 – Jul. 2025

- Developed **ML-powered Random Forest** desktop app classifying drum samples by instrument type with **86% accuracy** using spectral feature extraction.
- Implemented an **asynchronous Flask backend** to parallelize audio processing and model inference, reducing latency for large sample libraries.
- Architected a **CI/CD pipeline** using GitHub Actions to automate cross-platform builds and deployment for macOS, Windows, and Linux.

## TECHNICAL SKILLS

**Languages:** C (*Proficient*), Python (*Proficient*), C++ (*Proficient*), JavaScript (*Proficient*), SQL (*Familiar*)

**Frameworks & Mobile:** React Native, Expo, Flask, Electron, Express.js

**Cloud & Backend:** Supabase (PostgreSQL, Auth, RLS), Vercel, Cloudflare, Firebase, Node.js

**Developer Tools:** Git, Vim, Jupyter Lab, MATLAB, Google Analytics, Mixpanel

**Libraries:** Pandas, scikit-learn, Stripe API, SendGrid, Google Maps API

**Other:** Algorithms, Linux, OOP, Bash, REST APIs, Database Design, Row-Level Security, SCRUM, Agile Methodologies