TIM KRAEMER

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EDUCATION

University of California, San Diego - Computer Science, M.S. **Expected June 2026**

University of California, Santa Cruz - Computer Engineering, B.S. **July 2020 - June 2024**
GPA: 3.85 - Tau Beta Pi Engineering Honors Society

SKILLS

Programming Languages	Python, Typescript/Javascript, C, C++, SQL, JSON/XML, HTML, CSS
Technologies	Git, Cloud Services (AWS, Azure), REST APIs, PostgreSQL, MongoDB, Docker, Postman
Libraries/Frameworks	Flask, Node.js, Express, React, Angular.js, Pandas, NumPy

EXPERIENCE

Software Research Intern **Jun 2023 - Sept 2023**
JLab Sensing *Santa Cruz, CA*

- Engineered a robust data pipeline for a greenhouse temperature monitoring system using C/C++, integrating Git for version control and adhering to Agile methodologies throughout the development lifecycle.
- Achieved a **90%** reduction in power consumption by optimizing system architecture and presenting results to the PI and team.
- Created a custom temperature interface library and I2C communication library, ensuring rapid and reliable data transmission.
- Architected a scalable, high-performance communication framework that significantly enhanced data transmission speed and reliability, leveraging protocols such as UART, SPI, I2C, and ModBus.

Engineering Course Lab Instructor **Jan 2023 - Jun 2024**
University of California, Santa Cruz *Santa Cruz, CA*

- Guided and tested over **800 students** in Logic Design, Assembly, and Sensing Technology for course checkoffs.
- Assisted students in mastering technical topics, including Structural Verilog, RISC-V assembly programming, hardware interfacing, and general scripting, ensuring they gained practical, hands-on experience across diverse engineering disciplines.
- Staffed weekly guided lab sessions on topics such as IDEs, Git, logging, testing, and Logic Design.

PROJECTS

Large Language Model Hacking: Graduate Research Project — *Python, Ollama, HuggingFace, Google Colab* Link

- Pioneered a groundbreaking study on malicious tool-calling as a deterministic attach vector for LLMs, establishing new insights into potential vulnerabilities.
- Designed and implemented adaptive prompts to trigger malicious tool-calling in LLaMa, achieving an average success rate exceeding **80%** across **100+** tested prompts.
- Conducted extensive brute-force testing to reveal black-box functionality in Gemini, achieving over **85%** success in prompt injection attempts.

IoT Water Consumption Meter — *NginX, Flask, AWS, PostgreSQL, Swift, RESTful APIs, MQTT*

- Lead a design **team of 7 engineers** for Senior Capstone Design project, designing an IoT water consumption faucet attachment that measures and records isolated water flow, providing useful data metrics and recommendations to consumers via IOS app
- Spearheaded the development of a webserver on an AWS LightSail instance, architecting using Nginx and Flask, and optimized to handle **100+ simultaneous IoT device connections** with high reliability.
- Innovated an IOS specific app using Swift and SwiftUI, incorporating a login procedure, JWT token verification to display user specific data and metrics.

Backend Buddy - Developer Specific Toolkit — *Javascript, HTML, CSS, Jest, Playright, Github Actions* Link

- Developed a web-based developer toolbox using JavaScript, HTML, and CSS, offering tools like JSON formatting, Regex generation, and URL encoding/decoding to streamline backend development tasks.
- Automated testing and deployment using GitHub Actions, with Playwright for unit testing achieving **96% code coverage**, Linting, and HTML5 Validation to ensure code quality and cross-browser compatibility.
- Designed a customizable, browser-based interface with drag-and-drop functionality, prioritizing usability and security by avoiding logins or user data storage.
- Collaborated on prototyping using Figma and Miro, focusing on modular design and performance for backend developers.

PantryAI — *Node.js, Express, Nginx, AWS, MongoDB, RESTful APIs, React Native*

- Prototyped and implemented a comprehensive pantry management system that tracks inventory, provides recipe recommendations, and integrates with a React application for user interaction.
- Programmed robust backend services using Node.js and Express, handling CRUD operations for pantry items, user authentication, and third-party API integrations, with dynamic SKU # lookup.
- Adopted OpenAI API to generate personalized recipe suggestions based on current pantry contents and user-defined parameters.