TIM KRAEMER

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EDUCATION

University of California, San Diego **Expected December 2025**
M.S. in Computer Science, **Specialization in AI** - GPA: 3.92

University of California, Santa Cruz **July 2020 - June 2024**
B.S. in Computer Engineering, Minor in Computer Science - GPA: 3.85

EXPERIENCE

Software Engineering Intern **Jun 2025 - August 2025**
Deloitte Tax *Dallas, TX*

- Delivered the design and development of a C#-based proof-of-concept to migrate a core internal tax platform (used by **10K+** accountants across **600+** enterprise clients) from RabbitMQ to Azure Service Bus.
- Conducted an independent deep-dive analysis of **20+ microservices** to identify messaging inefficiencies, uncovering major bottlenecks including excessive retries and queue buildup, which informed remediation strategies.
- Drove modernization of a mission-critical platform supporting **billion-dollar** operations by aligning asynchronous communication patterns with Azure-native messaging best practices, leading to initial estimations of **70%** reduction in service retries.

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

- Developed a power-efficient data pipeline in C/C++ for a greenhouse temperature monitoring system, optimizing embedded system performance across multiple sensor protocols (UART, SPI, I2C, ModBus).
- Reduced system power consumption by **90%** through architectural refactoring and low-level optimizations, with findings presented to the principal investigator and research team.
- Architected a scalable, high-reliability communication framework that significantly improved data throughput and transmission stability in constrained hardware environments.

Computer Engineering Lab Instructor **Jan 2023 - Jun 2024**
UC Santa Cruz *Santa Cruz, CA*

- Guided and tested over **800 students** in Logic Design, Assembly, and Sensing Technology for course checkoffs.
- Assisted students with Structural Verilog, RISC-V, hardware interfacing, and scripting to build practical, hands-on skills.

PROJECTS

LLM Tokenization Hacking: Graduate Research — *Python, Ollama, HuggingFace, Google Colab*

- Conducted novel research on **malicious tool-calling as a deterministic attack vector** for LLMs, revealing key flaws.
- Optimized adaptive prompts that triggered tool misuse in LLaMa with **80%+ success** across 100+ tested cases.
- Conducted brute-force testing on Gemini models, achieving **85%+ success** in black-box prompt injections.

Trajectory Prediction on Argoverse Motion Forecasting Dataset — *Python, PyTorch, Kaggle*

- Designed a state-of-the-art deep learning model for self-driving car trajectory prediction using LSTM with spatial and temporal attention, achieving significant error reduction from 80,000 (linear baseline) to 7.97 MSE on the Argoverse2 dataset.
- Boosted model accuracy by over **30%** through innovations like multi-head attention, temporal CNNs, and Gaussian trajectory smoothing — outperforming baseline LSTMs and CNNs by a wide margin.
- Engineered input features from agent data, incorporating acceleration & social context to handle diverse urban driving scenarios.

HydroConnect - IoT Water Consumption Meter — *NginX, Flask, AWS, PostgreSQL, Swift, MQTT*

- Led cross-functional team of **7 engineers**, delivering full-stack IoT water consumption faucet attachment that measures and records isolated water flow from concept to deployment.
- Spearheaded the development of AWS webserver, architected using Nginx and Flask, and optimized to handle **100+ simultaneous device connections** with **99.7% reliability**, with iOS native app for metrics and savings recommendations.

SKILLS

Programming Languages	Python, Golang, C, C++, SQL, C#/.NET, Javascript
Tools/Platforms	Docker, Git, Linux, PostgreSQL, gRPC, REST APIs, AWS, RabbitMQ
Libraries/Frameworks	Pytorch, TensorFlow, React, Node.js, Express, Pandas, Numpy