Alexander Lu

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Summary

Resilient and motivated UC Berkeley EECS student with 4 years experience in building scalable AI systems and full-stack applications. Thrives in high-pressure environments and is willing to take risks. Leadership-driven with a track record of mentoring interns, onboarding researchers, and coordinating complex AI projects to ensure smooth teamwork and integration.

Skills

- **Languages:** C/C++, Java, Python, Bash, TypeScript/HTML/CSS, SQL, Swift
- **Frameworks/Tools:** TensorFlow, PyTorch, Linux, Scikit-Learn, RESTful APIs, LLMs, Flask, Spring Boot, React.js, Node.js, Git, Docker, AWS (EC2, Route 53), FAISS, VERL, VLLM
- **Concepts:** Machine Learning, Signal Processing, Algorithms, Data Structures, Linear Algebra, Computer Architecture, Computer Networking

Education

- **University of California - Berkeley** **Aug. 2024 - May 2027**
  - B.S. Electrical Engineering and Computer Science, Mathematics Minor
  - GPA - 4.00/4.00
  - Courses: Data Structures, Algorithms, Computer Architecture, Linear Algebra, Discrete Math, Signal Processing, Real Analysis, Circuit Analysis

Experience

Berkeley AI Research - Berkeley Speech Group **May 2025 - Present**

Model Interpretability Researcher

- Researching interpretability and faithfulness of frontier **reasoning models** by analyzing "Chain-of-Thought" reasoning.
- Employing logitlens view of **transformers** to analyze internal reasoning and decision making of **LLM** models.
- Fine-tuned **9** different **Qwen3** reasoning models for improved faithfulness measures from **80 to 88%**.
- Implemented a robust python pipeline to conduct GRPO and evolution-strategies fine-tuning.
- Editing open-source reinforcement learning library **VERL** to support logging and training features required by the lab.

UCSF Weill Institute for Neurosciences - Chen Lab **January 2025 - Present**

Machine Learning Intern

- Employing signal processing methods (Wavelet Transform, Fourier Analysis) with **SciPy** For EEG feature extraction.
- Engineered seizure detection pipeline with EEG time series; deploying SVM and GMM models; achieved **95%** accuracy
- Training and maintaining **Keypoint MoSeq** pipeline to perform **unsupervised learning** on detecting rodent movements.
- Optimized memory usage in a seizure-detection python library from over **200GB down to 4GB** by employing **chunking**.

SwiftScore LLC **September 2024 - May 2025**

SWE Intern

- Led and taught **3** interns to develop full-stack LMS solutions for educators with **React**, **Typescript**, and **Supabase**.
- Reduced site latency by **60%** by eliminating redundant React Hooks and API Calls. Documented code-base for readability.
- Organized **AGILE** development by planning scrum-boards, code reviewing pull-requests, and hosting sprint meetings.
- Developed **RESTful** endpoints on Python **Flask** backend. Implemented caching to reduce calls to database and latency.

Projects

Semantic Backlinks generator (https://github.com/YLu-1258/tapestry)

- **Python** backlink generator for obsidian vault style blogs that semantically encodes a blog with a sentence transformer.
- Employed **FAISS** for efficient similarity search of semantically similar blogs to save bloggers time on generating backlinks
- Built a data-visualization pipeline for users to customize density, confidence level, and semantic weights on a graph.

LSTM ACLED Conflict Prediction (https://tinyurl.com/DSS-ACLED)

- Implemented data preprocessing workflows with **numpy** and **pandas** to predict location metrics on ACLED data.
- Developed LSTM-based model using **TensorFlow** to predict conflict zones in ACLED data; achieved **70%** accuracy.
- Integrated an LLM-based location severity rating system with historical data to caution aid workers on safety and threats.

MacOS Clipboard (https://github.com/YLu-1258/MacOSClipboard/releases/tag/v1.0.0)

- Implemented light-weight clipboard tool in **Swift** for quick copy/paste and history operations for MacOS systems.
- Application runs quietly in the background and supports a variety of data-types from images to text.
- Exploring "polyglot" programming with function calls to **Objective-C** APIs with Swift code for greater efficiency.

Awards

- **CyberPatriot Semifinals 8th, 5th, 7th, and 6th place (top 2% nationally)** **2020 - 2024**
- **CyberPatriot 3rd place Nationally and 2nd place for Cisco Networking Challenge** **2024**
- **Certificate of Recognition from San Diego City Council** **2022 - 2023**
  - Awarded for service as vice president of 501(c)(3) Project Art of Learning