

Alexander Lu

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Summary

Motivated and driven college freshman with a background in computer science, machine learning, and cybersecurity who is eager to gain professional experience in software development. I am highly adaptable to new environments and yearn to tackle challenging problems. I aim to expand my skill set and to prepare for the job market, one project at a time.

Skills

- **Programming Languages:** Java, Python, C++/C, C#, JavaScript, Bash, PowerShell, SQL, MATLAB, x86/ARM asm, Swift
- **Technologies:** Node.js, TailwindCSS, Bootstrap, Java Spring Boot, Python Flask, React.JS, Next.JS, Sveltekit, Linux, Git, Docker, AWS EC2, AWS RDS, LEMP/XAMPP, VMWare, DeepLearning4J, Pytorch, Cisco Packet Tracer, Tensorflow, REST APIs
- **Technical Skills:** Computer Architecture, Computer Networking, CyberSecurity, Algorithms, Data Structures, Linear Algebra, Machine Learning, AGILE development

Education

- **University of California - Berkeley** **Aug. 2024 - June 2027**
 - B.S. Electrical Engineering and Computer Science, GPA - 4.0000/4.0000
 - Mathematics Minor
 - Organizations: CalHacks, UAVs@Berkeley
 - Courses: Data Structures, 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.
- Employing "logitlens" view of transformers to analyze internal reasoning and decision making of LLM models
- Engineering with openAI APIs to finetune, prompt, and collect sample data from Llama, Deepseek, Qwen, and OpenAI models.

UCSF Weill Institute for Neurosciences - Chen Lab

January 2025-Present

Machine Learning Intern

- Employing signal processing methods (Wavelet Transform, Fourier Analysis, etc.) to extract ML features from EEG signals.
- Implementing SVM and ANN models to classify and detect varying seizure types in mice with 95% accuracy.
- Training and maintaining Keypoint MoSeq pipeline to perform unsupervised learning on detecting rodent movements.

San Diego State University

May 2022 - Sept 2022

AI Researcher

- Optimized accuracy of erythrocyte detection algorithm by 10% through integrating a CLAHE algorithm on a UNet model.
- Developed computer vision model with the Pytorch and Keras framework to detect blood capillaries and cells.
- Implemented Contrast Limited Adaptive Histogram Equalization with OpenCV to create binary image masks for training.

DNHS AP Computer Science A Scrum Team

Aug 2023 - June 2024

Project Scrum Master

- Implemented scrum development in a team of 6 students for algorithm visualization and LSTM stock prediction projects.
- Maintained clean GitHub organization through scrum boards and issues.
- Enforced use of branches and pull requests to separate feature development.
- Oversaw ideation, development, and deployment of final product on AWS EC2 instance.

Projects

Dijkstra and Sorting Algorithms Visualization (<https://github.com/orgs/CSA-Tri-2>, <https://github.com/CSA-Tri-1>)

- Implemented algorithms in Java and developed a Spring Boot backend for Restful API endpoints. Deployed on AWS EC2.
- Utilized tailwindCSS and svelte for frontend stack. Deployed frontend site through Github Pages.

LSTM ACLED Conflict Prediction (<https://tinyurl.com/4ttyvawd>)

- Implemented data preprocessing workflows with numpy and pandas to predict location metrics on ACLED data.
- Implemented a LSTM neural network to predict regions requiring humanitarian aid with Tensorflow Keras.
- Integrated an LLM-based location severity rating system with historical data to caution aid workers on safety and threats.
- Achieved up to 70% accuracy in identifying future conflicts, with room for improvement with better hardware.

Awards

- **CyberPatriot Platinum Tier semifinals 8th, 5th, 7th, and 6th place (top ~2% nationwide)** **2020-2024**
- **CyberPatriot 3rd place Nationally Overall and 2nd place for Cisco 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