Annie Liu

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EDUCATION

University of California, San Diego GPA: 3.97
Bachelor of Science, Computer Science **SEPT 2021 - JUN 2025**

COURSEWORK

Linear Algebra, Probability, Statistics, Data Structures, Algorithms, Machine Learning, Operating Systems, Recommender Systems & Web Mining, Database Systems, Parallel Computing**,** Natural Language Processing, Computer Security

SKILLS

Languages: Java, Python, C, C++, SQL, HTML, TypeScript, Bash, LaTeX
Software Tools: Linux/Ubuntu, Git/Gitlab/GitHub/Github Actions CI/CD, GDB, Vim, Android Studio, Jupyter Notebook, JUnit

EXPERIENCE

Instructional Assistant - *UCSD Computer Science and Engineering* **MAR 2023 - PRESENT**

- Supported and guided over 2000 students in **testing** with **JUnit**, debugging, and designing while delivering comprehensive feedback on **Java** implementation and coding style during tutor hours for **Data Structures** course.

Software Engineer Intern - *Bloomberg* **JUN 2024 - SEPT 2024**

- Designed, implemented, and tested a web application via **C++** and **TypeScript** to perform mass updates directly.
- Optimized performance with **multithreading** and used **locks** for **synchronization**.
- Developed web services, a **MySQL**-based database schema to track requests, and an intuitive front-end interface.

Software Engineer Intern - *Splunk* **JUN 2023 - SEPT 2023**

- Streamlined Splunk's testing process by automating debug setup to handle 150+ **Gitlab** pipelines per month.
- Enabled rapid access to diagnostic test tools like pdb, pstacks, and live logs via **tmux**, **bash**, and **Python**.
- Provided a centralized, intuitive resource to initiate and run debug sessions effectively to enhance dev experience.

Research Intern - *UCSB Neuroscience Research Institute* **JUN 2020 - MAY 2021**

- Developed an automated modeling algorithm in **Python** to extract quantitative data on molecular responses to shear stress from 1000+ articles from the *GeneFinder* database.
- Demonstrated findings, particularly the lack of consistencies and data in the cardiovascular mechanobiology field, thru a comprehensive paper. Delivered a compelling presentation to an audience of 300+ individuals.

RESEARCH

Qiita Plugins Tools Development - *UCSD Jacobs School of Engineering* **JUN 2022 - SEPT 2022**

- Developed 8 plugins with a team of 4 in **Python** and tested workflows using **Github Actions** to expand existing microbiome web tool Qiita to be able to perform analyses on raw DNA sequences for COVID-19 pipelines.

SamBamViz Visualizer - *Research for UCSD Jacobs School of Engineering* **MAR 2022 - MAY 2022**

- Designed a web application using **HTML**, **JavaScript**, and **CSS** to visualize viral genome sequences with Vega.
- Enable public health officials to easily visualize TSV files with 1000+ rows of genetic data. (poster, Github)

EMPress Compression - *Research for UCSD Jacobs School of Engineering* **JAN 2022 - MAR 2022**

- Implemented data compression techniques with **JavaScript**, Gzip, and Pako, enhancing the web tool's capability to visualize phylogenetic trees and achieving a 5x increase in node visualization capacity. (poster)

Modeling Shear Stress on KLF2 Expression - *AP Capstone Diploma* **AUG 2020 - MAY 2021**

- Conducted systematic review on effect of laminar shear stress on KLF2 mRNA expression through **MATLAB** visuals.
- Created an informative database with 300+ entries from 80+ articles to advance heart disease prevention.
- Awarded a perfect score (top 1.56% of exam takers) by College Board for AP Research exam. (paper, presentation)

PROJECTS

TritonLink132B **APR 2024 - JUNE 2024**

- Developed a web app for student data management (e.g., enrollment, class scheduling) from front-end design to back-end integration and database architecture with **PostgreSQL**, **Java**, **JSPs**, and **Apache Tomcat**.
- Designed and implemented 35+ relational schemas, 25+ dynamic data entry forms, and 8 queries and reports.

Diachronic Relationships in Romance Languages **APR 2024 - JUNE 2024**

- Quantified diachronic links among 3 Romance languages using Facebook AI's self-supervised model **Wav2Vec 2**.
- Processed 300+ audio recordings to extract critical features and measure **phonetic** variances among Latin, Romance languages, and each other. Utilized **dimensionality-reduction** techniques to visualize branching patterns.

SpeechT5 Performance on Automatic Speech Recognition (*paper*) **APR 2024 - JUNE 2024**

- Authored a comprehensive analysis paper on Microsoft's encoder-decoder pre-training model **SpeechT5**.
- Evaluated **ASR** performance on 500 audio files from 4 datasets. Categorized common errors to find its limitations.

Clover for Students with Dyslexia *(app demo)* **MAR 2020 - SEPT 2020**

- Founded and spearheaded development of an **Android** app to help dyslexic students improve their cognitive skills.
- Implemented features, such as **optical character recognition**, text-to-speech functions, and font conversion tools.
- Awarded as 2020 Technovation Semifinalist out of over 6,000 teams & recognized by Congressman Ro Khanna for app creativity, design, and skill.

LEADERSHIP

Eta Kappa Nu - Kappa Psi (HKN) - *Advisor, President, Vice President of Events* **OCT 2021 - PRESENT**

- Spearheaded the vital **transition** from virtual to in-person operations for a 6-branch organization with 60+ officers.
- Revived key events such as career fairs, hackathons, and alumni networking nights, while re-establishing industry and alumni **connections**.
- Streamlined event planning and financial management using tools like **Notion** and **Trello**.
- Initiated the development of an HKN **web portal** to optimize attendance tracking and member induction processes.
- Fostered mentorship, diversity, and community-building through initiatives like coffee chats and outreach to underrepresented groups.

Scholars Society - *Mentor-Mentee Chair* **JUN 2021 - PRESENT**

- Matched 100+ students into mentorship pairings to provide support to UCSD underclassmen scholarship recipients.
- Organized 5+ social events with 200+ attendees to strengthen relationships in the scholars community.