Zhiyuan Song

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EDUCATION

University of California, Santa Cruz **Sep. 2022 – June 2026**
Bachelor of Science in Computer Science *GPA: 3.84/4.00*

RELEVANT COURSEWORK

- Computer Architect
- Machine Basic
- Intro Algorthm Anyl
- Assembly Language
- Prin Comp Sys Dsgn
- Prog Abs Python
- Prob Theory
- Comp Sys and C Prog

PROJECTS

AnimeHub | *Full-Stack Development, MongoDB, Express.js, React, Node.js, Javascript* **June 2024**

- Independently developed a **full-stack** anime forum website for enthusiasts using **JavaScript**.
- Utilized **React** and **Axios** to fetch and display anime data, adding rating and commenting features for users.
- Enhanced the user interface with **Ant Design** and **Material-UI**, improving overall user experience and visual appeal.
- Implemented user registration and authentication using **Express.js** and **JWT**, ensuring data security.
- Extended models and developed **RESTful APIs** for ratings, rankings, filtering, and managing favorites.
- Stored data in **MongoDB**, optimized queries with indexing, and implemented efficient data retrieval and filtering.
- Deployed the frontend on **Netlify** and the backend on **Heroku**, ensuring stable operation and high availability.
- Managed the **entire web development process**, including planning, coding, testing, and maintenance.

Word Range Queries using AVL Trees | *C++ Programming, Data Structures, Algorithm Optimization* **April 2024**

- Developed an advanced data structure using AVL trees for efficient insertions and range queries on large-scale text data.
- Implemented a **self-balancing AVL tree** to maintain optimal performance for insertion and query operations.
- **Enhanced AVL tree nodes** with subtree size, max, and min value properties to speed up range queries.
- **Optimized** the data structure to handle **2 million** insertions and queries in under one minute.
- Developed a custom **range query algorithm** using AVL tree properties for **logarithmic time complexity**.

Web Crawler in C | *C Programming, Web Scraping, libcurl, Regex* **November 2023**

- Developed a basic web crawler using fundamental **web scraping techniques** and systems programming.
- Utilized **command-line arguments** in a **Linux environment** to set seed URL, page directory, and crawling depth.
- Integrated **libcurl** to handle efficient HTTP requests and seamless HTML content retrieval from web pages.
- Designed and implemented HTML parsing with **regex** to extract and manage **hyperlinks**.
- Engineered a **FIFO** queue to effectively manage and prioritize URL processing for efficient crawling.
- Implemented mechanisms to handle URL normalization failures, download errors, and memory allocation issues.

TECHNICAL SKILLS

Programming Languages: JavaScript, Java, Python, C++, C, C#, HTML/CSS, Assembly Language, R
Libraries: Redux, Context API, Axios, Socket.io, Scikit-learn, Pandas, NumPy, Matplotlib, Redis, Mongoose, JWT
Frameworks/Databases: React, Node.js, Express.js, MongoDB, Redis
Tools: Linux, Unix, Git, GitHub, VS Code, Ubuntu, PyCharm, Jupyter

REWARDS

Dean's Honor: Winter 2024, Fall 2023, Spring 2023, Winter 2023, Fall 2022