Alfred Long

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EDUCATION

University of Wisconsin-Madison — Madison, WI
Bachelors in Computer Science; GPA: 3.88 — *Aug 2022 - Dec 2024*

University of California, Berkeley — Berkeley, CA
Exchange Program in Statistics and Computer Science; GPA: 3.95 — *Aug 2021 - May 2022*

WORK EXPERIENCE

Expedia Group — Seattle, WA
Full Stack Software Engineering Intern — *May 2023 - Aug 2023*

- **Synchronous Front-end Dashboard**: Utilized **React** to design a synchronous front-end tool with Expedia's **UITK** library, facilitating real-time creation and preview of market-feed cards for the **Vrbo** homepage. Added **segmentations** and **authentications** for sending cards to specific users, adhering to **agile development** practices.
- **Back-End Connectivity**: Designed a **GraphQL** schema and implemented **datasource** and **resolver** in **TypeScript**, optimizing UI tool-domain service interaction via **Experience API** with **MongoDB** for the **Bernie App**. Ensured efficient deployment through **CI/CD** practices with **Jenkins**. Attracted 400,000+ views and 45,000 clicks with a CTR of 11.25%
- **Testing**: Utilized **Jest** to conduct **Unit Tests** for both front-end and back-end code, achieving 95%+ test coverage. Created **mocks** to test the functionality of API deployment and pushed it to production.

Bopu Assets — Shenzhen, China
Quantitative Developer Intern — *May 2021 - Aug 2021*

- **Back-testing System**: Developed a **back-testing** system with Python for T+1 strategies on secondary stock market, accelerating the runtime by 20x compared to former version integrating **multiprocessing programming** with **Joblib**.
- **Level-2 and TICK Data Processing**: Cleaned, integrated and analyzed **terabytes** of trading data in **Level-2** and **TICK**. Performed **feature engineering**, creating new features based on **spread**, **bid-ask relationships** and more.
- **High-frequency Factors Digging**: Based on new features created, identified **15+** useful high-frequency factors with **Information Coefficient (IC)** greater than 0.05 in forecasting stocks' future return.
- **Result**: Received a **30%** return in 3 months based on self-developed strategy with **Sharpe ratio of 2**.

SELECTED PROJECTS

Xv6 Kernel: Implementation of Operating System Utilities — Madison, WI
Group Lead — *Aug 2023 - Nov 2023*

- **Implemented a Unix Shell (wsh)** : Developed a custom command-line interpreter in **C**, simulating essential features of Unix shells such as command execution, process management, built-in commands, background jobs, and inter-process communication using pipes.
- **Multi-Level Feedback Queue Scheduler** : Enhanced the default round-robin scheduler of the xv6 operating system by implementing a **Multi-Level Feedback Queue (MLFQ)** Scheduler, incorporating CPU usage decay and priority adjustments. Boosted the scheduler performance by 15%.
- **Multithreaded HTTP Proxy Server**: Developed a **multi-threaded** HTTP proxy server in **C**, featuring a thread-safe priority queue, capable of handling concurrent client requests.
- **FUSE File System**: Developed a log-structured file system using FUSE (Filesystem in Userspace) in **C**, enabling features like file creation, reading, writing, and directory management, with efficient log-based updates and inode structure modifications.

Minirel Database Management System Development — Madison, WI
Group Lead — *Aug 2023 - Nov 2023*

- **Buffer Manager**: Implemented a Buffer Manager in **C++**, utilizing a clock replacement policy to manage a database buffer pool, facilitating efficient data page transfers between disk and main memory.
- **Query and Update Operators**: Implemented **query and update operators**, enabling selection, projection, insertion, and deletion operations, enhancing the system's capability to interact with databases effectively.

Deep Neural Network Design and Implementation — Berkeley, CA
Group Lead — *Feb 2022 - May 2022*

- **Image Captioning**: Captioned images using **Recurrent Neural Network (RNN)** and **LSTM**, visualizing those networks using **PyTorch**. Implemented an image style transfer system using **SqueezeNet**.
- **Language Modeling**: Preprocessed raw text data, and trained it with *LSTM*, summarizing news using **Transformer**.

SKILLS SUMMARY

- **Languages**: Java, C++, Python, C, React, JavaScipt, TypeScript, SQL, HTML, CSS, Node.js, Express.js, R, MATLAB
- **Tools**: GIT, GitHub, RESTful API, MongoDB, GraphQL, GitHub Actions, Jenkins, AWS, PyTorch, Joblib, BeautifulSoup