Timothy Cai

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Education

- **Texas A&M University** College Station, TX
  Bachelor of Science in Computer Science *Graduating May 2025*
  - **Relevant Coursework:** Data Structures and Algorithms, Problem Solving Strategies, Probability, Discrete Mathematics, Analysis of Algorithms, Formal Languages and Automata, Computer Organization, Distributed Networks and Systems, Airport Systems and Design, Operating Systems

Experience

- **Frogslayer** College Station, TX
  Junior Software Developer *June 2022 - Present*
  - Working at a software consulting firm, with projects focusing on **Angular** with **TypeScript** and **.NET Core**
  - Rewrote calls to graph database, eliminating unefficient queries and reducing overall load by **270%**
  - Responsible for tight turnaround in fast paced web development environment, comfortable with ambiguity
  - Implemented numerous features affecting everything from UI to database integrations with **RxJS**, **React**, and **Gremlin**
- **Aggie Research Program** College Station, TX
  Researcher *Sept. 2021 - Aug. 2022*
  - Designed multi-faceted non-deterministic model simulating society to observe effects of media
  - Implemented mentioned model in **NetLogo** and processed over 30 million data points through **R** and **Python**
  - Worked closely with graduate students and professors on a multi-disciplinary team to design statistical models
- **Senseye** Austin, TX
  Software Engineer & Machine Learning Intern *May 2023 - Aug. 2023*
  - Designed and implemented internal **Python** library to autonomously pull data from **AWS Athena/Glue S3**
  - Intended to be lightweight and exist on the cloud as a piece of a larger machine learning pipeline using **Sagemaker**
  - Able to manipulate data through **ffmpeg** commands and can isolate keyframes within videos to probe machine learning models for accuracy

Projects

- **Found in Translation** *Tools Used: Python, JavaScript, Slack Bolt, Flask, Node.js, Co:Here, Pinecone, Azure*
  - **Overall Winner** at the Cohere 2023 Semantic Search Hackathon
  - Intelligent Slack bot that can **semantic search** for messages across languages as well as analyze emotions in a server
  - Utilized **Flask** to train **co:here** models on the Google GoEmotion dataset, with storage through **Pinecone**
  - Developed user interface with **Slack Bolt API**, and hosted everything on **AWS ec2** instances
- **Multithreaded Web Crawler** *Tools Used: C++, WinSock, TCP, DNS*
  - Designed and implemented web crawler scalable to **10000 threads** concurrently with Visual C++
  - Fully memory safe and robust to errors, crawling HTTP standard urls with TCP over windows sockets
  - With robots.txt detection and DNS handling, was able to parse over **1 million urls** in less than 5 minutes
- **Mock Shell** *Tools Used: C++, PHP*
  - Mock Linux shell accepting multiple commands and flags, with **multithreading** capability
  - Utilized **POSIX** standard to implement and maintain low level, efficient C++ code
  - Developed and designed systems for piping, file I/O redirection, background processes
- **NUC Legion** *Tools Used: MetalLB, Ansible, Kubernetes / k8s*
  - Built a highly available, 6 node Kubernetes cluster with leftover Intel NUCs through **k8s** and **Ansible**
  - Running in 1 master / 5 worker node configuration, with up to 3 node down tolerance.
- **Small Distributed Social Network** *Tools Used: C++, gRPC, glog, cmake*
  - Implementation of a social network service utilizing Chubby lock system with 3 server clusters communicating over **grpc**
  - Designed to be scalable, fault tolerant, and highly available with up to 1 down cluster
  - Server clusters split into master / slave, with **Chubby** running as coordinator, yielding close to **99%** uptime.

Technical Skills

- **Skills**: Competitive Programming (C++), Software Architecture, Full Stack, Networks and Distributed Engineering
- **Languages**: *(Proficient):* Python, Java, C++, Typescript, HTML, CSS *(Familiar):* Go, Scheme, SQL, Rust
- **Technologies**: Pinecone, Pandas, React, Angular, .NET Core, Node.js, Firebase, Heroku, gRPC, glog, cmake, Azure, AWS
- **Roles**: Aggie Competitive Programming Club Officer