

# 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

## 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**
  - Designed and reformatted data transfer system to reduce observable customer delay by up to **70%**
  - Responsible for tight turnaround in fast paced web development environment, comfortable with ambiguity
  - Implemented numerous features affecting everything from UI to customer interaction with **RxJS** and **React**
- **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
- **The Galactic Algorithm** Tools Used: *Python, tensorflow*
  - Heuristic algorithm that was designed to descramble a large image of mixed quadrants, written for 2023 TAMU Datathon
  - Final algorithm consisted of meshing three heuristics, with a final accuracy of **97%** accross 10000 images
  - Used a similar technique as Alpha Beta Pruning to optimize color difference thresholds for object detection
- **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, 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