# An Nguyen Tran

Houston, Texas, United States antran@caltech.edu 346-932-3542 in/an-tran-ct avarel.github.io

## EDUCATION

### Bachelors of Science in Computer Science
California Institute of Technology (Caltech) • Pasadena, CA • 2023 • 4.15

## COURSEWORK

### Intro to Software Engineering
CS 3 • C, Teamwork
• Worked on long-term large software deliverable in C with a small team of 4 programmers.
• Created a rudimentary physics engine with collision detection resolution and an asteroid game from using C and SDL2.

### Decidability and Tractability
CS 21 • Complexity Theory, Proofs
• Analyzed the theoretical runtimes of basic algorithms, and proved NP/PSPACE completeness of computational with formalized proofs.

### Intro to Programming Methods
CS 2 • Java, Data Structures
• Implemented fundamental CS data structures (Lists, Maps, Heaps) and graph algorithms (BFS, DFS, Djikstra, etc.).
• Worked on a game AI for Othello/Reversi using Java and algorithms such as Alpha-Beta searchers, Bitboards, and Evaluators.

## SKILLS

**Python, C & C++, Rust, Node.js, Unix, Tensorflow, Java, Kotlin, JavaScript/TypeScript, WebPack, HTML, CSS/SCSS, ReactJS**

## EXPERIENCE

### Undergraduate Research Fellow
**Caltech: Powell-Booth Laboratory for Computational Science (OVRAS)** **June 2020 – August 2020, Remote**
• Employed as a software development intern for the research group and supervised by a research mentor.
• Developed a new full-stack WebSocket protocol to replace the group's prototype protocol, resulting in performance increases and a new well-documented backend for the group's prototype of a remote educational platform.
• Accomplished a multi-platform client by using Rust and Actix to create the socket back-end, and TypeScript, WebPack, and ReactJS to build web front-end.

## PROJECTS

### Celltomata
Hacktech • March 2020
• Implemented the backend for a multiplayer fusion of Conway's Game of Life and .io games.
• Programmed the WebSocket backend and game logic in Rust, and front-end interface with Node.JS and HTML/CSS/JS.

### Lovecraft-LSTM
github.com/Avarel/Lovecraft-LSTM • January 2020
• Used the Python TensorFlow machine learning library and an LSTM model to generate texts based on 18 famous Lovecraft works.
• Computed and trained online using 60 cloud TPU hours of Google Colaboratory.

### Octave (Formerly Gnar)
github.com/Stardust-Discord/Octave • September 2016 – August 2019
• Wrote an open-source Discord bot in Java and Kotlin, using JDA and Lavaplayer, serving over 100000 Discord servers.
• Handled and streamed OPUS sound packets from YouTube videos (and 5 other sources) to Discord voice channels to deliver a premium music experience.

## INVOLVEMENT

### Software Member
California Institute of Technology • Caltech Robotics Club • October 2019 – Present
• Used ROS Melodic and PyTorch to implement detectors for a robotic submarine.

### Competitor
Riverside Community College • ACM-ICPC Competition • November 2019
• Competed in the regionals ICPC programming competition. Placed 31 out of 88 on freshman year.