An Nguyen Tran

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EDUCATION

Bachelor of Science in Computer Science
California Institute of Technology (Caltech) • Pasadena, CA • Class of 2023 • GPA 4.15

EXPERIENCE

Undergraduate Research Fellow
Caltech: Powell-Booth Laboratory for Computational Science **June 2020 – August 2020, Remote**
• Employed as a software engineering intern for the research group and supervised by a research mentor for the OVRAS research group.
• Designed a new full-stack WebSocket protocol to replace the group's prototype protocol, achieving performance increases.
• Created a new backend for the group's prototype of a remote educational platform with documentation, ensuring future maintainability.
• Achieved experimental multiplatform support by using TypeScript, Webpack, and ReactJS to build the web frontend.
• Developed the backend using Rust and Actix and deployed on Amazon Web Services and the private university cluster.

COURSEWORK

Intro to Software Engineering
CS 3 – C, Teamwork **Spring 2020**
• 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 **Winter 2020**
• Analyzed the theoretical runtimes of basic algorithms and NP/PSPACE completeness of computational problems with formalized proofs.

Intro to Programming Methods
CS 2 – Java, Data Structures **Winter 2020**
• Implemented fundamental CS data structures (Lists, Maps, Heaps) and graph algorithms (BFS, DFS, Dijkstra, etc.).
• Worked on a game AI for Othello/Reversi using Java and algorithms such as Alpha-Beta searchers, Bitboards, and Evaluators.

PROJECTS

Celltomata
Hacktech Hackathon **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 frontend 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, trained, and used the model online using 60 TPU/GPU cloud hours of Google Collaboratory.

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 5 video platforms to Discord voice channels to deliver a premium music experience.

SKILLS

C, C++, Rust, Python, Node.js, Unix, TensorFlow, Java, Kotlin, JavaScript/TypeScript, Webpack, HTML, CSS/SCSS, ReactJS

EXTRACURRICULARS

Caltech Robotics Club
California Institute of Technology • Software Member **October 2019 – Present**
• Used ROS Melodic and PyTorch to implement detectors for a robotic submarine. Worked with 3 other teams in the CRT club.

ACM-ICPC Competition
Riverside Community College • Competitor **November 2019 – Present**
• Competed in the regionals ICPC programming competition in a team of three students. Placed 31 out of 88 on freshman year.