Alistair Keiller

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EXPERIENCE

Invibratrac Chief Technology Officer (part-time) May 2024-Present

A stealth-mode startup developing medical devices, started by a serial entrepreneur and thoracic surgeon.

- Lead Full-stack Engineer on a 5-person team, creating a medical device product.
- Created embedded frontend in Rust and Iced and asynchronous embedded backend running in Tokio.
- Developing natural language processing and speech recognition that runs locally on Orin Nano.

Emeritus Summer Intern Summer, 2022

Emeritus collaborates with more than 80 top-tier universities to make high-quality education accessible and affordable worldwide. Time Magazine World's Top EdTech Company of 2024 (emeritus.org)

- Full Stack Engineer on a 25-person international software engineering team.
- Worked on back end and front end of the customer purchasing interface.
- Created full demo web interface showcasing new concepts; helped resolve issues with main interface.
- Learned from a world-class DevOps process, including a complex GitHub workflow and integration between GitHub, task management systems, and CI workflow runs.
- Proactively implemented Emeritus' first reproducible development environment, making sharing projects within the team easier.

AlwaysAI Summer Intern Summer, 2020

An early leader in providing real-time insights through Vision AI (alwaysai.co)

- Created an application for retail and manufacturing that detects when people are unmasked or not socially distanced and runs on inexpensive edge hardware.
- Developed an application for ubiquitous consumer drones to detect trash type and quantity while flying overhead.

Open Source Contributor 2020-Present

- Made 3,527 contributions including LLVM, Iced, and Typst, using 18 programming languages.
- Rewrote Typst's build system; featured by Typst on their website as a top contributor.
- Contributed an RFC to Iced (a Rust GUI framework).

Inventor 2016-Present

- Created a browser-based collaborative editor with a client-side compiler (patent pending).
- Developed a Tetris-like learning game to teach Quantum Computing. In "Quantris," players maneuver pieces representing quantum operations to complete objectives.
- Provide insights and tools for new ventures (e.g. math teaching tool for Gensy).
- Designed the architecture, frame, and electronics for a go-kart manufacturing startup.

EDUCATION

University of California, Irvine: Computer Science Major, 3.96 GPA 2024-Present
Stanford Online High School: 3.95 GPA (unweighted), including 23 university-level classes 2020-2024
Stanford University: Summer Session, Data Science and Organic Chemistry Summer, 2023
University of California, San Diego: Undergraduate Math and CS Coursework 2023-2024
University of California, Santa Cruz: Undergraduate Math Coursework Summer, 2022

PUBLICATIONS

- A. Keiller, "An Approach to Reduce Computational Load: Precalculating Gain Matrices for an LQR Controller of a Four-Axis Manipulator Using State Space Kinematics". 2023.
  - Published in arXiv and TechRxiv.

LEADERSHIP & EXTRACURRICULARS

UCI F1Tenth (Autonomous 1/10th Scale Car Racing) Co-President 2024-Present

- Built F1Tenth race car, including LiDAR, stereo cameras, IR, and custom voltage regulator.
- Created reinforcement learning model using Isaac Lab.
- Trained the research subteam on UPenn's F1Tenth course content.

UCI Formula SAE Electric Racing Embedded Lead 2024-Present

- The first-ever freshman to be promoted to Embedded Lead of UCI's Formula SAE electric racing team.
- Programmed a uniquely cost effective data collection and visualization pipeline.
- Building custom high power motor controller.

FIRST Robotics Competition Founder, Captain, Lead Programmer 2021-2024

Teams build and program industrial-size robots to play a difficult field game against like-minded competitors.

- Founder of first and only online, global FRC team (out of 3,300 teams competing).
- Won three Judges' Awards for unique design process and innovative control systems research.
- First FRC team to successfully implement VSLAM and Object Detection; our robot knows the location of itself, other robots, and game pieces.

Stanford Online High School TA and Peer Tutor 2021-2024

- First research TA for Light & Heat (Thermodynamics and Optics) and Modern Physics (Special Relativity and Quantum Mechanics).
  - Developed new representation of PR-box states for 228x memory reduction compared to standard.
  - Created a number of interactive visualizations and real-time simulations to illuminate difficult concepts such as single-slit diffraction and 2D time-dependent Schrödinger equation.
- TA for AP Computer Science A: Rewrote the assignment's build system in Gradle to improve build support with more editors and operating systems.

TECHNICAL SKILLS

- Favorite Tools: Git, Pytorch, Typst, Ansible, AWS, Docker, Cloudflare, AutoGluon, Fish, Bevy, wgpu
- Programming Experience in: Python, Rust, Julia, C, C++, C#, Bash, Java, JavaScript, TypeScript, Ruby, Svelte, NetLogo, Nix, arm64 assembly
- Database Systems: InfluxDB, MySQL, Postgres

HONORS AND AWARDS

- Stanford Kaggle Competition first place 2023

  The final project for my Stanford University graduate-level (majority Master's/PhD students) STATS 202 class was to predict patients' schizophrenia. I focused on iteration speed instead of algorithms. Rather than applying RNNs, LSTMs, and massive ensemble models, I used a cross-validation-hyperparameter-tuned XGBoost, which trained in under a minute and let me carefully control overfitting. I found which 10% of studies, doctors, and hospitals had the most optimal data, normalizing for any biases in each. My model ranked #1 on the Kaggle leaderboard.

- Google Foobar Level 5 (Highest Level): Google's Software Engineering Assessment 2022
- Gold Medal, World Math Team Competition 2019

COMMUNITY SERVICE & INTERESTS

Supports nonprofits with IT and technology projects. Enjoy nature breaks, away from my binary better half (computer) – long ultralight backpacking treks, sailing Hobie Cats, mountain biking, windsurfing.