Vijay Sharma

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Education

University of California, Berkeley **Aug 2024 – May 2026**

Bachelor of Science in Electrical Engineering and Computer Science (Graduating 2026) *Berkeley, CA*

- Relevant Coursework: Database Systems, Machine Learning, Efficient Algorithms and Computational Complexity, Computer Architecture, Data Structures & Algorithms, Information Systems Design.

Experience

NASA CA Space Grant Consortium **June 2024 – July 2024**

Robotics Intern *San Jose, CA*

- Engineered and implemented a high-precision soil moisture sensing system for space-optimized greenhouses, utilizing C++ for real-time data processing and Rust for robust hardware interfaces.
- Developed an efficient data acquisition protocol that achieved increased uptime and sub-second response times, critical for maintaining optimal growing conditions in resource-constrained environments.
- Created a fault-tolerant environmental monitoring system that provided real-time soil condition analytics, resulting in 25% improved accuracy in moisture detection and plant health prediction.
- Successfully presented the sensor prototype to NASA senior engineers, demonstrating its potential for integration into future space agriculture initiatives and receiving commendation for innovative approach to reliability testing.

Nanoblox Limited **July 2020 – August 2023**

Project Manager and Developer *Remote*

- Led a team of 10 developers to improve and develop Nanoblox, a Roblox game management system with over 50 million downloads and counting. The rewrite enhanced type-safety and modularity.
- Implemented a bootstrapping Luau compiler for in-game code execution within the Nanoblox system, increasing script execution speed by 50% and enhancing the gaming experience for Roblox players.
- Designed and implemented a distributed in-memory store with commit-based transactions, providing a faster and more reliable alternative to Roblox's default key-value store. This solution reduced data loss incidents by 50% and ensured consistent game state persistence across servers for Roblox developers using the system.

Loncapa Solver **January 2022 – June 2023**

Lead Developer *San Jose, CA*

- Implemented large scale algorithms to parse and match over 1 million queries with specific problem patterns in the database, improving the data retrieval process and allowing for 80% resolution of user queries.
- Created systems for automation of new problem solutions through web-scraping, OCR, and algorithmic parsing of a series of dependent mathematical expressions.
- Added clustering mechanisms utilizing Raft Consensus algorithm, for 50% increase in system reliability and 35% reduced load on individual nodes. Improved developer productivity by implementing unit tests and a CI/CD pipeline.
- Developed and maintained a highly reliable system that has been serving over 80,000 users and has been operating for more than a year without any major downtime or breakages, ensuring a consistent and dependable user experience.

Projects

Alex AI: AI-powered program to fully automate legal aspect of creating companies and aid in managing them through identifying optimal business structure. Semi finalist in TEDxMicrosoft AI Hackathon 2023.

Flick: Cross-platform rocket flight controller with active stabilization, hardware abstraction and sensors, bare-metal and OS compatibility, and support for PID and LQR control algorithms.

RusTOS: Real-time operating system built around safety and speed, with a simple implementation for maintainability. Features include a HAL, basic virtual file system (VFS) with support for Minix and EXT-2 file systems, controllable scheduler, physical and virtual memory managers. Supports ARM and RISC-V architectures.

Dasu: Giveaway chat-bot on Discord that handles interactions from over 2 million users.

Felix: Worked with researchers at the University of Illinois Urbana-Champaign to develop a novel gradient descent-based compiler optimization framework that creates differentiable space of tensor programs, achieving, 2.2x speedup over PyTorch and reaching optimal performance 3.4x faster than modern search methods.

Skills

Languages: C, Lua/Luau, Python, Rust, C++, Assembly (X86, Arm, Risc-V), OCaml, Verilog, TypeScript, Java, TeX
Libraries: Numpy, Pandas, Scipy, Pytorch, Keras, Scikit-learn, React
Technologies: Git, Linux, BSD, Docker, Nix, Kubernetes, PostgreSQL