Vihan Bhargava

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Education

University of California, Berkeley **May 2020 - May 2024**
B.A. Computer Science (concentration: Systems and Silicon Engineering) *GPA 3.7*

Experience

Hudson River Trading — *Core Markets, Build & Test* **May 2023 - Aug 2023**
Core Developer Intern *New York City, NY*

- Rapidly identified and solved a blocking production bug by reducing memory footprint of a program by 87% using tools like Valgrind.
- Optimize internal syncing tool written in Python and C++ by up to 50% in some cases.
- **Prototyped a monorepo version control system** integrated with internal tools to manage build history and artifacts.

Apple — *Special Projects & Hardware* **May 2022 - Aug 2022**
Device Engineering Intern *Sunnyvale, CA*

- Developed features for a novel embedded security device using a secure Apple hardware and software stack in Objective-C and associated tooling in Python.
- **Architected the device rescue and diagnostics OS daemon** and client, enabling field engineers to solve issues in minutes instead of weeks.
- Implemented tooling such as: networking configuration, enabling high-availability, enabling auto-pairing, and generating sysdiagnoses.
- **Placed first in the company-wide internal intern cybersecurity CTF.**

Apple — *Swift Standard Library Team* **May 2021 – Aug 2021**
Software Engineering Intern *Cupertino, CA*

- **Implemented the official `SortedSet` and `SortedDictionary` types for the Swift programming language used by millions of developers.**
- Devised the underlying B-Tree data structure with novel algorithms to yield over 1,000x improvements in some cases.
- Performed low-level performance tuning to achieve over up to **2-3x speed increase over the industry-standard C++ standard library implementation.**

Berkeley Laboratory for Usable and Experimental Security (BLUES) **Sep 2020 – Feb 2021**
Research Assistant

- **Designed high-throughput infrastructure to ingest 50,000,000+ data points and identify fraudulent relationships across them.**
- Automated deployment using serverless DevOps methodologies on top of Docker and AWS.

Projects

SCμM-V SoC — *Bringing up an IoT SoC built in Intel's 16nm process*

- Develop PCBs in Altium CAD to bootstrap a custom-designed 200MHz 32-bit SoC with 2.4GHz radios, 90GHz radar, and cryptography acceleration.
- Designed power unit for high-precision and frequency instrumentation.
- Using FPGAs to perform digital verification and bootstrapping software.

VSL — *Low-level programming language*

- **Designed a low-footprint compiled programming language with a focus on embedded systems.**
- Created a **interopability framework** in Rust with Clang API enabling dynamic dispatch and inheritance across unrelated languages (including C, C++, and Objective-C).