

RYAN COHEN

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PERSONAL PROJECTS

- **Caliga Bootloader** A boot loader project where I learned how to get information from and interact with modern hardware. Also learned how to interact with firmware such as UEFI and create a physical memory manager.
- **RyanOS** An operating system project with a custom UEFI boot loader. I learned how to run my operating system on emulators and on real hardware. Worked on a libc implementation and a UEFI interface library.
- **toy-bootboot** A project to re-implement a boot loader protocol on my own. Learned how to adhere to a protocol and how to create and run a UEFI boot loader.
- **chip8-rp2040** An emulator for the CHIP-8 interpreted language on a microcontroller with an OLED screen.
- **ssd1306-rp2040** A library for interfacing with a 128x64 OLED screen. Used in chip8-rp2040.
- **rraytracer** A ray tracer implementation based on the book "Ray Tracing in One Weekend" by Peter Shirley. Learned how a 2D image can be generated from a scene of 3D models using linear algebra.
- **rtga** A C library for interfacing with a TGA image file. Used in rraytracer for generating ray-traced images.

OPEN SOURCE CONTRIBUTIONS

Ripes (My Commits)

- Currently working on dynamic and filterable Qt interface for users to interact with a database of generalized ISA instructions. ([Github Issue](#)) ([Github Pull Request](#))
- Assisted in developing a generalized ISA assembler.
- Developed a library for defining generalized ISA information and instruction details at compile-time.
- Fixed bugs and submitted bug reports.

GRUB Boot Loader

- Fixed two integer underflow vulnerabilities in the command line that affected all supported systems. ([Commit](#))
- Fixed an out-of-bounds write vulnerability in the VGA text module affecting some BIOS systems. ([Commit](#))

Limine Boot Loader

- Fixed a bug. ([Commit](#))

UEFI-rs

- Contributed documentation to understand better how the library's APIs work and how they could be used.
- Fixed a bug where the Rust panic handler function would log an unnecessary file name. ([Commit](#))

Starship

- Contributed a feature. ([Commit](#))

SKILLS

Programming Languages C/C++, Rust, Python, Bash, Assembly (x86_64, ARM, RISC-V), Verilog/SystemVerilog

Development Tools Git, Github Actions, GNU Make, CMake, GCC, QEMU, GDB, Ghidra, Vivado

Frameworks Qt

EXPERIENCE

Mentee - Ripes

September 2023-

Linux Foundation

Remote

- Worked with my two mentors and another intern to make the contributions described above, in the Open Source Contributions section.
- Discussed projects, bugs, features, and ideas with my mentors.

Assistant of IT

Summer 2018

South Shore Charter Public School

Norwell, MA

- Helped teachers with IT problems
- Helped set up devices and networking in the new High School building
- Ensured that all Ethernet sockets worked properly on the newly built floor of the High School building
- Set up 100+ new Chromebooks for students
- Helped teachers set up technology in their classrooms (PCs, projectors, speakers, etc.)

Assistant of IT

South Shore Charter Public School

Summer 2016

Norwell, MA

- Helped teachers with IT problems
- Set up 200+ new devices for students and teachers (iPads, Macbooks, PCs, and Chromebooks)
- Helped teachers set up technology in their classrooms (PCs, projectors, speakers, etc.)

EDUCATION

UMass Lowell, Bachelor of Information Technology - In Progress, GPA: 3.94

Spring 2023-

Bristol Community College,

2020-2022

Associate of Computer Information Systems - Computer Science Transfer to UMass, GPA: 3.95

Scituate High School, High School Degree, GPA: 3.39

2015-2019