

# Shaun Loo

 zackertthescar |  zackertthescar.com |  loo00013@umn.edu |  +1 (651) 239-3688

## EXPERIENCE

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### Google Summer of Code

FFmpeg Code Contributor

Minneapolis, MN

May 2023 - August 2023

- Contributed to the FFmpeg native H.266 (VVC) decoder project, preparing FFmpeg for next-generation codecs
- Utilized AVX2 SIMD extensions in `x86_64` assembly to accelerate H.266 (VVC) decoding by up to 3.6%
- Details can be found at <https://zackertthescar.com/avx2/>

### University of Minnesota Twin Cities

Graduate Teaching Assistant

Minneapolis, MN

Sep 2024 - Present

Undergraduate Teaching Assistant

Sep 2022 - May 2024

- Supervised the smooth operation of programming laboratory sections of over 30 students
- Stimulated student interest in CS fundamentals by providing one-on-one or group guidance to over 50 students
- Expedited grading throughput and provided students with valuable feedback

## SKILLS

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**Languages:** C, C++, Rust, Java, Python, OCaml, TypeScript, `x86_64` Assembly (NASM, with `x86inc.asm`)

**Operating Systems:** macOS, Linux (Debian, Ubuntu, Fedora, Arch, NixOS), Windows 10/11

**Tools:** Git, Docker, FFmpeg, Bash, Hyper-V, VMWare Workstation, QEMU, Ghidra, Xilinx Vivado

## PROJECTS

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**SECD Machine:** Implemented an abstract machine capable of evaluating simply-typed lambda calculus expressions in OCaml.

**CompQual:** Utility to assess the output quality of different codecs at different bitrates. Command-line application in Python, utilizing FFmpeg and Netflix's VMAF library.

**Self-Hosting:** Maintained useful services including NGINX, Gitea, and Plex. Explored networking principles and studied administrating CI/CD tasks with Jenkins and Drone.

**Ray-Tracer:** Implemented a classic ray tracer in C capable of rendering `.obj` scenes. Currently working on a SIMD, multi-threaded implementation.

## EDUCATION

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### University of Minnesota Twin Cities

B.S Computer Science

Minneapolis, MN

May 2024

M.S Computer Science

Expected Graduation: May 2025

- Relevant Coursework: Machine Architecture (C, `x86_64` Assembly), Adv. Programming Principles (OCaml), Operating Systems (C, Linux Syscalls), Interactive Graphics and Games (WebGL, TypeScript)
- Awards and Honors: Dean's List (Fall 2021, Spring 2022, Fall 2022, Spring 2023)

## LEADERSHIP AND ACTIVITIES

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### University of Minnesota ACM Student Chapter

Website Manager

Minneapolis, MN

May 2023 - Present

Systems Administrator

May 2022 - May 2023

Vice President

Jan 2022 - May 2022

- Provisioned over 40 charter members with virtual machines for server hosting and general computing studies
- Administered a public-facing IP block of 64 IPs, coordinating with University OIT on policy enforcement
- Demystified the Linux terminal and Git to over 70 students by teaching UNIX Classes

### Free Geek Twin Cities

Modern Build Lab Volunteer

Minneapolis, MN

Dec 2021 - Present

- Provided crucial access to computers for low-income people by refurbishing and assembling over 40 computers
- Increased computer refurbishment throughput by up to 4 computers per day by optimizing refurbishment routines
- Assisted in onboarding volunteers by coaching new volunteers on refurbishment procedures