

HOWARD HALIM

Creative technologist proficient in many areas, from interface design to distributed systems. World-class math and problem solving skills. Always eager to learn new things and make the world a better place.



howardhalim.com



Plasma-Vortex



howard-halim



howardhalim@gmail.com



(412) 452-8385

WORK EXPERIENCE

Software Engineer Intern @ ExpII, Inc.

June 2021 – August 2021

- Modeled spread of COVID-19 by accurately simulating daily interactions of 100,000 people
- Improved speed and memory usage by 5x with precomputation, hashmaps, and cache optimizations
- Experimented with various parameters to determine which factors were most important in combating COVID
- Proved NOVID was 8x more effective at reducing R_0 than existing contact tracing methods

LEADERSHIP

Co-President, Software Chair, Math Chair @ CMIMC

May 2020 – Present

- Led 50-member student club, organizing math and programming competitions for high school students
- Developed online contest platform with 3000+ users to host virtual competitions during COVID pandemic
- Taught software team how to use Django, Git, SQL, Python, Javascript, and Docker

PROJECTS

Operating System Kernel

February 2022 – April 2022

- Implemented a Unix-like kernel from scratch, with full support for process management, virtual memory, interrupt handling, syscalls, protection rings, thread scheduling, and device drivers
- Ensured robustness with exception handling and synchronization mechanisms to prevent race conditions

Adversarial 2048 — adversarial2048.com

May 2022 – June 2022

- Created a 2048 spinoff with adversarial tile placement. Built with Rust, WebAssembly, and JavaScript
- Implemented minimax algorithm, alpha-beta pruning, memoization, iterative deepening, and best-first search

Probase — github.com/CMU-Math/probase

May 2020

- Created an online collaborative problem database for math contest organizers to share math problems
- Utilized Bootstrap, HTML, CSS, JavaScript for frontend and Python, Django, PostgreSQL for backend
- Website used by 100+ people. Features problem ratings, comments, sorting, filtering, and searching

EDUCATION

Carnegie Mellon University

August 2019 – May 2023

Bachelor's Degree in Computer Science. \$100,000 scholarship

SKILLS

- Math
- Machine Learning
- Operating Systems
- Computer Graphics
- Distributed Systems
- Web Development
- Functional Programming
- Performance Optimization

LANGUAGES AND TOOLS

Expert: C++ (40,000 lines written)
Advanced: Rust, Python, TypeScript, Git, Vim, Linux
Intermediate: Go, C, React, Django, Bash, PyTorch
Basic: Java, C#

SELECTED AWARDS

International Math Olympiad

Two-time silver medalist at IMO 2018 and 2019, representing Team Canada

International Collegiate Programming Contest

World Finalist at ICPC 2020, 12th place at North American Championship