

Manu Bhat

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Self-motivated Software Engineer proficient in writing low-level code, applying mathematical thinking, and contributing novel ideas.

Education

University of California San Diego

Sep 2022 - June 2026

B.S. in Mathematics and Computer Engineering (3.97 GPA, 4.0 Major GPA)

Honors

ICPC Southern California Regional - 2nd Place in competitive programming contest (of 80+ teams)	Nov 2024
Codeforces - Master	Sep 2024
picoCTF 2024 - 7th place globally in cyber security competition (of 6000+ teams)	Mar 2024
USA Computing Olympiad - Platinum Division	Dec 2022

Experience

Research Intern

Jun 2024 - Present

Turakhia Lab

San Diego, CA

- Designed/implemented parallelizable algorithms for virus discovery from wastewater data
- Reduced runtime by a linear factor; introduced ~50 times speedup of entire pipeline and allowed project to tackle significantly larger datasets

Embedded Software Engineer Intern

Jun 2023 - Sep 2023

MaXentric Technologies

San Diego, CA

- Automated calibration of radars and modified FreeRTOS firmware to allow loading of configuration via SD card.
- Developed UDP-based data transfer script to track packet loss on a V band network.
- Utilized Wireshark and JTAG interfaces for intricate debugging.

Machine Learning Researcher

Dec 2022 - Present

Rose Spatiotemporal Lab

San Diego, CA

- Researching how machine learning and group theory can be used in automatic symmetry discovery, particularly in physics based systems

Competitive Programming Tutor

Nov 2022 - Present

Breakout Mentors

Remote

- Teaching algorithms (e.g. dynamic programming) and problem solving in one-on-one sessions.
 - Produced Axum backend and React frontend that host problems and grade student submissions
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Projects

Monocurl

Jul 2020 - Present

- Monocurl is a desktop application that animates videos and slideshows using math.
- Animations are specified using a programming language I designed myself
- 40k+ lines of C involving custom compiler, computational geometry, Metal/Direct3D GPU shaders, a multi threaded environment, and more
- Developing custom cross platform UI library in Rust that will be used in future version of app

Lean4ij

Sep 2024 - Present

- Lean4ij is a plugin for IntelliJ that adds language support for the Lean theorem prover
- I am mainly responsible for the automatic type and goal hints feature

CHS Admin Submission Viewer

May 2022 - Sep 2022

- Selected by teacher to write an Electron admin tool that views, filters, and downloads submissions from the school's updated APCS website.
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Knowledge

Programming Languages: Rust, C++, C, Lean, Swift, Python, Java, Typescript

Tools/Frameworks: OpenGL, Ghidra, React, SwiftUI, MySQL, PyTorch, Electron, Linux, Zsh, Git, LLDB

Computer Science: AI/ML, Shaders, Proof Assistants, Compilers, Networks, Databases, Web/App Dev