Varun R Mallya

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Summary

Aspiring systems programmer with an interest in C++, Rust, and low-level development. Contributed to open-source projects and built tools like emulators and container runtimes.

Education

Indian Institute Of Technology, Roorkee *Aug 2023–Present*
Bachelor of Technology

- CGPA: 9.37/10.0
- **Coursework:** Programming and Data Structures, Data Science, Numerical Methods, Probability and Statistics, Multivariable Calculus and Vector Algebra, Computational Thermo Fluids

Deeksha CFL PU College, Bangalore *Mar 2022–Mar 2023*
12th Grade

- Grades: 97.33%
- **Coursework:** Physics, Chemistry, Mathematics, Computer Science, English, Sanskrit

Experience

Student Contributor *Remote*
Google Summer Of Code *May 2025–Present*

- Enhancing Sysprof by adding eBPF-based profiling capabilities to enable low-overhead, high-resolution system tracing.
- Working with the GNOME Foundation to integrate kernel-level observability features into user-space performance tooling.
- Before my GSoC project, Sysprof relied on polling /proc files which added a lot of overhead to Sysprof, but my eBPF based solution profiles right inside the kernel without polling as much and reduces this overhead.
- Used D-Bus, GLib, GObject, eBPF, libbpf, bpftool, gdb and data structures like ring buffers and per-CPU hash maps. Currently in the process of writing multiple tracers that can all run inside the same process on multiple threads to ensure minimal impact on the system being profiled.
- Currently learning to use BPF-Timers and XDP for the same to trace network activity.

Contributor *Remote*
Protocol Labs Developer Guild *May 2025–Present*

- Contributed to `py-libp2p` within the Protocol Labs Developer Guild, developing programs for pub-sub and testing YAMUX based ping functionality with integration over TCP and QUIC.
- Focused on building low-latency, resilient networking for distributed systems, aligned with real-world peer-to-peer protocol stacks.
- Added throttlers to limit network load during concurrent validation. Also made multiple small performance and time complexity improvements including making code that was unsafe for concurrent processing safe. Used the trio library in Python to achieve this.
- Contributed to efforts in making the whole code-base type safe using pyrefly and ruff.
- Currently working on finding and adding relay selection algorithms to the current implementation.

Software Developer *Roorkee, Uttarakhand*
SDSLabs *Feb 2024–Present*

- Participated in multiple hackathons, game jams and conducted lectures as a part of SDSLabs.
- Maintain multiple public websites on AWS. Also monitor and maintain internal servers for access-controlled

usage over SSH.

Achievements

PiWoT 2024: 3rd Runner Up in the PanIIT PiWoT Hackathon 2024 by building a complete RAG-based agentic legal document workflow management system.

IITRHF Excellence Award 2024: Awarded for outstanding academic, co-curricular, and extra-curricular achievements.

CSAW ESC 2024: Awarded 2nd Rank in India for solving challenges related to Embedded and Cyber Physical Systems. CSAW-ESC

ETHIndia 2024: Secured the first prize at ETHIndia (Walrus Track) by building a Rust toolchain for sharding/encryption with a team of 4. ETHIndia Github

Flare On 11: Completed 6 reverse engineering challenges and achieved 476th place out of 4157 players.

ETHOnline 2024: Clinched the DIMO and Sign Protocol sponsor tracks with a team of 5. ETHGlobal

OP Jindal Scholarship 2024: I was nominated by IIT Roorkee for this scholarship for having the highest CGPA in the Mechanical Engineering department.

JEE Advanced: AIR 3656

KCET: AIR 31 out of 3.5 lakh candidates

JEE Main: AIR 4193 out of 11.5 lakh candidates

Projects

Chip 8 Emulator *Chip 8 emulator*

- Designed a cycle-accurate emulator in Rust that implements all 35 opcodes. Rendered graphics using SDL2 with pixel-perfect timing.

Wal-Ter Devtools *WalTer*

- Contributed to a terminal-based DevTool in Rust for the Walrus decentralized file storage network, enabling secure sharded uploads, end-to-end encryption, IPFS migration, and epoch-based file lifecycle management.

Zeus *Zeus*

- Built a container runtime in Golang using Linux cgroups/namespaces and Goroutines for concurrent process isolation
- Studied kernel internals through manpages and source code to implement core features.

MVC-LMS *MVC-LMS*

- Built 18 REST APIs handling user authentication, book inventory, and checkout systems
- Designed 3 MariaDB tables (users, books, transactions) with normalized schema
- Implemented server-side rendering using Go's html/template package
- Secured endpoints with JWT and bcrypt password hashing
- Containerized with Docker Compose for deployment

Lid Driven Cavity Fluid Simulation *Lid Driven Cavity*

- Multi-threaded with OpenMP ,written in modern C++.
- Uses the vorticity streamfunction formulation to achieve 400% improvement over similar single threaded Python programs.

Skills

Languages: C++ ,C ,Rust ,x86 Assembly ,JavaScript ,Go ,Python ,GDScript ,TypeScript ,Bash ,HTML ,CSS.

Technologies: eBPF ,Cloudflare Tunnels ,Tailscale ,Docker ,OpenMP ,SDL2 ,Godot ,MySQL ,MariaDB ,MongoDB ,React ,Next.js ,Git ,Bash