

Maulik Barot

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Professional Summary

CS undergrad interested in low-level and system programming with proficiency in compiler design and modern C++. I enjoy building debuggers, emulators, and reverse engineering tools, and occasionally share insights through technical [blogs](#) [🔗](#).

Education

Indian Institute Of Technology, Roorkee

Aug 2023 – Present

Bachelor of Technology in Computer Science and Engineering

- CGPA: 8.85/10.0
- **Coursework:** Computer Architecture and Organization, Operating System, Compiler Design, Programming and Data Structures, Design and Analysis of Algorithm, Theory of Computation, Software Engineering, Probability and Statistics

Skills

Programming: C++, C, Rust, x86-64 Assembly, Bash, Go, Python, JavaScript

Tools & Technologies: CMake, gdb, Git, IDA-64, x64dbg/x86dbg, WinDbg, Binary-ninja, WindowsAPIs, dnspy, ILSpy, Powershell, Godot, MySQL, Postman

Experience

Open-Source Contributor *FLARE*

Jan 2025 - May 2025

- Added key capabilities and rule improvements to Mandiant's **capa** framework:
 - Introduced a dynamic limitation detector for more accurate analysis [\[PR #2568\]](#) [🔗](#).
 - Expanded instruction handling with emission support for **number(0)** across multiple types, improving instruction [\[PR #2639\]](#) [🔗](#).
 - Built a lint for duplicate feature detection, improving rule quality [\[PR #2573\]](#) [🔗](#).
 - Authored and refined behavioral detection rules to broaden capa's coverage.

CTF Player and Reverse Engineer *InfoSecIITR*

Roorkee, Uttarakhand Jun
2024 - Present

- Competed in national and international CTFs, focusing on reverse engineering and exploitation.
- Consistently placed among top teams, showcasing advanced binary analysis expertise.
- Co-organized **BackdoorCTF 2024** and **WinterHack CTF 2025**, overseeing challenge design and infra.
- Led workshops and sessions to foster cybersecurity and CTF culture on campus.

Software Developer *SDSLabs*

Roorkee, Uttarakhand Feb
2024 - Present

- Collaborated on SDS Labs projects and participated in multiple hackathons and game jams.
- Delivered a lecture on VPN technologies for 200+ students, covering tunneling and encryption.
- Managed logistics and tech setup for **Syntax Error 12**, a 2000+ participant campus hackathon.

Achievements

- **CSAW Finals 2025: 4th globally and 1st in India**, InfoSecIITR [\[Link\]](#) [↗](#).
- **CSAW Quals 2025: 17th globally and 1st in India**, InfoSecIITR [\[Link\]](#) [↗](#).
- **Flare-On 11**: Solved all 10 challenges; placed **151st / 4157** worldwide [\[Link\]](#) [↗](#).
- **SegFault Hackathon 2025: 1st place**, team UBqitous [\[Link\]](#) [↗](#).
- **JerseyCTF IV & V: 1st globally**, InfoSecIITR.
- **BYUCTF 2024: 5th globally**, InfoSecIITR.
- **AmateursCTF 2024: 9th globally**, InfoSecIITR.
- **BCA CTF 5.0: 7th globally**, InfoSecIITR.
- **Binary Clash 360: 2nd place**, team VMwhere.
- **CryptoHack: 39th in India** [\[Link\]](#) [↗](#).
- **JEE Advanced 2023: AIR 625**.
- **JEE Main 2023: AIR 913 / 1.15M** candidates.

Projects

cielc [\(GitHub\)](#) [↗](#)

Aug 2025 - Nov 2025

- Developed a full compiler translating a custom C++-like language to RISC-V assembly, including front-end (Flex/Bison) and optimized 3-address code with object-oriented features, as well as functional features like lambdas.
- Implemented Linear Scan Register Allocation for improved performance.
- **Stack:** C++, CMake, GitHub Actions, Flex, Bison, RISC-V Docs

fenris [\(GitHub\)](#) [↗](#)

Mar 2025 - May 2025

- Built a networked file system with thread-safe caching and synchronized concurrent access.
- Implemented ECDH-based key exchange and AES-GCM encryption for secure communication.
- Added Zlib compression and an LRU cache layer to improve throughput.
- Designed Protobuf-based message protocol for client-server interaction.
- **Stack:** C++, CMake, GitHub Actions, Protobuf, CryptoPP, zlib, spdlog

beast [\(GitHub\)](#) [↗](#)

Nov 2024 - Jun 2025

- Improved backend modularity and fixed deployment inconsistencies for SDS Labs' CTF platform.
- Added custom `xinetd` setup and **Docker Compose** support for containerized deployments.
- Optimized leaderboard queries by restructuring joins, reducing latency by 40%.
- **Stack:** Go, PostgreSQL, Docker, HTML

gbemu [\(GitHub\)](#) [↗](#)

Aug 2024 - Oct 2024

- Refactored APU subsystem to separate synthesis logic from callbacks.
- Implemented accurate timing and channel mixing following Pan Docs specs.
- **Stack:** C++, SDL2, Pan Docs

spinlock benchmarking [\(GitHub\)](#) [↗](#)

Aug 2025 - Sept 2025

- Implemented multiple spinlock algorithms (CAS loop and ticket lock) in C++ and used Google Benchmark to measure throughput under contention.
- Analyzed results versus `std::mutex` to evaluate performance trade-offs and optimize synchronization.
- **Stack:** C++, `atomics`, CMake, Google Benchmarks

mydbg [\(GitHub\)](#) [↗](#)

Dec 2023 - Jun 2024

- Built a Linux debugger using `ptrace` with breakpoint, signal, and process control support.
- Added symbol resolution, register inspection and memory dump features similar to GDB.
- **Stack:** C++, Linux ManPages