Abhinav Bhushan

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EDUCATION

Ramrao Adik Institute of Technology, DY Patil University — Navi Mumbai, India
B.Tech in Computer Science and Business Systems; CGPA: 8.48/10 — *July 2022 – Present*
- **Relevant Coursework**: Data Structures & Algorithms, Operating Systems, Computer Networks, DBMS, OOP.

New Bombay City School — Navi Mumbai, India
Higher Secondary Certificate (12th Grade); Science — *May 2019 – July 2021*

EXPERIENCE

Full-Stack Web Developer Intern — Dec 2023 – Jan 2024
Computer Society of India - RAIT — *Navi Mumbai, India*
- Orchestrated a scalable full-stack web application using the **MERN stack** (MongoDB, Express.js, React, Node.js).
- Formulated RESTful APIs to handle dynamic data routes and implemented **JWT-based authentication** for security.
- Optimized database queries in MongoDB to reduce response time for the chat application module.
- Collaborated with a team of 4 to deploy the application, ensuring cross-browser compatibility.

PROJECTS

Spectrometer Analysis System | *Python, PyQt5, NumPy, Hardware SDK* — Dec 2024
- Spearheaded a high-performance desktop app for spectral analysis, **commercialized and adopted by IGI**.
- Constructed a real-time data visualization pipeline rendering 30 FPS spectral graphs using PyQtGraph.
- Implemented low-level hardware control logic to manage exposure and white balance via camera SDKs.
- Built optimized data processing algorithms using NumPy for peak detection, signal smoothing, and CSV export.

"The Forge" - Remote Code Execution Engine | *Golang, Docker, Systems* — Oct 2025 – Present
- Architecting a high-performance RCE service to compile and run untrusted user code safely (Systems Programming).
- **Container Isolation**: Deployed strict sandboxing using Docker to enforce memory limits and prevent system access.
- **Concurrency**: Designing a worker-pool architecture in Golang to handle multiple code submissions simultaneously.
- Devised a robust error-handling pipeline to capture compilation errors and runtime exceptions securely.

Space Invaders Clone | *C++, OpenGL, CMake* — Mar 2025
- Programmed a 2D rendering engine from scratch using C++ and OpenGL (modern pipeline) without game engines.
- Implemented custom memory management for game entities to ensure stable frame rates on lower-end hardware.
- Configured a cross-platform build system using CMake to support development on both Windows and Linux.

Green Circuit - E-Waste Locator | *React.js, Google Maps API* — Feb 2024
- Developed a location-based web app to help users find nearby e-waste disposal centers using Google Maps API.
- Secured **11th place out of 100+ teams** in a sustainability hackathon for impactful UI/UX design.

TECHNICAL SKILLS

Languages: C++, Python, Golang, JavaScript, SQL (PostgreSQL), HTML/CSS
Systems: Docker, Git, Linux, CMake, Postman, MongoDB, Arduino
Libraries: React.js, Node.js, Express.js, PyQt5, OpenGL, STL
Concepts: DSA, System Design, OOP, REST APIs

ACHIEVEMENTS

Hackathon Finalist: Top 15 in HACK-A-LOUD Hackathon (Sustainability Track).
Competitive Programming: Active solver on Codeforces (solving 800-1000 rated problems) and LeetCode.
Martial Arts: Disciplined practitioner; developing mental resilience and focus.