Rahul Bokade

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Education

Rajiv Gandhi Institute of Technology (RGIT) — Mumbai
Bachelor of Engineering in Computer Engineering — *Expected Graduation: 2027*

Experience

Cybersecurity Research Intern — November 2025 – January 2026
Bhabha Atomic Research Centre (BARC) — *Mumbai, India*

- Evaluated open-source SBOM and SCA toolchains, mapping analytical findings to offline vulnerability databases.
- Executed deployment tests in a strictly **air-gapped environment**, preventing data exfiltration to secure infrastructure.

Arch Testing Team — June 2025 – Present
Arch Linux — *Remote / FOSS*

- Coordinated package signoffs for **[core]** and **[extra]** repositories, validating stability on bare-metal and virtual setups.
- Identified and reported critical kernel regressions, ensuring release quality for the global Arch Linux userbase.

Projects

FOVEA: Adaptive LiDAR Mapping (DRDO) | *PyTorch, spconv, CUDA* — 2026

- Trained a **sparse 3D U-Net** that labels every LiDAR point for semantic terrain mapping.
- Built a GPU grid engine for a **foveated 2.5D map**: 5 cm cells near the vehicle, coarsening to 40 cm out to 100 m.

Forest Fire Spread & Evacuation Routing | *PyTorch, FastAPI, Next.js, ERA5, MODIS* — Paper

- Predicted next-step fire spread with a **U-Net** on ERA5 weather and MODIS satellite data, benchmarked against ConvLSTM and hybrid models.
- Re-planned rescue and evacuation routes with **D* Lite** as the predicted fire front changes, over a live map of Uttarakhand.

DZap: Recovery & Secure-Wipe Live USB | *Rust, TypeScript, archiso*

- Built a bootable Linux image that takes resumable **ddrescue** images of failing drives and recovers files with per-file hash manifests.
- Wipes via **ATA / NVMe sanitize** after an identity-bound preflight, verifies, and exports **signed evidence bundles**.

ENCS Banking Simulator (Systemic Risk Engine) | *Rust, Python, PyTorch, React, Three.js*

- Engineered a contagion engine via **Rust** and **Monte Carlo** simulations, optimizing clearing vectors for a **50x speedup**.
- Designed a **Principal Neighbourhood Aggregation** GNN to predict default risk across a network of **4,500+ institutions**.

Rust-NN: Real-Time Neural Network Visualizer | *Rust, Macroquad, Serde, MPSC*

- Dense layers and backprop from scratch, no ML framework; trains MNIST over **MPSC** beside a live **Macroquad** GUI.

Competitions & Hackathons

Cambridge Battlecode 2026 | *#17 of ∼800 teams (peak)* — 2026

- **Rust** bot for a MOBA-style AI game: 350+ versions, tested in paired ladder runs and on 10,000+ ranked replays.

Amazon ML Challenge 2026 | *#120 of 4,500 teams* — 2026

- Entity resolution over three sources: blocking, fine-tuned bi-encoder, cross-encoder rerankers, XGBoost (**0.989 F0.5**).

Meta PyTorch OpenEnv Hackathon | *Top 100 of 800 teams* — April 2026

- Built a 30-step supply-chain environment to train agentic reasoning with **GRPO**, verified by a **PuLP MILP** oracle.

e-Yantra: Herd Link | *Regional Finalist* — 2025

- Engineered an edge-computing smart collar (ESP32-C3) with IMU behavioral inference and on-device FFT audio processing.
- Rust edge server (Tokio, Axum) with buffering and async Supabase sync; offline-first Android app with on-device ONNX.

Datathon 2025 (KJSCE) | *1st Runner-up* — February 2025

- Built two **XGBoost** models that predict which streaming subscribers are about to cancel, from raw behaviour data.

CideCode Hackathon (CID Karnataka) | *Consolation Prize* — March 2025

- Built a multimodal deepfake detection system using **MTCNN** for face extraction and CNNs for authenticity scoring.

Technical Skills

Languages: Python, Rust, C/C++, TypeScript, Go
AI & Machine Learning: PyTorch, CUDA, Transformers, XGBoost, Scikit-learn, ONNX, Computer Vision
Frameworks & Libraries: FastAPI, Flask, Tokio, Axum, React, Three.js, Macroquad
Systems & Tools: Linux (Arch/Hyprland), Git, Docker, archiso, Supabase, PolicyKit
Hardware & Embedded: ESP32, Raspberry Pi, NVIDIA Jetson, KiCad, ZMK Firmware, 3D Printing