

Varun Nimitt Jhaveri

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EDUCATION

Sardar Patel Institute of Technology (SPIT)
Bachelor of Technology in Computer Science Engineering

Mumbai
Expected Graduation: 2027

EXPERIENCE

Incoming Intern
HERE Technologies

Upcoming June – November 2026
On-Site

HPC System Administrator & Infrastructure Lead
SPIT Research Lab

October 2025 – Current
On-Site

- Architected and deployed a high-performance computing cluster on **Rocky Linux** using **Slurm** and **Open OnDemand**, managing resources for **224 CPU cores** and **250GB RAM**.
- Optimized a high-density compute node featuring an **NVIDIA RTX A6000 Ada GPU** and dual **64-core AMD EPYC** processors, configuring partitions that improved job scheduling efficiency for **50+ researchers**.
- Hardened security posture by implementing **Dex (OIDC)** authentication, **SELinux** enforcing policies, and custom **Apache SSL** configurations, achieving **Zero Trust** access standards.
- Engineered automated **Per-User Nginx (PUN)** reverse proxying, enabling seamless, secure web-based access to graphical research environments.

Backend Developer and Server Manager
SPIT Tech Team

August 2024 – September 2025
On-Site

- Developed the backend architecture for the college CSE website using **Django**, ensuring 99.9% uptime for student portals.
- Engineered scalable RESTful APIs, boosting website response speeds by **75%** through aggressive **Redis caching** and database query optimization.
- Automated the entire deployment workflow by building a **CI/CD pipeline** with **GitHub Actions** and a self-hosted runner, reducing deployment time from 20 minutes to **under 60 seconds**.

Arch Testing Team
Arch Linux

January 2023 – Current
WFH / FOSS Work

- Coordinated package signoffs for movement to **[core]** or **[extra]** repositories after validating system stability on **bare-metal** and virtualized environments.
- Identified and reported critical kernel regressions, ensuring release quality for thousands of global Arch Linux users.

GITHUB PROJECTS

OpenEnv DSC-CO (Supply Chain RLVR) | *OpenEnv, TRL (GRPO), Unsloth, Llama-3.2, PuLP*

- Developed an RLVR/RLVE meta-environment modeling a 30-step multi-echelon supply chain graph, verifying LLM long-horizon reasoning against a deterministic **PuLP/CBC MILP** oracle.
- Trained a **Llama-3.2-3B-Instruct** model via **TRL GRPO** and Unsloth 4-bit QLoRA, improving zero-variance terminal MILP reward from 0.052 to 0.226.
- Architected a strict **Pydantic** validation layer for MCP tools, executing hard-gates against specification gaming, phantom edge hallucinations, and negative integer flow exploits.

CreditIQ (MSME Credit Scoring Engine) | *FastAPI, Redis, Polars, XGBoost, NetworkX, React*

- Architected a real-time scoring pipeline fusing GST, UPI, and E-Way bill signals utilizing an async FastAPI saga worker and Redis Streams.
- Engineered a graph-based circular fraud detection module using NetworkX, identifying synthetic transaction rings via SCC decomposition.
- Trained an XGBoost histogram model calibrated to a CIBIL-aligned scale, integrating SHAP and a Gemma LLM for plain-language risk explainability.

HERE Spatial Change Detection (Map Maintenance Pipeline) | *DuckDB, Splink, PyTorch, Uber H3*

- Engineered a highly scalable, out-of-core probabilistic entity resolution engine using **DuckDB** and **Splink** to cross-reference OpenStreetMap with government registries.
- Dynamically detected POI changes across **60k+ nodes**, overcoming severe memory constraints by leveraging **H3 spatial indexing** and time-decaying Bayesian scoring.
- Integrated a zero-shot NLP classification pipeline to categorize spatial discrepancies and update map telemetry.

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

- Engineered a financial contagion engine using **Rust** and **Monte Carlo** simulations, optimizing Eisenberg-Noe clearing vectors to achieve a **50x speedup** over Python baselines.
- Designed a **Principal Neighbourhood Aggregation (PNA)** Graph Neural Network to predict institutional default risk, simulating liquidity spirals across a network of **4,500+ institutions**.
- Built a **React 19** and **Three.js** dashboard to visualize "Green Swan" climate risk scenarios in **real-time**.

Hyperledger LRM (Academic Blockchain) | *Hyperledger Fabric, TypeScript, Node.js, IPFS*

- Architected a permissioned blockchain using **Hyperledger Fabric** to store immutable records, writing smart contracts in **TypeScript** to automate degree issuance and credit transfers.
- Implemented a hybrid storage model using **IPFS** for decentralized certificate hosting, linking large files to on-chain metadata via **cryptographic hashes**.
- Deployed a monitoring stack with **Prometheus and Grafana** to visualize transaction throughput (TPS) and peer latency during stress testing.

Vis Diff Trackshift (Logistics Vision) | *Python, Flask, ChangeFormer, Mask R-CNN*

- Built a domain-aware inspection pipeline routing jobs to specialized models: **Mask R-CNN** for F1 damage and **ChangeFormer** for infrastructure risk detection.
- Engineered an automated alignment stage using **ORB+ECC** to correct perspective shifts, improving defect detection accuracy by **40%**.
- Integrated a **Gemini-powered debate engine** that stages adversarial reasoning between AI agents to reduce hallucination rates in final reports.

Bapple OS (x86 Operating System) | *C, Assembly, Makefile, QEMU*

- Developed a custom **x86 kernel** from scratch, implementing memory management and a standard template library (STL) with **zero external dependencies**.
- Created a specialized **framebuffer graphics driver** to render high-framerate animations directly on bare metal.
- Engineered a reproducible **Dockerized build system** to automate kernel compilation, GRUB ISO generation, and QEMU testing.

Tethys: Zero-Trust Secure File Drop | *Go, React, AWS, Kubernetes, Terraform, Jenkins*

- Engineered a **zero-trust, microservices-based** ephemeral file sharing platform, implementing in-browser **AES-256-GCM client-side encryption** and a WebCrypto polyfill.
- Built a **Go-based backend vault** for presigned S3 URLs and a **Kubernetes cronjob (Wiper)** to strictly enforce metadata TTLs and **cryptographically purge** expired payloads.
- Provisioned **AWS infrastructure** (VPC, EC2, RDS, S3) using **Terraform and Ansible**, orchestrating the system on a **K3s cluster** mapped to NIST SP 800-207 principles.
- Architected a fully automated **DevSecOps CI/CD pipeline** via **Jenkins**, incorporating **Trivy** image scanning, **Semgrep** static analysis, and secure **ECR deployment**.

Drive Wiper (Secure Wiping Utility) | *Arch Linux, Go, Electron, QEMU*

- Built a standalone **bootable Arch Linux ISO** featuring a Go (REST API) backend and Electron frontend for secure military-grade disk erasure.
- Automated the selection of optimal erasure methods (**ATA Secure Erase, NVMe Sanitize**) based on hardware detection.

Corne Keyboard (Custom-Engineered) | *Hardware, ZMK Firmware, 3D Printing*

- Designed and soldered a split ergonomic keyboard with **nice!view displays** and custom **ZMK firmware**, optimizing battery life for wireless usage.

HACKATHONS & ACHIEVEMENTS

IMC Prosperity 4 (Quantitative Trading Challenge) | *Top 5% (762nd of 18,800+ Teams)*

May 2026

- Achieved **1st place globally** in the Round 1 manual challenge, earning the **Manual Master** badge for generating the highest single-round profit among all teams.
- Developed **quantitative trading algorithms** and applied **game theory** in manual market-making rounds as a solo competitor.

Meta PyTorch OpenEnv Hackathon | *Top 100 out of 800 Teams*

April 2026

- Engineered the **dynamic supply chain combinatorial orchestration environment** (openenv-dsc-co) to train and verify **agentic reasoning** via **TRL GRPO**.

Ignisia-26 @MIT WPU Hackathon | *1st Place*

April 2026

- Built **CreditIQ**, an end-to-end **MSME credit scoring** and **fraud topology engine**, synthesizing multiple financial signal streams into **dynamic algorithmic risk pricing**.

HERE Technologies Hackathon Mumbai | *1st Place*

March 2026

- Engineered a highly scalable, out-of-core **probabilistic entity resolution engine** (**DuckDB, Splink**) to dynamically detect **OpenStreetMap POI changes** across **60k+ nodes**.

e-Yantra Hackathon (EYantra Herd Link) | *Region Finalist*

2025

- Engineered an **edge-computing smart collar** (ESP32-C3) with **IMU-based behavioral inference** and on-device **FFT audio processing**.
- Developed a **Rust-based central edge server** (Tokio, Axum) for **real-time analytics**, local data buffering, and **async Supabase synchronization**.
- Built an offline-first Android app featuring an **ONNX-optimized EfficientNet-B0** and **YOLOv8-nano cascade** for **mobile bovine breed classification**.

Datathon 2025 (KJSCE) | *1st Runner-up (2nd Place)*

February 2025

- Developed predictive models using **XGBoost** to identify **customer churn risk**, achieving high precision on user behavior datasets.

CideCode Hackathon (CID Karnataka) | *Consolation Place*

March 2025

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