

Shardul Junagade

Computer Science and Engineering
Senior Undergraduate, IIT Gandhinagar

shardul.junagade@iitgn.ac.in

+91-9833529375

[LinkedIn](#) | [GitHub](#)

EDUCATION

Indian Institute of Technology Gandhinagar

Bachelor of Technology in Computer Science and Engineering

CGPA: 8.8/10

Aug. 2023 – Present

PUBLICATIONS

Rishabh Mondal, Jeet Parab, Heer Kubadia, Shataxi Dubey, **Shardul Junagade**, Zeel B Patel, Nipun Batra. [Paper]
“SentinelKilnDB: A Large-Scale Dataset and Benchmark for OBB Brick Kiln Detection in South Asia Using Satellite Imagery.”
In **NeurIPS 2025 Datasets and Benchmarks Track**.

EXPERIENCE

Member of Technical Staff Intern @ DevRev

May 2026 – July 2026

- Built **Horus**, regional and global **Go/gRPC microservices** for self-serve custom domains on DevRev Support Portals, implementing **CRUDL APIs** and **Temporal workflows** for managing custom-domain and TLS certificate lifecycles via the **Fastly CDN SDK**; serving portals handling **10B+ weekly visits**.
- Implemented custom-domain routing using **Fastly VCL and Edge Dictionaries**, automating domain-to-portal mappings and extending the VCL routing layer to route and rewrite requests to the appropriate Support Portal backend.
- Built a regional **Kafka CDC consumer** to process portal settings changes and project custom-domain assignments, unassignments, and domain moves to both the Fastly Edge Dictionary and Horus Global.
- Owned end-to-end **infrastructure and deployment** of regional/global services and the Kafka consumer across dev, QA, and prod using **AWS, Terraform, and ArgoCD**.
- Delivered **22 significant PRs** across **14 repositories** and resolved **23 engineering issues** across **4 sprint boards**.

Summer Research Intern @ CVIG Lab, IIT Gandhinagar

May 2025 – July 2025

(Advisor: Prof. Shanmuganathan Raman) | [Poster](#)

- Implemented a **zero-shot pipeline** for generating **visual and audio anagrams** by guiding off-the-shelf diffusion models under any invertible linear transformations such as flips, rotations, color inversions, jigsaw permutations.
- Working on extending single-object visual illusions to **multi-object scenes** using region-based **MultiDiffusion**.

PROJECTS

miniTorch - A Lightweight Deep Learning Framework

May 2025 – June 2025

- Co-developed miniTorch, a NumPy-based deep learning framework inspired by **PyTorch**, supporting tensor broadcasting, a **custom autograd engine** for backpropagation, and neural network training.
- Implemented core components from scratch including **Tensor**, **Module**, linear layers, activation functions, loss functions, and optimizers; integrated computational graph visualization using **Graphviz** for gradient tracking.
- Validated miniTorch by training models on MNIST and toy datasets, achieving results comparable to PyTorch.

DVFS - Distributed Virtual File System

Jan. 2025 – Apr. 2025

- Built a **campus-wide distributed file system** in **Go + gRPC** with separated control plane (MetaServer) and data plane (FileServers), supporting multi-user CLI operations (ls, cd, upload, download, sharewith) across concurrent clients.
- Designed **ACL-based hierarchical sharing** with two-stage propagation for consistent cross-client authorization.
- Implemented **AFS-style cache coherence** via server-push callbacks to minimize read latency.
- Engineered **atomic persistence** with heartbeat-based stale server detection, soft-delete with metadata-assisted restore, and **TLS** across all gRPC channels.

Brick Kiln Detection from Satellite Imagery | [Accepted at NeurIPS 2025*](#)

Jan. 2025 – Apr. 2025

- Built an object detection pipeline using **MMRotate** object detectors to identify brick kilns in satellite imagery for air pollution monitoring across the Indo-Gangetic Plain.
- Trained and evaluated **RHINO** (Rotation Detection Transformer using Hausdorff distance in DINO), achieving **69 mAP** (same-region) and **53 mAP** (cross-region), outperforming YOLOv11 by up to 30%.
- Explored **super-resolution** methods to enhance image quality, resulting in over 10% performance gains for RHINO.

Beyond Vanilla HNSW: Learning Graph Structure for Smarter ANN Search

Feb. 2025 – Apr. 2025

- Designed and implemented data-driven improvements to **HNSW**, a graph-based algorithm for **approximate nearest-neighbor search**, including frequency-based layering and cluster-aware graph connections.
- Achieved notable improvements in **recall@k** and query time on **GloVe** embeddings compared to standard HNSW.

TECHNICAL SKILLS

Languages & Frameworks: Python, Go, C/C++, JavaScript, HTML/CSS, React.js, Streamlit, gRPC

Libraries: PyTorch, TensorFlow, Transformers, Ultralytics, Scikit-Learn, MCMC, BeautifulSoup, NumPy, pandas

Developer Tools: Git, Docker, AWS, Terraform, Kafka, ArgoCD, Fastly CDN, VCL, Datadog, SSH, Postman, uv, Claude Code

RELEVANT COURSEWORK

Computer Science: Machine Learning [A], Data Structures and Algorithms [A], Operating Systems [A], Compilers [A], Databases [A-], Discrete Mathematics [A-], Data-Centric Computing [A-], Introduction to Computing [A]

Mathematics: Linear Algebra and Single Variable Calculus [A], Calculus of Several Variables [A-], Probability and Statistics, Ordinary Differential Equations [A], Partial Differential Equations [A-], Numerical Methods [A]

ACHIEVEMENTS AND POSITIONS OF RESPONSIBILITY

- Ranked in the **Top 50 (44/10000+ teams) All-India** in the **Amazon ML Challenge 2025**.
- Recipient of the **Dean's List Award for Academic Excellence** with **SPI 9.81** in Semester-I at IIT Gandhinagar.
- Secured **1st Prize** in the Deep Learning Track of **HackRush 2025** - IIT Gandhinagar's annual hackathon.
- Awarded **Branch Change** to Computer Science and Engineering after ranking 2nd in the ME branch.
- Career Development Services (CDS), IIT Gandhinagar – Placement Coordinator
- SCALE, Machine Learning Club, IIT Gandhinagar – Core Member