

Shardul Junagade

Computer Science and Engineering
Junior Undergraduate, IIT Gandhinagar

shardul.junagade@iitgn.ac.in

+91-9833529375

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

EDUCATION

Indian Institute of Technology Gandhinagar

CGPA: **9/10**

Bachelor of Technology in Computer Science and Engineering, Minor in Mathematics Aug. 2023 – Present

Amber International School, Thane

Score: **95.8%** — Ranked **1st**

Class XII - Central Board for Secondary Education

June 2021 – May 2023

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.

Brick Kiln Detection from Satellite Imagery 🍷 | *NeurIPS 2025**

Jan. 2025 – Apr. 2025

- Built an end-to-end 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

- Improved HNSW, a graph-based algorithm for approximate nearest neighbor (ANN) search by designing and implementing various data-driven strategies such as frequency-based layering and cluster-aware connections.
- Achieved notable improvements in recall@k and query time on GloVe embeddings compared to standard HNSW.

Mini Language Model for Recipe Generation 🍷 | 🌐

Sep. 2024 – Oct. 2024

- Developed next-word generation models using MLP and LSTM, trained on Indian food recipes, to generate context-aware and syntactically coherent recipe text with configurable context size and embedding dimension.
- Deployed the model as an interactive Streamlit app supporting real-time text generation and model selection.

Learning-Based Image Reconstruction and Compression 🍷

Sep. 2024 – Oct. 2024

- Implemented matrix factorization and Random Fourier Features (RFF) + linear regression for image reconstruction; evaluated both methods using RMSE and PSNR scores.
- Built an image compression pipeline using low-rank matrix factorization and gradient descent, analyzing the trade-offs between compression efficiency and reconstruction quality.

TECHNICAL SKILLS

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

Libraries: PyTorch, TensorFlow, Ultralytics, Scikit-Learn, MMCV, BeautifulSoup, NumPy, pandas, Matplotlib

Developer Tools: Git, SSH, Linux, Docker, uv, VS Code, Postman

ACHIEVEMENTS

- 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.
- Secured an All India Rank of **5417** in **IIT-JEE (JEE Advanced)** and achieved a **99.5 percentile** in **JEE Mains**.

RELEVANT COURSEWORK

Computer Science: Machine Learning [A], Data Structures and Algorithms [A], Introduction to Data Science, 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]

POSITIONS OF RESPONSIBILITY

Placement Coordinator, Career Development Services

Feb. 25 – Present

- Leading a team of 30+ members to facilitate internship and placement activities for students at IIT Gandhinagar.
- Handling outreach by directly connecting with HR professionals to bring them on board for recruitment drives.