Dhairya Patel

M.Tech – Machine Learning

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Dhirubhai Ambani University
Technology
Formerly DA-IICT

Education

Dhirubhai Ambani University 2024 - Present
***CPI**: 7.81* *Gandhinagar, Gujarat*

B.Tech Dr. D. Y. Patil Institute of Engineering, Management and Research 2020 - 2024
***CGPA**:8.02* *Pune, Maharashtra*

12th School Name (GHSEB) 2019 - 2020
***Percentage**:70.46* *Gandhinagar, Gujarat*

10th School Name (GSEB) 2017 - 2018
***Percentage**:84* *Gandhinagar, Gujarat*

Experience

Suvidha Foudation (Remote) Feb 2023 – March 2023
Machine Learning Intern *Pune, Maharashtra*

- Trained machine learning models using a mix of traditional and neural NLP techniques, including Seq2Seq architectures, TF-IDF, and Word2Vec embeddings.
- Focused on building text generation and representation systems, gaining hands-on experience with model training and text data pipelines.

Projects

LOW IMAGE ENHANCEMENT | *Python, PyTorch, NAFNet*

- Developed diffusion-based RAW image enhancement system for extreme low-light conditions (100× exposure amplification)
- Engineered custom NAFNet architecture with optimized reverse diffusion process (1000→20 timesteps)
- Processed Sony SID dataset with specialized Bayer pattern handling for RAW sensor data
- Implemented multi-metric evaluation (PSNR/SSIM/LPIPS) revealing key optimization opportunities: Baseline PSNR: 5.70 dB (indicating extreme noise challenge) SSIM: 0.075 (highlighting structural similarity limitations) LPIPS: 0.747 (quantifying perceptual quality gap)
- Identified data preprocessing bottlenecks through metric patterns across 20 test samples
- Proposed three-phase improvement plan: perceptual loss weighting, exposure-aware conditioning, and progressive denoising

VIT(Vision Transformer) sketching | *PyTorch, CUDA, OpenCV*

- Designed a memory-efficient ViT using attention sketching (Gaussian/Count Sketch), cutting CPU memory by 15% for high-res images
- Trained a hybrid model (full + sketched attention) that matched standard ViT accuracy (91.3% vs 90.1%) with 1.2x-1,5xfaster inference
- Implemented weight fusion for deployment, reducing model size by 30% with very minute difference in accuracy

CNN from scratch | *Python, NumPy, OpenCV*

- Built a CNN from scratch using only NumPy, replicating core operations (convolution, pooling, backpropagation) without frameworks

AI-Based Multimodal Blood Cell Analysis and Disease Recommendation System | *Python, NumPy, pandas, tensorflow, sklearn*

- Developed end-to-end multimodal AI pipeline analyzing blood smear images + patient symptoms to predict hematological disorders
- Engineered YOLOv8 detection and U-Net segmentation and Efficient net classification models processing 50+ cells/sec, reducing manual microscopy time by 70%
- Trained 9-class CNN classifiers for each RBC/WBC pathology using Raabin-WBC/Elsafty datasets (F1-score: 0.89)
- Built disease recommendation engine (Scikit-learn MLP) combining image features + 10+ clinical symptoms

Technical Skills

Languages: Python, SQL (Beginner)
ML Frameworks: PyTorch, TensorFlow, Keras, Scikit-learn, OpenCV
Frameworks: Flask, FastAPI, Streamlit
Databases: MongoDB
Computer Vision: CNN, Vision Transformers, Diffusion Models, GEN-AI, etc
NLP: Hugging Face, LLM Fine-Tuning, Traditional NLP algorithms
Image Processing: SIFT, SURF, ORB, HOG, Canny Edge, Sobel, Hough Transform, Thresholding, Harris Corner
Web Scraping: Data-extraction, tools(BeautifulSoup, Scrapy, Selenium, etc) & automation
Core Subjects: Data Structures and Algorithms (Basic), Statistics, Hypothesis Testing, Linear Algebra
Areas of Interest: System Design, AI/ML, Distributed Systems

Position Of Responsibility

Core Member July 2025 - Present
Research Club DAU

- Recently joined the college Research Club; currently working with the AI Club to plan and organize events that encourage collaboration and interest in AI research.

Team Member Sep 2024 - Present
AI Club DAU

- Contributing to the development of a campus-wide AI chatbot (DAU) aimed at streamlining student queries and automating responses to common administrative tasks.
- Collaborating on an AI-based notes generation tool that extracts transcripts from YouTube lectures and converts them into structured, easy-to-read notes.

Achievements

- 1st Rank - Smart India Hackathon (SIH) 2023 (Intercollege)
- Winner - TECHNOV6 Hackathon by Ainnov8 DGI