

DHRUV PANCHAL

M.Tech – Information and Communication Technology

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Education

Dhirubhai Ambani University

CPI: 9.58

2024 – Present

Gandhinagar, Gujarat

Gandhinagar Institute Of Technology

CPI: 9.01

2020 – 2024

Gandhinagar, Gujarat

Experience

Kody Technolab Ltd.

Jan 2024 – Jun 2024

Python Intern - Intelligent Assistant with Face Recognition [Link](#)

Ahmedabad, India

- Developed a multimodal AI assistant integrating **face recognition**, **speech interfaces**, and **intent classification** to automate college-level query resolution.
- Achieved **97% accuracy** on a custom Keras based NLP classifier trained on **160+** domain-specific queries spanning **52** intent classes.
- Integrated real-time **speech-to-text (STT)** and **text-to-speech (TTS)** pipelines using Pyttsx3, enabling natural voice-based interaction.

Projects

High-Precision Rooftop Segmentation in Urban Aerial Imagery | Python, PyTorch, Transformers [Link](#)

- Led the end-to-end development of a novel hybrid pipeline using **YOLOs/DETR + SAM** improving rooftop segmentation on high-resolution satellite images. Improved performance by **23% IoU** and **11% Dice** over Baseline Model.
- Created the first India-specific rooftop segmentation dataset: **5000+ aerial tiles**, manually annotating **1300+ images**, categorizing them by rooftop density, and applying **active learning** and **augmentation** for improved generalization and efficiency.

Vision-Language Model (PaliGemma) | Python, Multimodal AI, PyTorch, Transformers [Link](#)

- Engineered a fully custom Vision-Language architecture integrating a **SigLIP vision transformer** with a **Gemma causal decoder**, enabling image conditioned generation via token injection and rotary-positioned attention.
- Developed an inference-ready pipeline with KV caching, top-p decoding, and tokenizer aware multimodal fusion demonstrating capabilities relevant to **visual catalog understanding**, smart listings, and scalable VQA systems.

Quantum Neural Network | Python, Quantum ML, PennyLane, TensorFlow [Link](#)

- Developed hybrid QNNs achieving 81.12% accuracy on CIFAR-10, rivaling classical CNNs (84.19%).
- Engineered 15+ quantum circuits; ablation study showed expressibility alone doesn't ensure optimal performance.
- Explored potential for scalable quantum ML applications in image classification.

Technical Skills

Programming Languages/Frameworks: Python, PyTorch, TensorFlow, Pandas, NumPy, SKLearn

Databases: MongoDB, SQL

Developer Tools: Git, GitHub, VS Code, Jupyter, Linux Shell, Colab, Kaggle, Canva, Figma, OverLeaf

Certifications

DSM – Data Science & Machine Learning, PW Skills

May – 2024

Machine Learning Specialization, Coursera (Stanford, DeepLearning.AI)

Mar – 2023

Position Of Responsibility

Teaching Assistant - DBMS, Signals & Systems, Fundamentals of ML

Aug 2024 – Present

Dhirubhai Ambani University

- Assisted in teaching **DBMS, Signals and Systems, and Fundamentals of ML**, conducting labs, tutorials, and challenges for **350+** students. Guided project presentations, resolved queries, and evaluated assignments/exams.

Achievements

- Awarded **Gold Medal** in B.E by Gandhinagar Institute of Technology for academic excellence 2024.