MALHAR INAMDAR

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Education

Pune Institute of Computer Technology, India 2023 - 2027

Bachelor of Engineering (B.E.) in Electronics and Telecommunication *9.23/10.00*

- **Coursework**: Data Structures, Algorithms, Digital Circuits, Differential Equations, Linear Algebra, Vector Calculus
- **MOOCS**: Machine Learning Specialization, Deep Learning Specialization

Technical Skills

Programming Languages: Python, C++, C, Javascript, Java

Tools & Frameworks: PyTorch, TensorFlow, LangChain, OpenCV, NumPy, Pandas, Scikit-learn, Transformers, FSL, Grad-CAM, Flask, Streamlit, RESTful APIs, Node.js

Software: Git, GitHub, Flask, VS Code, Streamlit, TensorDock

Experience

Vizuara Oct 2024 – Present

Research Intern *Pune, India*

- Worked under Dr. Raj Dandekar to write a research paper conducting research in developing Small Language Models (SLM) for regional Indian languages analysing language complexities in multilingual low resource settings.
- Explored the minimum Small Language Model (SLM) architecture required for effective training on three regional languages (Hindi, Marathi, Bengali), inspired by the TinyStories paper using cloud based GPU servers.
- Tested several Indic tokenizers to evaluate tokenization efficiency and linguistic complexity and investigated whether certain languages inherently require larger model architectures for effective representation and comprehension.
- Explored the usage of Rényi entropy and language morphology for tokenizer efficiency and language complexity analysis. Publication currently in review at ICML 2025.

Pune Institute of Computer Technology Sep 2024 – Present

Research Intern *Pune, India*

- Working under Dr. Geetanjali Kale to write a research paper conducting research in contrastive learning using Vision Transformers for video temporal data.

PICT Robotics Oct 2023 – Present

Technical Member *Pune, India*

- Selected as a Technical Member of PICT Robotics, a dedicated college club for robotics. Preparing for ABU Robocon 2025, national level robotics competition.
- Designed PCB circuits and Fusion 360 CAD Designs for robot designing and built multiple robots, with ESP32, IR, Ultrasonic, Hall sensors, like line following robot, ultrasonic sensor robot, hall sensor robot.

Projects

Vaidya Nidaan (01/2025 - 02/2025) **GitHub Link**

CNN, scikit-learn, GradCAM, Tensorflow, Keras, NumPy, Pandas, Matplotlib, OpenCV, NodeJS, Docker, ReactJS, React Native

- Developed an AI-based diagnostic tool to assist doctors in diagnosing Alzheimer's through medical imaging (MRI Scans) to detect abnormalities and provide potential diagnoses using suitable medical biomarkers for Alzheimer's, as part of PICT International Techfiesta Hackathon 2025.
- Utilized Grad-CAM for visual explanations to improve interpretability and trust in diagnostic decisions, developed an image-text chatbot for diagnostic assistance, and built a website and mobile app for real-time MRI scan analysis and reporting.
- Used FMRIB Software Library (FSL) to detect biomarkers such as hippocampal volume, white matter content, gray matter content, and generated a comprehensive medical report displaying Grad-CAM Output Image and prediction result along with a RAG pipeline explaining different biomarker values by referring research papers.
- Used VGG-19 Model to predict the occurrence of Alzheimer's in MRI scans and implemented data augmentation techniques to handle an imbalanced image dataset, achieving over 95% accuracy in disease prediction.

Stable Diffusion from scratch (10/2024 - 11/2024) Github Link

PyTorch, NumPy, Transformer, tqdm, lightning, pillow, UNet, VAE, CLIP Encoder *Paper Link*

- Implemented the "Denoising Diffusion Probabilistic Models" research paper from scratch using PyTorch.
- Constructed generative models for text-to-image, image-to-image functionality producing high quality images based on input prompt.
- Implemented the architecture using the Variational Autoencoder (VAE) utilizing U-Net and CLIP Encoder for denoising to generate output image.
- Ensured semantically meaningful output images were produced using suitable attention mechanism incorporated in the pipeline.

DiabetesCare AI (07/2024 - 08/2024) Github Link

scikit-learn, GridSearch, RandomForest, NumPy, Pandas, seaborn, Gemini LLM, Streamlit *Website*

- Developed a diabetes prediction system using Random Forest, achieving 94% accuracy on 100,000+ samples with 8 medical parameters. Applied SMOTE for class imbalance and optimized hyperparameters via GridSearch.
- Integrated Gemini-1.5-Flash API to provide personalized lifestyle and dietary recommendations for diagnosed patients, along with hospital location services in India
- Deployed a Gemini-powered chatbot for real-time patient interaction and visualized health reports for enhanced interpretability, hosted on Streamlit for accessibility

MCQ Generator Web Application (08/2024 - 08/2024) Github Link

Gemini LLM, Streamlit *Website*

- Web application deployed on Streamlit built for generating multiple choice questions by analyzing a file to be input by the user in text(.txt) or pdf format.
- The MCQs generated can be in varying order of difficulty as per the choice of user, easy, medium or hard along with number of questions are also to be input by the user as per their requirement..
- Used Gemini-1.5-Flash model for the implementation.

Awards

3rd in PICT Techfiesta International Hackathon Feb 2025

- Our team stood 3rd for our project Vaidya Nidaan aimed towards patients ailing with Alzheimer's disease out of participation of more than 400+ teams internationally.

Cretronix Runner-up Credenz'24 April 2024

- Our team of two, was the runner-up in the electronics circuit and arduino microcontroller programming competition at PICT IEEE's annual technical fest Credenz.

2nd in research idea presentation track Pulzion'24 Oct 2024

- Stood 2nd in the research Idea Presentation track of Paper Presentation competition held as part of PICT ACM's annual technical fest Pulzion.