Tirth Patel

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Education

9.16/10.0 **BTech in Computer Science & Technology**, *L.J Institute of Engineering and Technology, A'bad* | Gujarat, India *2021-25*

83.69% **Gujarat Board (XII)**, *St. Mary's School Naroda, A'bad* | Gujarat, India *2021*

92.55% **Gujarat Board (X)**, *St. Mary's School Naroda, A'bad* | Gujarat, India *2019*

Projects

Educational AI *April 2024*

[Natural Language Processing (NLP), Machine Learning (ML), Web Scraping, Knowledge Graphs]

- An **intelligent system** that can read and respond to user requests by combining past knowledge (document retrieval), external sources (web search), and complex language models with the assistance of **RAG**.
- Used **Self-Reflection methods** such as **Document Grading** and **Answer Grading**, as well as the **Hallucination Checker**, to ensure accuracy. Used a **Graph-based technique** for flexible decision-making and efficient query processing.
- Cutting-edge **AI platform** with a wide range of applications for **educational institutions**, including managing the content of textbooks and research papers in form of **PDF**.
- Educators are able to utilise the platform to get **personalised question answers**, bespoke **MCQ replies**, and **customised assessment tools**. It effortlessly incorporates **web documents**, providing learning opportunities beyond textbooks.

Automatic ECG Diagnosis (Top-5 Finalists Hackathon) *March 2024 - March 2024*

[Python, Tensorflow, Keras, PyTorch, NumPy, SciPy, Matplotlib, Pandas, Scikit-learn]

- Developed an automatic **12-lead ECG** diagnosis system using a **deep neural network**, achieving **84.3375%** accuracy on the test dataset.
- Designed a **residual neural network** to classify ECG signals into **6 common abnormalities** using **30,000+ recordings**.
- Implemented **end-to-end** scripts for training, evaluating, and deploying the deep learning model.
- Presented the ECG diagnosis project at a **top-5 finalist hackathon**, showcasing expertise in deep learning and **automated healthcare** solutions

Automatic Car Racer using Reinforcement Learning *Sept 2023 - Oct 2023*

[Python, Pygame, Cheesy AI]

- Developed a Pygame-based simulation using **NEAT** to guide cars autonomously on a **dynamic track**, integrating **neural network control** for navigation.
- Employed NEAT across **1000 generations** to evolve neural networks, managing **20-second runs** per generation for **performance evaluation** via fitness functions based on distance and safety metrics.

Movie Recommendation System *Feb 2023 - March 2023*

[Python, Numpy, Pandas, Sklearn]

- Leveraged Pandas and NumPy for extensive data handling, merging, and **feature extraction** from movie datasets.
- Applied advanced **text parsing techniques** and NLP methods to generate key features from movie information.
- Engineered a robust recommendation system using **cosine similarity** to suggest similar movies based on input titles.

Pneumonia Detection Model *January 2024 - January 2024*

[ML/DL, WebApp, Computer Vision]

- Developed a **Flask web application** to detect pneumonia in chest X-ray images using a trained **convolutional neural network (CNN) model**.
- Achieved an **accuracy of 97.11%** on the test dataset by experimenting with various **CNN architectures**.
- Implemented **image preprocessing** and **data augmentation** techniques to improve model robustness.

Achievements

- **2 Star in Codechef, (Highest Rating 1571)**, @tirth_70
- **Solved 150+ Problems in Leetcode**, @TIRTH325
- **Contributor on Kaggle**, @tirthpatel70

Skills

Programming Languages Python, C, C++, JAVA, JavaScript, HTML, CSS

Frameworks/ Libraries Langchain, Django, Flask, NLTK, Tensorflow, Keras, OpenCV, Streamlit, Selenium, Sklearn, MongoDB

Developer Tools Git, Github, Android Studio

Certifications
- Mathematics for Machine Learning and Data Science [Specialization][Deeplearning.AI]
- Algorithmic Thinking (Part 1) • Algorithmic Thinking (Part 2) [Rice University]
- Neural Networks and Deep Learning[Specialization][Deeplearning.AI]
- Improving Deep Neural Networks: Hyperparameter Tuning, Regularization and Optimization[Specialization][Deeplearning.AI]

Soft Skills Critical Thinking, Problem-solving, Team-Work

Interests

Area of Interest Machine Learning, Deep Learning, Data Science, Data Analysis, IOT., Computer Vision, NLP