Manan Parakh

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Education

Indian Institute of Technology, Kharagpur 2022 - 26
Bachelor of Technology in Aerospace Engineering CGPA : 8.28/10

Reasearch Internship

YOLOv5-Based AI System for Road Quality Inspection | Computer Vision | Prof. Sandeep Saha Jan '25 - Present
Objective : Develop an AI-driven road quality inspection system to accurately detect potholes, allowing road maintenance and safety improvements

- Implemented a YOLOv5-based pothole detection model, processing images at 8ms per frame for real-time detection with enhanced accuracy
- Integrated the YOLOv5 model with a Raspberry Pi camera and chip, deploying it on a drone for efficient, real-time road quality assessment
- Optimized model size and inference speed using ONNX Runtime, enabling seamless deployment on low-power hardware for live inspection

Projects

Neural Machine Translation (NMT) Using Deep Learning | Natural language Processing Feb '25 - March '25
Objective : Develop a high-precision English-French language translation model using advanced neural architecture to markedly enhance accuracy

- Constructed a **Seq2Seq** Encoder-Decoder model with an **Attention** mechanism, achieving **96%** peak validation accuracy on diverse dataset
- Integrated **NLTK** and **GloVe** Word Embeddings, improving preprocessing efficiency, representation, and comprehensive model performance
- Optimized model architecture with **Dual LSTM** layers in the encoder and a single LSTM layer with attention in decoder, enhancing accuracy

Movie Review Sentiment Analysis Model | TensorFlow June '24
Objective : Develop a robust sentiment analysis model using TensorFlow to accurately classify movie reviews, using various deep learning techniques

- Achieved a peak of **86.25%** validation accuracy on the sentiment analysis model with an **Embedding** layer for improved text representation
- Implemented **TextVectorization** and **Tf-Idf** techniques to preprocess raw text, enhancing feature extraction and overall model performance
- Leveraged TensorFlow's low-level API to optimize data pipelines with **tf.data.Dataset**, reducing data loading time and boosting the training

Bank Prediction using Auto Machine Learning Oct '23
Objective : Build a predictive model to analyze churn patterns and uncover key insights into customer behavior to develop better retention strategies

- Achieved **86%** peak accuracy and an F1 score of **0.91** by integrating neural hidden layers in an ANN for robust customer churn classification
- Developed an **AutoML**-based churn prediction model, leveraging data-driven insights to uncover patterns and enhance forecasting accuracy
- Implemented a binary classification model to predict customer attrition with high precision, **visualizing** key factors driving consumer churn

Competitions

Data-Driven Health Risk Assessment | Data Analytics | General Championship | IIT Kharagpur Mar '24 - Apr '24
Objective: Design a data-driven health risk assessment model, incorporating advanced analytics and a personalized recommendation engine

- Created a health risk model using census data from 85k+ U.S. locations, incorporating multiple data categories for precise risk evaluation
- Utilized clustering methods like **KMeans** and **DBSCAN** to segment data and develop accurate, scalable risk scoring for diverse populations
- Implemented a **Gemini-powered** recommendation engine using **2-shot learning** for personalization recommendation based on risk scores

Skills and Expertise

Programming Languages : Python | C++ | SQL (Basics) **Libraries:** Numpy | Pandas | Matplotlib | NLTK | TensorFlow| Scikit-Learn
MOOC: IBM Data Science Professional Certificate — Coursera | Machine Learning Specialization by Andrew Ng — OpenAI

Positions of Responsibility

Departmental Representative Sept '24 - Present
Career Development Centre, IIT Kharagpur

- Contributing to IIT Kharagpur's **50+ member Placement Team**, optimizing recruitment processes and improving industry collaborations
- Managed the execution of pre-placement talks, recruitment tests, and final interviews, streamlining the hiring process for **3,100+** students
- Secured the **highest number of offers among all IITs** in the placements, resulting in **1,000+** offers by Day 4 and a total of **1,600+** offers

Extracurricular Activities

- Secured Gold in **Choreography** at the **General Championship 2023**, outperforming 18 teams in a highly competitive cultural showcase
- Competed in the General Championship - Technology as an active member of the **Data Analytics** team for the Azad Hall of Residence
- **Books:** Avid reader with a collection of **50+ books** on Psychology and Philosophy, recently completing **17+ titles** with diverse perspectives