Lakshya Paliwal

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Education

Manipal University Jaipur *Aug 2023 - Jun 2027 (Expected)*
B.Tech in Computer Science and Engineering CGPA: 8.90/10
Relevant Coursework: Machine Learning, Deep Learning, Data Structures and Algorithms, Data Science, Artificial Intelligence, Statistics and Probability, Computer Organization and Architecture, Advanced Mathematics for Data Science, Linear Algebra for ML.

Skills

Programming Languages: Python, C, C++, Java, JavaScript, SQL
Technologies/Frameworks: FastAPI, Flask, Docker, MLflow, ZenML, Tensorflow, Keras, Hugging Face Transformers, Scikit-learn, LangGraph, LangChain, Jupyter Notebook, Colab, Git, GitHub, VS Code
Domains & Expertise: Machine Learning (ML), Deep Learning (DL), Natural Language Processing (NLP), Computer Vision (CV), Data Analysis, Front-End Development

Research Experience

Chronocept *Feb 2025*
Annotator

- Contributed to **Chronocept**, an AI research initiative focused on enhancing machine temporal reasoning by integrating **temporal validity** into natural language processing (NLP) systems. This enables AI models to reason about time, track event timelines, and distinguish between past, present, and future occurrences with greater accuracy.
- **Annotated 250+ text samples** using a structured three-step process:
  - **Text Segmentation:** Extracted grammatically and semantically meaningful subtexts while preserving temporal integrity.
  - **Temporal Axis Classification:** Categorized subtexts into predefined temporal axes (e.g., *Main Axis, Intention Axis, Hypothetical Axis*) to structure event timelines.
  - **Temporal Validity Modeling:** Assigned probability distributions to capture the validity of events over time, aiding machine understanding of temporal sequences.
- Contributed to the development of the Chronocept Dataset, a benchmark dataset designed to improve AI-driven temporal reasoning in NLP models.

Research Projects

- **SignSync :** AI-powered learning application designed to bridge communication gaps for the Deaf and Mute community. Using gesture detection and NLP techniques to convert American Sign Language gestures into human-readable text.
  - Used OpenCV and Mediapipe with custom training to detect specific hand gestures.
  - Integrated a Large Language Model (LLM) to convert detected ASL gestures into meaningful, grammatically correct human language.
  - Developed a FastAPI backend to enable seamless interaction between gesture detection and text transformation.
  - SignSync.
  - **Technologies:** Mediapipe, OpenCV, FastAPI, Tensorflow, groqcloud
- **Woof:**
  - Users can report stray dogs with GPS auto-detection, photo uploads, and an AI model that assesses the dog's health condition (Healthy, Injured, Critical).
  - Implemented a DBSCAN algorithm with severity-based weighting and time decay to identify high-risk areas and display them using Folium Map.
  - Retrieval-Augmented Generation (RAG) model to provide accurate responses about adoption procedures and policies, available dogs, medical history, streamlining the adoption process.
  - Woof.
  - **Technologies:** Scikit-learn, Folium, FastAPI, groqcloud, LangChain
- **Car-Park-In-Go:**
  - Built a user-friendly web interface to display real-time parking availability, ensuring seamless user interaction. Utilized Python with Flask for backend development.
  - Each frame is processed to extract regions corresponding to predefined parking spaces. The CNN model classifies these regions as either "Occupied" or "Free".
  - Provides an API endpoint to get the current count of free and occupied spaces.
  - Car-Park-In-Go.
  - **Technologies:** Python, Tensorflow/Keras, Flask, OpenCV, Pickle, Numpy
  .
- **HealthCare-Hub:**
  - Integrates multiple machine learning models to provide solutions for various healthcare-related predictions.
  - Integrated all predictive models into a cohesive and user-friendly Streamlit web application, providing an accessible interface for users to input data and receive predictions.
  - Models integrated under this Web-Application: Bone Fracture Detection, Brain Tumor Detection, Asthma Prediction, Breast

Cancer Classification, Calories Burnt Estimation, Diabetes Risk Assessment, Heart Disease Prediction, Medical Insurance Cost Estimation, Mental Health Support Chatbot.
  - HealthCare-Hub.
  - **Technologies:** TensorFlow/Keras, OpenCV, NumPy, Matplotlib, Python, Streamlit.
- **Car-Price-Prediction:**
  - End to End machine learning pipeline for predicting car prices. The model uses data (such as horsepower, enginesize, curbweight, etc.) to estimate prices of a car.
  - Conducted exploratory data analysis (EDA) using Pandas, Matplotlib, and Seaborn to understand feature correlations (Univariate, Bivariate, Multivariate analysis etc.)
  - Pipelines orchestrated using ZenML, ensuring modularity and reproducibility in data ingestion, preprocessing, model training, and evaluation.
  - Integrated MLflow for model tracking, experiment logging, and performance monitoring.
  - Car-Price-Prediction.
  - **Technologies:** Python, NumPy, Matplotlib, Seaborn, Scikit-learn, Pandas, ZenML, MLflow.

ACHIEVEMENTS AND CERTIFICATIONS

- **Dean's List:** Recognized on the Dean's List in the 2nd and 3rd semester for academic excellence.
- **Code-E-Manipal Hackathon:** Secured a Top 15 Position out of 250+ participating teams.
- **SIH 2024:** Internal Round Smart India Hackathon Qualifier.
- Deep learning Specialization: Deep Learning Specialization through DeepLearning.AI and Stanford University under the guidance of Andrew Ng.
- Machine Learning Specialization: Machine Learning Specialization through DeepLearning.AI and Stanford University under the guidance of Andrew Ng.