HASNAIN ALI POONJA

Address: 201, Adam Palace Garden East Karachi.

Contact No: +92 300 8921854

LinkedIn: https://www.linkedin.com/in/hasnain-ali-poonja/

Gmail: hasnainali.ha659@gmail.com

GitHub: https://github.com/hasnainali659

Medium: https://medium.com/@hasnainali.ha659

Objective

Dynamic and results-driven Machine Learning Engineer with a proven track record of success in leading AI product and projects. Seeking a challenging position at a cutting-edge tech company to leverage my skills in developing and deploying advanced machine learning models that contribute significantly to business growth.

Education

MS Robotics and Artificial Intelligence, NUST SMME, Islamabad.
Specialization **(Deep Learning, Computer Vision and Natural Language Processing)**
CGPA 3.81

BE Mechanical Engineer, NED University, Karachi.
Specialization **(Robotics)**
CGPA 3.63

Experience

- 12/2023 – Present
  AI Team Lead ICS Arabia.

  Projects

  1. As the Team Lead AI Engineer at ICS Arabia, I am spearheading the development of a cutting-edge generative AI application. Our focus lies in leveraging **large language models (LLMs)**, including those from **OpenAI, Google** as well as open source models such as **Mixtral and Llama 2**. The core functionality of our application centers around **Retrieval-Augmented Generation (RAG)**, enabling users to interact with various types of data seamlessly. Whether it's PDFs, Word documents, Excel spreadsheets, plain text, URLs, or even images, our application allows users to engage in natural conversations with the content.

Key Highlights:

Versatile Data Ingestion: Our RAG application seamlessly ingests diverse data formats, making it a powerful tool for information retrieval and interaction.

Contextual Memory: The application boasts an intelligent memory system, allowing it to retain context across conversations. This feature enhances user experience and facilitates more meaningful interactions.

Framework and Technologies:
Langchain: We utilized the Langchain framework for developing the RAG application. Its flexibility and robustness played a pivotal role in achieving our goals.
Pinecone: As the vector store, Pinecone enables fast and accurate similarity searches, enhancing the application's performance.
Structured Data Handling: For structured data, such as CSV files and SQL databases, we employed specialized Langchain agents. These agents extract valuable insights and provide context-aware responses.
Backend Infrastructure: The backend of our application is powered by Django, a reliable and scalable web framework. Its modular design allows for seamless integration with other components.

- 12/2022 – 12/2023
  Machine Learning Software Engineer at VIDIZMO.

  Projects
  1. Implemented a feature in VIDIZMO Studio allowing users to draw bounding boxes on objects in videos. Real-time tracking of objects using **CSRT (Continuous Shortest Regression Tracker) and deep Siamese tracker.** Achieved stable tracking without disruptions over a substantial **number of frames (15,000 frames).**
  2. Developed **PII detection** for multiple audios in English and Spanish for a calling agency in Orange County, USA. Extracted and processed audios, leveraging **Presidio** for **Named Entity Recognition (NER) and regex-based rules**. Redaction performed using **FFMPEG** with an impressive **timescale of 0.01 seconds.**
  3. Trained detection models using **YOLOv8** for various objects on the VIDIZMO benchmark dataset. Achieved high accuracy **(>90%)** in detecting objects such as **persons, faces, license plates, vehicles, and weapons**.
  4. Collaborated with a team to optimize the performance of the VIDIZMO application by introducing **Byte Track and IOU based trackers**. This integration aimed to improve the tracker performance for multiple classes after the detection from **YOLOv8**. Through this initiative, we were able to witness **an enhancement in performance up to 40%** when compared to the previous versions.
  5. Implemented Object Character Recognition (OCR) to recognize and extract characters from various document types, images, and videos, in multiple languages. For this, I utilized **Paddle OCR and Tesseract OCR** to create an efficient and robust OCR system.
  6. I was part of a team that worked on the redaction and clipping of individuals, faces, and vehicles, as well as OCR for the VIDIZMO application. Through this project, we aimedto ensure the privacy and confidentiality of individuals in sensitive videos by implementing **redaction and clipping functionalities**. We also incorporated OCR to improve searchability and accessibility of the videos.
  7. Implemented transcription functionality supporting multiple languages. Leveraged **OpenAI Whisper and AWS Transcribe** for accurate and efficient transcription.

- 6/2022 – 12/2022
  Machine Learning Engineer at CrossWing (Ontario Canada).

  Projects
  1. Working to automate roof cutting for different car models using Computer Vision. Developed a complete pipeline to annotate the car parts instance dataset using **CVAT(Computer Vision and Annotation tool)**. Augment the dataset and synthesize to make theimages to be scale invariant, background invariant and position invariant. Trained theimages using **YOLOv5 object detector**. Ensure the correct placement of car parts usingcomputer vision tracking algorithms like **centroid tracking**. Trained **Cycle GAN** togenerate different car models from a small set of cars dataset using **AWS Sagemaker.Used Pix 2 Pix** to augment car dataset to have different colorizations. Used **UnknownAware object detection** technique to enhance the dataset for unknown objects in the real-world environment.
  2. Quality control and layering count for medical gowns using computer vision tracking algorithms and YOLOv5 Object detector. Develop a pipeline to annotate the dataset using CVAT. Trained the dataset using YOLOv5 and develop a GUI to ensure the correctlayer counts.
  3. Worked on multiple trackers like **ByteTrack and OcSort** and deployed it on web application for car part detection and tracking.

- 01/2022 – Present
  Data Science and AI Trainer at AL NAFI
  Designed a complete AI career track in python covering the following courses.

a. Machine Learning in Python

- Data Analysis **(Using NumPy and Pandas)**
- Data Visualization **(Using Matplotlib, Seaborn, Plotly, Cufflinks)**
- Machine learning **(Using Scikit-Learn)**
- Deep Learning **(Using Keras and TensorFlow)**
- Natural Language Processing **(Using Bag of Words and NLTK).**
- Computer Vision **(Using OpenCV, Matplotlib, Pillow, Keras, TensorFlow)**

b. Machine learning Model Deployment

- Developed and deploy complete facial and gender recognition model on Heroku.
- Web Deployment **(Using HTML, CSS, Javascript for frontend, Flask and Django for backend).**

c. Deep learning in python

- Supervised and Unsupervised networks for deep learning
- Artificial Neural Network
- Convolutional Neural Network
- Recurrent Neural Network and Long Short-Term Memory
- Self-Organizing Maps
- Boltzmann Machine
- Auto Encoders

d. Computer Vision using OpenCV, PyTorch and TensorFlow

- Basic and advance image processing using OpenCV.
- Tracking algorithms.
- Convolutional Neural Networks using Keras and Pytorch.
- Object Detectors: SSD, YOLO, Faster RCNN, Mask RCNN
- GANS: Deepfakes and Cycle GAN
- Architectures: LeNet, AlexNet, VGGnet, ResNet, Fractal Net, DenseNet

- 3/2021 – 7/2022
  Research Associate at the National Center of Robotics and Automation (NCRA) and National Center of Artificial Intelligence (NCAI).

  Projects
  1. Design of **"Engagement and Focus Level Detection Using Computer Vision and Machine Learning for Classroom Environment and Online Learning"** using facial cues, body posture, and head rotation. Complete web deployment using **HTML, CSS, and Javascript for frontend and Flask framework for the backend.**
  2. Applied machine learning algorithm in Pakistan's first indigenously made NED Ventilator estimate compliance and resistance values of lungs for different patients.
  3. Kaggle data set to predict confirmed cases and fatalities due to COVID-19 in different countries using **LSTM and RNN.**
  4. **Robodoc:** Government-funded project for the design and development of a social humanoid robot to protect the health care professionals dealing with contagious diseases.
  5. **Robot Teleoperation with Haptic Feedback:** Teleoperated 6 DoF industrial Denso Robot with Haptic Touch Omni device on LAN.
  6. Developed a STEM product **"Augmented Reality and Virtual Reality based World Map with haptic feedback using Unity3D and Vuforia Engine".** https://ncra.neduet.edu.pk/

Publications

1. Evaluation of ECG-based Recognition of Cardiac Abnormalities using Machine Learning and Deep Learning. https://ieeexplore.ieee.org/abstract/document/9651457
2. Active stereo vision-based 3D reconstruction for image-guided surgery https://ieeexplore.ieee.org/abstract/document/9651353
3. Walking algorithm using gait analysis for 17 Dof Humanoid Robot (IEEC-2022 MDPI) https://www.mdpi.com/2673-4591/20/1/35.
4. Networked gaming using haptic feedback with multiplayer (IEEC-2022 MDPI).
5. Motor parametric calculation for robot locomotion (IEEC-2022 MDPI) https://www.mdpi.com/2673-4591/20/1/8.
6. Engagement detection and enhancement using computer vision, augmented reality, and haptics (**Submitted in Image and Vision Computing Elsevier**).

Professional Certifications

1. Git and Version Control (**Educative**.**io**)
2. Deep learning specialization (**Deeplearning.ai**)
3. Machine learning (**Stanford**)
4. Robotics Specialization (**University of Pennsylvania**)
5. Introduction to Python (**Google**)
6. Python data structures (**University of Michigan**)
7. Introduction to Python Programming (**DataCamp**)
8. Intermediate Python programming (**DataCamp**)
9. Introduction to SQL (**DataCamp**)
10. Supervised Learning Algorithm (**DataCamp**)
11. Unsupervised Learning Algorithm (**DataCamp**)
12. Computer Vision OpenCV, SSD and GANs (**Udemy**)
13. Machine Learning A-Z (**Udemy**)
14. Deep Learning A-Z (**Udemy**)
15. Nvidia DLI Certificate