Mohtashim Butt

24100238@lums.edu.pk | +92 306 4588419 | LinkedIn
Portfolio | GitHub

Industry Experience

Undergraduate Research Assistant — Center for Urban Informatics, Technology, and Policy
Development of a DL Model for urban greenspace segmentation — *Aug. 2023 – Ongoing*

- Collected satellite imagery from GEID, annotated them on LabelMe, and hosted on Roboflow.
- Fine-tuned Ultralytics Yolov8 instance segmentation model (a deep CNN-based architecture) for geographical transferability, trained it from scratch, and overlayed NDVI mask as a post-processing technique.
- Automated stitching process of Islamabad's F-7 Sector's images with greenspace segmentation for visualization purposes. | In-Progress Report

Technical Content Intern — Educative Inc.
Area: Research and Development — *June. 2023 – Sept. 2023*

- Conducted extensive research about the topics related to computer vision, computer graphics, and machine learning and curated around **58** quality articles.
- Set up docker files for OpenCV python code, VPython, d3.js, Octave, and React to deploy the applications within Educative's online widget. | My profile.

Research Intern — Centre for Water Informatics, and Technology
Engineering of a low-cost multi-camera module for forest fire detection — *May. 2023 – June. 2023*

- Integrated four ESP-32 camera modules to develop a low-cost single unit for capturing a multi-directional (360°) view.
- Wrote scripts (in PHP and Python) to automate the process of sending captured images to a self-hosted site and retrieving them to the local PC.
- Fine-tuned a tiny-Yolov5 model for forest fire detection from the retrieved images to trigger an alarm. | Final Report

Projects

Semantic Segmentation of Ancient Text and Carving on Petroglyphs — Directed Research Project
Supervisor: Dr. Murtaza Taj (Ph.D. Queen Mary University of London) — *Sept. 2023 – Ongoing*

- Generated a rich dataset bank by cropping, annotating, pre-processing, and augmenting ancient South Asian rock art images and text.
- Scrutinized pre-existing vision and language models like CLIP and Dall-E to leverage the prompt-based explanation of the segmented carvings on the rocks.

Emotionally Intelligent Eliza Chatbot — Speech and Language Processing Task
Supervisor: Dr. Agha Ali Raza (Ph.D. Carnegie Mellon University) — *Feb. 2023*

- Developed a therapist chatbot catering to the needs of university adults.
- Employed Regular Expressions (RegEx) for precise input parsing and structured responses.
- Developed a Naïve Bayes classifier from scratch for sentiment analysis and integrated it into Eliza, enabling the chatbot to respond to input prompts in accordance with the expressed emotions. | Source Code.

Similarity Detection and Sentiment Analysis of Online Text — Machine Learning Project
Supervisor: Dr. Agha Ali Raza (Ph.D. Carnegie Mellon University) — *Nov. 2023 – Dec. 2023*

- Fine tuned sentence transformer (SBERT) architecture for text embedding generation for the specific use case and designed the pipeline for text similarity detection and the model's evaluation.
- Analyzed the sentiments (using Naïve Bayes classifier) and similarity (using Logistic Regression classifier) of the Quora question pair dataset. | Source Code.

Teaching Experience

Teaching Assistant — Computer Vision Fundamentals (CS-5310)
Instructor: Dr. Murtaza Taj — *Fall-2023*

- Helped the instructor of this graduate-level course by grading components, conducting office hours, delivering tutorials, making the programming assignments, and taking the lead in the graded final project.
- Revamped the course structure by incorporating Hugging Face and Roboflow use.

Skills

- **Languages / Frameworks:** C, C++, Python(w/ NumPy, sci-kit learn, pandas, Keras, TensorFlow, PyTorch, OpenCV, matplotlib, NLTK), MATLAB, TypeScript, React, HTML, CSS, SQL and no-SQL database, Git, Docker, Haskell, Proteus, Arduino, LLM.

Education

Lahore University of Management Sciences – BS Computer Sciences — Lahore, Pakistan
Relevant Courses: Computer Vision, Introduction to Artificial Intelligence, Machine Learning, Speech and Language Processing with Generative AI, Deep Learning — *Aug. 2020 – May 2024*