

# Mohtashim Butt

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[Portfolio](#) | [GitHub](#)

## 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 overlaid 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