Osama Mohammed Afzal

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Education

Mohamed bin Zayed University of Artificial Intelligence (MBZUAI) — Abu Dhabi, UAE
Master of Science in Natural Language Processing — *Aug. 2022 – Present*

Fully Funded Academic scholarship including monthly stipend, accommodation, health insurance, sponsorship, airfare amounting up to ≈**$200,000**

Expected to Graduate in **2024**

National University of Sciences & Technology (NUST) — Islamabad, Pakistan
Bachelor of Science in Computer Science — *Sep. 2017 – Jun. 2021*

- Advisor: Dr. Faisal Shafait
- CGPA: 3.53/4.00 (88%)
- **Relevant Courses:** AI, Advanced Deep Learning, Image Processing, Distributed Computing

Al Waha International School — Jeddah, Saudi Arabia
CIE AS and A Levels – Class of 2017 — *Aug. 2015 – Jun. 2017*

Experience

Machine Learning Engineer — Islamabad, Pakistan
DCube Technologies — *Jun. 2021 – Jul. 2022*

- Conducted research on SOTA deep learning methods for Information Extraction from Documents
- Coded and Trained multiple deep learning Models for classification, Region Segmentation and NER
- Automated Training, Evaluation and Deployment of Models on change in Data using DVC
- Developed a tool to visualize and annotate data for Object Detection and Entity Tagging
- Deployment, Testing and packaging of Deep Learning Models as APIs For Production on GCP
- Conducted Daily Meetings with Client to iteratively refine product for the identified use case

Machine Learning Engineer — Islamabad, Pakistan
Hayyan Systems — *Mar. 2021 – Feb. 2022*

- Conducted research on SOTA deep learning methods for COVID detection, severity using CXRs
- Worked on the interpretability of machine learning models for different medical use cases
- Coded multiple Data based Analytics dashboard for an in house data platform

Undergraduate Research Assistant — Islamabad, Pakistan
TUKL NUST Research & Development Lab — *Jun. 2019 – Mar. 2021*

- Developed a Large Scale Image Viewer (LSIV) and annotation Tool for Whole Slide Images (WSI)
- Came up with a new annotation technique for labelling of medical data for machine learning
- Trained multiple Object Detection models such as Yolov3 and Yolov4 on Keratin Pearl Dataset
- Co-authored a paper in IEEE J-BHI

Publications (Google Scholar)

On Smart Gaze based Annotation of Histopathology for Training Deep CNNs — IEEE J-BHI
K. Mariam, **Osama Mohammed Afzal** et al. — (Paper / Code)

This work explores the viability of annotating histopathology data with a person's gaze compared to conventional hand-based annotation for object detection

Projects

Identification of Persons Wearing Masks
Final Year Thesis for completion of Undergraduatre Degree

- The thesis explored the viability of Periocular region as the primary biometric for a surveillance system in this age of COVID-19 where traditional systems which relied on the face failed due to masked faces
- Experimented with multiple architectures including siamese, self supervised and traditional networks
- The thesis concluded that Periocular Region showed promising results as a stand-alone biometric both in closed and open world conditions while also providing good results in situations where the person's face was occluded

COVID-19 Prognosis via Self-Supervised Representation Learning

- The goal of this project was to implement a solution for COVID-19 Prognosis which could aid hospitals in efficient triage of Patients based on the conditions of their CXR
- Fine-tuned the pre-trained model provided by FAIR on the collected data
- Used GradCAM to visualize and highlight the ROI for classification of the disease
- Coded a package for Chest X-ray analysis which included detection, severity and localisation of multiple disease

Neural Image Style Transfer
Semester Project for Distributed Computing

- The goal of this project was to create a web application and simulate it in a Production Evnironment to understand the complications of Productionizing a system in the real world
- Developed a full-stack web application with React as the front-end. The application accepted an image from the user and stylized it via a Deep Learning Model. The model was trained to add different styles to an image and was served via Flask
- Containarised the application for deployment on Google Kubernetes Engine (GKE) and GCS for backend storage. Load and Stress tested the deployed environment's autoscaling capabilities

Technical Skills

Languages: Python, JavaScript C/C++, SQL
Frameworks: Pytorch, Hugging Face, Fast.ai, Flask, Ray.io, REST APIs
Web & Mobile: React, Flutter
AI Interests: Self Supervised Learning, NLP, Transformers, Continual Learning
Developer Tools: Git, Docker, Google Cloud Platform, VS Code
Libraries: Pandas, NumPy, Matplotlib, opencv, Seaborn
Interests: DevOps, AI, AI Research, Cloud, NLP, Statistics

Skills

Languages: English (Advanced), Arabic (Limited Working Proficiency)

References

To be provided upon request