

FIZZA RUBAB

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EDUCATION

Habib University

Aug 2019 - May 2023

BS Computer Science - Double Minor in Electrical Engineering and Mathematics

Karachi, PK

- CGPA: 3.99/4.00, Rank: 1/114
- BS Thesis: Prompt Emergency Response: PLSP Mobile Application for Effective Cardiac Arrest and Trauma Management in Pakistan

Bentley University

Jun 2023 - Jul 2023

Wolfram Summer School - Research based Educational Program

Waltham, US

- Research Project: 3-Dimensional Human Pose Estimation
- Supervised by Dr. Stephen Wolfram and Miss Maria Sarsgyan

EXPERIENCE

Xu Lab, Computational Biology Department, Carnegie Mellon University

Aug 2023 - Present

Research Intern

Remote

- Supervised by Dr. Xueying Zhan, Dr. Xingjian Li and Prof. Min Xu
- Implemented and achieved 70% accuracy using a custom PointNet variant for cryo-ET classification through surface point cloud representation
- Improved particle picking algorithm with a localized DoG method, resulting in a 15-fold increase in particle detection rate
- Currently investigating image denoising through data-dependent diffusion models

Farnevo AgriTech

Aug 2023 - Present

Machine Learning Engineer

Karachi, PK

- Used State-of-Art Detectors (YoloV8, DeTR, MaskRCNN) to improve crop detection on drone images of the field
- Implemented a semi-supervised auto-labelling pipeline for Banana detection which improved accuracy by +15%
- Developed gap filling prescription algorithm which identified gaps in row crops upto 85% accurately in dense fields

Empathic Computing Laboratory, University of Auckland

Dec 2022 - Aug 2023

Virtual Research Intern

Remote

- Supervised by Mr. Ted Ahmadi and Dr. Mark Billinghurst
- Worked on the project, 'Neurophysiological Measures of the Working Memory', to predict cognitive load from EEG, HR, GSR, and Pupil dilation data cues from VR game experiments. Achieved 71% accuracy using ML Classifiers

Stanford University

May 2023 - Jun 2023

Instructor/Section Leader for CS106-A

Remote

- Selected 1 out of 11 from Pakistan to teach Code in Place course in affiliation with Stanford University
- Led engaging weekly Python programming sessions over zoom for a diverse group of students

Center for Cell Analysis and Modeling, University of Connecticut Health

Jun 2022 - May 2023

Google Summer of Code Contributor

Remote

- Supervised by Dr. Pedro Mendes and Dr. Hasan Baig
- Designed an improved version of the Cloud COPASI, streamlining HPC job submissions of biological models without SSH configurations.
- Implemented feature to create pools on AWS Cloud for non-HPC affiliated users
- Contributed to Cloud COPASI's manuscript to be submitted in a reputed system biology's journal

Aks IQ - Smart Trade Solutions

Dec 2022 - May 2023

Associate Software Engineer

Karachi, PK

- Developed a video editor with AI transcripts using State of Art Text-to-Speech models
- Developed intelligent product description retrieval system using transformer based query description embeddings
- Created Doc iQ, a business centric OCR solution to extract structured data from receipts, transactions and cheques

Securiti

Dec 2022 - May 2023

Backend Software Intern

Karachi, PK

- Developed a Logfile Analyzer using SVM model for classification of any textual content into logs or non logs
- Designed Regex merger algorithm for streamlined postal code extraction
- Developed MS Office documents data extractor utility using Apache POI for data retrieval



PUBLICATIONS

1. **F. Rubab**, S. Hafeez, M. H. Qazi, M. H. Syed, B. I. Azeemi and A. J. Kayani, "A Comparative Survey of Solutions to Russel's Paradox," in 4th International Conference on Computing, Mathematics and Engineering Technologies (ICOMET), 2023
2. I. Siddiqui, **F. Rubab**, H. Siddiqui and A. Samad, "Poet Attribution of Urdu Ghazals using Deep Learning," in 3rd International Conference on Artificial Intelligence (ICAI), 2023
3. S. Hafeez, S. Pervez, R. Naeem, **F. Rubab** and S. Raza, "Prompt Emergency Response: PLSP Mobile Application for Effective Cardiac Arrest and Trauma Management in Pakistan" in 13th IEEE Global Humanitarian Technology Conference (GHTC), 2023

AWARDS AND HONORS

Chancellor's Yohsin Medal For graduating with highest honor of excellent academics and metacurriculars	Habib University, 2023
Dean's Medal For graduating with the highest CGPA in Computer Science Program	Habib University, 2023
Best Research Award For producing the best research publication in Computer Science	Habib University, 2023
Best Khidmat (Volunteer) Award For conducting most impactful volunteer work using Computer Science skills	Habib University, 2023
Dean's Honor List For being one of the top 10% students in the program each semester	Habib University, 2020-2022
President's Honor List For maintaining position on Dean's Honor List in consecutive semesters	Habib University, 2021-2022
High Academic Achievement Scholarship Additional 10% Scholarship for the Top 3 students in the school each semester	Habib University, 2020-2023
2nd Position in Speed Programming, CyberSecurity Hacakthon For conducting most impactful volunteer work using Computer Science skills	Ignite, 2021
Bronze Medalist in ICPC Regionals For conducting most impactful volunteer work using Computer Science skills	ICPC, 2022
HU-TOPS Merit Scholarship 100% scholarship for four years awarded to top 50 students from all over Pakistan	Habib University, 2019-2023
First Position in National Examinations Securing highest grade nationwide overall with distinctions in mathematics and chemistry	AKUEB, 2019

RELEVANT PROJECTS

Cryo-ET Subtomogram Classification using Point Clouds • Modeled Cryo-ET subtomograms as surface point clouds using marching cubes algorithm, trained PointNet classifiers on simulated data, and currently developing a custom U-Net architecture for improved accuracy	Sep 2023 - Present
3D Human Pose Estimation using Machine Learning  • Implemented pose estimation in 3D for images and videos in the wolfram language by fusing a 2D pose estimation network, CenterNet, with MiDas, a variation sensitive monocular depth estimation framework.	Jun 2023 - Jul 2023
Poet Attribution of Urdu poetry  • Assembled a dataset of around 17000 couplets from 15 different poets and implemented various sequence models, RNN, GRUs and LSTMs for classification. 81% accuracy was achieved by fine-tuning a multilingual Bert transformer	Aug 2022 - Dec 2022

ACADEMIC SERVICES

- **Teaching Assistant at Habib University for 5 courses:** Natural Language Processing, Engineering Mathematics, Nature of Computation, Discrete Mathematics, Object Oriented Programming and Computer Science Freshman Seminar
- **Programming Fundamentals Workshop facilitator** for incoming computer science class of 2025, Habib University
- **Programming Bootcamp Instructor** for middle school students at Aga Khan School, Garden

SKILLS

Programming: Python (Advanced), C/C++ (Intermediate), Java (Intermediate), MATLAB (Intermediate), C# (Basic)
ML Tools: Pandas, Numpy, Scikit-Learn, Tensorflow/Keras, OpenCV, Pytorch, Onnx
Developer Tools: Django, Flask, Flutter, React
Languages: English: C2 (Expert), Urdu (Native)