Curriculum Vitae - Fizza Rubab

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EDUCATION

Michigan State University **Aug 2024 - Present**
PhD Computer Science and Engineering *East Lansing, US*
- Award: University Distinguished Fellowship
- Research Area: Computer Graphics, Vision and Geometry

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

ISMaeL, Max Planck Institute for Informatics **Jan 2024 - Present**
Visiting Research Intern *Saarbrücken, DE*
- Supervised by Dr. Thomas Leimkühler
- Learning repeated multidimensional integrals efficiently using neural fields
- Applying learned integrals for usecases like convolutions and image based lighting

Wolfram Research **Nov 2023 - May 2024**
Machine Learning Intern *Remote*
- Cross-referenced Wolfram Language's machine learning functionality with algorithms and topics from popular ML textbooks and libraries
- Implemented missing classification and prediction metrics such as huber loss, jaccard score and KL Divergence
- Worked on random data generator with controllable parameters for classification and clustering problems

Xu Lab, Carnegie Mellon University **Aug 2023 - Dec 2023**
Research Intern *Remote*
- Worked with Dr. Xueying Zhan and Dr. Xingjian Li
- Improved particle picking algorithm with a localized DoG method, resulting in a 96% particle detection rate
- Explored Pointnet based architectures for cryo-ET subtomogram classification through point cloud representation

Farmevo **Aug 2023 - Dec 2023**
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
- Redesigned Cloud-COPASI, streamlining HPC job submissions of biological models without SSH configurations.
- Implemented feature to create COPASI pools on AWS Cloud for non-HPC affiliated users

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 **Habib University, 2023**
For graduating with highest honor of excellent academics and metacurriculars

Dean's Medal **Habib University, 2023**
For graduating with the highest CGPA in Computer Science Program

Best Research Award **Habib University, 2023**
For producing the best research publication in Computer Science

Best Khidmat (Volunteer) Award **Habib University, 2023**
For conducting most impactful volunteer work using Computer Science skills

Dean's Honor List **Habib University, 2020-2022**
For being one of the top 10% students in the program each semester

President's Honor List **Habib University, 2021-2022**
For maintaining position on Dean's Honor List in consecutive semesters

High Academic Achievement Scholarship **Habib University, 2020-2023**
Additional 10% Scholarship for the Top 3 students in the school each semester

2nd Position in Speed Programming, CyberSecurity Hackathon **Ignite, 2021**
Awarded by president of Pakistan for securing first runner up position in speed programming

Bronze Medalist in ICPC Regionals **ICPC, 2022**
For excellent performance in International Collegiate Programming Contest, Topi Regionals

HU-TOPS Merit Scholarship **Habib University, 2019-2023**
100% scholarship for four years awarded to top 50 students from all over Pakistan

First Position in National Examinations **AKUEB, 2019**
Securing highest grade nationwide with distinctions in mathematics and chemistry

RELEVANT PROJECTS

3D Human Pose Estimation using Machine Learning **Jun 2023 - Jul 2023**
- Implemented 3D pose estimation in Wolfram Language for images and videos by fusing a 2D pose estimation network, CenterNet, with MiDas, a variation sensitive monocular depth estimation network.

Poet Attribution of Urdu Poetry **Aug 2022 - Dec 2022**
- 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.

ACADEMIC SERVICES

- **Teaching Assistant at Habib University for 5 courses:** Natural Language Processing, Linear Algebra, 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, C/C++, Java, MATLAB, C#, Mathematica
ML Tools: Numpy, Pytorch, Pandas, Scikit-Learn, Tensorflow/Keras, OpenCV, Onnx
Developer Tools: Django, Flask, Flutter, React
Languages: English, Urdu