Talha Ahmed

+92 331 4165009 | 24100033@lums.edu.pk | talha.123ahmed@live.com | talhaahmed2000.github.io |

Education

Lahore University of Management and Sciences Sep. 2020 – May 2024
B.S Mathematics - Economics (Joint Major) + Minor in Computer Science *CGPA/Minor GPA: 3.83/3.87*

Relevant Courses: *Real Analysis, Adv. Calculus, Applied Probability, Machine Learning, Convex Optimization, Data Mining, Deep Learning, Reinforcement Learning, Adv. Econometrics, Generative AI, Numerical Analysis*

Research Experience[1]

Research Assistant Summer. 2024 – Present
Dr. Hassan.Mohy-ud-Din - ***Website*** *Lahore, Pakistan*

- Working on **"Theory and Practice of Diffusion Models in Medical Imaging and Inverse Problems"**. This work has link with the research below. (**Work in Progress - Survey**)

Research Assistant Summer. 2024 – Present
Dr. Muhammad Tahir - ***LinkedIn*** *Lahore, Pakistan*

- Working on **"Interpretable and Controllable Diffusion Models"** with applications to signal processing and natural language processing.

Senior Year Research Summer. 2023 – May. 2024
Dr. Muhammad Tahir *Lahore, Pakistan*

- Worked on **"Model Based Deep Learning"** as a Senior Project. (**Report + Presentation**)

Research Assistant Sept. 2023 – Dec 2023
Dr. Hassan Mohy-ud-Din *Lahore, Pakistan*

- Worked on a brief term project on compiling detailed, concise notes on prominent mathematical inequalities and their applications to fields of data science, information theory etc. Compiled work can be found here: **Dropbox**

Research Assistant Jan. 2023 – May. 2023
Networks Systems Group @ LUMS *Lahore, Pakistan*

- As a directed research project, developed an app for measuring 'Digital Literacy' under supervision of Dr. Ihsan Ayub Qazi - ***Linkedin***.
- App can be found here: (**Github Link**)

Academic Distinctions

- Ranked in the **top 10%** of LUMS SBASSE Batch of 2024
- Placed on **Dean's Honor List** for **2020-2021, 2021-2022, 2022-2023**
- Graduated with **Dean's Honour List** and **High Distinction**

Teaching + Work Experience

ACTA 6304: Advanced Machine Learning (Spring 2024) Professor Momin Ayub Uppal
Teaching Assistant

- Held weekly office hours, made and graded assignments, and engaged in semi-formal student counseling

CS 535: Machine Learning (Fall 2024) Professor Momin Ayub Uppal
Teaching Assistant

- Held weekly office hours, invigilated quizzes and exams, held tutorials, made and graded assignments, and engaged in semi-formal student counseling

EDUX 562: Data Lab (Spring 2023) Professor Ahmad Ayub
Teaching Assistant

- Held weekly office hours, invigilated STATA labs, graded assignments, and engaged in semi-formal student counseling

[1]Further details on these research projects can be found at my website.

ECON 221: Intermediate Macroeconomics (Fall 2022) Professor Usman Elahi

Teaching Assistant

- Held weekly office hours, conducted assignment tutorials, created/reviewed/invigilated/graded quizzes, created/reviewed/solved assignments, and engaged in semi-formal student counseling

STATA Workshop (Dec 2022 - Jan 2022) Professor Usman Elahi

Teaching Assistant

- Assitant for Professor Usman Elahi (usman.elahi@lums.edu.pk) for 'Capacity Building and Training on Data Management & Analysis Using STATA' organized in collaboration with Bureau of Statistcs, Government of Punjab for Statistical Officers.

Undergraduate Course Projects/Presentations[2]

Speech Recognition and Translation System For Medical Communication Spring 2024

CS 5302: Generative AI for Natural Language and Speech Processing

- We aimed to develop an application that can interpret, translate, and vocalize spoken language in real-time, and is specifically catered for patient-doctor conversations.
- We integrated various open source models of Automatic Speech Recognition, Neural Machine Translation, and Text-to-Speech synthesis etc. (**Project Deliverables**), (**Github Link**)

Reinforcement Learning Algorithms on Tic-Tac-Toe Fall 2023

CS 6314: Dynamic Programming and Reinforcement Learning

- Trained a reinforcement learning agent to play 2D and 3D Tic-Tac-Toe using algorithms like Value Iteration, Temporal Difference Learning, and Deep Q Networks. (**Project Report**), (**Github Source Code**)

Panel Data and Tobit Analysis on Health Care Dataset Fall 2023

ECON 438: Econometrics II

- Conducted panel data and Tobit analysis on a German healthcare dataset to determine factors influencing doctor or hospital visits using fixed/random effects and tobit models.(**Project Report + Source Code**).

Clustering, Association and Frequent Pattern Mining Spring 2023

CS 432: Introduction to Data Mining

- Analyzed drug consumption patterns in Connecticut, USA using DBSCAN, Apriori, and Fpgrowth algorithms for clustering, association, and frequent pattern mining. (**Project Report**).

Sentiment Analysis on Audio Recordings Spring 2023

CS 535: Machine Learning

- Identification and extraction of features followed by a mathematical background of some popular machine learning methods and their performance evaluation (**PDF Link**).

Technical Skills

Languages: C++, Python, STATA, MATLAB, R, HTML/CSS, Tableau
Programming Frameworks: Keras, Tensorflow, PyTorch, OpenCV, Shiny, Numpy, Pandas, Matplotlib, Seaborn
Tools: Linux, Git, Dropbox, Latex, Microsoft, VS Code, Google Colab

[2]Further details on these and additional course projects can be found at my website.