Rukhshan Haroon

rukhshan.haroon@tufts.edu
+1 (781) 827-9920
Personal Site

Room No. 440K, Joyce Cummings Center
177 College Ave., Medford, MA 02155

Research Overview

As a systems researcher in human-computer interaction, I integrate machine learning technologies—such as large language models (LLMs)—into user-facing software to create and evaluate new human-AI interactions. In my recent work, I developed an instant messaging interface that leverages assistive AI agents to enable smoother, more empathetic interactions between autistic and non-autistic users. To ensure scalable and cost-effective deployment of LLMs, I leverage application-level systems techniques, such as query routing and prompt caching.

Education

Ph.D. in Computer Science *Sep. 2022 – May 2027*
Tufts University, USA
Advisor: Fahad R. Dogar

B.S. in Computer Science *Sep. 2018 – May 2022*
Lahore University of Management Sciences (LUMS), Pakistan

Research Papers

[1] "TwIPS: A Large Language Model Powered Texting Application to Simplify Conversational Nuances for Autistic Users." In *Proceedings of the 26th International ACM SIGACCESS Conference on Computers and Accessibility* **(ASSETS 2024)**. PDF

[2] "LLMProxy: Reducing Cost to Access Large Language Models" **(Under submission)**. **An LLM-based question and answer application that I co-developed for this project has been used in 4 countries over 15 weeks, handling 10K+ user interactions!** PDF

[3] "On the Frontline During the Covid-19 Pandemic: Gender Inequality and Experiences of Healthcare Workers in Pakistan." In *ACM Journal on Computing and Sustainable Societies* **(JCSS 2024)**. PDF

[4] "SoK: A Tale of Reduction, Security and Correctness - Evaluating Program Debloating Paradigms and Their Compositions" In *Proceedings of the 28th European Symposium on Research in Computer Security* **(ESORICS 2023)**. PDF

[5] "Unpacking Misinformation Amid the COVID-19 Pandemic: A Mixed Methods Study" In *IEEE Internet Computing* vol. 26, no. 2 **(IC 2022)**. PDF

Skills

Software: Prompt Engineering, Retrieval Augmented Generation, Python, PyTorch, AWS Lambda, Unity, Docker, Figma, DynamoDB, ReactJS, NodeJS, C#, C++, C.

Research: System Development and Prototyping, User Interface Design, Mixed-methods Research (statistical analysis, qualitative methods), Experimental Design.

Coursework: HCI for Disabilities, Deep Learning, Assistive Design, Data Mining, Artificial Intelligence, Data Science, Advanced Programming, Data Structures, Algorithms, Probability, Statistics, Software Engineering.

Experience

Tufts University, Massachusetts, USA — Sep. 2022 - present
Graduate Research Assistant
Led research projects end-to-end and mentored undergraduate students.

Internet Security and Privacy Lab, LUMS, Lahore, Pakistan — May 2021 - May 2022
Undergraduate Research Assistant
Developed a scalable benchmarking framework for software debloating tools.

Technology for People's Initiative, LUMS, Lahore, Pakistan — May 2021 - Sep. 2022
Undergradaute Research Assistant
Co-led the design, data collection, and analysis for two mixed-methods studies.

Awards and Recognitions

First Place at XR Hackathon, Harvard University — 2023
Award of Academic Distinction, Lahore University of Management Sciences — 2022
Students as Co-Researchers Grant, Lahore University of Management Sciences — 2021
Dean's Honour List, Lahore University of Management Sciences — 2020-2022