Mohammad Taha Zakir

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My Website

EDUCATION

Lahore University of Management Sciences (LUMS) <div align="right">Lahore, Pakistan</div>

*BS Computer Science - CGPA: **3.62/4.00** | Major CGPA: **3.67/4.00** | Dean's Honor List* <div align="right">*Aug. 2019 – May 2023*</div>

Relevant Coursework

Data Science, Databases, Advanced Programming, Algorithms, Software Engineering, Machine Learning, Deep Learning, Speech Processing, Human-Computer Interaction

PUBLICATIONS

Ali Saif, **Mohammad Taha Zakir**, Agha Ali Raza, Mustafa Naseem **"EvolveUI: User Interfaces that Evolve with User Proficiency"** *(Accepted to ACM COMPASS 2024)*

RESEARCH EXPERIENCE

LLM's for Menstrual Health <div align="right">May 2024 – August 2024</div>

Research Assistant | Advisor: Dr. Maryam Mustafa | Lab: IML <div align="right">*LUMS*</div>

- Designed and led a study to evaluate an expert-supervised LLM-powered chatbot for menstrual health education and support for young women living in a society where menstruation is a cultural taboo.
- Conducted data analysis from conversations and interviews to identify users' menstrual health information needs, offering design recommendations for culturally sensitive, LLM-based educational tools.
- Co-authored and submitted a paper to an **A+ rank HCI conference.**

Super Abbu - Maternal Health Information Platform <div align="right">Jan. 2023 – Present</div>

Research Assistant | Advisors: Dr. Agha Ali Raza and Proff. Mustafa Naseem | Lab: CSaLT <div align="right">*LUMS*</div>

- Used SQL to extract pertinent statistics from a large-scale database. Led Mixed Methods analysis on this data of 500+ users for an IVR-based maternal-health platform.
- Increased user retention by 60% by applying design changes informed by data analysis that improved UX.
- Designed and developed (in React Native with a PHP backend) a full-stack mobile application improving doctor response time by 24 hours. Case study for this app can be accessed here.
- Conducted usability testing for the doctor's application to evaluate user satisfaction and identify desired features.
- Conducted extensive desk research and designed a prototype for an AI-based clinical decision support tool.
- Designed and tested a high-fidelity prototype with an evolving interface to research the development of a smartphone application for Super Abbu that is accessible for low-literate users.

Kahaani - Audiobooks and Language Learning for Children <div align="right">Aug. 2023 – Jan. 2024</div>

Research Assistant | Advisors: Dr. Agha Ali Raza and Dr. Awais Athar | Lab: CSaLT <div align="right">*LUMS*</div>

- Designed and developed a novel Urdu story-telling system that utilizes a Text-to-Speech (TTS) model.
- Developed a system to add diacritics to Urdu text using few-shot learning with GPT-4 for enhanced TTS output.
- Implemented visual accessibility features and conducted usability tests. Case study can be accessed here.
- Designed and developed a speech-based chatbot for Urdu language learning tailored toward K-8 students.

Speaker Identification for Urdu language <div align="right">Jan. 2022 – May 2022</div>

Research Assistant | Advisors: Dr. Agha Ali Raza | Lab: CSaLT <div align="right">*LUMS*</div>

- Implemented a transformer-based Speaker Identification (SI) system for English and Urdu with 85+% accuracy.
- Led a group of researchers to annotate and generate and phonetically-rich Urdu dataset to train the SI model.
- Designed and developed (in React and FastAPI) a model testing and dataset generation platform.

Research Writing Intern <div align="right">June 2021 – August 2021</div>

Institute: LUMS <div align="right">*Lahore, Pakistan*</div>

- Conducted interviews and wrote investigative write-ups about cutting edge research projects at LUMS.
- Designed artwork to provide the write-ups with visual identities and to help illustrate key points from the articles.
- Work published in The Particle magazine and the SBASSE website.

Teaching Experience

Head Teaching Assistant for Software Engineering - CS 360
Jan. 2023 – May 2023

Instructor: Dr. Maryam Abdul Ghafoor | Institute: LUMS
Lahore, Pakistan

- Led a group of 3 other TA's to oversee course content and mentor students during a semester-long project.
- Facilitated learning for 70+ students through quizzes, assignments, tutorials, presentations and office hours.

Teaching Assistant for Computational Problem Solving - CS 100
Aug. 2021 – December 2021

Instructor: Dr. Maryam Mustafa | Institute: LUMS
Lahore, Pakistan

- Worked with 5 other TA's to guide students about programming and mentor them during a month-long project.
- Facilitated learning for 80+ students through quizzes, assignments, tutorials and office hours.

Work Experience

Technical Content Engineer
July 2023 – April 2024

Educative
Lahore, Pakistan

- Increased web traffic by creating computer science courses catering to millions of users.
- Improved work-flow efficiency by 70% by implementing automated test-case generation for coding problems.
- Improved work-flow efficiency by 50% on LLM courses by creating Docker setups to run LLMs on our platform.

Projects

Helpful Hangman | *React, Vite, Flask* | [English Game](#) | [Urdu Game](#)
Oct 2023

Personal project due to interest in language-learning games

- Designed and developed (using React for the front-end and Flask for the back-end) a novel Hangman game that utilizes a Text-to-Speech model to teach phonemic awareness.
- Implemented and deployed this game for the English and Urdu languages.

Hamari Nur - Designing for Climate Action | *Figma, ATLAS.ti* | [Case Study](#)
Jan. 2023 – May 2023

ICT4D Course Project | Advisor: Dr. Maryam Mustafa

- Designed a solution to encourage sustainable behavior change in Pakistani youth to promote climate action.
- Researched and analyzed the perceptions and attitudes of Pakistani youth regarding the climate crisis through interviews with 20+ participants, followed by a thematic analysis of the data to extract actionable insights.
- Developed a high-fidelity prototype for an narrative-based ambient interface that continually encourages sustainable behavior by utilizing the user's smartphone wallpaper.

Caraamad - Safe Mobility for Women App | *Miro, Figma* | [Case Study](#)
Aug. 2022 – Dec. 2022

HCI Course Project | Advisor: Dr. Suleman Shahid

- Conducted extensive user and desk research through interviews and surveys (with 100+ participants) and a comprehensive literature review for female mobility in Pakistan.
- Designed a high-fidelity prototype for a female carpooling platform and conducted 25+ usability tests.
- Presented insights and prototype to Punjab Safe City Authorities and secured funding for the app.

Biases in Cricket Player Valuation | *Python, SQL* | [Medium Article](#)
Aug. 2022 – Dec. 2022

Data Science Course Project | Advisor: Dr. Ihsan Ayyub Qazi

- Conducted Data Cleaning, Exploratory Data Analysis and Causal Inference on a cricket players dataset to investigate fairness for player valuations within the IPL.
- Trained and tested linear, lasso, ridge regression models to predict auction prices for players new to the IPL.
- Wrote an article on Medium to present, summarize and explain the findings from this project.

Efficient CNNs via Structured Lottery Ticket Pruning | *Python* | [Github Repository](#)
Jan. 2022 – May 2022

Deep Learning Course Project | Advisor: Dr. Murtaza Taj

- Conducted an extensive literature review about previous work on the lottery ticket hypothesis.
- Achieved almost 80% accuracy on an 85+% sparse network through structured lottery ticket pruning.
- Wrote a short paper to present the results of this project and discuss the potential for future work.

Renfri - E-commerce Mobile App | *React Native, Firebase, Figma*
Jan. 2022 – May 2022

Software Engineering Course Project | Advisor: Dr. Suleman Shahid

- Designed and developed an e-commerce platform for university students using React Native and Firebase.
- Wrote extensive documents for user research and design requirements regarding this project.

Kitabees - Online Book Store Management System | *React, Node, MongoDB, Heroku*
Aug. 2021 – Dec. 2021

Databases Course Project | Advisor: Dr. Naveed Arshad

- Designed and developed an online book store management system using the MERN stack.
- Compiled a dataset with detailed information about nearly 10,000 distinct books.

Technical Skills

Languages: Python, JavaScript, C/C++, SQL, HTML, CSS, PHP, Haskell, LaTeX, STATA, MATLAB, Bash
Frameworks: React, Node.js, Express.js, FastAPI, Flask, MongoDB, MySQL, Tailwind CSS, Material-UI
Developer Tools: Docker, Git, Kubernetes, Figma, Heroku, Jupyter, Postman, Vercel, Firebase
Libraries: pandas, NumPy, Matplotlib, PyTorch, TensorFlow, openCV, scikit-learn, Seaborn, PyWebIO

Honors and Awards

Dean's Honor List
2019 - 2022

LUMS
Lahore, Pakistan

- Awarded on the basis of maintaining a GPA above 3.60 throughout the academic year.

Vice-President for Anime and Manga at LUMS
2021 - 2022

LUMS
Lahore, Pakistan

- The society was the recipient of the Creativity Award at the LUMS Annual Society Awards during my tenure.

HR Director for SPADES (Science Society)
Jan. 2020

LUMS
Lahore, Pakistan

- Won the PSIFI Star award for my efforts during PSIFI (Pakistan's largest science olympiad.)

Best Presentation Award for PHY-100
Aug. 2019 - Dec. 2019

LUMS
Lahore, Pakistan

- Awarded for a presentation on Simple Harmonic Motion.