Mohammad Taha Zakir

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EDUCATION

Carnegie Mellon University Pittsburgh, Pennsylvania
MS AI Systems Management - Fulbright Scholarship *Aug. 2025 – Aug. 2026*
Lahore University of Management Sciences (LUMS) Lahore, Pakistan
*BS Computer Science - CGPA: **3.62/4.00** | Major CGPA: **3.67/4.00** | Dean's Honor List* *Aug. 2019 – May 2023*

PUBLICATIONS

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

WORK EXPERIENCE

Software Engineer April 2025 – July 2025
Oasys.health *Remote*
- Designed and built a therapist practice management and telehealth platform integrating wearable device analytics to deliver real-time insights into patient well-being.
- Developed an end-to-end testing pipeline integrated into the CI/CD workflow using GitHub Actions, automating validation of user interface flows and server-side API responses.

Research Associate May 2024 – March 2025
LUMS | The University of Michigan Ann-Arbor | Saarland University in Germany *Lahore, Pakistan*
- Led teams of undergraduate students on multiple research projects related to the domains of AI and HCI and authored research papers detailing project results.
- More details about the projects listed in the Research Experience section below.

Software Engineer (Content) July 2023 – April 2024
Educative *Lahore, Pakistan*
- Increased web traffic by creating interactive educational courses for large language models, and web development.
- Improved work-flow efficiency by 70% by implementing automated test-case generation for coding problems.

RESEARCH EXPERIENCE

Red Teaming Large Language Models Aug. 2025 – Present
Research Assistant | Advisors: Prof. Ramayya Krishnan, Prof. Beibei Li *Carnegie Mellon University*
- Investigating adversarial testing of large language models (LLMs) to identify and characterize model vulnerabilities, focusing on factors that determine adversarial prompt success.
- Applied unsupervised topic modeling using BERTopic, SentenceTransformers, and HDBSCAN to cluster and analyze thematic patterns in a large-scale human–LLM red-team conversation dataset.
- Developed a high-throughput AI annotation pipeline supporting concurrency and sliding-window context retention to process long dialogues efficiently.
- Contributed to experimental design addressing reliability in LLM-generated annotations.

Empathy Induction in Software Developers through LLM Personas Jan 2025 – July 2025
Research Associate | Advisors: Dr. Maryam Mustafa | Lab: IML *LUMS*
- Designed and implemented the experimental protocol, including user interviews, psychological empathy measures, and quantitative and qualitative evaluation metrics.
- Developed an LLM-powered chatbot persona, based on a user archetype derived from primary and secondary research on social media users in Pakistan.
- Conducted interviews and contributed to manuscript writing and analysis for paper.

LLM's for Menstrual Health Education May 2024 – August 2024
Research Associate | Advisor: Dr. Maryam Mustafa | Lab: IML *LUMS*
- Designed and led a study to evaluate an expert-supervised LLM-powered chatbot for menstrual health education. Used RAG to enhance the chatbot's knowledge base.

- 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.**

IVR-based Health Information Platform
Jan. 2023 – Aug. 2023

Research Associate | Advisors: Dr. Agha Ali Raza and Prof. Mustafa Naseem | Lab: CSaLT LUMS

- 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.
- 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.

Audiobooks and Language Learning for Children
Aug. 2023 – Jan. 2024

Research Associate | Advisors: Dr. Agha Ali Raza and Dr. Awais Athar | Lab: CSaLT LUMS

- 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.
- Designed and developed a speech-based chatbot for Urdu language learning tailored toward K-8 students.

Speaker Identification for Urdu language
Jan. 2022 – May 2022

Research Assistant | Advisors: Dr. Agha Ali Raza | Lab: CSaLT LUMS

- 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.

Teaching Experience

Summer School Instructor for Data Science and Visualization
June. 2024 – July 2024

Institute: LUMS *Lahore, Pakistan*

- Designed and taught a Data Science and Visualization project-based course to 70+ high school students.

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.

Projects

Helpful Hangman | *React, Vite, Flask* | English 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*
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 a narrative-based ambient interface that continually encourages sustainable behavior by utilizing the user's smartphone wallpaper.

Caraamad - Safe Mobility for Women App | *Miro, Figma*   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: Transformers, PyTorch, TensorFlow, openCV, Huggingface, LangChain, pandas

HONORS AND AWARDS

Fulbright Scholarship   2025
Masters   *Pittsburgh, PA*
- Received a highly competitive Fulbright Scholarship (4.8% acceptance rate) to study at Carnegie Mellon University, representing Pakistan in the inaugural AI Systems Management cohort.

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.