

# Mohammad Taha Zakir

+92 336 3789200 | [taha.zakir2@gmail.com](mailto:taha.zakir2@gmail.com) | [linkedin.com/in/taha-zakir206](https://linkedin.com/in/taha-zakir206) | [github.com/tahazakir](https://github.com/tahazakir)  
[My Portfolio](#)

## EDUCATION

### Lahore University of Management Sciences (LUMS)

Lahore, Pakistan

*Bachelor of Science in Computer Science*

*Aug. 2019 – May 2023*

- CGPA: **3.62/4.00** | Major CGPA: **3.67/4.00**
- Graduated with Distinction
- Placed on Dean's Honor List for academic excellence

### Relevant Coursework

**App Development:** Data Structures, Algorithms, Advanced Programming, Databases, Software Engineering

**AI:** Machine Learning, Deep Learning, Mathematical Foundations of Machine Learning, Data Science

**HCI:** Human-Computer Interaction, Information and Communication Technology for Development, Human Behavior

## RESEARCH EXPERIENCE

### Kahaani - Audiobooks and Language Learning for Children

Aug. 2023 – Present

*Research Assistant | 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. Case study can be accessed [here](#).
- Designed and developed a speech-based chatbot for Urdu language learning tailored toward K-8 students.

### Super Abbu - Maternal Health Information Platform

Jan. 2023 – Present

*Research Assistant | Advisors: Dr. Agha Ali Raza and Proff. 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. 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.

### 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.

### Research Writing Intern

June 2021 – August 2021

*Institute: LUMS*

*Lahore, Pakistan*

- 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

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### Technical Content Engineer

July 2023 – Present

*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

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### 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

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**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

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### **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.