Haisum Haroon

3rd Year Computer Science Undergraduate, Information Technology University (ITU)
haisumharoon@gmail.com (+92) 320 004 6847 Lahore, Punjab, Pakistan

OVERVIEW

I study the **reliability, security** and **fairness** of intelligent systems, such as **large scale software systems** and **large language models** (llms), through rigorous testing and system development. My recent research focuses on (1) **automated test repair** for software testing, and (2) evaluating **LLMs for disability-related bias and fairness**. Through my work, I aim to build secure, reliable and human-centered software systems.

SKILLS

Technical: C++, Python, Java, C, SQL, MongoDB, Firebase, Android Development, Web Development (HTML/CSS/JS), OpenAI/LLM APIs.
Research: Experimental Design, User Study Design, Quantitative & Qualitative Data Analysis, Statistical Testing, Thematic Analysis, Dataset Curation, Critical Thinking, Technical Writing.
Selected Coursework: Computer Networks, Operating Systems, Databases, Data Structures, Algorithms, Statistics, OOP, Artificial Intelligence.

RESEARCH EXPERIENCE

Research Assistant — Darko Marinov, UIUC+ Research Program *Mar 2025 – Present*

- Selected from **1,500+ international applicants** for a research program in software engineering.
- Conducted an in depth **literature review** on **automated test repair** and **software testing**, including papers from FSE, ISSTA, and USENIX.
- Implemented and evaluated automated testing pipelines, analyzing **repair reliability, obsolete test detection, test coverage, mutation behavior, and flaky tests**; studied techniques such as **symbolic** and **concolic execution**.
- Wrote reproducibility scripts in Python to validate results across multiple testing frameworks.

Research Assistant — Rukhshan Haroon, Tufts University *May 2025 – Oct 2025*

- Investigated **bias in large language models (LLMs)** when interpreting autistic vs. neurotypical communication across structured, cross-neurotype dialogue scenarios.
- Curated and revised a dataset of **two-turn dialogues** in collaboration with autistic advisory board members.
- Designed and conducted **1,200+ controlled GPT-4o evaluations** across four prompt conditions to measure how autism disclosure and framing influence model judgments.
- Conducted **paired statistical analysis** using the Stuart–Maxwell test for marginal homogeneity, with **Holm–Bonferroni correction** for multiple comparisons, to quantify distribution shifts across conditions.
- Performed **thematic analysis** (Braun & Clarke) on model explanations using NVivo to identify recurrent reasoning patterns.

Research Assistant — Dr. Faisal Bukhari, AIT/Punjab University *Jan 2025 – April 2025*

- Conducted a **mixed-methods study** on a mental health chatbot; recruited 50 participants via simple random sampling and collected 3–20 day interaction data.
- Gathered structured survey responses on emotional support, satisfaction, usability, demographics.
- Applied multiple statistical tests: **Wilcoxon signed-rank**, **Mann–Whitney U**, **McNemar's**, **Chi-square**, **Kruskal–Wallis H**, **Spearman's rank correlation** etc.
- Analyzed relationships between age, education, gender, retention, interaction time, perceived helpfulness, and effectiveness of chatbot against different mental health disorders.

Research Assistant — Dr. Faisal Bukhari, AIT/Punjab University *Dec 2023 – Jul 2024*

- Led a user study of 40 participants on privacy practices with **hands-on inspection of participants' devices** to assess settings, permissions, and data-sharing behaviors across **six privacy domains**.
- Designed and administered surveys, performed preprocessing and applied **quasi-Poisson regression modeling** to analyze trends.
- Identified **gender-based behavior–perception gaps** and presented findings for privacy education and policy.

PROGRAMMING PROJECTS

XenVault — *C++, Python, Flask, HTML/CSS, JavaScript, SQLite*

- Developed a **fault-tolerant distributed storage system**

- Implemented **TCP/IP socket programming** with **Winsock2** for robust inter-node communication.
- Engineered a **dynamic chunking** mechanism and metadata management with **XOR encryption** to distribute files across multiple nodes. Developed **reassembly maps** for accurate file reconstruction and ensured data integrity with checksums.
- Built **web interface** supporting file uploads, retrieval, and deletion.

DriveSense — *Android Studio, Java*

- Built a **driving behavior monitoring app** that detects unsafe events including harsh braking, sharp turns, over-speeding, and rapid acceleration.
- Implemented **real-time event detection logic** using accelerometer, GPS, and speed sensors.
- Tracked trips in **persistent internal storage**, recording timestamps, geolocation, and violations.
- Visualized trips and designed a **multi-screen UI** with banner/interstitial ads for monetization using **Google AdMob** and **Google Maps API**

Apparel Management System — *React.js, Tailwind CSS, ASP.NET, C#, SQL, WebRTC*

- Developed a **full-stack web platform** featuring secure authentication, inventory/order management, and role-based admin and customer dashboards.
- Integrated an **AI-powered chatbot** to enhance customer experience and implemented **WebRTC video conferencing** for live online fashion courses.
- Ensured **scalable, secure hosting** with real-time updates and efficient transaction workflows.

TriviumElite — *Firebase, Java, Android Studio*

- Built an **educational quiz app** offering adaptive difficulty and multi-subject support.
- Implemented **secure authentication** and real-time leaderboard using **Firebase**.
- Added performance analytics and **API-based dynamic question fetching**.

EDUCATION

Information Technology University (ITU), Lahore, Pakistan
Bachelor of Science in Computer Science, Expected Graduation: 2027

HONORS AND ACHIEVEMENTS

Selected Research Assistant, UIUC+ Program (5% acceptance rate) 2025
Gold Honor, International Youth Math Challenge (Ranked Top 1% in the World) 2021