

Zainab Iftikhar

PH.D. CANDIDATE · HUMAN COMPUTER INTERACTION · MACHINE LEARNING

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My research focuses on developing human-centered AI systems. By emphasizing diverse human needs and data-driven decision-making. I create systems that facilitate meaningful interactions, improve collaboration, and support mental well-being in tech-mediated spaces.

Education

Brown University, Dept. of Computer Science

PH.D. COMPUTER SCIENCE

- Advisor: Jeff Huang

Providence, RI

Sep 2021 - May 2027

National University of Computer & Emerging Sciences (NUCES)

B.SC. COMPUTER SCIENCE

- Cum Laude | Dean's List 2014-18
- Advisors: Mehreen Saeed & Mubasher Baig | Thesis: [Mitigating Bias in Hiring with Conversational Agents](#)

Lahore, PK

Aug 2014 - May 2018

Publications

CONFERENCES (* DENOTES EQUAL CONTRIBUTION)

- **Zainab Iftikhar**, Sean Ransom, Amy Xiao, Jeff Huang. Evaluating Peer and AI Counselors' Responses in Online Cognitive Behavioral Therapy Sessions. In Proceedings of the 2023 Conference on Computer-Supported Cooperative Work (CSCW '24). ACM. (*under review*)
- Sara Syed*, **Zainab Iftikhar***, Amy Xiao, Jeff Huang. (2023) Machine and Human Interpretation of Empathy in Online Peer Support: A Cognitive Behavioral Approach. In Proceedings of the 2023 Conference on Human Factors in Computing Systems (CHI '24). ACM
- **Zainab Iftikhar**, Yumeng Ma, Jeff Huang. (2023) "Together but not together": Evaluating Typing Indicators for Interaction-Rich Communication. In Proceedings of the 2023 Conference on Human Factors in Computing Systems (CHI '23). ACM.
- **Zainab Iftikhar**, Qutaiba Rohan ul Haq, Osama Younus, Taha Sardar, Hammad Arif, Mobin Javed, Suleman Shahid (2021) Designing Parental Monitoring and Control Technology: A Systematic Review. In Human-Computer Interaction-INTERACT 2021: 18th IFIP TC 13 International Conference, Springer
- Suleman Shahid, **Zainab Iftikhar**, Rabiah Arshad, Omar Mubin, Abdullah Al Mahmud (2021) Child-Computer Interaction in the Global South: Designing for Children on the Margins. In Interaction Design and Children (IDC '21). ACM

JOURNALS

- **Zainab Iftikhar**, Rabiah Arshad, Suleman Shahid. Enhancing User Engagement in mHealth Apps for Depression Management & Behavior Change: A Systematic Review of Persuasive Design Principles. In Behavior & Information Technology. (*under review*)
- Mahmoud Elkhodr, Omar Mubin, **Zainab Iftikhar**, Maleeha Masood, Belal Alsinglawi, Suleman Shahid (2021) Technology, Privacy, and User Opinions of COVID-19 Mobile Apps for Contact Tracing: Systematic Search and Content Analysis. In Journal of Medical Internet Research (JMIR)

Research Experience

Brown HCI Lab

PHD STUDENT

Providence, RI

Sep 2021 - Present

- **Extracting Sleep Data from Wearable Devices** Intercepting network traffic between sleep wearables & cloud to extract sleep data and explore practical constraints of real-world tracking devices in assessing sleep and heart rate among individuals affected by Alzheimer & Dementia
- **Responsible GenAI for Therapeutic Support** Conducting a comparative analysis of human and AI responses in therapeutic support using PyTorch and OpenAI. Evaluated quality, validity, and privacy implications of responses, and addressed biases in GenAI algorithms [\[website\]](#)
- **Analyzing Language Shifts in Therapeutic Sessions with ML** Explored speech patterns, sentiment, and linguistic markers for insights into emotional states. Using SVM, BERT, LIWC and POS Tags, identified key markers, informing personalized mental healthcare
- **Relationship Informatics: Visualizing Communication Data for Self-Reflection** Building interfaces using Flask, SciPy and Hugging-face that utilize communication data to help individuals analyze their communication patterns and understanding of relationship dynamics [\[website\]](#)
- **Prototyping Interactive Text-Based Communication Interfaces** Developed predictive and interactive user interfaces using JavaScript to enhance text-based peer support conversations that enabled effective communication and engagement
- **Live Typing for Remote Collaboration** Developed and evaluated interactive typing indicators using NodeJS increase users' social presence in remote communication. Conducted a mixed-methods study with 24 participants to investigate their impact on task-based collaboration [\[code\]](#)

Human Computer Interaction for Inclusion, Well-being and Learning Lab

Lahore, PK

RESEARCH ASSOCIATE

Dec 2019 - Aug 2021

- **Virtual Showdown: An Accessible Virtual Reality Game for Pakistani Visually Impaired Youth** Developed a customised VR game for Pakistani youth by examining the contextual changes in existing VR systems and the difference in body movement strategies adopted by the participants
- **Interactive CBT and Storytelling to Improve Mental Health** Implemented interactive storytelling and gamification features in Unity to enhance self-guided therapy. Resulted in a significant 30% increase in user engagement, improving mental health outcomes.
- **Accessible XAI in COVID-19 Information Dissemination** Implemented a COVID-19 chatbot using eXplainable Artificial Intelligence (XAI) to provide users with accurate info on COVID-19. Achieved 90% user satisfaction rate and successfully addressed over 10,000 inquiries [website]
- **Empowering Women through Pakistan's First Legal Q&A System** Developed Pakistan's first Q&A System using Node.js, Python, and Angular, aimed at educating women. Empowered 5,000+ women, leading to a 50% increase in reported instances of legal actions against abuse [website]

Intelligent Interviewer: Mitigating Bias in Hiring with an AI Conversational Agent

Lahore, PK

SENIOR THESIS | OUTSTANDING THESIS AWARD

May 2017 - May 2018

- Developed *Intelligent Mock Interviewer*, a AI powered conversational agent to address and mitigate hiring bias in the recruitment process
- Implemented multimodal ML system to assess candidate personality from visual and audio features using NumPy, TensorFlow, PyTorch and NLTK. Employed debiasing techniques to ensure fair and equitable decision-making

Work Experience

Human Computer Interaction for Inclusion, Well-being and Learning Lab

Lahore, PK

PRODUCT LEAD

Dec 2019 - Aug 2021

- Designed, developed and evaluated social support healthcare interactive systems for people with disabilities in Pakistan using mixed research methods (logs data, ethnography, interviews, survey analysis)
- Consultatively launched five web-based and two Android research prototypes into production applications by analyzing user requirements, prototyping wireframes, and presenting business cases and system specifications to multiple stakeholders

Pantera Energy

Lahore, PK

SOFTWARE ENGINEER

July 2018 - Dec 2019

- Developed Pantera energy Saver, using Flask, MongoDB and Angular, to optimize the performance of solar energy systems through data analysis and algorithmic improvements, resulting in a 10% increase in energy efficiency and 15% reduction in maintenance costs
- Developed Pantera's scalable solar energy monitoring and control system using SCADA and Python, resulting in improved real-time visibility and control for 500+ solar energy systems, and a 25% reduction in maintenance costs
- Build machine learning-based predictive maintenance algorithms, reducing system downtime by 20% and minimizing on-site maintenance visits by 30%

Awards, Fellowships, & Grants

- 2022 - 23 **Travel Grant for CHI'22 & CHI'23**, Brown University
- 2022 **GHC Scholarship**, Grace Hopper Celebration of Women in Computing
- 2021 **Travel Grant for INTERACT'21**, National Centre for Cyber Security
- 2020 **Leadership Award**, Promoted to Product Lead, LUMS HCI Lab
- 2019 **Performance Excellence Award**, Pantera Energy
- 2014 - 18 **Academic Excellence Award (Silver Medalist) x3**, NUCES

US, DE

Florida, FL

Bari, IT

Lahore, PK

Lahore, PK

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Service

- 2023 - 24 **Student Leader**, Graduate Outdoor Adventure Program
- 2023 **Session Chair**, ACM CHI
- 2023 - 24 **PhD Student Liasion (Muslim Student Association)**, Brown University
- 2022 - 23 **PhD Student Representative (Diversity and Inclusion Initiative)**, Brown University
- 2022 - 23 **Study Group Leader (NSF REU Site)**, Brown University
- 2021 - 23 **Paper Reviewer (x3)**, ACM CHI (x3), ACM CSCW (x1)
- 2020 **FWS And Roots Millennium Schools**, Autism Educator

Providence, RI

Hamburg, DE

Providence, RI

Providence, RI

Providence, RI

Providence, RI

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Teaching Experience

- Spring '21 **Computer Networks**, Instructor
- Spring '21 **Topics in Human-Computer Interaction**, Teaching Assistant, LUMS
- 2019 - 20 **Design & Analysis of Algorithms**, Teaching Assistant, NUCES
- Spring'19 **Artificial Intelligence**, Teaching Assistant, NUCES
- Spring'18 **Human Computer Interaction**, Teaching Assistant, NUCES

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Mentoring

2021 – 23 **Amy Xiao, Jieyun Li, Sara Syed**, Brown HCI Lab

Providence, RI

2022 – 23 **Yumeng Ma**, Distributed Research Experiences for Undergraduates (DREU)

Providence, RI

Fall '22 **Andrew Li**, Brown University (Fall UTRA)

Providence, RI

Spring '22 **Yitian Cao**, ExploreCSR (Now at Purdue)

Providence, RI

2021 **Abdul Moeed Asad**, LUMS HCI Lab (Now at Purdue)

Lahore, PK

2021 **Ali Asghar Aamir**, LUMS HCI Lab (Now at Purdue)

Lahore, PK

2021 **Mehreen Masood**, LUMS HCI Lab (Now a Ph.D. Student at UC Irvine)

Lahore, PK

Skills

Python, JAVA, C++, JavaScript, SQL, React, Angular, Amazon Redshift, AWS Lambda, Heroku, TensorFlow, PyTorch, NLTK, Experimental Design, Data Collection, Quantitative Analysis (server logs, user behavior, surveys), Qualitative Analysis