

# Zainab Iftikhar

PHD CANDIDATE · HUMAN-COMPUTER INTERACTION · MACHINE LEARNING · CSCW

✉ zainab\_iftikhar@brown.edu | 🏠 zainabiftikhar.com | 📷 zainabiftikhar

*My research focuses on creating systems to enhance technology-driven accessibility and equitable tech use in mental health support, legal aid, and public health information by combining machine learning, NLP, and AR/VR methods.*

## Education

### Brown University

PH.D. IN COMPUTER SCIENCE

Advisor: Jeff Huang

Providence, RI

2021 – 2027

### Brown University

SC.M IN COMPUTER SCIENCE

Coursework: Computational Linguistics, HCI, Deep Learning, Data Science, UI/UX

Providence, RI

2021 – 2023

### National University of Computer & Emerging Sciences (NUCES)

B.Sc. COMPUTER SCIENCE

Cum Laude | Top 5 Students | Dean's List 2014 - '18 | Silver Medalist (x3)

Coursework: HCI, Artificial Intelligence, Software Engineering, Design & Analysis of Algorithms

Lahore, PK

2014 – 2018

## Publications

*\* denotes equal contribution*

### CONFERENCES

(in review) **Zainab Iftikhar**, Sean Ransom, Amy Xiao, Jeff Huang. 2024. Evaluating Peer and Large Language Model's (LLM) Responses in Online Cognitive Behavioral Therapy Sessions. CSCW '24.

(to appear) Sara Syed\*, **Zainab Iftikhar\***, Amy Xiao, Jef Huang. 2024. Machine and Human Interpretation of Empathy in Online Peer Support: A Cognitive Behavioral Approach. CHI '24.

**Zainab Iftikhar**, Yumeng Ma, Jeff Huang. 2023. "Together but not together": Evaluating Typing Indicators for Interaction-Rich Communication. CHI '23. [pdf] [code]

**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. INTERACT '21. [pdf]

### JOURNALS

(in review) **Zainab Iftikhar**, Rabiah Arshad, Suleman Shahid. 2023. Enhancing User Engagement in mHealth for Depression Management & Behavior Change: A Systematic Review of Persuasive Design Principles. BIT '24.

Mahmoud Elkhodr, Omar Mubin, **Zainab Iftikhar**, Maleeha Masood et al. 2021. Technology, Privacy, & User Opinions of COVID-19 Mobile Apps for Contact Tracing: Systematic Search & Content Analysis. JMIR '21. [pdf]

### WORKSHOPS, EXTENDED ABSTRACTS & PROGRAM POSTERS

Suleman Shahid, **Zainab Iftikhar**, Rabiah Arshad, Omar Mubin, Abdullah Al Mahmud. 2021. Child-Computer Interaction in the Global South: IDC '21. [pdf]

Yitian Cao, **Zainab Iftikhar**, Amy Greenwald. 2022. Biases in "fair" hiring algorithms: A Fairness Analysis. ExploreCSR '22: Socially Responsible Artificial Intelligence partnered with Google Research. [pdf]

Manar Abdelatty, **Zainab Iftikhar**, Titas Grusnius, Tyler Jacobson (2022) Attention-Based Object Detection: A Scalable Re-implementation. Deep Learning Day '22. [pdf]

## Research Experience

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### Brown University

Providence, RI

ADVISOR: JEFF HUANG

2021 - Present

- Developing systems to improve human-AI interaction in healthcare, wellness and mental health contexts
- Working on text-based systems across social media and messaging channels to analyze, visualize, and understand communication patterns for improved collaboration and task performance
- Integrating machine learning algorithms with social data analysis to uncover insights into human interconnectedness, self-reflection and collaboration for translating complex data into actionable reflection

### Lahore University of Management Sciences

Lahore, PK

CO-ADVISORS: SULEMAN SHAHID, MOBIN JAVED

2019-2021

- Designed, developed, and evaluated AI-based, ethically conscious social support healthcare interactive systems for individuals with disabilities in Pakistan.
- Successfully transitioned seven research applications, including three web-based, two mobile and two AR/VR systems, into production by conducting mixed-methods research.

### National University of Computer & Emerging Sciences

Lahore, PK

CO-ADVISORS: MEHREEN SAEED, MUBASHER BAIG

2014-2018

- Honor's Thesis: Assessing Reliability, Trust and Transparency in Multi-Modal Hiring Algorithms [pdf]
- Implemented multimodal ML system to assess candidate personality from visual, audio and interview speech using NumPy, TensorFlow, PyTorch and NLTK. Employed debiasing techniques to ensure fair and equitable decision-making

## Research Projects

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### OPEN SOURCE

**Live Typing.** 2022. Real-time typing indicators to increase social presence for improved collaboration & task performance.

App: <https://www.npmjs.com/package/live-typing>

Code: <https://github.com/brownhci/live-typing>

### SYSTEMS

**Sochiatrist.** 2021 – Present. A social data extractor to predict signals of self-reflection from social media & messaging data.

App: <https://sochiatrist.cs.brown.edu/>

**Cheeserburger Therapy.** 2021 – Present. An accessible chat-based platform that provides peer support through Cognitive Behavioral Therapy (CBT) to scale mental health support.

App: <https://cheeserburgertherapy.org>

**Corona Assisted.** 2021. Pakistan's first web-based chat and awareness platform in English and Urdu that integrates explainable Artificial Intelligence (XAI) for fact-checking information on COVID-19.

App: <https://corona.assisted.pk/en>

**HumQadam.** 2021. Pakistan's first question-answer awareness system (NLP) in English and Urdu to empower women regarding legal actions to take for gender-based violence and a referral directory for contact.

App: <https://play.google.com/store/apps/details?id=com.harismuneer.humqadam>

## Industry Experience

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### Lahore University of Management Sciences

Lahore, PK

PRODUCT LEAD

2019 - 2021

- Leading the research team in HCI Lab for Inclusion, Well-being and Learning Lab, I designed, developed and launched web, mobile and VR/AR health systems for neuro-divergent children, elderly suffering from dementia, visually impaired and low-literate populations in Pakistan

## Pantera Energy

### SOFTWARE ENGINEER

Lahore, PK  
2017 - 2019

- Developed Pantera energy Saver, using Flask, MongoDB and Angular, to optimize solar systems' performance through data analysis and algorithmic improvements, resulting in a 10% increase in energy efficiency and 15% reduction in costs
- Build ML-based predictive maintenance algorithms, reducing system downtime by 20% and minimizing on-site maintenance visits by 30%

## Awards, Fellowships, & Grants

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- 2023 **Conference Travel Fund, International Travel Fund (both for CHI'23)**, Brown University
- 2022 **Grace Hopper Celebration of Women Scholarship**, Brown University
- 2021 **Conference Travel Fund (INTERACT'21)**, National Centre for Cyber Security
- 2020 **Leadership Award, Promoted to Product Lead**, Lahore University of Management Sciences
- 2019 **Performance Excellence Award**, Pantera Energy
- 2018 **Outstanding Undergraduate Researcher Honorable Mention**, NUCES  
**Academic Excellence Award (Silver Medalist) x3**, NUCES

## Teaching Experience

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- 2022 – 2023 **NSF REU: AI for Computational Creativity**, Study Group Leader, Brown University
- Spring '21 **Topics in Human-Computer Interaction**, Teaching Assistant, LUMS
- Spring '21 **Computer Networks**, Teaching Fellow Position, NUCES
- 2019 – 2020 **Design & Analysis of Algorithms**, Teaching Assistant, NUCES
- 2019 – 2020 **Artificial Intelligence**, Teaching Assistant, NUCES
- Spring '18 **Human Computer Interaction**, Teaching Assistant, NUCES

## Research Mentorship

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- 2023 – 2024 **Amy Xiao**, Brown HCI Lab
- 2022 – 2023 **Jieyun Li**, Brown HCI Lab
- 2021 – 2022 **Sara Syed, now at Goldman Sachs**, Brown HCI Lab
- 2022 – 2023 **Yumeng Ma**, Distributed Research Experiences for Undergraduates (DREU)
- Spring '22 **Yitian Cao**, ExploreCSR, now at Goldman Sachs

**Mehreen Masood**, LUMS HCI Lab, now a Ph.D. Student at UC Irvine

## Service, Outreach and Review

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- 2023 – 2024 **Leader**, Graduate Outdoor Adventure Program, Brown University
- 2023 – 2024 **PhD Student Liaison**, Muslim Student Association, Brown University
- 2022 – 2023 **PhD Student Representative**, Diversity and Inclusion Initiative, Brown University
- 2023 **Session Chair**, ACM CHI
- 2021 – 2024 **Peer Reviewer**, ACM CHI (x4), ACM CSCW (x1)

## Skills

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**Programming:** Python, C++, Java, React, JavaScript, Node.js, Angular, MySQL

**Practices/Tools:** Tensorflow, PyTorch, Pandas, Sklearn, spaCy, NumPy, NLTK, Docker, EC2, Flask, AWS Lambda, Heroku

**HCI Research methods:** Experimental Design, Qualitative Analysis, Mixed methods, Log Analysis, Interview, Surveys, Contextual Inquiry, Usability Study, Thematic Analysis, Grounded Theory