Aimen Gaba

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Research Focus

Human-Computer Interaction, Information Visualization, Machine Learning, Fairness and Bias, User Perception, Trust in AI.

Education

University of Massachusetts Amherst
Amherst, MA, USA

PhD in Computer Science
Sep 2021 - May 2025 (expected)

- **Advisors:** Dr. Cindy Xiong Bearfield, Dr. Yuriy Brun
- **Thesis:** Natural Language and Visual Design can Influence Trust and Bias Perception in AI
- **Interests:** HCI, Data Visualization, Ethical AI, Trust in AI, Natural Language, Human perception, Fairness and Bias
- Achieved PhD candidacy with **distinction**

University of Massachusetts Amherst
Amherst, MA, USA

MS in Computer Science, GPA: 3.9
Sep 2021 - Dec 2023

- **Thesis:** How Visualization Design Affects Trust & Perceived Bias in Machine Learning
- **Courses:** Advanced Methods in HCI, Introduction to Neural Networks, Making Sense of Visual Information, Research Methods

Lahore University of Management Sciences
Lahore, Pakistan

BS in Computer Science
Aug 2014 - Jun 2018

- **Interests:** HCI, Affective Computing, Context-Aware Tools, Ed-Tech, Health Informatics
- **Courses:** Human-Computer Interaction, Computer Graphics, Topics in Interactive Computing

Work Experience

Adobe Research
College Park, MD, USA

Research Scientist/Engineer Intern
May 2024 - Aug 2024

- **Team**: Document Intelligence Lab under supervision of Dr. Ani Nenkova, Dr. Alexa F Siu, and Dr. Jack Wang
- Designed a novel prototype to include Search and Generative AI assistance in document-grounded user workflows and conducted extensive user interview studies to evaluate user preferences for generative vs. extractive responses
- **Skills:** User Interviews, Prototyping, Design Sprints, User Study Design, Quantitative Analysis

University of Massachusetts Amherst
Amherst, MA, USA

Research Assistant
Sep 2021 - Present

- Developed design recommendations for ML visualizations and visual analytics tools by investigating the impact of visualization design on fairness vs. accuracy trade-offs for decision making and identifying gender differences in decision making patterns
- Examined the impact of bias in large language models (LLMs) on trust and decision making among individuals of diverse gender identities
- Created a visualization design framework for ambiguous natural language comparisons, informing design implications through user interviews and empirical validation
- Advised by Dr. Emily Wall, Dr. Kyle Wm. Hall, Dr. Yuriy Brun, and Dr. Cindy Xiong Bearfield. Ongoing collaboration with **Tableau Research** under Dr. Vidya Setlur
- **Skills:** User-centered Design, Participant Recruitment & Interviews, Survey Design, Quantitative & Qualitative Analysis, Cognitive heuristics

Carnegie Mellon University
Pittsburgh, PA, USA

Visiting Researcher
Jul 2023 - Aug 2023

- Investigated how blind and low-vision individuals approach technology and innovation when given the opportunity to lead design efforts by employing speculative design methods (ongoing collaboration with Frank Elavsky and Dr. Dominik Moritz)
- **Skills:** Study Design, User Interviews, Thematic Analysis, Longitudinal Study, Speculative design, Human factors

Tower Technologies (Pvt.) Ltd
Lahore, Pakistan

UX/UI Designer
Jun 2019 - Mar 2020

- Constructed user personas and storyboards by conducting user research, formulated the solution with user flow diagrams and brainstorming, built the lo-fi prototypes and wire-frames, and eventually hi-fi prototypes iteratively tested by the users.
- **Skills:** User Experience (UX), Design Thinking, Adobe Photoshop, Lo-fi & Hi-fi Prototyping, Leadership

United We REACH
Lahore, Pakistan

Management Trainee Officer
Aug 2018 - Jan 2019

- Collaborated with a four-person team to develop a CNN model that utilised YOLO as a foundation to improve the accuracy of ambient lighting conditions in the Mobile net architecture.
- **Skills:** RStudio with RMarkdowns, ggplots2, Statiscal analysis in R.

Teaching Experience

University of Massachusetts Amherst *Amherst, MA, USA*
Teaching Assistant *Spring 2022 & Spring 2023*
- **Course**: Introduction to UX Research (CS 490U)
- **Instructor**: Dr. Cindy Xiong Bearfield
- Delivered lectures on UX research principles and practices, as well as guiding students in using the R statistical software for data analysis. In addition to grading assignments and projects, I provided detailed feedback to support student learning. I also assisted the students by clarifying concepts and answering questions to ensure a deeper understanding of the course material.

Lahore University of Management Sciences *Lahore, Pakistant*
Teaching Assistant *Fall 2017*
- **Course**: Computer Organization and Assembly Language (CS320)
- **Instructor**: Dr. Mohammad Jahangir Ikram
- Led the course staff as the Teaching Assistant. Designed and evaluated final course projects, assignments, and quizzes using Assembly language, C++, and Proteus.

Publications

My Model is Unfair, Do People Even Care? Visual Design Affects Trust and Perceived Bias in Machine Learning *IEEE VIS, Melbourne, Australia*
Aimen Gaba, Zhanna Kaufman, Jason Cheung, Marie Shvakel, Kyle Hall, Yuriy Brun, and Cindy Xiong Bearfield *Oct 2023*

Comparison Conundrum and the Chamber of Visualizations: An Exploration of How Language Influences Visual Design *IEEE VIS, Oklahoma, USA*
Aimen Gaba, Vidya Setlur, Arjun Srinivasan, Jane Hoffswell, and Cindy Xiong *Oct 2022*

How Do We Measure Trust in Visual Data Communication? *IEEE BELIV, Oklahoma, USA*
Hamza Elhamdadi, Aimen Gaba, Yea-Seul Kim, and Cindy Xiong *Oct 2022*

Reasoning Affordances with Tables and Bar Charts *IEEE TVCG, Melbourne, Australia*
Cindy Xiong, Elsie Lee Robbins, Icy Zhang, Aimen Gaba, and Steven Franconeri *Jan 2023*

Bias, Accuracy, and Trust: Gender-Diverse Perspectives on Large Language Models *Under Review*
Aimen Gaba, Emily Wall, Tejas Ramkumar Babu, Kyle Hall, Yuriy Brun, and Cindy Xiong Bearfield *Feb 2025*

Tulna: A Chain-of-Thought Approach for Interpreting Natural Language Comparisons in Visual Analytics *In Preparation*
Vidya Setlur, Aimen Gaba, Kylie Lin, and Cindy Xiong Bearfield *UIST 2025*

Understanding How Blind and Low-Vision Users Perceive, Design, and Innovate in Assistive Technology *In Preparation*
Aimen Gaba, Frank Elavsky, Dominik Moritz, and Cindy Xiong Bearfield *CHI 2025*

Awards & Honors

Current	**Responsible Technology Coalition Leadership Team Member** , University of Massachusetts Amherst	*Amherst, USA*
2024	**GHC Scholar (UMass CICS Scholarship),** Grace Hopper Celebration	*Philadelphia, USA*
2021-23	**CSWomen Social Events Coordinator,** University of Massachusetts Amherst	*Amherst, USA*
2023	**Tapia Scholar (UMass CICS Scholarship),** ACM Richard Tapia Conference	*Dallas, USA*
2022	**CRA Scholar,** CRA-WP for IDEALS	*San Diego, USA*
2022	**Visiting Graduate Student with Jamie Morgenstern,** University of Washington	*Seattle, USA*
2022	**Student Volunteer at Undergraduate Research Night,** University of Massachusetts Amherst	*Amherst, USA*
2021	**$10,000 Research Scholarship,** Adobe Research	*Amherst, USA*
2021	**$4,000 CICS PhD Scholarship,** University of Massachusetts Amherst	*Amherst, USA*

Skills

Programming	Python (Pandas, NumPy), Vega-Lite, R, C++, HTML/CSS, D3, JavaScript
User Research	Qualitative Analysis, Quantitative Analysis, User Experience (UX) Design, User Interviews, User Surveys
Analysis	Statistical Analysis (ANOVA, t-test, Regression), Bootstrapping, Thematic analysis
Soft Skills	Time Management, Teamwork, Problem-solving, Documentation, Engaging Presentation