

Aimen Gaba

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Research Interests

I work at the intersection of Human-Computer Interaction and Data Visualization. I investigate how visual design affects trust and bias in machine learning models as well as how bias in large language models affects marginalized groups. I am also exploring how to design interactive alt-text experiences for blind and low-vision users.

Education

University of Massachusetts Amherst

Amherst, MA, USA

MS/PhD in Computer Science, GPA: 3.86

Sep 2021 - Current

- **Advisors:** Dr. Cindy Xiong, Dr. Yuriy Brun
- **Interests:** HCI, Data Visualization, Natural Language Interfaces, Fairness in ML Models.
- **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

University of Massachusetts Amherst

Amherst, MA, USA

Research Assistant

Sep 2021 - Present

- Ongoing collaboration with **Adobe Research** and **Tableau**.
- I investigate how natural language recommendation systems can better understand ambiguity and complexity of comparison queries to recommend visualizations that best align with users' intent. I also study how perceived fairness in ML models influences users' trust in these models.
- **Skills:** R, Python, Survey design, User Research, Design Sprints, Statistical Analysis, User Interviews, HTML/CSS, JavaScript, D3.

Carnegie Mellon University

Pittsburgh, PA, USA

Visiting Researcher

Jul 2023 - Aug 2023

- Worked with Dr. Dominic Moritz in the HCI Data Interaction Group to create alt-text experiences for blind and low-vision users.

University of Washington

Seattle, WA, USA

Visiting Researcher

Jul 2022 - Aug 2022

- Worked with Dr. Jamie Morgenstern at the Paul G. Allen School of Computer Science and Engineering.

University of Massachusetts Amherst

Amherst, MA, USA

Teaching Assistant

Jan 2023 - Jun 2023

- TA for **Introduction to UX Research (CS490U)** taught by Dr. Cindy Xiong.
- **Skills:** RStudio with RMarkdowns, ggplots2, Statistical analysis in R, User-centered Design.

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, Lowfi & Hi-fi Prototyping, Leadership, User studies, Tool Evaluation.

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?

Hamza Elhamdadi, [Aimen Gaba](#), Yea-Seul Kim, and Cindy Xiong

IEEE BELIV, Oklahoma, USA

Oct 2022

Reasoning Affordances with Tables and Bar Charts

Cindy Xiong, Elsie Lee Robbins, Icy Zhang, [Aimen Gaba](#), and Steven Franconeri

IEEE TVCG

Jan 2023

Additional Project Experience

Trust and Fairness in Machine Learning Models

Amherst, USA

University of Massachusetts Amherst

May 2022 - Current

- Research with **Dr. Cindy Xiong** and **Dr. Yuriy Brun** to look into how individuals' trust in machine learning models varies as their accuracy and fairness are varied, particularly investigating gender fairness.
- **Skills:** R (ggplot2), Python (pandas), Statistical Analysis, Survey design, Study design, Documentation.

QuickBuy: Aiding Fast Decision Makers with Online Shopping

Amherst, USA

University of Massachusetts Amherst

Jan 2022 - May 2022

- A tool that allows ordering products while shopping online with minimal cognitive load using psychological heuristics. Using this tool, users reported less information overload and mental fatigue as compared to online retailers such as Amazon.
- **Skills:** Prototyping, Adobe InDesign, Framer, Teamwork, Technical Writing, Literature Review, Evaluation.

Raabta: Augmentative and Alternative Communication (AAC) for Special Children

Lahore, Pakistan

Lahore University of Management Sciences

Jan 2018 - May 2018

- A tool to explore context-aware augmented and alternative communication (AAC) systems for children with intellectual disabilities, with a primary focus on Autism and Cerebral Palsy. Thorough literature review, interviews and focus groups were carried out to understand the needs of special children, speech therapists, and teachers. The effectiveness of the tool was evaluated through questionnaire and informal interviews.
- **Skills:** Prototyping, HTML/CSS, JavaScript, iBeacons, User study, Literature Review.

BloodHub: Connecting Donors to Patients

Lahore, Pakistan

Lahore University of Management Sciences

Sep 2016 - Dec 2016

- Designed and developed an **Android application** to connect blood donors to patients in Pakistan. The application implemented an optimum working platform developed through an in-depth analysis of user study, using the design process for analysis, prototyping, testing, and implementation.
- **Skills:** Android Studio, XML, JavaScript, Lowfi & Hifi prototyping, User studies, Study Evaluation, Design Thinking.

Achievements

2022 **Attendee**, CRA-WP for IDEALS

San Diego, 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

2021 **Student Volunteer**, IEEE VIS

Virtual Conference

2021 - Present **CSWomen Social Events Coordinator**, UMass Amherst

Amherst, USA

Skills

Programming Python (Pandas, NumPy), Vega-Lite, R (ggplot2), C++, HTML/CSS, D3, JavaScript.

Miscellaneous Tableau, \LaTeX (Overleaf/R Markdown), Git, MS Office Firebase, Shell (Bash/Zsh).

Soft Skills Time Management, Teamwork, Problem-solving, Documentation, Engaging Presentation.