Grace Guo

ML Interpretability | Explainable AI | Visual Analytics
gguo31@g.harvard.edu | Google Scholar | Personal Website | LinkedIn

Education

Georgia Institute of Technology *Atlanta, GA*
PhD Human-centered Computing *June 2024*

Carnegie Mellon University *Pittsburgh, PA*
BS Human-computer Interaction and Cognitive Science *May 2018*

Awards

IBM PhD Fellowship (1 of 10 worldwide, 2023)

Experience

Harvard University *Boston, MA*
Postdoctoral Fellow *Current*

- Develop novel interpretability methods for quantifying and evaluating concept distributions in generative AI outputs
- Collaborate with physicians at the Harvard Medical School to develop new AI and visual analytics systems to analyze highly multiplexed spatial data of tissues
- Mentor and advise students in the Doctoral Program

IBM Research *Cambridge, MA*
Research Intern *May 2023 - Aug 2023*

- Developed a novel framework for counterfactual explanation of AI image and video classification models in biomedical domains
- Built MiMICRI, an open-source visualization tool in JavaScript, D3, and React
- Built a Python embedding of MiMICRI to support the generation of in-domain counterfactual cardiac MRI images in JupyterLab
- MiMICRI was published and presented at ACM FAccT 2024

IBM Research *Cambridge, MA*
Research Intern *May 2022 - Aug 2022*

- Collaborated with the IBM Healthcare Analytics team on causal inference problems
- Built Causalvis, an open-source visualization package in JavaScript, D3, and React with a Python embedding to support causal inference analysis in JupyterLab
- Causalvis was published and presented at ACM CHI 2023

Pacific Northwest National Laboratory *Richland, WA*
Research Intern, National Security Internship Program *May 2020 - Aug 2020*

- Designed and built VAINE, a visualization system for interactively estimating causal effects in natural experiments
- VAINE was published and presented at IEEE VIS 2021

Skills

Languages & Frameworks: Python (Pandas, NumPy, scikit-learn, PyTorch), JavaScript (React, Vue, Svelte, D3.js, WebGL), Git
Data Analytics & Visualization: SQL, matplotlib, seaborn, Tableau, Looker, D3.js
Research & Communication: A/B testing, causal inference, experimental design, model evaluation, stakeholder storytelling, quantitative research methods, qualitative research methods
Generative AI & NLP: Explainable AI (XAI), retrieval-augmented generation (RAG), document parsing, prompt engineering, web scraping (Selenium, Beautiful Soup), text summarization

Publications

[1] Salma Abdel Magid, Weiwei Pan, Simon Warchol, **Grace Guo**, Junsik Kim, Mahia Rahman, and Hanspeter Pfister. 2025. Is What You Ask For What You Get? Investigating Concept Associations in Text-to-Image Models. Transactions on Machine Learning Research (TMLR) (2025).

[2] Simon Warchol, **Grace Guo**, Johannes Knittel, Dan Freeman, Usha Bhalla, Jeremy L Muhlich, Peter K Sorger, and Hanspeter Pfister. 2025. SEAL: Spatially-resolved Embedding Analysis with Linked Imaging Data. bioRxiv (2025), 2025–07. *(To appear in IEEE VIS 2025)*

[3] Grace Guo, Subhajit Das, Jian Zhao, and Alex Endert. 2025. More Like Vis, Less Like Vis: Comparing Interactions for Integrating User Preferences
Into Partial Specification Recommenders. IEEE Transactions on Visualization and Computer Graphics (2025).

[4] Mark S Keller, Eric Mörth, Thomas C Smits, Simon Warchol, **Grace Guo**, Qianwen Wang, Robert Krueger, Hanspeter Pfister, and Nils Gehlenborg. 2025. The State of Single-Cell Atlas Data Visualization in the Biological Literature. IEEE Computer Graphics and Applications (2025).

[5] **Grace Guo**, Lifu Deng, Animesh Tandon, Alex Endert, and Bum Chul Kwon. 2024. MiMICRI: Towards Domain-centered Counterfactual Explanations of Cardiovascular Image Classification Models. In Proceedings of the 2024 ACM Conference on Fairness, Accountability, and Transparency (FAccT). 1–14.

[6] **Grace Guo**, Aishwarya Mudgal Sunil Kumar, Adit Gupta, Adam Coscia, Chris MacLellan, and Alex Endert. 2024. Visualizing Intelligent Tutor Interactions for Responsive Pedagogy. In Proceedings of the 2024 International Conference on Advanced Visual Interfaces (AVI). 1–9.

[7] **Grace Guo**, John Stasko, and Alex Endert. 2024. What We Augment When We Augment Visualizations: A Design Elicitation Study of How We Visually Express Data Relationships. In Proceedings of the 2024 International Conference on Advanced Visual Interfaces (AVI). 1–6.

[8] Anh-Ton Tran, **Grace Guo**, Jordan Taylor, Katsuki Chan, Elora Raymond, and Carl DiSalvo. 2024. Situating Data Sets: Making Public Data Actionable for Housing Justice. In Proceedings of the 2024 CHI conference on human factors in computing systems (CHI). 1–16.

[9] **Grace Guo**, Ehud Karavani, Alex Endert, and Bum Chul Kwon. 2023. Causalvis: Visualizations for Causal Inference. In Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems (CHI). 1–20.

[10] **Grace Guo**, Maria Glenski, ZhuanYi Shaw, Emily Saldanha, Alex Endert, Svitlana Volkova, and Dustin Arendt. 2021. Vaine: Visualization and AI for natural experiments. In Proceedings of the 2021 IEEE Visualization Conference (VIS). IEEE, 21–25.

[11] Fabian Sperrle, Mennatallah El-Assady, **Grace Guo**, Rita Borgo, D Horng Chau, Alex Endert, and Daniel Keim. 2021. A Survey of Human-Centered Evaluations in Human-Centered Machine Learning. In Computer Graphics Forum, Vol. 40. Wiley Online Library, 543–568.

[12] Austin P Wright, Zijie J Wang, Haekyu Park, **Grace Guo**, Fabian Sperrle, Mennatallah El-Assady, Alex Endert, Daniel Keim, and Duen Horng Chau. 2020. A comparative analysis of industry human-AI interaction guidelines. arXiv preprint arXiv:2010.11761 (2020).

[13] **Grace Guo**, Bianchi Dy, Nazim Ibrahim, Sam Conrad Joyce, and Ate Poorthuis. 2020. Examining Design-Centric Test Participants in Graphical Perception Experiments. In EuroVis (Short Papers). 43–47.

[14] Ate Poorthuis, Lucas van der Zee, **Grace Guo**, Jo Hsi Keong, and Bianchi Dy. 2020. Florence: a Web-based Grammar of Graphics for Making Maps and Learning Cartography. Cartographic Perspectives 96 (2020), 32–50

[15] Sam C Joyce, **Grace Guo**, Bianchi Dy, Nazim Ibrahim, and Ate Poorthuis. 2019. Seeing numbers: Considering the effect of presentation of engineering data in design. In Proceedings of IASS Annual Symposia, Vol. 2019. International Association for Shell and Spatial Structures (IASS), 1–8.

Talks

Explainable AI *ACM FAccT, 2024*
MiMICRI: Towards Domain-centered Counterfactual Explanations of Cardiovascular Image Classification Models

Visual Tools for Education *ACM AVI, 2024*
Visualizing Intelligent Tutor Interactions for Responsive Pedagogy

Visualization II *ACM AVI, 2024*
When We Augment Visualizations: A Design Elicitation Study of How We Visually Express Data Relationships

Politics of Datasets *ACM CHI, 2024*
Situating Data Sets: Making Public Eviction Data Actionable for Housing Justice

Invited Talk @ Tableau Research *Salesforce, 2024*
Visualizations in Context: Toolkits for Expressive Visualization Augmentation

Making Sense & Decisions with Visualization *ACM CHI, 2023*
Causalvis: Visualizations for Causal Inference

Doctoral Colloquium *IEEE VIS, 2022*
Flexible and Expressive Augmentation of Domain-Specific Visualizations

AI+VIS *IEEE VIS, 2021*
VAINE: Visualization and AI for Natural Experiments

State-of-the-Art Reports (STARs) *EuroVis, 2021*
Survey of Evaluations in Human-Centered Machine Learning: Dimensions for Measuring Trust, Interpretability and Explainability

Teaching

CS 1710: Visualization
Fall 2025
Harvard SEAS

EC 2135: Data Visualization for Analysis and Communication
Spring 2025
Harvard Business School

CS4460: Introduction to Information Visualization
Spring 2023
Georgia Institute of Technology

CS7455: Issues in Human-Centered Computing
Spring 2022
Georgia Institute of Technology

CS4873: Computing, Society and Professionalism
Summer 2021
Georgia Institute of Technology

CS7450: Information Visualization
Fall 2020
Georgia Institute of Technology

85-211: Cognitive Psychology
Fall 2016, Fall 2017
Carnegie Mellon University

15-112: Fundamentals of Programming and CS
Fall 2015, Spring 2016
Carnegie Mellon University

Service

Conference Organizing Committee

Information+, IEEE Vis Posters Track
2025

Reviewing

CHI Papers, EuroVis Full Papers, CG&A Special Issue, TVCG Journal Papers
2025

CHI Papers, VIS Full Papers, VIS Short Papers, TVCG Journal Papers
2024

VIS Full Papers
2023