Dongping Zhang

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Research interests

My research lies at the intersection of Human-Computer Interaction and Artificial Intelligence, with a focus on designing interactive tools and visualization systems that enhance the interpretability, robustness, and real-world deployment of ML/AI systems. I build interfaces and frameworks that help users understand uncertainty and model behavior in AI-powered decision support systems, enabling more informed and trustworthy decisions. My work combines uncertainty quantification, human-centered design, and rigorous empirical validation through large-scale experiments and user studies.

Education

Northwestern University — Evanston, IL
Ph.D., M.S. in Technology and Social Behavior — 2018 - 2024
Dual Ph.D. in Computer Science and Communication Studies
Committee: Jessica Hullman (Chair), Jason Hartline, Matt Kay, Ágnes Horvát
Dissertation: *Strategies for Communicating Uncertainty in Predictive Systems for Enhanced Data-Driven Decision-Making*

The University of Chicago — Chicago, IL
M.A. in Computational Social Science — 2016 – 2018
Advisor: Luc Anselin

University of California, Berkeley — Berkeley, CA
B.A. in Statistics, B.A. in Economics — 2012 – 2016

Peer-reviewed publications

Zhang, Dongping, Angelos Chatzimparmpas, Negar Kamali, and Jessica Hullman (2024). "Evaluating the Utility of Conformal Prediction Sets for AI-advised Image Labeling." *Proc. 2024 CHI Conf. Hum. Factors Comput. Syst.*, Article 302. DOI: https://doi.org/10.1145/3613904.3642446
***Best Paper Honorable Mention* (*Top 5% of 4,028 paper submissions*)**

Zhang, Dongping, Jason Hartline, and Jessica Hullman (2024). "Designing Shared Information Displays for Agents of Varying Strategic Sophistication." *Proc. ACM Hum.-Comput. Interact.*, Volume 8, Issue CSCW1, Article 42, DOI: https://doi.org/10.1145/3637319

Zhang, Dongping, Eytan Adar, and Jessica Hullman (2021). "Visualizing Uncertainty in Probabilistic Graphs with Network Hypothetical Outcome Plots (NetHOPs)." *IEEE Trans. Vis. Comput. Graph.*, Volume 28, Issue 1, pp. 443-453. DOI: https://doi.org/10.1109/TVCG.2021.3114679

Open-sourced model

Zhang, Dongping and Uri Wilensky. "NetLogo Taxi Cabs Model". *Center for Connected Learning and Computer-Based Modeling*, Northwestern University, Evanston, IL. http://ccl.northwestern.edu/netlogo/models/TaxiCabs

Industry research experience

Research Scientist | AI + Data Visualization 2024 - Present
National Renewable Energy Laboratory Golden, CO
PI: Kristi Potter and Juliane Mueller
Project: Lead research at the intersection of AI and Data Visualization, developing novel visualization techniques to enhance AI-assisted decision-making in renewable energy applications. My work includes designing actionable uncertainty visualizations for large-scale surrogate models, enabling policymakers to interpret and interact with uncertainty in ensemble simulation outputs more effectively. Additionally, I investigate methods to visualize distribution shifts caused by noise from differential privacy mechanisms, ensuring the interpretability, privacy, and robustness of AI-driven decision support workflows. I collaborate closely with DOE stakeholders and academic partners to secure competitive funding, while also mentoring junior researchers and shaping research directions within the Computational Science Center.

Academic research experience

Graduate Research Assistant 2019 – 2024
MU Collective Research Lab, Northwestern University
PI: Jessica Hullman
Project: Developed and evaluated advanced uncertainty quantification techniques to communicate prediction uncertainty in machine learning and deep learning models. Engineered and implemented innovative design strategies for prediction interfaces, focusing on human-in-the-loop, data-driven decision-making. This approach not only facilitated informed user decisions for optimal system performance but also emphasized the importance of explainability and transparency in predictive modeling.

Graduate Research Assistant 2018 – 2019
Science of Networks in Communities, Northwestern University
PI: Noshir Contractor
Project: Utilized digital trace data to construct large social networks through ML/AI models. This involved processing large-scale user interaction data to infer and analyze complex social dynamics of tie formation, which unveiled key patterns and dynamics in social interactions within work organizations.

Academic Services

Program Committee / Reviewer
IEEE Workshop on Uncertainty Visualization — IEEE VIS 2025

Reviewer
The Journal of Visualization and Interaction — JoVI

Reviewer
IEEE Transactions on Visualization and Computer Graphics — IEEE TVCG

Program Committee / Reviewer
TVCG Journal Paper Track — IEEE PacificVis 2025

Program Committee / Reviewer
IEEE Workshop on Uncertainty Visualization — IEEE VIS 2024

Teaching experience

Teaching assistant, Department of Computer Science (Northwestern)
COMP_SCI 333: Interactive Information Visualization — Fall 2023

Teaching assistant, School of Communication (Northwestern)
COMM_ST 395: Rhetoric of Sports Marketing — Spring 2022

Invited talks

Designing Information Displays for Multi-agent Strategic Settings
ACM CSCW 2024

Uncertainty Quantification for AI-Advised Decision-Making
ACM CHI 2024

Conformal Prediction for Deep Learning Classifiers
A Symposium on Human+AI, The University of Chicago, October 2023

Visualizing Uncertainty Embedded in Probabilistic Graph Models
IEEE VIS 2021 Virtual

Predictive Extensions to ERGMs and Applications in Real-time Monitoring of Organizational Social Networks
Seventh International Workshop on Social Network Analysis (ARS'19)

Honors and scholarships

Segal Design Institute Research Cluster Fellowship — 2020 – 2021
Northwestern University
Selected as a research fellow to advance knowledge of design innovation.

Computational Social Sciences Tuition Award — 2016 – 2018
The University of Chicago
Received a merit-based tuition scholarship during my M.A. program.

Regents' and Chancellor's Scholarship 2012 – 2016
University of California, Berkeley
The most prestigious scholarship awarded to the top 2% of undergraduates.

Skills

Programming: R, Python, SQL
Web-based Prototyping: HTML, CSS, JavaScript
Developer Tools: Node.js, Bootstrap, Webpack, React, Firebase, Git, Figma
Information Visualization: D3.js, ggplot2, igraph, Tableau
Qualitative Methods: Ethnography, Research Interview, Observational Study, Survey Design, Design of Experiment
Quantitative Methods: Social Network Analysis, Agent-based Modeling and Simulation, Bayesian Modeling, Game Theory, Information Design, Data and Predictive Analytics, Machine Learning, Artificial Neural Network