Dongping Zhang

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Research interests

My research investigates effective means to quantify and visualize uncertainty inherent in ML/AI models, aiming to support more informed data-driven decision-making. I develop methods, tools, and interfaces to communicate forms of uncertainty that arise in data and predictive analytics. Through an interdisciplinary and mixed-methods approach, I use ML/AI models to dissect complex systems, design uncertainty quantification methods, and extract quantitative insights from large-scale online experiments.

Education

Northwestern University   Evanston, IL

Ph.D., M.S. in Technology and Social Behavior   *2018 - 2024*

Dual Ph.D. Program 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

	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
Mentor: Kristi Potter and Juliane Mueller
Project: Specialize in the intersection of Data Visualization and Artificial Intelligence, advancing both fields through fundamental research and applications related to renewable energy. Assist NREL in growing research by leading proposals and projects, mentoring students and junior staffs, and contributing to the strategic growth of the Computational Science Center.

Economic Research Assistant Summer 2017
Compass Lexecon Chicago, IL
Mentor: Todd Kendall
Project: Reproduced and validated statistical models that plaintiffs and their experts presented in defense of our clients. Engineered and automated the legal settlement data collection pipeline using web scraping.

Economic Research Assistant Summer 2016
PricewaterhouseCoopers Shanghai, PRC
Mentor: G. Bin Zhao
Project: Processed, analyzed, and visualized quarterly economic data and managed macro-economic database. Co-authored and published the inaugural edition of PwC China Economic Quarterly.

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.

Graduate Research Assistant   2016 – 2018
Center for Spatial Data Science, The University of Chicago
PI: Luc Anselin
Project: Designed algorithms through data wrangling and mining the origin-destination flows of 50 million Chicago taxi trips. Modeled urban mobility patterns, providing comprehensive insights into the city's transit dynamics.

Academic Services

Program Committee / Reviewers
IEEE Workshop on Uncertainty Visualization   IEEE VIS 2024

Program Committee / Reviewers
TVCG Journal Paper Track   IEEE PacificVis 2025

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 Infomation 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

Programming: R, Python, SQL
Web-based Prototyping: HTML, CSS, JavaScript
Developer Tools: Node.js, Bootstrap, Webpack, 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