

Dongping Zhang

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Research interest My research investigates effective means to quantify and communicate prediction uncertainty inherent in ML/AI models, aiming to support effective, data-driven decision-making. My work creates innovative interactive tools, prototypes, and methods for quantifying and visualizing various forms of uncertainty that arise in data and predictive analytics. Employing an interdisciplinary and mixed-methods approach, I utilize ML/AI models to dissect and elucidate large 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	<i>Expected 2024</i>
<i>Dual Ph.D. Program in Computer Science and Communication Studies</i>	
Committee: Jessica Hullman (Chair), Jason Hartline, Matt Kay, Ágnes Horvát	
Dissertation: Uncertainty Quantification for 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 publication

Zhang, Dongping, Angelos Chatzimparmpas, Negar Kamali, and Jessica Hullman. “Evaluating the Utility of Conformal Prediction Sets for AI-advised Image Labeling.” *Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems*. 2024. <https://doi.org/10.1145/3613904.3642446>

Zhang, Dongping, Jason Hartline, and Jessica Hullman. “Designing Shared Information Displays for Agents of Varying Strategic Sophistication.” *Proceedings of the ACM on Human Computer Interaction* 8. CSCW1 (2024): 1-34. <https://doi.org/10.1145/3637319>

Zhang, Dongping, Eytan Adar, and Jessica Hullman. “Visualizing Uncertainty in Probabilistic Graphs with Network Hypothetical Outcome Plots (NetHOPs).” *IEEE Transactions on Visualization and Computer Graphics* 28.1 (2021): 443-453. <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>

Academic research experience **Graduate Research Assistant** 2019 – present
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.

Industry research experience **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.

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 **Uncertainty Quantification using 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, 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