Wenxin Ding

Research Interest

My research interest lies in machine learning security and privacy. Specifically, I focus on bridging the gap between theoretical understanding and empirical practice. My research studies the safety behavior of machine learning models under strategically optimized training data. Recently, I have been working on problems regarding vulnerabilities of text-to-image diffusion models and developing tools for content creators against copyright infringement.

Education

University of Chicago Chicago, IL
Ph.D. in Computer Science (4.0 / 4.0) 2021.9 – 2026.6

Carnegie Mellon University Pittsburgh, PA
M.S. in Computer Science – Research Thesis (4.11 / 4.33) 2020.8 – 2021.8

B.S. in Computer Science and B.S. in Mathematical Sciences (3.92 / 4.0) 2016.8 – 2020.5
Minor in Computational Finance

Work Experience

Research Assistant, University of Chicago (Chicago, IL) 2021.9 – Present
Advisors: Prof. Heather (Haitao) Zheng and Prof. Ben Y. Zhao

- Design effective data poisoning attacks against text-to-image generative models as a tool to protect content creators from copyright infringement
- Develop analytical framework to quantify the change in diffusion model performance under data poisoning attacks
- Propose and implement methodology to train robust model versions by selecting augmented training data
- Theoretically formulate the optimal loss of robust multi-class classifiers and derive theorems to approximate the loss

Research Engineer, Qualcomm (San Diego, CA) 2025.6 – 2025.9
Mentors: Dr. Jonathan Petit and Dr. Cong Chen

- Evaluate black-box and white-box jailbreak attacks against vision language models (VLMs)
- Develop effective jailbreak attacks against VLMs
- Build new benchmark datasets for evaluating VLM safety commissioned by MLCommons

Research Assistant, Carnegie Mellon University (Pittsburgh, PA) 2019.2 – 2021.8
Advisors: Prof. Nihar B. Shah and Prof. Weina Wang

- Design mathematically modeling for score calibration of peer-review data
- Apply differential privacy to protect anonymity of reviewer identity
- Derive Pareto-optimal calibration method to trade-off data utility and user privacy

Peer-Reviewed Publications

Conferences

- **Wenxin Ding**, Cathy Li, Shawn Shan, Ben Y. Zhao, Haitao Zheng. "Understanding Implosion in Text-to-Image Generative Models." *in Proceedings of ACM SIGSAC Conference on Computer and Communications Security (CCS), 2024*.
- Shawn Shan, **Wenxin Ding**, Josephine Passananti, Haitao Zheng, Ben Y. Zhao. "Prompt-Specific Poisoning Attacks on Text-to-Image Generative Models." *in Proceedings of IEEE Symposium on Security and Privacy (S&P), 2024.*

- **Wenxin Ding**, Arjun Nitin Bhagoji, Ben Y. Zhao, and Haitao Zheng. "Towards Scalable and Robust Model Versioning." *in Proceedings of IEEE Conference on Secure and Trustworthy Machine Learning (SaTML), 2024.*
- Sihui Dai*, **Wenxin Ding***, Arjun Nitin Bhagoji, Daniel Cullina, Ben Y. Zhao, Haitao Zheng, and Prateek Mittal. "Characterizing the Optimal 0-1 Loss for Multi-class Classification with a Test-time Attacker." *in Proceedings of Advances in Neural Information Processing Systems (NeurIPS), 2023*. Spotlight paper.
(* for equal contribution)
- Shawn Shan, **Wenxin Ding**, Emily Wenger, Haitao Zheng, and Ben Y. Zhao. "Post-breach recovery: Protection against white-box adversarial examples for leaked DNN models." *in Proceedings of ACM SIGSAC Conference on Computer and Communications Security (CCS), 2022*.
- **Wenxin Ding**, Gautam Kamath, Weina Wang, and Nihar B. Shah. "Calibration with privacy in peer review." *in Proceedings of IEEE International Symposium on Information Theory (ISIT), 2022*.

Workshops

- Wenxin Ding, Nihar B. Shah, and Weina Wang. "On the privacy-utility tradeoff in peer-review data analysis." *AAAI Privacy-Preserving Artificial Intelligence (PPAI) workshop, 2021*. Spotlight paper.

Teaching Experience

Teaching Assistant

University of Chicago

- CMSC 25800 Adversarial Machine Learning
- CMSC 25300/35300 Mathematical Foundations of Machine Learning

Carnegie Mellon University

- 15110 Principles of Computing (Head Teaching Assistant)
- 15213 Introduction to Computer Systems
- 15440 Distributed Systems

Mentor

- Strong Women Strong Girls, Pittsburgh, PA

Service

Technical Program Committee

- 2025 ACM Conference on Computer and Communications Security (CCS)
- 2025, 2026 IEEE Conference on Secure and Trustworthy Machine Learning (SaTML)
- 2024 ACM Workshop on Artificial Intelligence and Security (AISec)

Reviewer

- Nature
- 2025 ACM SIGGRAPH Asia
- 2024, 2025 The Conference on Uncertainty in Artificial Intelligence (UAI)
- SIAM Journal on Mathematics of Data Science (SIMODS)

Awards

- 2025 University of Chicago William Rainey Harper Dissertation Fellowship
- 2024 University of Chicago UU Fellowship
- 2021 University of Chicago Eckhardt Scholar
- 2020 Carnegie Mellon University Senior Leadership Recognition
- 2019 Mark Stehlik SCS Alumni Undergraduate Impact Scholarship
- 2017 William Lowell Putnam Mathematical Competition (Rank: 255 / 4638)