

Data and Decision Sciences, 727 Prices Fork Rd.
Blacksburg, VA 24060
✉ haohuiw@vt.edu

Homepage: <https://wanghh7.github.io/>



Haohui Wang

Brief Biography

I am a fourth-year PhD student in the Computer Science Department at Virginia Tech. I am very fortunate to be advised by Prof. Dawei Zhou. My research interests lie in machine learning and AI for scientific discovery, with applications spanning cybersecurity and materials science. My enthusiasm is to study artificial long-tail intelligence as a unifying perspective for designing AI systems that can learn, reason, and generalize reliably under dynamic, out-of-distribution, and complex conditions, where critical behaviors often reside in the tail. I have authored 10+ publications in premier academic venues across AI, data mining, and information retrieval, including ICML, NeurIPS, KDD, ICDM, and NAACL. My work has been recognized with the Amazon Fellowship, the CCI SWVA Cyber Innovation Scholarship, and the KDD Student Travel Award.

Education

- 2022–Now **Virginia Tech**, Blacksburg, VA, USA,
Ph.D. in Computer Science, Advisor: Dawei Zhou.
- 2019–2022 **Zhejiang University**, Zhejiang, China,
M.S. in Probability and Mathematical Statistics, Advisor: Peng Zhang.
Thesis: Robust Entropy Strategy Active Learning Algorithm.
- 2015–2019 **Shandong University**, Shandong, China,
B.Sc. in Mathematics, Advisor: Shihua Zhang, Shujun Fu.
Thesis: Robust Bayesian Matrix Decomposition with Mixture of Gaussian Noise.

Professional Experience

- 08/2022–Now **Virginia Tech**, USA, Graduate Research Assistant.
- 04/2022– **Alibaba DAMO Academy**, China, Research Intern.
- 08/2022 Co-developed SOTA federated hetero-task learning benchmark (1.5K stars on GitHub).
- 09/2020– **DiDi Global**, China, Algorithm Intern.
- 01/2021 Built an active learning risk control model to predict payment behavior of 300K users.

Selected Awards and Honors

- 2025 Amazon Fellowship
- 2024, 2023 CCI SWVA Cyber Innovation Scholarship
- 2024, 2023 KDD Student Travel Award
- 2020 Honor for Graduate at Zhejiang University
- 2020 Tesla Competition Machine Learning Model Group, 7th out of 67 teams
- 2017 Loo-keng Hua Scholarship
- 2017 Outstanding Student Scholarship at Shandong University

Professional Services

- 2026 Reviewer, ACM Computing Surveys, IEEE Transactions on Network Science and Engineering, ICML, NeurIPS
- 2025 Presenter, Amazon-Virginia Tech AI Workshop
- 2025 Program Committee, WWW Companion Short Paper Track
- 2025 Reviewer, Medical Image Analysis, IEEE Transactions on Network Science and Engineering, ICLR AgenticAI Workshop, ICLR, NeurIPS, KDD
- 2025 Guest Lecture, CS4824: Machine Learning
- 2024 Reviewer, KDD, WWW
- 2024 Guest Lecture, CS6804: Machine Learning on Graphs
- 2024 Invited Talk, Oak Ridge National Lab, Deloitte AI Lab
- 2024 Organizer, WWW TrustLOG Workshop
- 2024 Conference Volunteer, KDD Conference
- 2023 Conference Volunteer, KDD Conference

Publications

- ICML Tianyu Pang, Vignesh Kothapalli, Shenyang Deng, Haohui Wang, Dawei Zhou, Yaoqing Yang. "Balancing Learning Rates Across Layers: Exact Two-Step Dynamics and Optimal Scaling in Linear Neural Networks". ICML, 2026.
- ACL Jianpeng Chen, Wangzhi Zhan, Haohui Wang, Brian Mayer, Dongqi Fu, Dawei Zhou. "PhyVer: Physics-Grounded Material Claim Verification with Multi-Fidelity Physical Evidence". ACL Demo, 2026.
- NeurIPS Haohui Wang, Shuaicheng Zhang, Si Zhang, Dawei Zhou. "HeroFilter: Adaptive Spectral Graph Filter for Varying Heterophilic Relations". NeurIPS, 2025.
- ICML Xinyue Zeng, Haohui Wang, Junhong Lin, Jun Wu, Tyler Cody, Dawei Zhou. "LensLLM: Unveiling Fine-Tuning Dynamics for LLM Selection". ICML, 2025.
- KDD Weijie Guan, Haohui Wang, Jian Kang, Lihui Liu, Dawei Zhou. "EVINET: Towards Open-World Graph Learning via Evidential Reasoning Network". KDD, 2025.
- KDD Jianpeng Chen, Wangzhi Zhan, Haohui Wang, Zian Jia, Jingru Gan, Junkai Zhang, Jingyuan Qi, Tingwei Chen, Lifu Huang, Muhao Chen, Ling Li, Wei Wang, Dawei Zhou. "MetamatBench: Integrating Heterogeneous Data, Computational Tools, and Visual Interface for Metamaterial Discovery". KDD, 2025.
- ICDM Adithya Kulkarni, Haohui Wang, Wangzhi Zhan, Jianpeng Chen, Dawei Zhou. "The End of Trial-and-Error: A Vision for Generative Intelligence in Metamaterial Design." IEEE International Conference on Data Mining Workshops, 2025.
- JBHI Tanmoy Sarkar Pias, Yiqi Su, Xuxin Tang, Haohui Wang, Shahriar Faghani, Danfeng Yao. "Enhancing Fairness and Accuracy in Diagnosing Type 2 Diabetes in Young Adult Population." IEEE Journal of Biomedical and Health Informatics, 2025.

- NAACL Jingyuan Qi, Zian Jia, Minqian Liu, Wangzhi Zhan, Junkai Zhang, Xiaofei Wen, Jingru Gan, Jianpeng Chen, Qin Liu, Mingyu Derek Ma, Bangzheng Li, Haohui Wang, Adithya Kulkarni, Muhao Chen, Dawei Zhou, Ling Li, Wei Wang, Lifu Huang. "MetaScientist: A Human-AI Synergistic Framework for Automated Mechanical Metamaterial Design." *NAACL Demo Track*, 2025.
- NeurIPS Haohui Wang, Weijie Guan, Jianpeng Chen, Zi Wang, Dawei Zhou. "Towards Heterogeneous Long-tailed Learning: Benchmarking, Metrics, and Toolbox." *NeurIPS D&B Track*, 2024.
- KDD Haohui Wang, Baoyu Jing, Kaize Ding, Yada Zhu, Wei Cheng, Si Zhang, Yonghui Fan, Liqing Zhang, Dawei Zhou. "Mastering Long-Tail Complexity on Graphs: Characterization, Learning, and Generalization." *KDD*, 2024.
- ICML Haohui Wang, Yuzhen Mao, Yujun Yan, Yaoqing Yang, Jianhui Sun, Kevin Choi, Balaji Veeramani, Alison Hu, Edward Bowen, Tyler Cody, Dawei Zhou. "EvoluNet: Advancing Dynamic Non-IID Transfer Learning on Graphs". *ICML*, 2024.
- Preprint Liuyi Yao, Dawei Gao, Zhen Wang, Yuexiang Xie, Weirui Kuang, Daoyuan Chen, Haohui Wang, Chenhe Dong, Bolin Ding, Yaliang Li. "A Benchmark for Federated Hetero-Task Learning". *arXiv preprint*, 2022.
- Neurocomputing Haohui Wang, Chihao Zhang, Shihua Zhang, "Robust Bayesian Matrix Decomposition with Mixture of Gaussian Noise". *Neurocomputing*, 2021.

Teaching and Mentoring Experience

- 2024-2026 Mentor for Junior PhD Students Xinyue Zeng and Weijie Guan, Virginia Tech
- 2019 Teaching Assistant, Math415 Linear Algebra, Zhejiang University