

Tianhao Wang

☎ +1-765-409-2725 • ✉ tianhao@virginia.edu • 🌐 tianhao.wang

Professional Experience

University of Virginia

Assistant Professor in Computer Science and Data Science

Jan 2022–

Carnegie Mellon University

Post Doctoral Fellow

Mentor: Elaine Shi

May 2021–Dec 2021

Education

Purdue University

PhD in Computer Science, GPA 4.00/4.00

Advisor: Ninghui Li

Aug 2015–May 2021

Fudan University

BS in Software Engineering, GPA 3.79/4.00 (Rank 1/79)

Advisor: Yunlei Zhao

Sep 2011–July 2015

Publication

Conference Papers.....

1. Privacy Audit as Bits Transmission: (Im)possibilities for Audit by One Run (USENIX'25)

Zihang Xiang, Tianhao Wang, Di Wang

2. White-box Membership Inference Attacks against Diffusion Models (PETS'25)

Yan Pang, Xuhui Kang, Mengdi Huai, Yang Zhang, Tianhao Wang

3. SPAS: Continuous Release of Data Streams under w -Event Differential Privacy (SIGMOD'25)

Xiaochen Li, Tianyu Li, Yitian Cheng, Chen Gong, Kui Ren, Zhan Qin, Tianhao Wang

4. From Easy to Hard: Building a Shortcut for Differentially Private Image Synthesis (SP'25)

Kecen Li, Chen Gong, Xiaochen Li, Yuzhong Zhao, Xinwen Hou, Tianhao Wang

5. Data-adaptive Differentially Private Prompt Synthesis for In-Context Learning (ICLR'25)

Fengyu Gao, Ruida Zhou, Tianhao Wang, Cong Shen, Jing Yang

6. Towards Understanding Unsafe Video Generation (NDSS'25)

Yan Pang, Aiping Xiong, Yang Zhang, Tianhao Wang

7. Black-box Membership Inference Attacks against Fine-tuned Diffusion Models (NDSS'25)

Yan Pang, Tianhao Wang

8. Trajdeleter: Enabling Trajectory Forgetting in Offline Reinforcement Learning Agents (NDSS'25)

Chen Gong, Kecen Li, Jin Yao, Tianhao Wang

9. Revisiting EM-based Estimation for Locally Differentially Private Protocols (NDSS'25)

Yutong Ye, Tianhao Wang, Min Zhang, Dengguo Feng

10. Delay-allowed Differentially Private Data Stream Release (NDSS'25)

Xiaochen Li, Zhan Qin, Kui Ren, Chen Gong, Shuya Feng, Yuan Hong, Tianhao Wang

11. **NetDPSyn: Synthesizing Network Traces under Differential Privacy (IMC'24 (Short Paper Track))**
Danyu Sun, Joann Qionga Chen, Chen Gong, [Tianhao Wang](#), Zhou Li
12. **Benchmarking Secure Sampling Protocols for Differential Privacy (CCS'24)**
Yucheng Fu, [Tianhao Wang](#)
13. **PreCurious: How Innocent Pre-Trained Language Models Turn into Privacy Traps (CCS'24)**
Ruixuan Liu, [Tianhao Wang](#), Yang Cao, Li Xiong
14. **Machine Unlearning of Pre-trained Large Language Models (ACL'24)**
Jin Yao, Eli Chien, Minxin Du, Xinyao Niu, [Tianhao Wang](#), Zezhou Cheng, Xiang Yue
15. **Towards Certified Unlearning for Deep Neural Networks (ICML'24)**
Binchi Zhang, Yushun Dong, [Tianhao Wang](#), Jundong Li
16. **PrivImage: Differentially Private Synthetic Image Generation using Diffusion Models with Semantic-Aware Pretraining (USENIX'24)**
Kecen Li, Chen Gong, Zhixiang Li, Yuzhong Zhao, Xinwen Hou, [Tianhao Wang](#)
17. **BAFFLE: Hiding Backdoors in Offline Reinforcement Learning Datasets (SP'24)**
Chen Gong, Zhou Yang, Yunpeng Bai, Jieke Shi, Junda He, Kecan Li, Bowen Xu, Arunesh Sinha, Xinwen Hou, David Lo, [Tianhao Wang](#)
18. **Preserving Node-level Privacy in Graph Neural Networks (SP'24)**
Zihang Xiang, [Tianhao Wang](#), Di Wang
19. **Backdoor Attacks via Machine Unlearning (AAAI'24)**
Zihao Liu, [Tianhao Wang](#), Mengdi Huai, Chenglin Miao
20. **GlucoseSynth: Generating Differentially-Private Synthetic Glucose Traces (Neurips'23)**
Josephine Lamp, Mark Derdzinski, Christopher Hannemann, Joost van der Linden, Lu Feng, [Tianhao Wang](#), and David Evans
21. **Mitigating Membership Inference Attacks via Weighted Smoothing (ACSAC'23)**
Mingtian Tan, Xiaofei Xie, Jun Sun, [Tianhao Wang](#)
22. **Differentially Private Resource Allocation (ACSAC'23)**
Joann Qionga Chen, [Tianhao Wang](#), Zhikun Zhang, Yang Zhang, Somesh Jha, Zhou Li
23. **Securely Sampling Discrete Gaussian Noise for Multi-Party Differential Privacy (CCS'23)**
Chengkun Wei, Ruijing Yu, Yuan Fan, Wenzhi Chen, [Tianhao Wang](#)
24. **DP-Forward: Fine-tuning and Inference on Language Models with Differential Privacy in Forward Pass (CCS'23)**
Minxin Du, Xiang Yue, Sherman Chow, [Tianhao Wang](#), Chenyu Huang, Huan Sun
25. **Practical Differentially Private and Byzantine-resilient Federated Learning (SIGMOD'23)**
Zihang Xiang, [Tianhao Wang](#), Wanyu Lin, Di Wang
26. **Differentially Private Vertical Federated Clustering (VLDB'23)**
Zitao Li, [Tianhao Wang](#), Ninghui Li

27. **FACE-AUDITOR: Data Auditing in Facial Recognition Systems (USENIX'23)**
Min Chen, Zhikun Zhang, [Tianhao Wang](#), Michael Backes, Yang Zhang
28. **PrivTrace: Differentially Private Trajectory Synthesis by Adaptive Markov Model (USENIX'23)**
Haiming Wang, Zhikun Zhang, [Tianhao Wang](#), Shibo He, Michael Backes, Jiming Chen, Yang Zhang
29. **A Plot is Worth a Thousand Words: Model Information Stealing Attacks via Scientific Plots (USENIX'23)**
Boyang Zhang, Xinlei He, Yun Shen, [Tianhao Wang](#), Yang Zhang
30. **Is Adversarial Training Really a Silver Bullet for Mitigating Data Poisoning? (ICLR'23)**
Rui Wen, Zhengyu Zhao, Zhuoran Liu, Michael Backes, [Tianhao Wang](#), Yang Zhang
31. **FLORAS: Differentially Private Wireless Federated Learning Using Orthogonal Sequences (ICC'23)**
Xizixiang Wei, [Tianhao Wang](#), Ruiquan Huang, Cong Shen, Jing Yang, Vincent Poor
32. **Memorization in NLP Fine-tuning Methods (EMNLP'22)**
Fatemehsadat Miresghallah, Archit Uniyal, [Tianhao Wang](#), David Evans, Taylor Berg-Kirkpatrick
33. **Federated Boosted Decision Trees with Differential Privacy (CCS'22)**
Samuel Maddock, Graham Cormode, [Tianhao Wang](#), Carsten Maple, Somesh Jha
34. **Graph Unlearning (CCS'22)**
Min Chen, Zhikun Zhang, [Tianhao Wang](#), Michael Backes, Mathias Humbert, Yang Zhang
35. **Locally Differentially Private Sparse Vector Aggregation (SP'22)**
Zhou, Mingxun, [Tianhao Wang](#), Hubert Chan, Giulia Fanti, and Elaine Shi
36. **Continuous Release of Data Streams under both Centralized and Local Differential Privacy (CCS'21)**
[Tianhao Wang](#), Joann Chen, Zhikun Zhang, Dong Su, Yueqiang Cheng, Zhou Li, Ninghui Li, Somesh Jha
37. **When Machine Unlearning Jeopardizes Privacy (CCS'21)**
Min Chen, Zhikun Zhang, [Tianhao Wang](#), Michael Backes, Mathias Humbert, Yang Zhang
38. **PrivSyn: Differentially Private Data Synthesis (USENIX'21)**
Zhikun Zhang, [Tianhao Wang](#), Jean Honorio, Ninghui Li, Michael Backes, Shibo He, Jiming Chen, Yang Zhang
39. **Answering Multi-Dimensional Range Queries under Local Differential Privacy (VLDB'21)**
Jianyu Yang, [Tianhao Wang](#), Ninghui Li, Xiang Cheng, Sen Su
40. **Differential Privacy for Text Analytics via Natural Text Sanitization (ACL'21 Findings)**
Xiang Yue, Minxin Du, [Tianhao Wang](#), Yaliang Li, Huan Sun, Sherman Chow
41. **Improving Utility and Security of the Shuffler-based Differential Privacy (VLDB'20)**
[Tianhao Wang](#), Bolin Ding, Min Xu, Zhicong Huang, Cheng Hong, Jingren Zhou, Ninghui Li, Somesh Jha
42. **Collecting and analyzing data jointly from multiple services under local differential privacy (VLDB'20)**
Min Xu, Bolin Ding, [Tianhao Wang](#), Jingren Zhou
43. **Towards Effective Differential Privacy Communication for User Data Sharing Decision and Comprehension (SP'20)**
Aiping Xiong, [Tianhao Wang](#), Ninghui Li, Somesh Jha

44. **Recovering Distributions under Local Differential Privacy (SIGMOD'20)**
Zitao Li, Tianhao Wang, Milan Lopuhaä-Zwakenberg, Ninghui Li, Boris Skoric
45. **Consistent and Accurate Frequency Oracles under Local Differential Privacy (NDSS'20)**
Tianhao Wang, Milan Lopuhaä-Zwakenberg, Zitao Li, Ninghui Li, Boris Skoric
46. **Koinonia: Verifiable E-Voting with Long-term Privacy (ACSAC'19)**
Huangyi Ge, Sze Yiu Chau, Victor E Gonsalves, Huian Li, Tianhao Wang, Xukai Zou, Ninghui Li
47. **Answering Multi-Dimensional Analytical Queries under Local Differential Privacy (SIGMOD'19)**
Tianhao Wang, Bolin Ding, Jingren Zhou, Cheng Hong, Zhicong Huang, Ninghui Li, Somesh Jha
48. **Privacy at Scale: Local Differential Privacy in Practice (SIGMOD'18)**
Graham Cormode, Somesh Jha, Tejas Kulkarni, Ninghui Li, Divesh Srivastava, Tianhao Wang (alphabetical order)
49. **Locally Differentially Private Frequent Itemset Mining (SP'18)**
Tianhao Wang, Ninghui Li, Somesh Jha
50. **Marginal Release via Local Differential Privacy (CCS'18)**
Zhikun Zhang, Tianhao Wang (co-first author), Ninghui Li, Shebo He, Jiming Chen
51. **Locally Differentially Private Protocols for Frequency Estimation (USENIX'17)**
Tianhao Wang, Jeremiah Blocki, Ninghui Li, Somesh Jha
52. **On the Security and Usability of Segment-based Visual Cryptographic Authentication Protocols (CCS'16)**
Tianhao Wang, Huangyi Ge, Omar Chowdhury, Hemanta Maji, Ninghui Li
53. **Secure Dynamic SSE via Access Indistinguishable Storage (AsiaCCS'16)**
Tianhao Wang, Yunlei Zhao
54. **Weight Balancing on Boundaries and Skeletons (SoCG'14)**
..., Tianhao Wang, ... (alphabetical order)
- Journal Articles.....
55. **Edge-Protected Triangle Count Estimation under Relationship Local Differential Privacy (TKDE'24)**
Yuhan Liu, Tianhao Wang, Yixuan Liu, Hong Chen, Cuiping Li
56. **Locally Differentially Private Heavy Hitters Identification (TDSC'21)**
Tianhao Wang, Ninghui Li, Somesh Jha
57. **PURE: A Framework for Analyzing Proximity-based ContactTracing Protocols (CSUR'21)**
Fabrizio Cicala, Weicheng Wang, Tianhao Wang, Ninghui Li, Elisa Bertino, Faming Liang, Yang Yang
58. **DPSyn: Experiences in the NIST Differential Privacy Data Synthesis Challenges (JPC'21)**
Ninghui Li, Zhikun Zhang, Tianhao Wang
59. **A Simple Algorithm for Finding All k -edge-connected Components (PLoS ONE'15)**
Tianhao Wang, Yong Zhang, Francis Y. L. Chin, Hing-Fung Ting, Yung H. Tsin, Sheung-Hung Poon

Contributed Book Chapters.....
60. Handbook of Sharing Confidential Data: Differential Privacy, Secure Multiparty Computation, and Synthetic Data (CRC Press, 2024)
Jörg Drechsler, Daniel Kifer, Jerome Reiter, Aleksandra Slavković

Teaching

Spring 2025: CS 6501 Data Privacy (35 Students)
Fall 2024: CS 3710 Intro to CyberSecurity (138 Students)
Fall 2023: DS 6559 Security & Privacy Elective (PhD Course, 3 Students)
Spring 2023: CS 6161 Design & Analysis of Algorithms (47 Students)
Fall 2022: CS 4501 Data Privacy (52 Students)
Spring 2022: CS 6501 Data Privacy (31 Students), DS 6011 Data Science Capstone (12 Students)

Students

Xiaochen Li: working on DP (PostDoc Fellow)	<i>2024-now</i>
Yucheng Fu: working on DP and Applied Crypto	<i>2024-now</i>
Kai Chen: working on DP and AI	<i>2024-now</i>
Yan Pang: working on Generative AI Privacy and Security	<i>2023-now</i>
Chen Gong: working on AI Privacy and Security	<i>2023-now</i>

Services

Proposal Reviewer:

2025: NSF CISE/CNS Panelist
2024: NSERC Discovery Grant External Reviewer
2022: NSF CISE/CNS×2, NSF TTP Ad-hoc Reviewer, NSERC Discovery Grant External Reviewer

PC Member:

2026: IEEE SP
2025: ACM CCS, NDSS, IEEE SP, USENIX Security, SaTML, TPDF, PPAI
2024: ACM CCS, NDSS, IEEE SP, VLDB, TPDF, AISec, PPAI
2023: ACM CCS, NDSS, PETS, VLDB, ICDE, AAAI, WWW, TPDF, PPAI
2022: ACM CCS, PETS, AsiaCCS, ESORICS, EUROSP, Neurips, ICML, EMNLP, AAAI (Senior PC), CIKM, AISec
2021: ACM CCS, PETS, AsiaCCS, ESORICS, AISec, TPDF

Department Service:

2024-25: Colloquium Series
2023-24: Faculty Search, Colloquium Series, Diversity, Equity, and Inclusion, Systems PhD Curriculum (for SDS)
2022-23: Faculty Search, Colloquium Series, Computing Resources, Data Justice Academy Program (for SDS)

Grant

1. CCI CVN SEAS Research: Distributed Differentially Private Tabular Data Synthesis (PI)
2. NSF: SaTC: CORE: Small: Security and Privacy in Machine Unlearning (PI)
3. CCI NoVa CATAPULT: Privacy-preserving Synthetic Data Generation (PI)
4. CCI CVN SEAS Commercialization and Innovation: Privacy-preserving Synthetic Data Generation (PI)
5. NSF: CICI:TCR: Enhancing Security and Privacy of Community Cyberinfrastructures for Collaborative

Research (Co-PI)

6. NSF: IMR: MM-1B: Foundations for Differentially Private Internet Measurement (Lead PI)
7. NSF: PPOSS: LARGE: Co-designing Hardware, Software, and Algorithms to Enable Extreme-Scale Machine Learning Systems (Senior Personnel)
8. NSF: CCRI: New: A Scalable Hardware and Software Environment Enabling Secure Multi-party Learning (Co-PI)

Awards

CSAW Applied Research Competition Finalist	2024
VLDB Distinguished Reviewers	2024
ACM CCS Best Reviewer Award	2022
UVA Institute for Practical Ethics Faculty Fellowships for Courses in Ethics	2022
CERIAS Diamond Award: Only One in University	2021
NIST Challenge for a Better Meter Stick for Differential Privacy: 1st place	2021
NIST Differential Privacy Temporal Map Challenge: 2nd, 4th, and 3rd places in three phases	2021
iDASH Secure Genome Analysis Competition (Track III): 2nd place	2020
Bilsland Dissertation Fellowship: 1 of 3 in Department	2019
NIST Differential Privacy Synthetic Data Challenge: 2nd place in all three phases	2019
Symantec Research Labs Graduate Fellowship: Finalist	2019
NIST Unlinkable Data Challenge: Runner-up and People's choice	2018
Emil Stefanov Memorial Fellowship: Only One in Department	2018
CERIAS Best Poster Award: 2nd place	2016
Excellent Graduation Thesis: Only One in School	2015
Excellent Graduate Award: 1 of 20 in University	2015
Google Excellence Scholarship: 1 of 58 nationwide (undergrads and grads combined)	2014
Outstanding Student: 1 of 10 in University	2014
National Scholarship: Only One in School	2012