

# Tianhao Wang

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## Research Interests

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Differential privacy, machine learning privacy, applied cryptography

## Professional Experience

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### University of Virginia

*Assistant Professor*

*Jan 2022–*

### Carnegie Mellon University

*Post Doctoral Fellow*

**Mentor: Elaine Shi**

*May 2021–Dec 2021*

## Education

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### 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*

## Awards

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<b>CERIAS Diamond Award:</b> Only One in University	2021
<b>NIST Challenge for a Better Meter Stick for Differential Privacy:</b> 1st place	2021
<b>NIST Differential Privacy Temporal Map Challenge:</b> 2nd, 4th, and 3rd places in three phases	2021
<b>iDASH Secure Genome Analysis Competition (Track III):</b> 2nd place	2020
<b>Bilsland Dissertation Fellowship:</b> 1 of 3 in Department	2019
<b>NIST Differential Privacy Synthetic Data Challenge:</b> 2nd place in all three phases	2019
<b>Symantec Research Labs Graduate Fellowship:</b> Finalist	2019
<b>NIST Unlinkable Data Challenge:</b> Runner-up and Peppole's choice	2018
<b>Emil Stefanov Memorial Fellowship:</b> Only One in Department	2018
<b>Excellent Graduation Thesis:</b> Only One in School	2015
<b>Graduate Star:</b> 1 of 20 in University	2015
<b>Google Excellence Scholarship:</b> 1 of 58 nationwide (undergrads and grads combined)	2014
<b>Outstanding Student:</b> 1 of 10 in University	2014
<b>National Scholarship:</b> Only One in School	2012

## Publications

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Conference Papers.....

### 1. Graph Unlearning (CCS'22)

Min Chen, Zhikun Zhang, Tianhao Wang, Michael Backes, Mathias Humbert, Yang Zhang

2. **Locally Differentially Private Sparse Vector Aggregation (SP'22)**  
Zhou, Mingxun, Tianhao Wang, Hubert Chan, Giulia Fanti, and Elaine Shi
3. **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
4. **When Machine Unlearning Jeopardizes Privacy (CCS'21)**  
Min Chen, Zhikun Zhang, Tianhao Wang, Michael Backes, Mathias Humbert, Yang Zhang
5. **PrivSyn: Differentially Private Data Synthesis (USENIX'21)**  
Zhikun Zhang, Tianhao Wang, Jean Honorio, Ninghui Li, Michael Backes, Shibo He, Jiming Chen, Yang Zhang
6. **Answering Multi-Dimensional Range Queries under Local Differential Privacy (VLDB'21)**  
Jianyu Yang, Tianhao Wang, Ninghui Li, Xiang Cheng, Sen Su
7. **Differential Privacy for Text Analytics via Natural Text Sanitization (ACL'21 Findings)**  
Xiang Yue, Minxin Du, Tianhao Wang, Yaliang Li, Huan Sun, Sherman Chow
8. **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
9. **Collecting and analyzing data jointly from multiple services under local differential privacy (VLDB'20)**  
Min Xu, Bolin Ding, Tianhao Wang, Jingren Zhou
10. **Towards Effective Differential Privacy Communication for User Data Sharing Decision and Comprehension (SP'20)**  
Aiping Xiong, Tianhao Wang, Ninghui Li, Somesh Jha
11. **Recovering Distributions under Local Differential Privacy (SIGMOD'20)**  
Zitao Li, Tianhao Wang, Milan Lopuhaä-Zwakenberg, Ninghui Li, Boris Skoric
12. **Consistent and Accurate Frequency Oracles under Local Differential Privacy (NDSS'20)**  
Tianhao Wang, Milan Lopuhaä-Zwakenberg, Zitao Li, Ninghui Li, Boris Skoric
13. **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
14. **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
15. **Locally Differentially Private Frequent Itemset Mining (SP'18)**  
Tianhao Wang, Ninghui Li, Somesh Jha
16. **Marginal Release via Local Differential Privacy (CCS'18)**  
Zhikun Zhang, Tianhao Wang (co-first author), Ninghui Li, Shebo He, Jiming Chen
17. **Locally Differentially Private Protocols for Frequency Estimation (USENIX'17)**  
Tianhao Wang, Jeremiah Blocki, Ninghui Li, Somesh Jha
18. **On the Security and Usability of Segment-based Visual Cryptographic Authentication Protocols (CCS'16)**  
Tianhao Wang, Huangyi Ge, Omar Chowdhury, Hemanta Maji, Ninghui Li

## 19. Secure Dynamic SSE via Access Indistinguishable Storage (AsiaCCS'16)

Tianhao Wang, Yunlei Zhao

## 20. Weight Balancing on Boundaries and Skeletons (SoCG'14)

..., Tianhao Wang, ... (alphabetical order)

## Journal Articles.....

### 21. Locally Differentially Private Heavy Hitters Identification (TDSC'21)

Tianhao Wang, Ninghui Li, Somesh Jha

### 22. PURE: A Framework for Analyzing Proximity-based Contact Tracing Protocols (CSUR'21)

Fabrizio Cicala, Weicheng Wang, Tianhao Wang, Ninghui Li, Elisa Bertino, Faming Liang, Yang Yang

### 23. DPSyn: Experiences in the NIST Differential Privacy Data Synthesis Challenges (JPC'21)

Ninghui Li, Zhikun Zhang, Tianhao Wang

### 24. 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

## Tutorials.....

### 25. Privacy at Scale: Local Differential Privacy in Practice (SIGMOD'18)

Graham Cormode, Somesh Jha, Tejas Kulkarni, Ninghui Li, Divesh Srivastava, Tianhao Wang (alphabetical order)

## Student Mentorship

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<b>Xuhui Kang:</b> PhD student from UVA, working on DP ML	<i>2022-now</i>
<b>Archit Uniyal:</b> PhD student from UVA, working on Privacy Attacks to ML	<i>2022-now</i>
<b>Joann Chen (female):</b> PhD student from UC Irvine, working on DP side channels	<i>2020-now</i>
<b>Rui Wen:</b> PhD student from CISPA, working on shuffler DP	<i>2020-now</i>
<b>Min Chen (female):</b> PhD student from CISPA, working on machine learning privacy	<i>2020-now</i>
<b>Jianyu Yang:</b> Visiting Student from BUPT, worked on LDP range queries	<i>2018-2020</i>
<b>Zhikun Zhang:</b> Visiting Student from Zhejiang University, worked on LDP marginals	<i>2017-2018</i>

## Teaching

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Fall 2022: CS 4501 Data Privacy

Spring 2022: CS 6501 Data Privacy

## Services

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### PC Member:

2023: NDSS, VLDB, ICDE

2022: ACM CCS, PETS, AsiaCCS, ESORICS, EUROSP, Neurips, ICML, AAAI (Senior PC), CIKM, DLS

2021: ACM CCS, PETS, AsiaCCS, ESORICS, AISec, TPDP