

Haodi Wang



Research Area: Zero-knowledge Proof, Privacy Preservation, Deep Learning

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Date of Birth: February. 1996

Education Background

Beijing Normal University

09/2018-Present

- PhD candidate, recommended, School of Artificial Intelligence.
- Research Area: Zero-knowledge proofs and deep learning.
- GPA: **3.96 out of 4.0**.
- Rank: **1 out of 30**

Beijing Normal University

09/2014-08/2018

- Bachelor of Science in Computer Science, School of Artificial Intelligence;
- GPA: **3.85 out of 5.0**
- Rank: **6 out of 54**

Research Projects

Research on the proof of deep learning model by zero-knowledge proof

03/2020-01/2021

- Construct and train the mnist-demo/LeNet-5/AlexNet/VGG16 model;
- Give detailed principles and operation of the CNN model;
- Cooperate with SECBIT Labs for the paper (published on CCS' 21).

Research on the zero-knowledge machine learning inference pipeline

07/2021-01/2023

- Construct the main idea of this project, fully implement the scheme;
- Published on PETS' 23;
- The extended version was submitted to TDSC.

Research on the secure query on hybrid blockchain using novel ZKP protocol

12/2020-12/2022

- Construct the main idea and fully implement the scheme;
- Published on TIFS.

Research on the privacy-preserving label noise correction scheme for FL;

12/2021-03/2023

- Construct the main idea and fully implement the scheme;
- Submitted to ICDE'24, Minor revision.

Research on a new proxy for Neural Architecture Search

01/2023-09/2023

- Using the minimum eigenvalue of the Pearson correlation matrix as a novel proxy;
- Published on NeurIPS'23 as co-first author.

Research on image inpainting and image fusion with text recovery and residual learning

09/2018-08/2019

- Published three conference and two journal papers.

Publications

- [1] **Haodi Wang**, Yu Guo, Rongfang Bie, Xiaohua Jia. Verifiable Arbitrary Queries with Zero Knowledge Confidentiality in Decentralized Storage. IEEE Transactions on Forensics and Security (TIFS). 2023.
- [2] **Haodi Wang**, Tangyu Jiang, Yu Guo, Fangda Guo, Rongfang Bie, Xiaohua Jia. Label Noise Correction for Federated Learning: A Secure, Efficient and Reliable Realization. 40th IEEE International Conference on Data Engineering (ICDE'24). (Accepted)
- [3] **Haodi Wang**, Thang Hoang. ezDPS: An Efficient and Zero-Knowledge Machine Learning Inference Pipeline[J]. Proceedings on Privacy Enhancing Technologies (PETS'23), 2023, 2: 430-448.
- [4] **Tangyu Jiang**, **Haodi Wang**, Rongfang Bie. MeCo: Zero-Shot NAS with One Data and Single Forward Pass via Minimum Eigenvalue of Correlation, Thirty-seventh Conference on Neural Information Processing Systems (NeurIPS'23). 2023. (Co-first Author)
- [5] Ming He, **Haodi Wang***, Yunchuan Sun, Rongfang Bie, Tian Lan, Qi Song, Xi Zeng, Matevz Pustisek, Zhenyu Qiu. T²L: Traceable and Trustable Consortium Blockchain for Logistics Based on Authenticated Data Source and ZK-Proof of Retrievability. Digital Communication and Networks. 2022.
- [6] Yun Li, Cun Ye, Yuguang Hu, Ivring Morpheus, Yu Guo, Chao Zhang, Yupeng Zhang, Zhipeng Sun, Yiwen Lu, and **Haodi Wang**. 2021. ZKCPlus: Optimized Fair-exchange Protocol Supporting Practical and Flexible Data Exchange. In Proceedings of the 2021 ACM SIGSAC Conference on Computer and Communications Security (ACM CCS'21). Association for Computing Machinery, New York, NY, USA, 3002–3021. DOI:

<https://doi.org/10.1145/3460120.3484558>.

- [7] **Wang H.**, Jiao L., Bie R., Wu H. Semantic Inpainting with Multi-dimensional Adversarial Network and Wasserstein Distance. In: Peng Y. et al. (eds) Pattern Recognition and Computer Vision. PRCV 2020. Lecture Notes in Computer Science, vol 12307. 2020. Springer, Cham. https://doi.org/10.1007/978-3-030-60636-7_7
- [8] **Haodi Wang**, Ding An, Xiaoyu Zhu, Xiaoyilei Yang, Rongfang Bie. TIMS: A Secure Testing-Machine Information Management System. Procedia Computer Science. Volume 187, 2021, Pages 176-182, ISSN 1877-0509, <https://doi.org/10.1016/j.procs.2021.04.049>.
- [9] **Haodi Wang**, Libin Jiao, Hao Wu, Rongfang Bie. New Inpainting Algorithm Based on Simplified Context Encoders and Multi-Scale Adversarial Network, Procedia Computer Science, Volume 147, 2019, Pages 254-263, ISSN 1877-0509, <https://doi.org/10.1016/j.procs.2019.01.250>.
- [10] Xiaoyu Zhu, **Haodi Wang**, Zhiyi Zhang, Xiuping Wu, Junqi Guo, Hao Wu. A deep learning network based end-to-end image composition. Signal Processing: Image Communication, Volume 101, 2022, 116570, ISSN 0923-5965. <https://doi.org/10.1016/j.image.2021.116570>.
- [11] Libin Jiao, Hao Wu, **Haodi Wang**, Rongfang Bie. Multi-scale semantic image inpainting with residual learning and GAN[J]. Neurocomputing 2019-331(9252312):199-212.

Skills and Certificates

- Programming language: Python, Rust, PostgreSQL;
- Platform: Keras, TensorFlow, LibSnark;
- TOEFL: 103;
- GRE Score: Verbal 157, Quantitative 166, Writing 3.5.

International Experience

University of California, Berkeley - Summer School

07/2018-08/2018

- Course: The person in big data, **93.48 out of 100**;
- Course: Academic writing, **95.49 out of 100**.

Virginia Tech, Blacksburg - Visiting Ph.D.

01/2020-Present

- Advisor: Prof. Thang Hoang
- Research interest: Zero-knowledge proof in ML/DL

Teaching Assistant Experience

Beijing Normal University, Principle of Database System

2019 Fall, 2020 Fall

- Teach experiment classes for nearly **60 class hours**;
- Help undergraduate students with the operation of PostgreSQL;
- Assist in correcting experiment results and tested papers.

Beijing Normal University, Deep Learning

2018 Fall

- Teach undergraduate students about the basic concepts in convolutional neural network;
- Help undergraduate students with the operation of python and toy-models;
- Assist in correcting programming errors and results in homework.

Other Experience

Monitor of postgraduate class

09/2018-08/2020

- Successfully organized several activities, including the journey to XiangShan, Beihai Park etc.;
- Assist my classmate in their daily lives;
- Practiced communication skills and enhanced the sense of responsibility.

Honor & Award

- The **First prize** of the scholarship for New Graduate Students of Beijing Normal University, 2018;
- The **First prize** of Academic Scholarship for Graduate Students of Beijing Normal University, 2019, 2020, 2021, and 2022.
- The **Outstanding student cadres** of Beijing Normal University, 2019;
- **Merit Student** and **Outstanding Members** of Beijing Normal University.