

Wenyuan Zhao — CV

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1st year Ph.D. student in Electrical and Computer Engineering department at Texas A&M University, focusing on Information Science and Learning Systems.

Research Interest

- Deep Gaussian Process and Diffusion Model
- Information and Coding Theory
- Machine Learning for Wireless Communication

Education

Texas A&M University Ph.D., Information Science and Learning Systems	College Station, TX 2023-Now
University of California San Diego M.S., Communication Theory and Systems	La Jolla, CA 2021-2023
Southeast University B.E., Information Engineering	Nanjing, China 2017-2021

Publications

- Zhao, Wenyuan, et al. "GAN-based Algorithm for EEG Brain Signals." ECE228 and SIO228 Machine Learning for Physical Applications. UC San Diego, 2022.
- Zhao, Wenyuan. "Machine Learning-based Matrix Optimization Algorithm in Massive MIMO." Undergraduate Thesis at Southeast University, 2021.
- Zhao, Wenyuan. "A Survey on Fog Computing Applications in Internet of Vehicles." 2021 2nd International Conference on Computing and Data Science (CDS), pp. 27-32. Stanford, CA, USA, 2021.
- Zhao, Wenyuan. "Classification of Customer Reviews on E-commerce Platforms Based on Naive Bayesian Algorithm and Support Vector Machine." Journal of Physics: Conference Series. Vol. 1678. No. 1. IOP Publishing, 2020.

Internships and Research Experiences

Deep Gaussian Process and Diffusion Models

Advisor: Prof. Tian Chao, ECE Dept, TAMU

Sept. 2023 - present

- Theory and algorithm development: approximate DGP model with sparse structure
- Applications to conditional generative tasks
- Software development and validation

Weakly Private Information Retrieval

Advisor: Prof. Tian Chao, ECE Dept, TAMU

Sept. 2023 - present

- Weakly PIR problem under the Max-L metric and the MI leakage metric
- Code construction for homogeneity and heterogeneity in servers' trustfulness
- Optimized code with the trade-off between the download cost and the amount of privacy leakage

AI-driven dynamic mmWave mesh backhaul

Advisor: Prof. Xinyu Zhang, ECE Dept, UC San Diego

Mar. 2022 - Aug. 2023

- Proposed RL-driven method for dynamic mmWave mesh configuration
- Bridging the Simulation-to-Reality gap in mmWave interference mapping
- Hybrid simulation framework and testbed for dynamic mmWave mesh

Machine learning-based matrix optimization in massive MIMO

Advisor: Prof. Lei Wang, NCRL, SEU

Nov. 2020 - Jun. 2021

- Complex matrix inversion in precoding algorithms for massive MIMO downlink
- Proposed Complex-valued Gradient Neural Network to solve the complex matrix inversion problem
- Validated CVGNN in Rayleigh channel and showed its power in massive MIMO applications

Machine learning and data science

Advisor: Prof. Mark Vogelsberger, MIT

Jun. 2020 - Sept. 2020

- Word segmentation and text frequency extraction in Chinese Semantic sentiment analysis
- Proposed a Machine Learning-based method to classify customer reviews on e-commerce platforms
- Evaluated the classification accuracy and robustness on Chinese e-commerce company

AI-driven large-scale mmWave transmission scheme

Advisor: Prof. Cheng Zhang, NCRL, SEU

Feb. 2019 - Jun. 2020

- Formulated mmWave beam alignment and tracking (BA/T) as a stochastic bandit learning problem
- Implemented greedy strategy and upper confidence bound (UCB) strategy for optimal beam searching
- Evaluated bandit learning-driven mmWave BA/T in dynamic environments

High precision sensor data acquisition

Advisor: Prof. Fei Li, SEU

Apr. 2018 - Apr. 2019

- Designed a data acquisition platform with STM32f373
- Improved sampling precision from 16-bit to 20-bit based on Nyquist sampling theorem

Academic Projects

GAN-based EEG Signal Generation

Guide: Prof. Yuanyuan Shi, ECE Dept, UC San Diego

Mar. 2022 - Jun. 2022

- Designed a generative adversarial network (GAN) model to extend electroencephalographic (EEG) signals
- Solved vanishing gradient problem and model collapse problem in GAN by using Wasserstein distance

Blind Deconvolution Using Convex Programming

Guide: Prof. Piya Pal, ECE Dept, UC San Diego

Jan. 2022 - Feb. 2022

- Solved a blind deconvolution problem: recover two signals w and x from their convolution $y = w * x$
- Implemented the convex algorithm to recover signals from their blind convolution
- Evaluated robustness of the convex algorithm against sparsity and low-rank condition

Honors and Awards

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| ○ Sun Qingyun Scholarship (Top 3 out of 280) | Jun. 2020 |
| ○ First Prize of Mathematical Contest in Modeling (CUMCM) (Top 0.7%, best from SEU) | Nov. 2019 |
| ○ Mitsubishi Electric Corporation Scholarship (Top 2 out of 245) | Jun. 2019 |
| ○ Honorable Mention of Mathematical Contest in Modeling Competition (MCM) | Jan. 2019 |
| ○ Academic Records Scholarship (twice) | Apr. 2018 |

Technical Strengths

- **Programming Languages:** C/C++, Python, Verilog, MATLAB
- **Machine Learning Tools:** PyTorch, TensorFlow, DeepLearning Toolbox
- **Others:** L^AT_EX, VSCode, PyCharm, Xcode, ISE, Vivado

Positions of Responsibility

- **Teaching assistant** for courses like *Communication Networks* and *Computer Programming*
- **Director** (*Student Union 2018-19, SEU*): Involved in the communication and coordination of companies and universities and assisting them in recruiting students for internships