Yiming Zhang

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EDUCATION

Northwestern university, Evanston, IL, USA — Enrolled: Sept 2021 — Expected: May 2026
Doctor of Philosophy in Electrical and Computer Engineering — Cumulative GPA: 3.84/4.00

Northwestern university, Evanston, IL, USA — Sept 2021 — Dec 2023
Master of Science in Electrical and Computer Engineering

Relevant Courses: Machine Learning, Deep Reinforcement Learning, Distributed Optimization, Random Process, Design & Analysis of Algorithms

University of Electronic Science and Technology of China, Chengdu, China — Sept 2017 - June 2021
Bachelor of Engineering in Automation — Average GPA: 3.97/4.00

WORK EXPERIENCE

Futurewei Technologies, Inc. — Rolling Meadows, Illinois
Research Intern — June 2023 - Sept 2023

- Developed robust data analysis tools to generate high-quality datasets tailored for data-driven approaches.
- Formulated AI/ML-based techniques for beam management and benchmarked them against traditional time series prediction methods, such as ARIMA.
- Actively contributed and presented results at 3GPP standard meetings, incorporating performance feedback from other companies for continuous improvement.

Research Intern — June 2022 - Sept 2022

- Designed two-timescale control pattern and work flow for wireless networks, prioritizing energy conservation without compromising Quality of Service(QoS).
- Developed traffic-driven reinforcement learning(RL) methods based on characteristics of communication channels and power consumption.
- Implemented and tested the proposed algorithms using real-world data from industry.

RESEARCH & RELEVANT EXPERIENCE

Northwestern University — Evanston, Illinois
Research Assistant at Communications and Networking Laboratory

Research on multi-agent reinforcement learning(MARL) — Sept 2021 - Present

- Conducted advanced research on resource allocation in networked systems, mathematically formulated the problem.
- Engineered a wireless network simulator, packaged as software, to model dynamic traffic under varying channel conditions and traffic densities in cellular networks.
- Crafted and implemented an MARL framework detailing state representation, action space, and reward function based on agent-environment interactions. Addressed scalability and non-stationarity challenges in multi-agent RL through centralized training and decentralized execution(CTDE).
- Employed advanced neural network structures like decision transformer and extended it to multi-agent setting, integrate offline and online training to develop hybrid RL.

Research on large laguage model(LLM) — Aug 2023 - Present

- Utilized LLM to enhance RL processes, conducting comprehensive reviews and analyses of advanced mechanisms such as ReAct, Reflexion, Chain of Thoughts (CoT), Tree of Thoughts (ToT), and AutoGPT. Successfully implemented and reproduced their results to validate efficacy in multiple experiments.
- Designed and implemented the RAFA(reason for now act for future) framework, demonstrating its effectiveness through practical application in the Minecraft environment.

Teaching Assistant of ECE department (EE302 Probabilistic Systems) — Sept 2023 - Dec 2023 — Sept 2024 - Dec 2024

- Managed the learning process of over 20 undergraduate students, providing comprehensive support through office hours, meticulous grading, and individual consultations to guarantee personalized assistance and prompt feedback.
- Coordinated and facilitated student laboratory sessions in data analysis, utilizing tools such as MATLAB and R for hands-on learning experiences.

University of Electronic Science and Technology of China — Chengdu, China
Research Assistant at Microwave measurements and remote sensing lab — Sept 2017 - June 2021

- Developed deep learning algorithms to identify pathological changes in over 10,000 immunofluorescence kidney tissue images using U-net for segmentation and CNNs for classification.
- Formulated and scrutinized a unique "q-Renyi" kernel function, deriving an innovative kernel adaptive filtering algorithm for predictive analysis of time-series data.

Schonfeld Early Engagement (SEE) Summit — New York, US
PhD Track competition — April 2024

- Achieved Third Place in the 2024 Schonfeld Datathon, analyzing complex datasets from RedGraphs, Estimize, Factset Truevalue, and Visible Alpha.
- Performed feature engineering (e.g. Alpha generation) through raw datasets. Applied feature selection and hyperparameter tunning to optimize ML model like LGBM.

PUBLICATIONS

Yiming Zhang, Libiao Peng, Xifeng Li, Yongle Xie. A Sparse Robust Adaptive Filtering Algorithm Based on the Renyi Kernel Function. *IEEE Signal Processing Letter, 2020*

Lyu J., Bi D-J., Liu B., et al. (including. **Zhang Y-M.**). Compressive Near-field Millimeter Wave Imaging Algorithm Based on Gini Index and Total Variation Mixed Regularization. *Journal of Electronic Science and Technology, 2023*

Yiming Zhang, Dongning Guo. Distributed MARL for Scheduling in Conflict Graphs. *Allerton Conf. Commun. Control Computing, 2023*

Yiming Zhang, Dongning Guo. Spectrum Allocation and Scheduling in Conflict Graphs via Scalable Multi-agent Reinforcement Learning. *Asilomar Conf. on Signals, Systems, and Computers, 2024*

Yiming Zhang, Dongning Guo. Traffic-driven Spectrum and Power Allocation via Scalable Multi-agent Reinforcement Learning. *Allerton Conf. Commun. Control Computing, 2024*

Yiming Zhang, Kun Yang, Shen Cong, Dongning Guo. Multi-Agent Decision Transformer for Power Control in Wireless Networks. *International Conf. on Acoustics, Speech, and Signal Processing, 2025* (Publications under review)

Yiming Zhang, Dongning Guo. Multi-Agent Reinforcement Learning for Multi-Cell Spectrum and Power Allocation. *IEEE Transactions on Communications, 2025*(Publications under review)

SKILLS

- **Programming:** Proficient in Python, C/C++, MATLAB, R
- **Software:** Tensorflow, Pytorch, Verilog, Latex, Microsoft Word, Excel.
- **Hardware:** Arduino, Microchip, GNU radio, AutoCAD.