Jianing Bai

Room 236, Mechanics Building, School of Technology, Peking University, Beijing, 100084, P. R. China
(+86)15369330920 bai@stu.pku.edu.cn

EDUCATION

College of Engineering, Peking University, Beijing, China Aug 2020- Jul 2023
M.S. in Mechanical Engineering

College of Information Science and Engineering, Hebei North University, Zhangjiakou, China Aug 2015- Jul 2019
B.E. in Information Engineering, Overall GPA: 3.51/4.0, Major GPA: 3.86/4.0 Ranking: Top 3% (100+ students)
Core Courses: Higher Mathematics (90) / Probability Theory and Mathematical Statistics (96) / Discrete Mathematics (93) / Computer Network (93) / Data Structure (91) / Network Communication Programming (93) / Network Database System (90)

ACADEMIC FOCUS / RESEARCH INTEREST

Machine Learning, Power Systems, Network Systems, Reinforcement Learning, Control Optimization.

PUBLICATIONS

1. **Jianing Bai**, Ren Wang, and Zuyi Li. Physics-Constrained Backdoor Attacks on Power System Fault Localization. IEEE Power and Energy Society General Meeting 2023, IEEE. (Accepted) (https://arxiv.org/abs/2211.04445)
2. **Jianing Bai**, Tianhao Zhang, Chen Wang, and Guangming Xie. MA-CC: Cross-Layer Congestion Control via Multi-Agent Reinforcement Learning. Computing Conference 2023, Springer. (Accepted) (http://arxiv.org/abs/2206.01972)

RESEARCH EXPERIENCES

Multi-Agent Reinforcement Learning Based Network | Peking University | Research Assistant Dec 2020- May 2022
Advisor: Guangming Xie, professor at College of Engineering, Peking University

- Researched and applied the multi-agent reinforcement learning algorithm to TCP and AQM to address the proposed cross-layer congestion control problem through cooperation.
- Designed a typical dumbbell-like network scenario under the ns3-gym simulator by modeling it as a multi-agent decision-making problem, which developed the application of MARL in the congestion control area.
- Proved that the proposed method outperformed typical rule-based and learning-based congestion control algorithms, potentially improving the adaptability and time variance of components of the Internet's communication infrastructure.

Distributed System Enhanced ACGAN | National University of Singapore | Research Assistant May 2022- Jun 2022
Advisor: Yang You, professor at College of Computer Science, National University of Singapore

- Programmed model in Python to implement and deploy ACGAN for image recognition tasks.
- Improve the model training efficiency based on data parallel, pipeline parallel, and tensor parallel strategies.

Physics-Constrained Backdoor Attacks on Power System | Illinois Tech | Research Assistant June 2022- Present
Advisor: Ren Wang, assistant professor at Department of Electrical and Computer Engineering, Illinois Institute of Technology

- Designed a novel physics-constrained backdoor attack strategy on DL-based fault line localization tasks in power systems.
- Considered different threat models where attackers could directly manipulate training data or only access measurements to improve the variety of the program; conducted fault localizations on the IEEE 68-bus power system..
- Demonstrated that the proposed physics-constrained backdoor attacks could fail the predictions using a small amount of malicious data while maintaining a high accuracy on clean data.

AWARDS

1. First Prize, Triple-A Student Award (3 students/department) 2016, 2017, 2018
2. Academic Excellence Award of Peking University (5 students/class) 2020

SKILLS

Programming Languages: C/C++, Python (including PyTorch and TensorFlow)
Tools: LaTex, Linux OS, Matlab, Microsoft Office, Photoshop
Standard English Tests: TOEFL