

**Zixuan Liu**  
zx-liu21@mails.tsinghua.edu.cn

*Research Interests*

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**Reinforcement Learning in Real-World Scenarios**

*Focusing on **dynamics adaptation** and **safety constraints** in real-world scenarios, such as **robotics** and **smart grid**.*

*Education*

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**Tsinghua University**

2021.09 – Present

*M.E. Degree in Electronic and Information Engineering; GPA: 3.80/4.00*

*Beijing, China*

**Harbin Institute of Technology**

2016.09 – 2021.06

*B.E. Degree in Mechatronics Engineering; GPA: 94.6/100.0; R: 5/125*

*Harbin, Heilongjiang, China*

*Research Experience*

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**General Robotic Manipulation with Foundation Models**

2023.09 – Present

*NUS School of Computing, Robot Learning and Intelligent System Lab*

*Singapore*

- Designing network architecture for the foundation model
- Ongoing work

**Reinforcement Learning with Hard Safety Constraints**

2022.10 – 2023.09

*Tencent, AI Lab*

*Shenzhen, Guangdong, China*

- Combining optimization with policy networks
- Combining optimization with simulators

**Adversarial Imitation Learning with Dynamics Adaptation**

2022.01 – 2022.06

*Tencent, AI Lab*

*Shenzhen, Guangdong, China*

- Proposing a method to deal with dynamics shift between source and target domains
- Providing a theoretical guarantee for the method

*Other Experience*

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**The 4th Power Dispatching AI Application Competition 2022**

2022.09 – 2022.09

*China Southern Power Grid*

*Guangzhou, Guangdong, China*

- Ranking: 12/24
- Introducing graph neural networks to predict powerflow
- Designing an action filter to optimize unsafe actions

**New Power System Artificial Intelligence Application Competition**

2022.07 – 2022.09

*China Electricity Council*

*Beijing, China*

- Ranking: 13/34
- Introducing grid safety constraints to reinforcement learning through regularization
- Alternatively using traditional optimization to output safe actions

## Research Presentations

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**Revisiting Plasticity in Visual Reinforcement Learning: Data, Modules and Training Stages (Accepted to ICLR 2024) [OpenReview]**

*Guozheng Ma, Lu Li, Sen Zhang, Zixuan Liu, Zhen Wang, Yixin Chen, Li Shen, Xueqian Wang, Dacheng Tao*

**UniContact: A Basic Model for Robotic Manipulation of Contact Synthesis on Rigid and Articulated Rigid Bodies with Arbitrary Manipulators (Under review for ICLR)**

*Gang Yang, Zhixuan Xu, Zixuan Liu, Jichen Sun, Hanwei Fan, Xinghao Zhu, Lin Shao*

**Differentiable Frank-Wolfe Optimization Layer (Accepted to Tiny Papers @ ICLR 2024) [OpenReview][GitHub]**

*Zixuan Liu, Liu Liu, Xueqian Wang, Peilin Zhao*

**Dynamics Adapted Imitation Learning (Published in TMLR) [OpenReview][GitHub]**

*Zixuan Liu, Liu Liu, Bingzhe Wu, Lanqing Li, Xueqian Wang, Bo Yuan, Peilin Zhao*

**NN-Based Reinforcement Learning Optimal Control for Inequality-Constrained Nonlinear Discrete-Time Systems With Disturbances (Published in TNNLS) [IEEE]**

*Shu Li, Liang Ding, Miao Zheng, Zixuan Liu, Xinyu Li, Huaiguang Yang, Haibo Gao, Zongquan Deng*

## Patents

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**Power Grid Dispatching Method, Device, Equipment and Storage Medium [GooglePatent]**

*Liu Liu, Peilin Zhao, Zixuan Liu. Guangdong: CN116960997A*

**Neural Network Training Method and Device for Industrial System Control [GooglePatent]**

*Liu Liu, Peilin Zhao, Zixuan Liu. Guangdong: CN116956995A*

**Training Method, Training Device, Training Equipment, Training Medium and Training Program Product for Strategy Generator [GooglePatent]**

*Liu Liu, Zixuan Liu, Peilin Zhao. Guangdong: CN116956018A*

**Method and Apparatus for Generating Controlstrategy for Industrial System [GooglePatent]**

*Liu Liu, Zixuan Liu, Peilin Zhao. Guangdong: CN116954162A*

## Awards & Honors

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**President Graduate Fellowship**

*Naitional University of Singapore*

2024

**Outstanding Research Scholarship**

*Tsinghua University*

2023

**Outstanding Graduates**

*Harbin Institute of Technology*

2021

**National Scholarship**

*Ministry of Education of the People's Republic of China*

2019

**Provincial Merit Students**

*Heilongjiang Provincial Education Department*

2019

### *Specialized Skills*

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**Programming Languages:** Python  
**Deep Learning Framework:** PyTorch  
**English:** TOEFL (107), GRE (322)