

# YULAI ZHAO

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## EDUCATION

### PRINCETON UNIVERSITY

Ph.D. in Electrical and Computer Engineering, expected 2027

Major: Machine Learning

Advisors: S.Y. Kung and Jason D. Lee

8/22

–Present

### TSINGHUA UNIVERSITY

Bachelor of Engineering

Major: Electrical Engineering

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–6/22

## RESEARCH EXPERIENCE

### PRINCETON UNIVERSITY, NJ, U.S.

*Research Assistant, Department of Electrical and Computer Engineering*

- Focused on theories for multi-agent reinforcement learning.
- Presented the first provable convergent multi-agent PPO algorithm with rates.
- Completed a first-author paper accepted by ICML 2023.

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–1/23

### ETH ZURICH, Switzerland

*Research Assistant, Institute for Machine Learning at ETH Zurich*

- Studied optimization in a novel scheme called performative prediction.
- Raised mild assumptions that implied weak convexity of the performative risks.
- Completed a first-author paper accepted by OPT 2022 (NeurIPS 2022 Workshop).

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### UNIVERSITY OF WASHINGTON, remote

*Research Assistant, Paul G. Allen School of Computer Science and Engineering*

- Studied representation learning theory under a transfer learning scheme.
- Presented a new statistical theory aiming at explain the success of NLP pre-training.
- Proved that pre-training could significantly improve sample efficiency of downstream tasks.
- Use a regularization inspired by the new theory to improve the base BERT model.
- Completed a first-author paper accepted as oral presentation at AISTATS 2023.

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### UNIVERSITY OF WASHINGTON, remote

*Research Assistant, Paul G. Allen School of Computer Science and Engineering*

- Studied reinforcement learning theory in a multi-agent environment.
- Applied natural policy gradients to two-player zero-sum games.
- Completed a first-author paper accepted by AISTATS 2022.

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## SELECTED PUBLICATIONS

1. Local Optimization Achieves Global Optimality in Multi-Agent Reinforcement Learning  
**Yulai Zhao**, Zhuoran Yang, Zhaoran Wang, Jason Lee  
International Conference on Machine Learning (ICML) 2023
2. Blessing of Class Diversity in Pre-training  
**Yulai Zhao**, Jianshu Chen, Simon S. Du  
International Conference on Artificial Intelligence and Statistics 2023 (**Oral & Notable Paper**)
3. Optimizing the Performative Risk under Weak Convexity Assumptions  
**Yulai Zhao**  
OPT 2022: Optimization for Machine Learning (NeurIPS 2022 Workshop)
4. Provable Efficient Policy Optimization for Two-Player Zero-Sum Markov Games  
**Yulai Zhao**, Yuandong Tian, Jason D. Lee, Simon S. Du  
International Conference on Artificial Intelligence and Statistics 2022

## AWARDS

Scholarship of Academic Excellence, Tsinghua University, 2020  
Friends of Tsinghua-Toyota scholarship, Tsinghua University 2019  
Scholarship of Academic Excellence, Tsinghua University, 2019

Top 10 in “Infinity of Math” competition, Tsinghua University, 2018

#### PROGRAMMING AND COMPUTING SKILLS

C++, Python (NumPy, pandas, PyTorch), MATLAB, PowerPoint