

**Interests:** Sequential Decision-making, Optimization, Probability, AI & Operations.

## Education

- **The Chinese University of Hong Kong, Shenzhen, China** 2025 (expected)  
*Ph.D. in Computer Science and Information Engineering.*  
**Supervisor:** [Zhi-Quan \(Tom\) Luo](#) **Research:** <https://richardli.xyz/#research>  
**Committee:** [Jim Dai](#), [Xinyun Chen](#), [Baoxiang Wang](#), [Benjamin Van Roy](#) (Stanford & Google DeepMind)
- **Huazhong University of Science and Technology, Wuhan, China** 2020  
*M.S. in Computer Science. With National Scholarship.*
- **Huazhong University of Science and Technology, Wuhan, China** 2017  
*B.E. in Computer Science (Honors Program). Outstanding Graduate.*

## Professional Experience

- **Tencent AI & Robotics X, Shenzhen, China** 2019, 2020  
*Research Intern in Agent Center*  
Participate in the team project in high-throughput and sample-efficient distributed Actor-Learner system for parallel roll-out sampling and asynchronous reinforcement learning with off-policy data reuse.
- **SenseTime Research, Peking, China** 2018  
*Computer Vision Trainee Researcher*  
Work on incremental and continual learning system for multi-label image classification.
- **Department of Computer Science, Cornell University, Ithaca, NY** 2017  
*Undergraduate Research Assistant*  
Work with John E. Hopcroft on hidden community detection, a new graph concept for network analysis.
- **Microsoft Research Lab, Asia** 2016  
*Research Intern in Theory Center*  
Work on influence learning and maximization in social networks.
- **John Hopcroft Center on Computing Science, Wuhan, China** 2015-2017  
*Undergraduate Research Assistant*  
Lead reading group on machine learning and spectral graph algorithms. Work on network analysis.

## Awards

- **Best Paper Award**, in the third doctoral and postdoctoral Daoyuan academic forum, 2024.
- **SRIBD Ph.D. Fellowship** (Gold Class), by Shenzhen Research Institute of Big Data (SRIBD), 2023.
- **Presidential Ph.D. Fellowship**, by The Chinese University of Hong Kong, Shenzhen, 2019-2023.
- **Tencent AI Ph.D. Fellowship**, by Tencent AI & The Chinese University of Hong Kong, Shenzhen, 2018.
- **Award of Excellence in Internship**, by Microsoft Research Lab, 2016.
- **Qiming Star Award (Selected as one of 5 recipients out of 7,112 undergraduates.)**, by Huazhong University of Science and Technology, 2016. **Reports:** [1] [Newspaper](#). [2] [HUST Online](#).
- **National Scholarship**, by Huazhong University of Science and Technology, 2018.
- **First Prize**, in Parallel computation and Application Contest (PAC) held by Intel and CCF, 2015.
- **First Prize**, in China National Mathematics Olympiad (Province level), 2013.

## Selected Oral Presentations

### ■ GPT-HyperAgent: Adaptive Foundation Models for Online Decisions

*Invited talk* in 2024 INFORMS Annual Meeting, Seattle, Oct. 21, 2024.

### ■ HyperAgent: Advancing Scalable Exploration through Fast Uncertainty Estimation in RL

*Invited talk* in International Symposium on Mathematical Programming (ISMP), Montréal, Jul. 25, 2024.

### ■ HyperAgent: A Simple, Efficient and Scalable RL Framework for Complex Environments

"Q\* meets Thompson Sampling: Scaling up Exploration via HyperAgent"

*Invited talk* at RLChina.org, Jun. 25, 2024.

*Invited talk* at Princeton University, May 2, 2024.

*Invited talk* in INFORMS Optimization Society (IOS) Conference, Rice University, Mar. 23, 2024.

*Contributed talk*, in the third doctoral and postdoctoral Daoyuan academic forum, Jan. 13, 2024.

### ■ No-Regret Learning in Unknown Game with Applications

*Invited talk* in RL Theory Student Workshop at Nanjing University, Aug. 23, 2022.

*Contributed Talk* in the second doctoral and postdoctoral Daoyuan academic forum, Aug. 20, 2022.

### ■ HyperDQN: A Randomized Exploration Method for Deep Reinforcement Learning

*Contributed Talk* in NeurIPS Workshop Ecological Theory of Reinforcement Learning, Dec. 14, 2021

## Selected Research Publications

### Preprints

- 1 **Yingru Li**. *Simple, Unified Analysis of Johnson-Lindenstrauss with Applications*. Preprint. Presentation at ICML 2024 Workshop "High-dimensional Learning Dynamics 2024: The Emergence of Structure and Reasoning". arXiv: [2402.10232](https://arxiv.org/abs/2402.10232) [stat.ML].
- 2 **Yingru Li**, Liangqi Liu, Hao Liang, Wenqiang Pu, and Zhi-Quan Luo. *Optimistic Thompson Sampling for No-Regret Learning in Unknown Games*. Preprint. Presentation at ICML 2023 Workshop "The Many Facets of Preference-Based Learning". arXiv: [2402.09456](https://arxiv.org/abs/2402.09456) [cs.LG].
- 3 **Yingru Li**, Jiawei Xu, and Zhi-Quan Luo. *Adaptive Foundation Models for Online Decisions: HyperAgent with Fast Incremental Uncertainty Estimation*. Preprint. Presentation at ICML 2024 Workshops: (1) "Aligning Reinforcement Learning Experimentalists and Theorists"; (2) "Automated Reinforcement Learning: Exploring Meta-Learning, AutoML, and LLMs".
- 4 **Yingru Li**. *Probability Tools for Sequential Random Projection*. Preprint. Presentation at ICML 2024 Workshop "High-dimensional Learning Dynamics 2024: The Emergence of Structure and Reasoning". 2024. arXiv: [2402.14026](https://arxiv.org/abs/2402.14026) [math.ST].

### Conference Proceedings

- 5 **Yingru Li** and Zhi-Quan Luo. "Prior-dependent analysis of posterior sampling reinforcement learning with function approximation". In: *The 27th International Conference on Artificial Intelligence and Statistics (AISTATS)*. 2024. arXiv: [2403.11175](https://arxiv.org/abs/2403.11175) [stat.ML].
- 6 **Yingru Li**, Jiawei Xu, Lei Han, and Zhi-Quan Luo. "Q-Star Meets Scalable Posterior Sampling: Bridging Theory and Practice via HyperAgent". In: *The 41st International Conference on Machine Learning (ICML)*. Proceedings of Machine Learning Research. 2024. arXiv: [2402.10228](https://arxiv.org/abs/2402.10228) [cs.LG].
- 7 Liangqi Liu, Wenqiang Pu, **Yingru Li**, Bo Jiu, and Zhi-Quan Luo. "Radar Anti-jamming Strategy Learning via Domain-knowledge Enhanced Online Convex Optimization". In: *2024 IEEE 13th Sensor Array and Multichannel Signal Processing Workshop (SAM)*. IEEE. 2024. arXiv: [2402.16274](https://arxiv.org/abs/2402.16274) [eess.SP].
- 8 Ziniu Li, **Yingru Li**, Yushun Zhang, Tong Zhang, and Zhi-Quan Luo. "HyperDQN: A Randomized Exploration Method for Deep Reinforcement Learning". In: *International Conference on Learning Representations (ICLR)*. 2022. URL: <https://openreview.net/pdf?id=X0nrKAXu7g->.

- 9 Qing Wang, **Yingru Li**, Jiechao Xiong, and Tong Zhang. "Divergence-Augmented Policy Optimization". In: *Advances in Neural Information Processing Systems (NeurIPS)*. Vol. 32. Curran Associates, Inc., 2019. URL: <https://openreview.net/pdf?id=rylacVSeIS>.

## Journal Articles

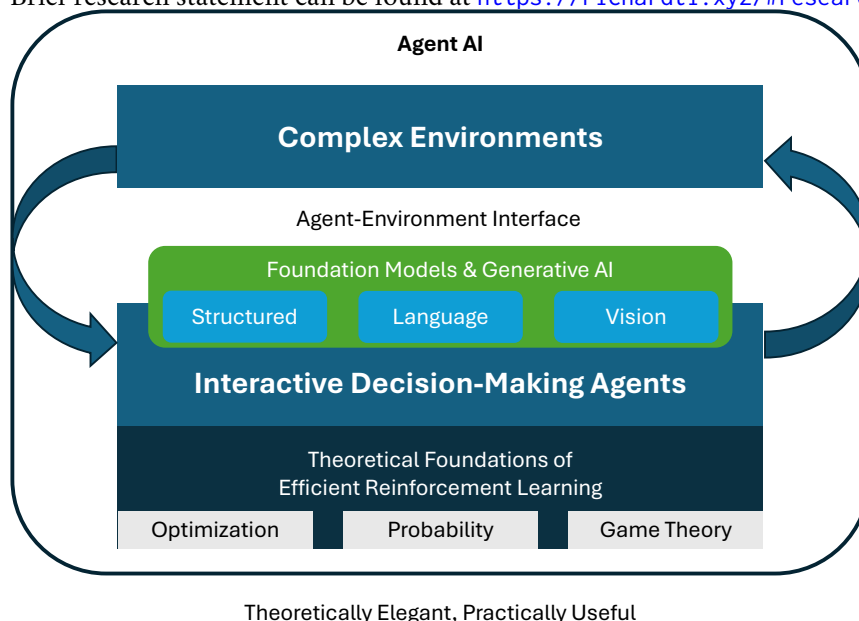
- 10 Kun He, **Yingru Li**, Sucheta Soundarajan, and John E. Hopcroft. "Hidden community detection in social networks". In: *Information Sciences* 425 (2018), pp. 92–106. ISSN: 0020-0255. DOI: <https://doi.org/10.1016/j.ins.2017.10.019>.

## Under Preparation

- 11 **Yingru Li**, Xiangbo Wu, Yanchuan Tang, Xiang Wan, Benyou Wang, and Zhi-Quan Luo. "Uncertainty-aware Vision-Language Agents for Multi-turn Medical Decision-making". under preparation. 2024.
- 12 **Yingru Li**, Jiawei Xu, Xiangbo Wu, Anningzhe Gao, Baoxiang Wang, Benyou Wang, and Zhi-Quan Luo. "Controlled Decoding via Q-Star on Outcome Feedback for Language Models". under preparation. 2024.

## Research Highlight

I focus on algorithms and theory for interactive agents that operate in complex and uncertain environments. This work necessitates advancements in methods for knowledge and uncertainty representation, exploration, adaptation, and decision-making. To achieve these goals, I use and develop fundamental tools in Math & CS. The methods developed have been applied to gaming, human-AI alignment, and reliable & safe operations. Brief research statement can be found at <https://richardli.xyz/#research>.



## Academic Service

- Review for Conference on Neural Information Processing Systems (NeurIPS) [12 papers], International Conference on Learning Representations (ICLR) [2 papers]; ICLR Workshop "Bridging the Gap Between Practice and Theory in Deep Learning" (2 papers), ICML Workshop "Aligning Reinforcement Learning Experimentalists and Theorists" (2 papers).
- Chair for [RL Seminar](#) in The Chinese University of Hong Kong, Shenzhen, China (Spring 2019, Summer 2020, Fall 2020, Spring 2021, Summer 2021, Fall 2021, Spring 2022, Fall 2022.); for 2 sessions in INFORMS Annual Meeting 2024 on "Integrating Generative AI with Sequential Decision-making".

## Teaching

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■ <b>Stochastic Processes</b> (STA/DDA4001)	Fall 2018
■ <b>Optimization II</b> (MAT3220)	Spring 2019
■ <b>Distributed and Parallel Computing</b> (CSC4005)	Fall 2019
■ <b>Reinforcement Learning</b> (DDA6105/CIE6023)	Fall 2020
■ <b>Matrix Analysis</b> (CIE6002)	Spring 2021
■ <b>Deep Learning and Their Applications</b> (MDS6224)	Spring 2022

My teaching duties include delivering weekly tutorials, correcting assignments, and running laboratory sessions when required, **all in English**.

## Beyond Academia

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I enjoy photography. I often play tennis and swim, and occasionally play golf. These activities allow me to live in the moment and help me find physical and spiritual freedom.