

# Zihan Ding

## Curriculum Vitae

351 Lemonick Court, Princeton, NJ, USA, 08540

☎ 6093754472

✉ zihand@princeton.edu; zhding96@gmail.com

🌐 [quantumiracle.github.io/webpage/](https://quantumiracle.github.io/webpage/)

### Education

**Homepage:** <https://quantumiracle.github.io/webpage/>.

**Google Scholar:** [Link](#).

2021.08– **Princeton University**, Princeton, NJ, U.S.

- **Ph.D.** in Electrical and Computer Engineering
- **M.A.** in Electrical and Computer Engineering (2023)
- Advisor: Chi Jin

2018.09– **Imperial College London**, London, U.K.

2019.09

- **M.Sc.** in Computing (Machine Learning Specialism) with **Distinction** degree
- Robot Learning Laboratory
- Advisor: Edward Johns

2014.09– **University of Science and Technology of China**, Hefei, Anhui, China.

2018.07

- **B.Sc.** in Photoelectric Information Science and Engineering (Physics)
- **B.Eng.** in Computer Science and Technology
- Advisor: Jinming Cui, Yunfeng Huang

### Research Interests

**Deep Reinforcement Learning, Multi-Agent RL, Robot Learning, Generative Models and Large Language Models, RL for Finance.**

### Publications

2020 **Deep Reinforcement Learning: Fundamentals, Research and Applications**, Hao Dong, **Zihan Ding**, Shanghang Zhang Eds., Springer 2020 ISBN 978-981-15-4094-3, 1st ed.

[\[Homepage\]](#) [\[eBook\]](#)

2022 **Machine Learning System: Design and Implementation**, Luo Mai, Hao Dong et al, Tsinghua University Press 2022 ISBN, Author of Chapter: Reinforcement Learning System.

[\[Homepage\]](#)

2024 **How to beat a Bayesian Adversary?**, **Zihan Ding**, Kexin Jin, Jonas Latz, Chenguang Liu (alphabetic order).

[\[Paper\]](#)

- 2024 **Reinforcement Learning in High-frequency Market Making**, Yuheng, Zheng, **Zihan Ding**.  
Preprint [\[Paper\]](#)
- 2024 **Diffusion World Model**, **Zihan Ding**, Amy Zhang, Yuandong Tian, Qinqing Zheng, The 12th International Conference on Learning Representations (ICLR) 2024 Workshop GenAI4DM.  
[\[Paper\]](#)
- 2024 **Constraint-Aware Diffusion Models for Trajectory Optimization**, Anjian Li, **Zihan Ding**, Adji Bousso Dieng, Ryne Beeson.  
Preprint
- 2024 **FightLadder: A Benchmark for Competitive Multi-Agent Reinforcement Learning**, Wenzhe Li, **Zihan Ding**, Seth Karten, Chi Jin, The 41st International Conference on Machine Learning (ICML).  
[\[Website\]](#)
- 2024 **Efficient and Guaranteed-Safe Non-Convex Trajectory Optimization with Constrained Diffusion Model**, Anjian Li, **Zihan Ding**, Adji Bousso Dieng, Ryne Beeson, The 12th International Conference on Learning Representations (ICLR) 2024 Workshop GenAI4DM.
- 2023 **Consistency Models as a Rich and Efficient Policy Class for Reinforcement Learning**, **Zihan Ding**, Chi Jin, 12th International Conference on Learning Representations (ICLR) 2024.  
[\[Paper\]](#)[\[Code\]](#)
- 2023 **Survey of Consciousness Theory from Computational Perspective: At the Dawn of Artificial General Intelligence**, **Zihan Ding\***, Xiaoxi Wei\*, Yidan Xu\*.  
Preprint [\[Paper\]](#)
- 2023 **Representation Learning for Low-rank General-sum Markov Games**, Chengzhuo Ni, Xuezhou Zhang, Yuda Song, **Zihan Ding**, Chi Jin, Mengdi Wang, 11th International Conference on Learning Representations (ICLR) 2023.  
[\[Paper\]](#)
- 2023 **Learning a Universal Human Prior for Dexterous Manipulation from Human Preference**, **Zihan Ding**, Yuanpei Chen, Allen Z. Ren, Shixiang Shane Gu, Hao Dong, Chi Jin.  
Preprint [\[Paper\]](#)
- 2022 **A Deep Reinforcement Learning Approach for Finding Non-Exploitable Strategies in Two-Player Atari Games**, **Zihan Ding\***, Dijia Su\*, Qinghua Liu, Chi Jin.  
Preprint [\[Paper\]](#) [\[Code\]](#)
- 2022 **Learning Distributed and Fair Policies for Network Load Balancing as Markov Potential Game**, Zhiyuan Yao\*, **Zihan Ding\***, 36th Conference on Neural Information Processing Systems (NeurIPS) 2022.  
[\[Paper\]](#) [\[Code\]](#)

- 2022 **Multi-Agent Reinforcement Learning for Network Load Balancing in Data Center**, *Zhiyuan Yao, Zihan Ding, Thomas Clausen*, 31th ACM International Conference on Information and Knowledge Management (CIKM) 2022.  
[\[Paper\]](#) [\[Code\]](#)
- 2022 **Not Only Domain Randomization: Universal Policy with Embedding System Identification**, *Zihan Ding*, Robotics Science and Systems (RSS) 2023 Interdisciplinary Exploration of Generalizable Manipulation Policy Learning: Paradigms and Debates Workshop.  
[\[Paper\]](#) [\[Code\]](#)
- 2021 **CDT: Cascading Decision Trees for Explainable Reinforcement Learning**, *Zihan Ding, Pablo Hernandez-Leal, Gavin Weiguang Ding, Changjian Li, Ruitong Huang*.  
[\[Paper\]](#) [\[Code\]](#)
- 2021 **Probabilistic Mixture-of-experts for Efficient Deep Reinforcement Learning**, *Jie Ren, Yewen Li, Zihan Ding, Wei Pan, Hao Dong*.  
[\[Paper\]](#) [\[Code\]](#)
- 2021 **Reinforced Workload Distribution Fairness**, *Zhiyuan Yao, Zihan Ding, Thomas Clausen*, Machine Learning for Systems Workshop at 35th Conference on Neural Information Processing Systems (NeurIPS) 2021.  
[\[Paper\]](#) [\[Code\]](#)
- 2021 **RLzoo: A Comprehensive and Adaptive Reinforcement Learning Library**, *Zihan Ding, Tianyang Yu, Yanhua Huang, Hongming Zhang, Luo Mai and Hao Dong*, ACM Multimedia Open Source Software Competition 2021.  
[\[Paper\]](#) [\[Code\]](#)
- 2021 **DMotion: Robotic Visuomotor Control with Unsupervised Forward Model Learned from Videos**, *Haoqi Yuan, Ruihai Wu, Andrew Zhao, Haipeng Zhang, Zihan Ding, Hao Dong*, International Conference on Intelligent Robots and Systems (IROS) 2021.  
[\[Paper\]](#) [\[Website\]](#)
- 2021 **Sim-to-Real Transfer for Robotic Manipulation with Tactile Sensory**, *Zihan Ding, Ya-Yen Tsai, Wang Wei Lee, Bidan Huang*, International Conference on Intelligent Robots and Systems (IROS) 2021.  
[\[Paper\]](#)
- 2021 **Bayesian Optimization for Wavefront Sensing and Error Correction**, *Zhonghua Qian, Zihan Ding, Mingzhong Ai, Yongxiang Zheng, Jinming Cui, Yunfeng Huang, Chuanfeng Li, Guangcan Guo*, Chinese Physics Letters.  
[\[Paper\]](#)
- 2021 **DROID: Minimizing the Reality Gap using Single-shot Human Demonstration**, *Ya-Yen Tsai, Hui Xu, Zihan Ding, Chong Zhang, Edward Johns, Jie Shao, and Bidan Huang*, IEEE Robotics and Automation Letters (RA-L) .  
[\[Paper\]](#)

- 2020 **Crossing The Gap: A Deep Dive into Zero-Shot Sim-to-Real Transfer for Dynamics**, *Eugene Valassakis, Zihan Ding and Edward Johns*, International Conference on Intelligent Robots and Systems (IROS) 2020.  
[\[Paper\]](#)[\[Website\]](#)[\[Video\]](#)
- 2020 **Sim-to-Real Transfer for Optical Tactile Sensing**, *Zihan Ding, Nathan F. Lepora and Edward Johns*, International Conference on Robotics and Automation (ICRA) 2020.  
[\[Paper\]](#)[\[Code\]](#)[\[Video\]](#)
- 2020 **Arena: A General Evaluation Platform and Building Toolkit for Multi-Agent Intelligence**, *Yuhang Song, Jianyi Wang, Thomas Lukasiewicz, Zhenghua Xu, Mai Xu, Zihan Ding, and Lianlong Wu*, The Thirty-Fourth AAAI Conference on Artificial Intelligence 2020.  
[\[Paper\]](#)[\[Code\]](#)
- 2019 **Fast and High-Fidelity Readout of Single Trapped-Ion Qubit via Machine-Learning Methods**, *Zihan Ding, Jinming Cui, Yunfeng Huang, Chuanfeng Li, Tao Tu, Guangcan Guo*, Physical Review Applied.  
[\[Paper\]](#)[\[Code\]](#)
- 2019 **Tensor Super-Resolution with Generative Adversarial Nets: A Large Image Generation Approach**, *Zihan Ding, Xiao-Yang Liu, Miao Yin*, International Joint Conference on Artificial Intelligence (IJCAI) Human Brain Artificial Intelligence Workshop 2019.  
[\[Paper\]](#)[\[Code\]](#)
- 2018 **Deep Reinforcement Learning for Intelligent Transportation Systems**, *Xiao-Yang Liu, Zihan Ding, Sem Borst, Anwar Walid*, NeurIPS Workshop on Machine Learning for Intelligent Transportation Systems 2018.  
[\[Paper\]](#)[\[Code\]](#)
- 2018 **Accelerated Exhaustive Eye Glints Localization Method for Infrared Video Oculography**, *Zihan Ding, Jiayi Luo, Hongping Deng*, Proceedings of the 33rd Annual ACM Symposium on Applied Computing, SAC '18.  
[\[Paper\]](#)[\[Code\]](#)

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## Open-Source Projects

- 2022 **MARS**, *principal developer*, [\[Repo\]](#), multi-agent reinforcement learning library.
- 2022 **FinRL**, *contributor*, [\[Repo\]](#), an open-source library for stock trading w/ RL.
- 2019 **TensorLayer RL Tutorials**, *principal developer*, [\[Repo\]](#), tutorials for RL.
- 2019 **RLzoo**, *principal developer*, [\[Repo\]](#), single-agent reinforcement learning library.

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## Work Experiences

- 2022.09–  
Present **Graduate Research Assistant**, Princeton University, New Jersey.
- Machine learning and reinforcement learning.

- 2024.05– **Research Scientist Intern**, Adobe Inc., Research Lab, San Jose, advised by  
 2024.08 Yuchen Liu, Krishna Kumar Singh, Difan Liu, Haitian Zheng, Yan Kang, Zhe Lin.  
 ○ Few-step Video Generation Model.
- 2023.05– **Research Scientist Intern**, Meta, FAIR Lab, New York, advised by Qinqing  
 2023.12 Zheng, Amy Zhang, Yuandong Tian.  
 ○ Offline Model-based Reinforcement Learning.
- 2021.03– **Research Intern**, Inspir.ai, Beijing, China.  
 2021.08  
 ○ Multi-agent Reinforcement Learning; Game Theory.
- 2020.09– **Research Intern**, Tencent, Robotics X Lab, Shenzhen, Guangdong, China.  
 2021.03  
 ○ Sim-to-real Methods for Robotics Control with Tactile Sensory.
- 2020.02– **Research Intern**, Borealis AI, Toronto, Ontario, Canada.  
 2020.06  
 ○ Explainable Reinforcement Learning Based on Differentiable Decision Tree.

## Research Experiences

- 2019.09– **Research Intern**, Imperial College London, Robot Learning Lab, advised by  
 2020.01 Dr. Edward Johns.  
 ○ Sim-to-real Reinforcement Learning for Robotic Arm Control with Tactile Sensor
- 2017 **Undergraduate Research**, USTC, Immersive Multimedia Communication Laboratory, advised by Prof. Zhibo Chen.  
 ○ Competition of NeurIPS 2017: Learning to Run
- 2016–2018 **Undergraduate Research**, USTC, CAS Key Laboratory of Quantum Information, advised by Dr. Jinming Cui and Prof. Yunfeng Huang.  
 ○ Machine Learning assisted Qubit Readout in Trap-ion System.

## Talks

- 2024.04 **Intel AI, Deep Learning Community of Practice**, Diffusion World Model for Offline Model-based Reinforcement Learning .
- 2024.03 **Princeton Language & Intelligence: Vision Language Seminar**, Break the Mystery of Sora .

## Honors & Awards

- 2018 **Best Undergraduate Thesis Award at USTC 2018**, top 2 in the major.
- 2017 **NeurIPS 2017: Learning to Run Competition**, 4<sup>th</sup>/479 .
- 2016 **DJI RoboMaster AI Challenge 2016**, 3<sup>rd</sup>/40.

## Academic Services

**Organization Committee:.**

- Human in the Loop Learning (HiLL) Workshop at NeurIPS 2022
- FinRL Contest at ACM ICAIF 2023

**Reviewer of Conferences and Journals:.**

- European Conference on Computer Vision (ECCV) 2024
- International Conference on Machine Learning (ICML) 2024
- International Conference on Robotics and Automation (ICRA) 2024
- International Conference on Learning Representations (ICLR) 2024
- IEEE Robotics and Automation Letters (RA-L) 2023
- International Conference on Computer Vision (ICCV) 2023
- The IEEE / CVF Computer Vision and Pattern Recognition Conference (CVPR) 2023
- International Conference on Learning Representations (ICLR) 2023
- Association for the Advancement of Artificial Intelligence (AAAI) 2023
- Conference on Neural Information Processing Systems (NeurIPS) 2022
- International Conference on Machine Learning (ICML) 2022
- International Conference on Robotics and Automation (ICRA) 2022
- 56th Conference on Information Sciences and Systems (CISS) 2022
- International Conference on Artificial Intelligence and Statistics (AISTATS) 2022
- Conference on Neural Information Processing Systems (NeurIPS) 2021
- IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM) 2021
- International Conference on Intelligent Robots and Systems (IROS) 2021
- IEEE Robotics and Automation Letters (RA-L) 2021
- NeurIPS 2020 Quantum Tensor Networks in Machine Learning Workshop
- NeurIPS 2019 Autonomous Driving Workshop
- IEEE Access

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**Skills****◦ Languages**

Python, C++, C#, Prolog

**◦ Frameworks**

PyTorch, TensorFlow (v1.&v2.), TensorLayer

**◦ Tools**

git, L<sup>A</sup>T<sub>E</sub>X, ROS, MuJoCo, Unity3D, PyRep, SolidWorks, AutoCAD, Mathematics, MATLAB, OpenCV