

Jiahao Yao

CONTACT INFORMATION

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USA

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RESEARCH INTERESTS

Machine learning, deep learning, reinforcement learning, unsupervised learning, quantum computing

EDUCATION

University of California, Berkeley

Department of Mathematics

August 2018 - Present

Ph.D. Program in Applied Mathematics, Advisor: [Lin Lin](#)

Peking University

Department of Mathematics

September 2014 - June 2018

B.S. in Computational Mathematics

INDUSTRY EXPERIENCE

Microsoft Research Asia Beijing, China *Research Engineer* March 2018 - June 2018

Advised by Cheng Chen, System Research Group.

Built toolkit for deep learning model management: [mmdnn.com](https://github.com/mmdnn)

Github star: 5k+

Anyscale, Inc.

San Francisco, CA *Senior Engineer* April 2022 - August 2022

Advised by Richard Liaw and Matthew Deng, Anyscale.

Built Ray JaxTrainer (multi-node multi-GPUs, TPUs): [ray.io](https://github.com/ray-project/ray-jax-trainer)

Github star: 20k+

PUBLICATIONS

Jiahao Yao, Haoya Li, Marin Bukov, Lin Lin, Lexing Ying.

Monte Carlo Tree Search based Hybrid Optimization of Variational Quantum Circuits, (video)
In *Proceedings of Mathematical and Scientific Machine Learning (MSML 2022)*.

Jiahao Yao, Paul Köttering, Hans Gundlach, Lin Lin, Marin Bukov.

Noise-Robust End-to-End Quantum Control using Deep Autoregressive Policy Networks,
In *Proceedings of Mathematical and Scientific Machine Learning (MSML 2021)*.

Jiahao Yao, Lin Lin, Marin Bukov.

Reinforcement Learning for Many-Body Ground State Preparation based on Counter-Diabatic Driving,

In *Physics Review X* (2021). [[Coverage at LBL](#)]

Kevin J. Sung, **Jiahao Yao**, Matthew P. Harrigan, Nicholas C. Rubin, Zhang Jiang, Lin Lin, Ryan Babbush, Jarrod R. McClean.

Using models to improve optimizers for variational quantum algorithms
In *Quantum Science and Technology, QST-100846.R1*.

Jiahao Yao, Marin Bukov, Lin Lin.

Policy Gradient based Quantum Approximate Optimization Algorithm, (video)
In *Proceedings of Mathematical and Scientific Machine Learning (MSML 2020)*.

Michael Luo, **Jiahao Yao**, Richard Liaw, Eric Liang, Ion Stoica

IMPACT: Importance Weighted Asynchronous Architectures with Clipped Target Networks.
In *Proceedings of 8th International Conference on Learning Representations (ICLR 2020)*.

TEACHING

University of California, Berkeley*Teaching Assistant*

| | |
|---|-------------|
| Math 104: Introduction to Analysis | Fall 2018 |
| Math 112A: Mathematical Tools for the Physical Sciences | Fall 2018 |
| Math 128A: Numerical Analysis: Introduction to Machine Learning | Spring 2019 |
| Math 54: Linear Algebra & Differential Equations | Fall 2022 |

Peking University*Instructor*

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| Deep Learning short course in PKU | Fall 2016 |
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MONTORING

Undergraduate Research

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| Paul Köttering (now Masters student at NYU) | Summer 2020 |
| Hans Gundlach (now Masters student at Cambridge) | Fall 2020 |
| Pranav Vaidhyanathan (now Ph.D. student at Oxford) | Fall 2020 |

Honored Bachelor Thesis Advising

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| Zehao Zhao (now Masters student at MIT) | Spring 2022 |
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Curriculum and Career Development Advising

Zitong Yang (now Ph.D. student at Stanford), Xiang Ji (now Ph.D. student at Princeton), Hongli Zhao (now Ph.D. student at UChicago).

HONORS AND AWARDS

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| • Excellent Graduate Student, PKU | June 2018 |
| • 2018 Mathematical Contest In Modeling, COMAP, Meritorious Winner | April 2018 |
| • S.-T. Yau College Mathematics Contests, Team Gold Medal | August 2017 |
| • S.-T. Yau College Mathematics Contests, Silver Medal in Computational Math | August 2017 |
| • Mathematical Contest In Modeling, COMAP, Meritorious Winner | April 2017 |
| • National Scholarship, Minister of Education (highest honor) | October 2016 |
| • Pivot of Merit Student in PKU, top 1% | October. 2016 |
| • National Undergraduate Physics Competition, First Prize | December. 2015 |
| • 27th Chinese Chemistry Olympiad, Silver Medal | December. 2013 |

OPEN SOURCE SOFTWARES

- MMdnn: model management for the deep neural network.
GitHub: <https://github.com/Microsoft/MMdnn>
- Ray: a unified framework for scaling AI and Python applications.
GitHub: <https://github.com/ray-project/ray>
- Ray Lightning: Pytorch Lightning Distributed Accelerators using Ray.

GitHub: https://github.com/ray-project/ray_lightning

INVITED TALKS

- MCTS-QAOA: Monte Carlo Tree Search based Hybrid Optimization of Variational Quantum Circuits. MSML 2022. , [Virtual](#), August 2022.
- Variational Quantum algorithm: from a Reinforcement Learning and Counter-diabatic perspective. [Workshop on Variational Learning for Quantum Matter](#), Switzerland, July 2022.
- RL4QAOA: A Reinforcement Learning Approach to Quantum Approximate Optimization Algorithm. APS march meeting, [Virtual](#), March 2021.
- RL4QAOA: A Reinforcement Learning Approach to Quantum Approximate Optimization Algorithm. SIAM CSE mini symposium, [Virtual](#), March 2021.
- RL-QAOA: A Reinforcement Learning Approach to Quantum Approximate Optimization Algorithm. Two Sigma PhD Research Symposium, [Virtual](#), December 2020.
- Policy Gradient based Quantum Approximate Optimization Algorithm. MSML 2020. Princeton, New Jersey, USA. July 2020.

PROFESSIONAL
SERVICE

External Reviewer for:
Conference: ICML, NeurIPS.
Journal: PRApplied, PRE.