Yuhao Ding

PhD Candidate · Industrail Engineering and Operations Research

University of California, Berkeley

+1 5103320516 | yuhao_ding@berkeley.edu | https://yuhaod.github.io/homepage/

Education

University of California, Berkeley — *Berkeley, CA*

Ph.D. student in Industrial Engineering and Operations Research — *August 2018-May 2023*

- Advisor: Prof. Javad Lavaei
- GPA: 3.95/4.0

University of Michigan, Ann Arbor — *Ann Arbor, MI*

MS in Electrical and Computer Engineering — *September 2016-April 2018*

- Advisor: Prof. Necmiye Ozay
- GPA: 4.0/4.0

Nanjing University of Aeronautics and Astronautics — *Nanjing, China*

BE in Aerospace Engineering — *September 2012-June 2016*

- GPA: 93/100
- Honor Graduate

Professional Experience

Amazon AWS AI Lab — *Santa Clara*

Applied Research Scientist intern — *May 2022-August 2022*

- Ensemble time series models using deep reinforcement learning.
- Mentors: Dr. Youngsuk Park, Dr. Karthick Gopalswamy, Dr. Hilaf Hasson, Dr Yuyang Wang, Dr. Luke Huan
- Strong inclined for return offer and the paper submitted to ICLR 2023

Microsoft Research — *Remote*

Research intern — *May 2021-August 2021*

- Causal-aware simulation-based optimization.
- Mentor: Dr. Emre Kiciman, Dr. Cheng Zhang, Dr. Qie Zhang, Dr. Swati Sharma
- Filed a patent application.

Ford Motor Company — *Ann Arbor, MI*

Part-time Research intern — *December 2017-May 2018*

- Deep reinforcement learning based autonomous driving simulator.
- Advisor: Prof. Ilya Kolmanovsky, Dr. Subramanya Nageshrao

Publications

Journal

Y. Ding, J. Lavaei, and M. Arcak, "Time-variation in Online Nonconvex Optimization Enables Escaping from Spurious Local Minima", IEEE Transactions on Automatic Control, 2021.

S. Fattahi, C. Josz, **Y. Ding**, R. Mohammadi, J. Lavaei, S. Sojoudi, "Absence of spurious local trajectories in time-varying optimization", IEEE Transactions on Automatic control, 2021.

Y. Ding, J. Zhang, J. Lavaei, "Beyond Exact Gradients: Convergence of Stochastic Soft-Max Policy Gradient Methods with Entropy Regularization", under review of IEEE Transactions on Automatic control.

Conference proceedings

Y. Ding, M. Jin, J. Lavaei. "Non-Stationary Risk-Sensitive Reinforcement Learning: Near-Optimal Regret and Adaptive Detection", the 37th AAAI Conference on Artificial Intelligence (AAAI), 2023.

D. Ying, M. Guo, **Y. Ding**, J. Lavaei, M. Shen, "Variational Policy Gradient Primal-Dual Method for Convex Constrained Markov Decision Processes", the 37th AAAI Conference on Artificial Intelligence (AAAI), 2023.

Y. Ding, J. Lavaei, "Provably Efficient Primal-Dual Reinforcement Learning for CMDPs with Non-stationary Objectives and Constraints", the 37th AAAI Conference on Artificial Intelligence (AAAI), 2023.

D. Ying, **Y. Ding**, J. Lavaei, "A Dual Approach to Constrained Markov Decision Processes with Entropy Regularization", the 25th International Conference on Artificial Intelligence and Statistics (AISTATS), 2022.

Y. Ding, J. Zhang, J. Lavaei. "On the Global Convergence of Momentum-based Policy Gradient", the 25th International Conference on Artificial Intelligence and Statistics (AISTATS), 2022.

Y. Ding, and J. Lavaei, "Structured Projection-free Online Convex Optimization with Multi-Point Bandit Feedback". the 60th IEEE conference on Decision and Control (CDC), 2021.

Y. Ding, Y. Bi, and J. Lavaei "Analysis of Spurious Local Solutions of Optimal Control Problems: One-Shot Optimization Versus Dynamic Programming". 2021 American Control Conference (ACC), 2021.

Y. Ding, J. Lavaei, and M. Arcak "Escaping spurious local minimum trajectories in online time-varying nonconvex optimization". 2021 American Control Conference (ACC), 2021. **Finalist for Best Student Paper Award**.

Y. Ding, F. Harirchi, S.Z. Yong, E. Jacobsen, N. Ozay, "Optimal Input Design for Affine Model Discrimination with Applications in Intention-Aware Vehicles". 9th ACM/IEEE International Conference on Cyber-Physical Systems (ICCPS), Porto, Portugal, April 2018.

K. Singh, **Y. Ding**, N. Ozay, S.Z. Yong, "Input Design for Nonlinear Model Discrimination via Affine Abstraction". Proc. 6th IFAC Conference on Analysis and Design of Hybrid Systems (ADHS), Oxford, UK, July 2018.

In Review

D. Ying, **Y. Ding**, A. Koppel, and J. Lavaei "Scalable Multi-Agent Reinforcement Learning with General Utilities.", submitted to ACC 2023.

Y. Ding, Y. Park, and K. Gopalswamy, H. Hasson, Y. Wang, L. Huan "Dynamic Ensembling for Probabilistic Time Series Forecasting via Deep Reinforcement Learning.", submitted to ICLR 2023.

V. Khattar, **Y. Ding**, M. Jin, J. Lavaei, "Provable Guarantees for Meta-Safe Reinforcement Learning", submitted to ICLR 2023.

Y. Ding, H. Feng, and J. Lavaei, "Aggressive Local Search for Constrained Optimal Control Problems with Many Local Minima." arXiv preprint arXiv:1903.08634.

In Preparation

Y. Ding, E. Kiciman, and C. Zhang, Q. Zhang, S. Sharma "Causal-aware Models for Simulator-based Decision-making".

Patents

E. Kiciman, and C. Zhang, Q. Zhang, S. Sharma, **Y. Ding**, R. Chandra, "Optimization and decision-making using causal aware machine learning models trained from simulators" (pending).

Awards, Fellowships, & Grants

2022 **Marshall-Olivier-Rosenberger Fellowship**, UC Berkeley

2021 **Finalist for Best Student Paper Award**, 2021 American Control Conference (ACC)

2018 **Graduate student Fellowship**, IEOR, UC Berkeley

2016 **China Scholarship Council (CSC) scholarship**, CSC

2015 **The Alan Mulally Leadership Scholarship**, Ford Motor Company
German Academic Exchange Service (DAAD) scholarship,

2014 **Excellent scholarship**, Chinese Aviation Electromechanical System Company

2013 **Chinese Mathematics Competition (Jiangsu province)**, First prize
Chinese National Scholarship,

Teaching Experience

Fall 2019 **IEOR 160: Nonlinear and discrete optimization**, Graduate Student Instructor *UC Berkeley*

Courses

Operations research

Mathematical Programming I, II (**A+**); Applied Stochastic Process I,II; Optimization for machine learning (**A+**); Network Flows and Graphs (**A+**); Control and Optimization for Power Systems (**A+**); Supply Chain and Logistics Management.

Statistics

Theoretical Statistics I, II (**A+**); High-dimensional statistics for low-dimensional model (**A+**); Statistical Learning Theory; Statistical Models: Theory and Application; Analysis of time-series.

Deep learning

Designing, Visualizing and Understanding Deep Neural Networks (**A+**); Deep Reinforcement Learning (**A+**).

Others

Stochastic Systems: Estimation and Control (**A+**); Population Games.

Outreach & Professional Development

Peer Review

IEEE Transactions on Automatic Control
Systems & Control Letters
Conference on Neural Information Processing Systems, 2021, 2022
International Conference on Machine Learning, 2022
Conference on Artificial Intelligence and Statistics, 2021
American Control Conference, 2020, 2021
IEEE Conference on Decision and Control, 2021

Professional Memberships

IEEE, student member
INFORMS, student member