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Google Scholar

Yi Ding

Research Interests

Machine learning for systems, Computer Systems, Computer Architecture, Machine Learning, Causal Inference

Education

8/2015–12/2020 **The University of Chicago** Chicago, IL, USA
PhD & MS in Computer Science. Advisor: Henry Hoffmann
PhD Dissertation: *Learning Structure for Computer Systems Management*

7/2013–8/2015 **Nanyang Technological University** Singapore
Doctoral Student in Computer Science. Passed Qualification Exam.

9/2008–7/2012 **Beijing Jiaotong University** Beijing, China
B.E. in Electronic Science and Technology. Graduated with *Highest Honor*.

Professional Employment

8/2023-present **Purdue University** West Lafayette, IN, USA
Assistant Professor in Elmore Family School of Electrical and Computer Engineering

1/2021-8/2023 **Massachusetts Institute of Technology** Cambridge, MA, USA
Postdoctoral Associate & NSF Computing Innovation Fellow. Mentor: Michael Carbin

10/2021-12/2022 **Meta** Cambridge, MA, USA
Visiting Researcher. Accelerated maintenance efficiency of production servers in hyperscale datacenters.

6/2019-9/2019 **Google** Sunnyvale, CA, USA
Research Intern. Introduced causal analysis to fleet understanding and automated confounder discovery.

Selected Awards and Honors

2020-2023 CRA/CCC/NSF Computing Innovation Fellowship [Link].
2021 Meta Research Award [Link].
2020 EECS Rising Stars at UC Berkeley [Link]

Publications

ASPLOS 2023 Gokul Ravi, Pranav Gokhale, Yi Ding, William M. Kirby, Kaitlin N. Smith, Jonathan M. Baker, Peter J. Love, Henry Hoffmann, Kenneth R. Brown, Frederic T. Chong. "CAFQA: A Classical Simulation Bootstrap for Variational Quantum Algorithms". *ACM International Conference on Architectural Support for Programming Languages and Operating Systems*, 2023.

Biometrika 2023 Guillaume Basse, Yi Ding, Panos Toulis. "Minimax Designs for Causal Effects in Temporal Experiments with Treatment Habituation". *Biometrika*, 2023. (Top theoretical statistics journal)

MLSys 2022 Yi Ding, Avinash Rao, Hyebin Song, Rebecca Willett, Henry Hoffmann. "NURD: Negative-Unlabeled Learning for Online Datacenter Straggler Prediction". *Conference on Machine Learning and Systems*, 2022.

ESEC/FSE 2021 Yi Ding, Ahsan Pervaiz, Michael Carbin, Henry Hoffmann. "Generalizable and Interpretable Learning for Configuration Extrapolation". *ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering*, 2021.

ISCA 2019 Yi Ding, Nikita Mishra, Henry Hoffmann. "Generative and Multi–phase Learning for Computer Systems Optimization". *International Symposium on Computer Architecture*, 2019.

Onward! 2021 Alex Renda, Yi Ding, Michael Carbin. "Programming with Neural Surrogates of Programs". *ACM SIGPLAN International Symp. on New Ideas, New Paradigms, and Reflections on Programming and Software*, 2021.

npj Urban Sus. 2021 Kathryn Schertz, James Saxon, Carlos Cardenas-Iniguez, Luís Bettencourt, Yi Ding, Henry Hoffmann, Marc G Berman. "Neighborhood Street Activity and Greenspace Usage Uniquely Contribute to Predicting Crime". *npj Urban Sustainability, Nature Research Journal*, 2021.

AISTATS 2020 Yi Ding, Panos Toulis. "Dynamical Systems Theory for Causal Inference with Application to Synthetic Control Methods". *International Conference on Artificial Intelligence and Statistics*, 2020.

NeurIPS 2020 Ming Gao, Yi Ding, Bryon Aragam. "A Polynomial-time Algorithm for Learning Nonparametric Causal Graphs". *Advances in Neural Information Processing Systems*, 2020.

ISCA 2019 Yi Ding, Nikita Mishra, Henry Hoffmann. "Generative and Multi–phase Learning for Computer Systems Optimization". *International Symposium on Computer Architecture*, 2019.

NeurIPS 2017 Yi Ding, Risi Kondor, Jonathan Eskreis-Winkler. "Multiresolution Kernel Approximation for Gaussian Process Regression". *Advances in Neural Information Processing Systems*, 2017. (Top 4%, Spotlight)

ICDM 2017 Yi Ding, Chenghao Liu, Peilin Zhao, Steven CH Hoi. "Large Scale Kernel Methods for Online AUC Maximization". *IEEE International Conference on Data Mining*, 2017. (Top 9%, Long Oral)

AAAI 2015 Yi Ding, Peilin Zhao, Steven CH Hoi, Yew-Soon Ong. "An Adaptive Gradient Method for Online AUC Maximization". *AAAI Conference on Artificial Intelligence*, 2015. (Oral)

AAAI 2014 Pengcheng Wu, Yi Ding, Peilin Zhao, Chunyan Miao, Steven CH Hoi. "Learning Relative Similarity by Stochastic Dual Coordinate Ascent". *AAAI Conference on Artificial Intelligence*, 2014.

Preprints

In Submission Alex Renda, Yi Ding, Michael Carbin. "Turaco: Complexity-Guided Data Sampling for Training Neural Surrogates of Programs". 2023.

In Submission Yi Ding, Aijia Gao, Thibaud Ryden, Kaushik Mitra, Sukumar Kalmanje, Yanai Golany, Michael Carbin, Henry Hoffmann. "Accelerating Datacenter-level Maintenance Job Scheduling with Acela". 2022.

In Submission Yi Ding, Hyunji Kim, Ahsan Pervaiz, Henry Hoffmann, Michael Carbin. "Saxon: Safe Exploration for On-Node Resource Control". 2022.

In Submission Yi Ding, Alex Renda, Ahsan Pervaiz, Michael Carbin, Henry Hoffmann. "Cello: Efficient Computer Systems Optimization with Predictive Early Termination and Censored Regression". 2022.

Workshop Contributions

WiML 2020 Yi Ding, Avinash Rao, Henry Hoffmann. "Causal and Interpretable Learning for Datacenter Latency Prediction". *Women in Machine Learning Workshop co-located with NeurIPS*, 2020.

WiML 2020 Ming Gao, Yi Ding, Bryon Aragam. "A Polynomial-time Algorithm for Learning Nonparametric Causal Graphs". *Women in Machine Learning Workshop co-located with NeurIPS*, 2020.

CausalML 2019 Yi Ding, Guillaume Basse, Panos Toulis. "Minimax Crossover Designs". *NeurIPS Workshop on "Do the right thing": machine learning and causal inference for improved decision making*, 2019.

CODE@MIT 2019 Guillaume Basse, Yi Ding, Panos Toulis. "Minimax Crossover Designs for Digital Experimentation". *Conference on Digital Experimentation at MIT*, 2019.

WiML 2019 Yi Ding, Nikita Mishra, Henry Hoffmann. "Generative and Multi–phase Learning for Computer Systems Optimization". *Women in Machine Learning Workshop co-located with NeurIPS*, 2019.

WiML 2018 Yi Ding, Panos Toulis. "Nonparametric Causal Inference in Dynamical Systems with Synthetic Controls". *Women in Machine Learning Workshop co-located with NeurIPS*, 2018.

Teaching

University of Chicago, Chicago, IL

Spring 2017 **Teaching Assistant**, Machine Learning and Large Scale Data Analysis (CMSC 25025)

Winter 2017 **Teaching Assistant**, Machine Learning (CMSC 25400)

Spring 2016 **Teaching Assistant**, Machine Learning (MPCS 53111)

Winter 2016 **Teaching Assistant**, Machine Learning for Public Policy (CAPP 30255)

Research Advising

Master

2021–2022 **Hyunji Kim**, *MIT*, Current: Strip

Undergraduate

2019–2020 **Avinash Rao**, *UChicago*, Current: Goldman Sachs

Grants

2020–2023
Funder: NSF
Title: Computing Innovation Fellows 2020 Project
People: Michael Carbin (PI), Yi Ding
Awarded: $295,704

2021
Funder: Meta
Title: Meta Research Award On Statistics for Improving Insights, Models, and Decisions
People: Michael Carbin (PI), Yi Ding
Awarded: $46,000

Service

Program Committee

2022 SPLASH Onward!
Conference on Systems and Machine Learning (MLSys)
ACM Asia-Pacific Workshop on Systems
Journal of Systems Research

Technical Reviewing

2022 Neural Information Processing Systems (NeurIPS)
International Conference on Learning Representations (ICLR)
International Conference on Machine Learning (ICML)
2021 Neural Information Processing Systems (NeurIPS)
AAAI Conference on Artificial Intelligence (AAAI)
2020 AAAI Conference on Artificial Intelligence (AAAI)
2019 Neural Information Processing Systems (NeurIPS)
International Conference on Machine Learning (ICML)

Talks

2023 "A Holistic View on Machine Learning for Systems"
- Microsoft Research — Apr. 2023
- Texas A&M University, Department of Computer Science & Engineering — Apr. 2023
- University of Southern California, Department of Electrical & Computer Engineering — Apr. 2023
- University of Illinois, Department of Computer Science — Mar. 2023
- Cornell Tech, Department of Electrical & Computer Engineering — Mar. 2023
- Washington University in St. Louis, Department of Computer Science & Engineering — Mar. 2023
- Purdue University, Department of Electrical & Computer Engineering — Mar. 2023
- Purdue University, Department of Computer Science — Mar. 2023
- Virginia Tech, Department of Computer Science — Mar. 2023
- Indiana University Bloomington, Department of Computer Science — Feb. 2023
- University of Colorado Boulder, Department of Computer Science — Feb. 2023
- University of Massachusetts Amherst, College of Information and Computer Sciences — Feb. 2023

2022 "NURD: Negative-Unlabeled Learning for Online Datacenter Straggler Prediction"
- Conference presentation at MLSys, Santa Clara, USA — Aug. 2022

2022 "Predictable Maintenance Job Planning in Datacenters"
- Meta Infrastructure Data Science Faculty Workshop at KDD, DC, USA — Aug. 2022

2021 "Generalizable and Interpretable Learning for Configuration Extrapolation"
- Conference presentation at ESEC/FSE, Virtual — Nov. 2021

2020 "Dynamical Systems Theory for Causal Inference with Application to Synthetic Controls"
- Causal Data Science Meeting, Virtual — Nov. 2020
- Conference presentation at AISTATS, Virtual — Aug. 2020

2019-2020 "Generative and Multi–phase Learning for Computer Systems Optimization"

- Xiapeisu Youth Forum at ICT, Chinese Academy Of Sciences, Virtual — Sep. 2020
- Conference presentation at ISCA, Phoenix, USA — Jun. 2019

2017 "Multiresolution Kernel Approximation for Gaussian Process Regression"

- Conference presentation at NeurIPS, Long Beach, USA — Dec. 2017

2017 "Large Scale Kernel Methods for Online AUC Maximization"

- Conference presentation at ICDM, New Orleans, USA — Nov. 2017

2015 "An Adaptive Gradient Method for Online AUC Maximization"

- Conference presentation at AAAI, Austin, USA — Jan. 2015

Leadership in Equity, Diversity, and Inclusion

2018-2020 **Prime Minister of PhD Student Representatives in UChicago CS department**. Acted as the primary interface between faculty and PhD students and responsible for handling faculty-grad interactions and concerns to improve departmental equity and inclusion.

2018-2019 **Co-chair of Graduate Women in UChicago CS department (GWiCS)**. Managed funding for events that foster a community of peer mentorship, which have been attended by 75% of the female PhD students. Also advocated for better department-wide dissemination of resources for female-identifying graduate students.

Last updated July 21, 2023.