Na Zhang

Contact Information

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Webpage: https://nazhangai.github.io/mlresearch

Research Interests

Trustworthy Machine Learning, Reinforcement Learning, Deep Learning, Causal Inference

Education

Harvard University

M.P.A. Development Economics, March 2018
Thesis: Managing Risks of China's External Debt
Advisor: Jeffrey Frankel, Carmen Reinhart

Concentrations: Financial Economics, Statistical Machine Learning

Massachusetts Institute of Technology

Master of Science (MS) Engineering Systems, June 2010
Thesis: Apply Option-thinking in Long Term Infrastructure Investment
Advisor: Richard de Neufville

Concentrations: Decision-Making Under Uncertainty, Statistical Modeling

Beihang University

Bachelor of Engineering (BEng) in Advanced Engineering, July 2008
Thesis: Recipient of Best Thesis Award
Advisor: Peide Feng

Minor and Concentrations: Applied Mathematics
Selected as one of top 37 from 3500+ peers to join university-wide Honors College, established to provide rigorous training in mathematics and physics
Graduated with Honor

Publications

Non-Asymptotic Confidence Intervals of Off-Policy Evaluation: Primal and Dual Bounds
International Conference on Learning Representations (ICLR), 2021, submission

Certified Monotonic Neural Networks
Xingchao Liu, Xing Han, Na Zhang, Qiang Liu
Advances in Neural Information Processing Systems (NeurIPS), 2020

Off-Policy Interval Estimation with Lipschitz Value Iteration
Ziyang Tang, Yihao Feng, Na Zhang, Qiang Liu
Advances in Neural Information Processing Systems (NeurIPS), 2020

Transparent Interpretation with Knockout
Xing Han, Yihao Feng, Na Zhang, Qiang Liu
International Conference on Machine Learning (ICML), 2020
Workshop on interpretability in machine learning

Professional Experience

University of Texas at Austin
Machine Learning Researcher 02/2019 -

- Proposed a provably correct method for obtaining interval bounds for off-policy evaluation in a general continuous setting
- Proposed to certify the monotonicity of a general piece-wise linear neural networks by solving a mixed integer linear programming problem
- Designed a model-agnostic algorithm that can iteratively build a set of training data that are most responsible for a given prediction

Tsinghua University
Machine Learning Researcher 04/2019 -

- Explored how best to incorporate domain-knowledge, including domain-based constraints, into the cutting-edge ML algorithms
- Framed asset management as a reinforcement learning problem to maximize proper financial metrics, and used economic expertise to guide the reward function design
- Applied monotonic neural networks to capture desirable financial constraints

Harvard University
Research Associate 01/2018 - 12/2018

- Built statistical models to estimate impacts of currency unions on bilateral trade
- Analyzed the role of cross-border capital flows in liquidity allocation during local and global liquidity shocks

China Development Bank
Research Associate, Project Manager 01/2018 - 01/2019

- Worked as financial advisor of large-scale cross-border projects, e.g. $20 billion+ Yamal Liquefied Natural Gas project
- Led research on identifying, analyzing, and monitoring risks of overseas assets portfolio of the bank

Massachusetts Institute of Technology
Research Assistant 01/2018 - 01/2019

- Focused on real options design of complex systems to increase their expected value in the context of uncertainty and risk
- Proposed a framework to apply option-thinking in long-term infrastructure investment
- Quantitatively analyzed the application of flexibility in engineering systems to both minimize undesirable consequences and exploiting desirable opportunities

Selected Honors & Awards

Harvard Ng Teng Fong Fellowship	2015 - 2017
Mossavar-Rahmani Center Research Funding	2016 - 2017
HKS Degree Programs Student Affairs Research Funding	2016 - 2017
Performance Recognition Award, China Development Bank	2012 - 2013
MIT Richard L. de Neufville Graduate Fellowship	2009 - 2010
Chiang Chen Overseas Graduate Fellowship, 1 of 10 national winners	2008 - 2009
Honorable Mention in US Mathematical Contest in Modeling	2007
Second Prize in NUS-PKU Mathematical Modeling Contest	2006
Outstanding Academic Performance Scholarship	2004 - 2008
Outstanding Freshman Scholarship (top 0.5%)	2004

Teaching Experience

Teaching Assistant, Advanced Macroeconomics for the Open Economy II — Spring 2017
Harvard University

Teaching Assistant, Introduction to Technology and Policy — Fall 2009
Massachusetts Institute of Technology