Tianyi Peng

Contact Information

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Research Interests

AI in Operations, Reinforcement Learning, Experimentation, High-Dimension Statistics, Data-Driven Decision Making

Academic Appointments

Columbia University, Graduate School of Business 2024 - present
Decision, Risk, & Operations Division
Assistant Professor

Academic Degrees

Massachusetts Institute of Technology 2017 - 2023
Ph.D. in Statistics and Aeronautics/Astronautics, GPA: 5.0/5.0
Field in Operations Research
Advisor: Vivek Farias

Tsinghua University 2013 - 2017
Bachelor in Computer Science
- ⋆ Selected for the *Yao Class* (a CS pilot program led by Prof. Andrew C. Yao)
- ⋆ Graduated with Best Thesis Award

Professional Experience

Cimulate.AI
Leading the development of generative-AI models in e-commerce.
Founding member 2023 - 2024
Consultant 2024 - current

Anheuser-Busch InBev 2020 - 2023
Data scientist. Leading the development of TestOps, a pioneering experimentation platform for physical retailers.

TikTok (ByteDance) 2021 - 2023
Data Scientist. Addressing interference problems in the experimentation platform at Bytedance and developing recommendation algorithms at TikTok.

Liberty Mutual 2021 - 2023
Data Scientist. Developing novel data-imputation methods for improving insurance pricing.

Publications

Learning Treatment Effects in Panels with General Intervention Patterns
with Vivek Farias and Andrew Li
Preliminary: NeurIPS 2021 *(Oral, top 0.6% of submissions)*
Under review in *Journal of the American Statistical Association*
- ⋆ *Finalist*, **MSOM Best Student Paper Prize 2022**

Generalized Synthetic Control for TestOps at ABI
with Vivek Farias et al.
To appear in *INFORMS Journal on Applied Analytics*
- ⋆ *Winner*, **INFORMS Daniel H. Wagner Prize 2022**

Markovian Interference in Experiments
with Vivek Farias, Andrew Li, and Andrew Zheng
Preliminary: NeurIPS 2022 *(Oral)*
Under preparation for *Management Science*
⋆ *Winner*, **Applied Probability Society Best Student Paper Prize 2022**
⋆ *Winner*, **RMP Jeff McGill Student Paper Award 2022**

Fixing Inventory Inaccuracies at Scale
with Vivek Farias and Andrew Li
Preliminary: ICML 2021, MSOM Supply Chain SIG 2022
Accepted by *Manufacturing & Service Operations Management*

Synthetically Controlled Bandits
with Vivek Farias, Ciamac Moallemi, and Andrew Zheng
Preliminary: MSOM Service Management SIG 2022
Under review in *Management Science*

The Limits to Learning a Diffusion Model
with Jackie Baek, Vivek Farias, Andreea Georgescu, Retsef Levi, Deeksha Sinha, Joshua Wilde, Andrew Zheng
Preliminary: EC 2021
Accepted by *Management Science*

Uncertainty Quantification for Low-Rank Matrix Completion with Heterogeneous and Sub-Exponential Noise
with Vivek Farias and Andrew Li
Preliminary: AISTATS 2022
Under preparation for *Operations Research*

Optimal Entanglement Swapping and Distribution
with Wenhan Dai and Moe Win
IEEE Journal on Selected Areas in Communications, vol. 38, pp. 540-556, 2020
⋆ **Best Paper Award**, *International Conference on Computing, Networking and Communications (ICNC 2020)*

Quantum Queuing Delay
with Wenhan Dai and Moe Win
IEEE Journal on Selected Areas in Communications, vol. 38, pp. 605-618, 2020
⋆ *ICNC 2020*

Simulating Large Quantum Circuits on a Small Quantum Computer
Tianyi Peng, Maris Ozols, Aram Harrow, Xiaodi Wu
Physical Review Letters *125, 150504 (2020)*

Quantum Uncertainty Relation of Coherence
Xiao Yuan, Ge Bai, Tianyi Peng, Xiongfeng Ma
Physical Review A 96 (3), 032313

Tight Detection Efficiency Bounds of Bell Tests in No-signaling Theories

Zhu Cao, Tianyi Peng
Physical Review A 94, 042126

Efficient and Robust Physical Layer Key Generation
Tianyi Peng, Wenhan Dai, Moe Win
Military Communications Conference (MILCOM) 2019

Remote State Preparation for Multiple Parties
Wenhan Dai, Tianyi Peng, Moe Win
IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) 2019, 7983-7987, **Invited Paper**

Teaching Experience

Hands-on Deep Learning (15.S04)
Teaching Assistant for MBA Students, Rating 6.9/7.0 — Spring 2022

Quantum Information and Quantum Computation
Lecturer for MIT High School Studies Program (Not Rated) — Summer 2019

Statistics for Engineers and Scientists (6.434)
Teaching Assistant (Not Rated) — Fall 2018

Service

Reviewer for *Management Science, Operations Research, EC2024, Mathematical Programming, AAAI 2023, AISTATS 2022, IEEE Journal on Selected Areas in Communications, Quantum, ACM Transactions on Quantum Computing, New Journal of Physics*
Organizer, MIT LIDS Student Conference — 2020

Outside Activities

Columbia Business School requires its faculty members to disclose any activities that might present a real or apparent conflict of interest. The list below complies with this requirement

Cimulate.AI — 2024 - current
Consultant

Honors and Awards

Winner, Jeff McGill Student Paper Award — 2022
Winner, Applied Probability Society Best Student Paper Prize — 2022
Winner, Daniel H. Wagner Prize for Excellence — 2022
Finalist, MSOM Best Student Paper Prize — 2022
Finalist, Post-Pandemic Supply Chain and Healthcare Management conference, Best Paper Competition — 2021
Best Paper Award, ICNC — 2020
1st place, MIT Quantum Hackathon — 2020
2nd place (among 2780 teams), IEEE programming competition IEEExtreme 13.0 — 2019
Best Thesis Award, Tsinghua University — 2017
China 12-person team for International Olympiad in Informatics (IOI) — 2013
International Gold Prize, Asia-Pacific Informatics Olympiad (APIO) — 2012