## Tianyi Peng (2025/01/01)


**Contact Information**

tianyi.peng@columbia.edu https://tianyipeng.github.io


**Research Interests**

AI in Operations, Reinforcement Learning, Experimentation, AI-driven Simulation

**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 - 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**

QGym: Scalable Simulation and Benchmarking of Queuing Network Controllers
Haozhe Chen, Ang Li, Ethan Che, Tianyi Peng, Jing Dong, and Hongseok Namkoong
*NeurIPS 2024 Datasets and Benchmarks Track*

Speeding up Policy Simulation in Supply Chain RL
with Vivek Farias, Joren Gijsbrechts, Aryan Khojandi, and Andrew Zheng
Under Preparation for *Operations Research*

Learning Treatment Effects in Panels with General Intervention Patterns
with Vivek Farias and Andrew Li
Preliminary: NeurIPS 2021 *(Oral, top 0.6% of submissions)*
Major revision in *Operations Research*
- ⋆ *Finalist*, **MSOM Best Student Paper Prize 2022**

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

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

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

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

Uncertainty Quantification for Low-Rank Matrix Completion with Heterogeneous and Sub-Exponential Noise
with Vivek Farias and Andrew Li
AISTATS 2022

Optimal Entanglement Swapping and Distribution
Wenhan Dai, Tianyi Peng, 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
Wenhan Dai, Tianyi Peng, Moe Win
*IEEE Journal on Selected Areas in Communications, vol. 38, pp. 605-618, 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

**Generative AI: Technical and Social (B9153)**
*Instructor*, Columbia University — Fall 2024

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

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

## Service

Reviewer for *Management Science, Operations Research, Annals of Statistics, Mathematical Programming, Biometrika, NeurIPS 2024, EC2024, AAAI 2023, AISTATS 2022, IEEE Journal on Selected Areas in Communications, Quantum, ACM Transactions on Quantum Computing, New Journal of Physics*

Organizer, Frontiers in AI Symposium at Columbia Business School, Fall 2024
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

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| China 12-person team for International Olympiad in Informatics (IOI) | 2013 |
| International Gold Prize, Asia-Pacific Informatics Olympiad (APIO) | 2012 |