Tao Lin

tlin@g.harvard.edu
https://tao-l.github.io/
(+1)6174179856 or (+86)15910565536

Education

- **Harvard University**, Ph.D. in Computer Science 09/2020 – 05/2025
  Advisor: Yiling Chen
  Dissertation: Incentive Design in the Machine Learning Age
  Areas of Research: Economics and Computation, Mechanism Design, Information Design, Game Theory, Machine Learning, Theoretical Computer Science
- **Peking University**, B.Sc. in Computer Science and Technology, *summa cum laude* 09/2016 – 05/2020
  Advisor: Xiaotie Deng
  Thesis: Private Information Protection Game in Auctions

Experience

- *Postdoctoral Researcher* at **Microsoft** 2025 – 2026
  Host: Aleksandrs Slivkins
- *Student Researcher* at **Google** 06 – 09, 2024
  Mentor: Christopher Liaw
- *Research Intern* at **ByteDance** 05 – 09, 2023
  Mentor: Yang Liu
- *Short-term research visit* to **University of British Columbia** 07 – 09, 2019
  Mentor: Hu Fu

Research Interests

My research spans economics, machine learning, and theoretical computer science, focusing on mechanism design and information design with learning-based decision-makers. Example directions include:

- *Learning agents*: I investigate how the learning behavior of boundedly rational agents (modeled by, e.g., reinforcement learning) affects the outcome of games, compared to the outcome predicted by the traditional rational-agent-based economic theory.
- *Learning principals*: I also study how the principals (designers of mechanisms and information structures) can achieve the optimal design goals by learning unknown parameters about the agents and the environments from repeated interactions. Involving dynamic and strategic data sources, this learning problem departs from the canonical machine learning paradigm that assumes stationary and exogenous data distributions, requiring new methodologies that I aim to develop.

My research is often motivated by the interplay between economic incentives and machine learning algorithms in real-world AI systems, such as *advertising auctions* and *recommender systems*.

Conference Publications

- **Generalized Principal-Agent Problem with a Learning Agent** [ICLR 2025] (spotlight)
  Tao Lin, Yiling Chen
  - *Revise-and-resubmit* to journal [Quantitative Economics]
- **Information Design with Unknown Prior** [ITCS 2025]
  Tao Lin, Ce Li

- **User-Creator Feature Polarization in Recommender Systems with Dual Influence** [NeurIPS 2024]
  Tao Lin, Kun Jin, Andrew Estornell, Xiaoying Zhang, Yiling Chen, Yang Liu
- **Bias Detection via Signaling** [NeurIPS 2024]
  (alphabetical) Yiling Chen, *Tao Lin*, Ariel D. Procaccia, Aaditya Ramdas, Itai Shapira
- **Multi-Sender Persuasion: A Computational Perspective** [ICML 2024]
  Safwan Hossain*, Tonghan Wang*, *Tao Lin**, Yiling Chen, David C. Parkes, Haifeng Xu
  (*: equal contribution)
- **Learning Thresholds with Latent Values and Censored Feedback** [ICLR 2024]
  Jiahao Zhang, *Tao Lin*, Weiqiang Zheng, Zhe Feng, Yifeng Teng, Xiaotie Deng
- **Sample Complexity of Forecast Aggregation** [NeurIPS 2023] (spotlight)
  Tao Lin, Yiling Chen
- **From Monopoly to Competition: Optimal Contests Prevail** [AAAI 2023]
  (alphabetical) Xiaotie Deng, Yotam Gafni, Ron Lavi, *Tao Lin*, Hongyi Ling
- **Nash Convergence of Mean-Based Learning Algorithms in First Price Auctions** [WWW 2022]
  (alphabetical) Xiaotie Deng, Xinyan Hu, *Tao Lin*, Weiqiang Zheng
- **How Many Representatives Do We Need? The Optimal Size of a Congress Voting on Binary Issues** [AAAI 2022]
  Manon Revel, *Tao Lin*, Daniel Halpern
- **Learning Utilities and Equilibria in Non-Truthful Auctions** [NeurIPS 2020]
  (alphabetical) Hu Fu, *Tao Lin*
- **A Game-Theoretic Analysis of the Empirical Revenue Maximization Algorithm with Endogenous Sampling** [NeurIPS 2020]
  (alphabetical) Xiaotie Deng, Ron Lavi, *Tao Lin*, Qi Qi, Wenwei Wang, Xiang Yan
- **Private Data Manipulation in Optimal Sponsored Search Auction** [WWW 2020]
  (alphabetical) Xiaotie Deng, *Tao Lin*, Tao Xiao

Journal Publications

- **From Monopoly to Competition: When do Optimal Contests Prevail?** [Games and Economic Behavior, 2023]
  (alphabetical) Xiaotie Deng, Yotam Gafni, Ron Lavi, *Tao Lin*, Hongyi Ling

Notes Not Planned to Publish

- **How Does Independence Help Generalization? Sample Complexity of ERM on Product Distributions** [2022]
- **On Clearing Prices in Matching Markets: A Simple Characterization without Duality** [2019]

Teaching Experiences

- *Teaching assistant* for **Convex Optimization and Its Applications** (Harvard University) Spring 2022
- *Teaching assistant* for **Algorithmic Game Theory** (Peking University) Fall 2019

Academic Services

- Organizer of EC'25 Workshop on "Information Economics X LLMs" 2025
- Organizer of Harvard EconCS seminar 2023 – 2024
- Conference Review: NeurIPS'25 '24 '23, ICML'25 '24, ICLR'25 '24,
  AAAI'26 '25, AISTATS'25, ACML'24, PPAI'24,

STOC'24, SODA'24, ITCS'23, IJTCS'24,
EC'25, WINE'25, SAGT'25

- Journal Review: Theoretical Computer Science, SIAM Journal on Computing, ACM Transactions on Economics and Computation

Selected Talks

- Chinese University of Hong Kong, Computer Science and Engineering Seminar 11/2024
  Title: *How to Avoid Polarization in Recommender Systems with Dual Influence?*
- INFORMS Annual Meeting, "Innovations in Data-driven Marketplaces" session 10/2024
  Title: *Bayesian Persuasion with a Learning Agent*
- ESIF Economics and AI+ML Meeting 08/2024
  Title: *Generalized Principal-Agent Problem with a Learning Agent*
- *Invited* talk at CCF Annual Conference on Computational Economics 08/2023
  Title: *Private Data Manipulation in Sponsored Search Auctions*
- Peking University Turing Class "CS peer talk" 06/2023
  Title: *Sample Complexity of Forecast Aggregation*
- Harvard EconCS seminar 03/2023
  Title: *Persuading a Behavioral Agent: Approximately Best Responding and Learning*
- *Invited* talk at AAMAS Workshop on Learning with Strategic Agents 05/2022
  Title: *Nash Convergence of Mean-Based Learning Algorithms in First Price Auctions*
- Institute for Theoretical Computer Science (ITCS), SUFE 06/2020
  Title: *Robustness of Empirical Revenue Maximization in Auction Learning*

Awards

- Siebel Scholarship 2024
  (Annually awarded for academic excellence and demonstrated leadership to 80 top students from the world's leading graduate schools.)
- Peking University Turing Class Scholarship 2019
- Peking University "Fang Zheng" Scholarship 2017
- Chinese National Olympiad in Informatics, Silver Medal 2015

References

Yiling Chen
Gordon McKay Professor of Computer Science
John A. Paulson School of Engineering and Applied Sciences
Harvard University
yiling@seas.harvard.edu

Ariel D. Procaccia
Gordon McKay Professor of Computer Science
John A. Paulson School of Engineering and Applied Sciences
Harvard University
arielpro@seas.harvard.edu

Ron Lavi
Associate Professor, Department of Economics
University of Bath
arl65@bath.ac.uk

Haifeng Xu
Assistant Professor, Department of Computer Science and Data Science Institute
University of Chicago
haifengxu@uchicago.edu

Yang Liu
Assistant Professor, Department of Computer Science and Engineering
University of California, Santa Cruz
yangliu@ucsc.edu

Christopher Liaw
Research Scientist
Google
cvliaw@google.com