

Tao Lin

(+1)6174179856
✉ tlin@g.harvard.edu
🌐 <https://tao-l.github.io/>

Education

- **Harvard University**, Ph.D. in Computer Science 09/2020 – 05/2025
Advisor: Yiling Chen (expected)
Areas of Research: Machine Learning, Mechanism Design, Information Design
- **Peking University**, B.S. in Computer Science and Technology, *summa cum laude* 09/2016 – 05/2020
Advisor: Xiaotie Deng
Thesis: Private Information Protection Game in Auctions

Research Interests

My research focuses on the interplay between **machine learning** and **economic incentives** in multi-agent systems. As machine learning algorithms increasingly shape real-world decision-making, the *strategic behavior* of involved agents – whether users or data providers – fundamentally impacts the algorithmic performance. My research thus investigates the theoretical foundations and practical limitations of learning in strategic, dynamic multi-agent environments, departing from the traditional machine learning paradigm that assumes exogenous, stationary data distributions. By examining the complex interplay between incentives and learning in both theoretical economic models (*mechanism design* and *information design*) and real-world systems (e.g., *ad auction platforms* and *recommender systems*), I aim to contribute to the community’s common goal of building socially responsible AI systems.

Publications

- [User-Creator Feature Dynamics 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]
(α - β) 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]
Tao Lin, Yiling Chen (spotlight)
- [From Monopoly to Competition: Optimal Contests Prevail](#) [AAAI 2023]
(α - β) Xiaotie Deng, Yotam Gafni, Ron Lavi, *Tao Lin*, Hongyi Ling
• Under *revise-and-resubmit* to journal [Games and Economic Behavior]
- [Nash Convergence of Mean-Based Learning Algorithms in First Price Auctions](#) [WWW 2022]
(α - β) Xiaotie Deng, Xinyan Hu, *Tao Lin*, Weiqiang Zheng
- [How Many Representatives Do We Need? The Optimal Size of an Epistemic Congress](#) [AAAI 2022]
Manon Revel, *Tao Lin*, Daniel Halpern
- [Learning Utilities and Equilibria in Non-Truthful Auctions](#) [NeurIPS 2020]
(α - β) Hu Fu, *Tao Lin*

- [A Game-Theoretic Analysis of the Empirical Revenue Maximization Algorithm with Endogenous Sampling](#) [NeurIPS 2020]
(α - β) Xiaotie Deng, Ron Lavi, *Tao Lin*, Qi Qi, Wenwei Wang, Xiang Yan
- [Private Data Manipulation in Optimal Sponsored Search Auction](#) [WWW 2020]
(α - β) Xiaotie Deng, *Tao Lin*, Tao Xiao

Working Papers

- [Generalized Principal-Agent Problem with a Learning Agent](#) [2024]
Tao Lin, Yiling Chen
- [Information Design with Unknown Prior](#) [2024]
Tao Lin, Ce Li

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]

Research Experiences Outside Harvard

- **Google**, “Market Algorithms” group 06 – 09, 2024
Student Researcher
Host: Christopher Liaw
- **ByteDance**, “Responsible AI” group 05 – 09, 2023
Research Intern
Host: Yang Liu
 - Led five people to work on a project on “polarization in recommender systems”.
 - Proposed research problem, proved theoretical results, ran initial experiments, drafted the paper.
 - Paper published at [NeurIPS 2024].
- **Peking University**, Center on Frontiers of Computing Studies 09/2018 – 09/2021
Research Assistant
Advisor: Xiaotie Deng
 - Led six people to work on a project on “incentive-compatible learning in auctions”.
 - Dispatched tasks, reviewed literature, did simulations, and proved main theorems.
 - Paper published at [NeurIPS 2020].
 - *Advised two undergraduate students* to write a paper on “no-regret learning in first-price auctions”.
 - Proposed research problems, suggested solutions, surveyed literature, revised paper.
 - Paper published at [WWW 2022] and *invited* to present at [AAMAS 2022 workshop on Learning with Strategic Agents].
- *Summer research visit* to **University of British Columbia** 07 – 09, 2019
Host: Hu Fu
 - Drove a project on “sample complexity of learning equilibria in non-truthful auctions” from formulation to completion. Paper published at [NeurIPS’20].

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 Harvard EconCS seminar 2023 – 2024
- Conference Review: NeurIPS'24 '23, ICML'24, ICLR'25 '24, AAAI'25, AISTATS'25, ACML'24, PPAI'24, STOC'24, SODA'24, ITCS'23, IJTCS'24, EC'20
- Journal Review: Theoretical Computer Science, SIAM Journal on Computing

Selected Talks

- 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 “Tu Ling Ben Jing” Prize 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