

TIAN LI

CURRICULUM VITAE

EMPLOYMENT

University of Chicago Assistant Professor Department of Computer Science Data Science Institute	IL, USA 2024 - present
Meta FAIR Labs Postdoctoral Researcher Host: <i>Kamalika Chaudhuri</i>	CA, USA 2023 - 2024

EDUCATION

Carnegie Mellon University Ph.D. in Computer Science M.S. in Computer Science Advisor: <i>Virginia Smith</i> Thesis: <i>Scalable and Trustworthy Learning in Heterogeneous Networks</i>	PA, USA 2018 - 2023 2018 - 2020
Peking University B.S. in Computer Science (summa cum laude) B.A. in Economics	Beijing, China 2014 - 2018 2015 - 2018

INTERNSHIP

Google Research <i>Research Intern</i>	WA, USA Summer 2022
Peking University <i>Undergraduate Researcher</i>	Beijing, China 2016 - 2018
Microsoft Research Asia <i>Research Intern</i>	Beijing, China Winter 2017
ETH Zurich <i>Visiting Student</i>	Zurich, Switzerland Summer 2017

AWARDS & HONORS

Expert Reviewer, TMLR	2024
First Place, U.S. Privacy-Enhancing Technologies Pandemic Challenge	2023
Rising Stars in EECS Workshop, Invited Participant	2022
Rising Stars in Data Science, UChicago	2022
Oral Presentation (top 5%) at NeurIPS 2022 OPT-ML Workshop	2022
Rising Stars in Machine Learning, UMD	2021

Best Paper Award at ICLR Workshop on Security and Safety in ML Systems	2021
Outstanding Reviewer Award (top 8%), NeurIPS	2021
Top 10% Reviewers, ICML	2021
A. Nico Habermann Educational Service Award, CMU	2020
Several awards and scholarships, Peking University	2014 - 2018
Student Summer Research Fellowship, ETHZ	2017

PUBLICATIONS (* indicates equal contribution)

Manuscripts

Z. Li, **T. Li**, V. Smith, J. Bilmes, T. Zhou. Multi-Objective Multi-Solution Transport.

J. Wang, Z. Charles, Z. Xu, G. Joshi, H. B. McMahan, et al. A Field Guide to Federated Optimization.

Conference or Journal Publications

Y. J. Cho, D. Jhunjhunwala, **T. Li**, V. Smith, and G. Joshi. Maximizing Global Model Appeal in Federated Learning. In *Transactions on Machine Learning Research (TMLR)*, 2024.

T. Li*, A. Beirami*, M. Sanjabi, and V. Smith. On Tilted Losses in Machine Learning: Theory and Applications. In *Journal of Machine Learning Research (JMLR)*, 2023.

T. Li, M. Zaheer, K. Liu, S. Reddi, B. McMahan, and V. Smith. Differentially Private Adaptive Optimization with Delayed Preconditioners. In *International Conference on Learning Representations (ICLR)*, 2023. (Oral Presentation (top 5%) at NeurIPS 2022 OPT-ML Workshop)

T. Li, M. Zaheer, S. Reddi, and V. Smith. Private Adaptive Optimization with Side Information. In *International Conference on Machine Learning (ICML)*, 2022.

R. Balakrishnan*, **T. Li***, T. Zhou*, N. Himayat, V. Smith, and J. Bilmes. Diverse Client Selection for Federated Learning via Submodular Maximization. In *International Conference on Learning Representations (ICLR)*, 2022.

M. Khodak, R. Tu, **T. Li**, L. Li, M-F. Balcan, V. Smith, and A. Talwalkar. Federated Hyperparameter Optimization: Challenges, Baselines, and Connections with Weight-Sharing. In *Neural Information Processing Systems (NeurIPS)*, 2021.

T. Li*, A. Beirami*, M. Sanjabi, and V. Smith. Tilted Empirical Risk Minimization. In *International Conference on Learning Representations (ICLR)*, 2021.

T. Li, S. Hu, A. Beirami, and V. Smith. Ditto: Fair and Robust Federated Learning Through Personalization. In *International Conference on Machine Learning (ICML)*, 2021. (**Best Paper Award at ICLR 2021 Secure ML Workshop**)

D. Dennis, **T. Li**, and V. Smith. Heterogeneity for the Win: One-Shot Federated Clustering. In *International Conference on Machine Learning (ICML)*, 2021.

L. A. Melgar, D. Dao, S. Gan, N. M. Gürel, N. Hollenstein, J. Jiang, B. Karlas, T. Lemmin, **T. Li**, Y. Li, X. Rao, J. Rausch, C. Renggli, L. Rimanic, M. Weber, S. Zhang, Z. Zhao, K. Schawinski, W. Wu,

and C. Zhang. Ease.ML: A Lifecycle Management System for MLDev and MLOps. In *Conference on Innovative Data Systems Research (CIDR)*, 2021.

T. Li, A. K. Sahu, A. Talwalkar, and V. Smith. Federated Learning: Challenges, Methods, and Future Directions. In *IEEE Signal Processing Magazine (SPM), Special Issue on Streaming, Distributed Machine Learning*, 2020. (**Most Popular SPM Article of 2020: Link**)

T. Li, A. K. Sahu, M. Zaheer, M. Sanjabi, A. Talwalkar, and V. Smith. Federated Optimization in Heterogeneous Networks. In *Conference on Machine Learning and Systems (MLSys)*, 2020.

T. Li, M. Sanjabi, A. Beirami, and V. Smith. Fair Resource Allocation in Federated Learning. In *International Conference on Learning Representations (ICLR)*, 2020.

T. Yu, **T. Li**, Y. Sun, S. Nanda, V. Smith, V. Sekar, and S. Seshan. Learning Context-Aware Policies from Smart Homes via Federated Multitask Learning. In *Conference on Internet of Things Design and Implementation (IoTDI)*, 2020.

T. Li, A. K. Sahu, M. Zaheer, M. Sanjabi, A. Talwalkar, and V. Smith. FedDANE: A Federated Newton-Type Method. In *Asilomar Conference on Signals, Systems, and Computers (Asilomar)*, 2019. (*Invited Paper*)

T. Li, J. Zhong, J. Liu, W. Wu, and C. Zhang. Ease.ml: Towards Multi-Tenant Resource Sharing for Machine Learning Workloads. In *Very Large Data Bases Conferences (VLDB)*, 2018.

Workshop Papers

S. Wu, **T. Li**, Z. Charles, Y. Xiao, Z. Liu, Z. Xu, and V. Smith. Motley: Benchmarking Heterogeneity and Personalization in Federated Learning. In *Workshop on Federated Learning: Recent Advances and New Challenges, NeurIPS 2022*.

S. Caldas, S. K. Duddu, P. Wu, **T. Li**, J. Konecny, H. B. McMahan, V. Smith, and A. Talwalkar. LEAF: A Benchmark for Federated Settings. In *Workshop on Federated Learning for Data Privacy and Confidentiality, NeurIPS 2019*.

Z. Wang*, **T. Li***, Y. Shao, and B. Cui. CUTE: Query Knowledge Graphs by Tabular Examples. In *Web and Information Management Conference (WAIM)*, 2018. (*Demo*)

C. Zhang, W. Wu, and **T. Li**. An Overreaction to the Broken Machine Learning Abstraction: The Ease.ml Vision. In *Human-In-the-Loop Data Analytics Workshop, SIGMOD 2017*.

TALKS

Tilted Losses in Machine Learning: Theory, Applications, and Recent Advances
- *Midwest Machine Learning Symposium, MN, May 2024*.

Robustness of Zero/Few-Shot Learning in Foundation Models
- *NeurIPS Workshop Panelist, LA, Dec. 2023*.

Tilted Losses in Machine Learning: Theory and Applications
- *AJCAI Workshop on Federated Learning and Foundation Models, hybrid, Nov. 2023*.
- *Google Efficient ML Workshop, NY, Nov. 2023*.
- *KDD Workshop on Federated Learning for Distributed Data Mining, CA, Aug. 2023*.

Open Problems of Learning in Federated Settings

- FLOWER Summit, hybrid, May 2023.

Scalable and Trustworthy Learning in Heterogeneous Networks

- Meta FAIR Labs, virtual, Apr. 2023.
- University of Southern California, CS Colloquium, CA, Apr. 2023.
- EPFL, School of Computer and Communication Sciences, virtual, Mar. 2023.
- Intel Labs, virtual, Mar. 2023.
- University of Chicago, Data Science Institute, IL, Feb. 2023.
- University of Wisconsin Madison, ECE Seminar, WI, Feb. 2023.
- University of Massachusetts Amherst, College of Information and Computer Sciences, MA, Feb. 2023.

Differentially Private Adaptive Optimization with Delayed Preconditioners

- Simons Workshop on Federated and Collaborative Learning, CA, July 2023.
- NeurIPS OPT-ML Workshop, LA, Dec. 2022.

Scalable and Trustworthy Learning in Heterogeneous Networks

- UChicago Rising Stars in Data Science Workshop, IL, Nov. 2022.
- USC Symposium on Frontiers of Machine Learning and Artificial Intelligence, CA, Nov. 2022.

Differential Privacy Meets Adaptive Optimization

- Workshop on Information Theory and Applications (ITA), CA, Feb. 2024.
- SIGKDD FL for Data Mining Workshop, CA, Aug. 2023.
- SIAM Conference on Optimization (OP23), WA, May 2023.
- UCSD HDSI Seminar, virtual, Nov. 2022.

Trustworthy Learning in Heterogeneous Networks

- Andalusian Research Institute in DaSCI Seminar, virtual, Nov. 2022.
- Qualcomm AI Research DistributedML Seminar, virtual, Oct. 2022.

On Out-Of-Distribution Generalization in Personalized Federated Learning

- Google Research, WA, Aug. 2022.

Motley: Benchmarking Heterogeneity and Personalization in Federated Learning

- Intel-NSF Workshop on Machine Learning for Wireless Systems, virtual, Oct. 2022.
- Google Research, WA, July 2022.

Personalized Federated Learning: Interplays with Competing Constraints and Beyond

- International Conference on Continuous Optimization, PA, July 2022.

On Heterogeneity in Federated Settings

- UMD Rising Stars in Machine Learning Speaker Series, virtual, Nov. 2021.
- CMU Catalyst Group meeting, virtual, Apr. 2021.

Tilted Empirical Risk Minimization

- Tsinghua University AI TIME forum, virtual, June 2021.

Fair and Robust Federated Learning Through Personalization

- Stanford Software Lunch, virtual, Apr. 2022.
- TrustML Young Scientists Seminar series, virtual, Feb. 2022.
- ICLR Secure ML Workshop, virtual, May 2021.

Learning in Heterogeneous Networks: Optimization and Fairness

- CONIX Student Research Seminar, virtual, Aug. 2020.

- Federated Learning One World Seminar, virtual, Aug. 2020.

Federated Optimization in Heterogeneous Networks

- MLSys Conference, TX, Mar. 2020.

- On-device Intelligence Workshop, TX, Mar. 2020.

- Carnegie Bosch Institute Research Projects Workshop, PA, Mar. 2019.

SERVICES

Department Service

UChicago Data Science PhD Admission Committee, 2023 - 2024

Organizer/Co-Organizer

ICLR 2024 Workshop on Privacy Regulation and Protection in Machine Learning

ICML 2023 Workshop on Federated Learning and Analytics in Practice: Algorithms, Systems, Applications, and Opportunities

MLSys 2023 Workshop on Federated Learning Systems

ACL 2022 Workshop on Federated Learning for Natural Language Processing

Program Committee

IEEE Conference on Secure and Trustworthy Machine Learning (SatML), 2025

Conference on Machine Learning and Systems (MLSys), 2024, 2025

International Conference on Very Large Data Bases (VLDB), 2023, 2025

Reviewer

Conferences

International Conference on Machine Learning (ICML) (*Top 10% reviewers in 2021*), Neural Information Processing Systems (NeurIPS) (*Outstanding Reviewer Award 2021*), International Conference on Learning Representations (ICLR), Transactions on Machine Learning Research (TMLR) (Action Editor), IEEE International Symposium on Information Theory (ISIT)

Workshops

ICML 2024 NextGenAISafety Workshop (Area Chair), AAAI 2022 Federated Learning Workshop, NeurIPS 2021 Federated Learning Workshop, ICML 2021 Federated Learning Workshop, ICML 2021 Workshop on Information-Theoretic Methods for Responsible ML, ICLR 2021 Responsible AI Workshop (Area Chair), NeurIPS 2020 Federated Learning Workshop

Journals

SIAM Journal on Mathematics of Data Science (SIMODS), IEEE Journal on Selected Areas in Communications (JSAC) Series on Machine Learning for Communications and Networks, Nature Communications, Journal of Machine Learning Research (JMLR)

Others

International Conference on Machine Learning (ICML) Workshop Proposal, 2024

Others

Women in Machine Learning (WiML) Workshop mentor, 2023

CMU Computer Science Department Mentorship Program mentor, 2022

CMU Computer Science Department Faculty Hiring Committee student member, 2021 - 2022

Grant Proposal 'Robust Federated Learning for IoT Services' Reviewer, CES 23, French National Research Agency, 2021

CMU School of Computer Science Graduate Application Support Program mentor, 2020

CMU Computer Science Department Ph.D. Orientation Committee member, 2019

EuroSys Shadow Program Committee member, 2018

TEACHING

UChicago

CMSC 25300: Mathematical Foundations of Machine Learning (undergraduate)

Fall 2024

Others

Guest Lecturer for CSE 598: Machine Learning Security, Privacy, and Fairness

Arizona State University, Fall 2022

"Learning in Heterogeneous Networks"

Guest Lecturer for 15-884: Special Topic: Machine Learning Systems

Carnegie Mellon University, Spring 2021

"Federated Learning"

Teaching Assistant for 15-884: Special Topic: Machine Learning Systems

Carnegie Mellon University, Spring 2021

Instructor: Tianqi Chen

Head Teaching Assistant for 10-405/10-605: Machine Learning with Large Datasets

Carnegie Mellon University, Spring 2020

Instructors: Virginia Smith and Heather Miller