Xiaohan Chen

Basic Information

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Employment History

Senior Algorithm Engineer   Aug, 2022 — Present
Alibaba Group (U.S.) Inc., Bellevue, WA, USA
Manager: Dr. Wotao Yin

Research Intern   Jun, 2021 — Aug, 2021
Microsoft Cloud & AI, Bellevue, WA, USA   Oct, 2020 — Dec, 2020
Supervisor: Dr. Yu Cheng and Dr. Zhe Gan   Jun, 2020 — Aug, 2020

Research Intern   Jun, 2019 — Nov, 2019
Max Planck Institute for Intelligent Systems, Tübingen, Germany
Supervisor: Dr. Krikamol Muandet and Dr. Siyu Tang

Education Background

University of Texas at Austin   **Austin, TX, U.S.**
Ph.D. in Electrical and Computer Engineering   Aug, 2020 — Aug, 2022
Visual Informatics Group
Supervisor: Prof. Zhangyang (Atlas) Wang
Ph.D. Thesis: Sparsity prior in efficient deep learning based solvers and models

Texas A&M University   **College Station, TX, U.S.**
Ph.D. in Computer Science (transferred with my advisor)   Aug, 2017 — Aug, 2020
Supervisor: Prof. Zhangyang (Atlas) Wang

University of Science and Technology of China   **Hefei, Anhui, China**
B.S. in Mathematics and Applied Mathematics   Sep, 2013 — Jun, 2017
B.E. in Computer Science (Double Degree)

Research Interests

- *Large language models, LLM agents*
- *Learning to optimize, meta learning*
- *Efficient deep learning, sparse neural networks*
- *Sparse optimization, inverse problems*

Publications

† Most recent first.
* The authors equally contributed to the paper.

Refereed Papers

1. Ziang Chen, Jialin Liu, <u>Xiaohan Chen</u>, Xinshang Wang, Wotao Yin, "Rethinking the Capacity of Graph Neural Networks for Branching Strategy", *In Proceedings of Advances in Neural Information Processing Systems* (**NeurIPS**), 2024.

2. <u>Xiaohan Chen</u>, Jialin Liu, Wotao Yin, "Learning to optimize: A tutorial for continuous and mixed-integer optimization", Science China Mathematics, 2024.

3. Haoyu Wang, Jialin Liu, <u>Xiaohan Chen</u>, Xinshang Wang, Pan Li, Wotao Yin, "DIG-MILP: a Deep Instance Generator for Mixed-Integer Linear Programming with Feasibility Guarantee", *Transactions on Machine Learning Research* (**TMLR**), 2024.

4. Jialin Liu, <u>Xiaohan Chen</u>, Zhangyang Wang, Wotao Yin, HanQin Cai, "Towards Constituting Mathematical Structures for Learning to Optimize", *International Conference on Machine Learning* (**ICML**), 2023.

5. Ruisi Cai, <u>Xiaohan Chen</u>, Shiwei Liu, Jayanth Srinivasa, Myungjin Lee, Ramana Kompella, Zhangyang Wang, "Many-task federated learning: A new problem setting and a simple baseline", *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition* (**CVPR**) Workshops, 2023.

6. Shiwei Liu, Tianlong Chen, <u>Xiaohan Chen</u>, Xuxi Chen, Qiao Xiao, Boqian Wu, Tommi Kärkkäi-nen, Mykola Pechenizkiy, Decebal Constantin Mocanu, Zhangyang Wang, "More ConvNets in the 2020s: Scaling up Kernels Beyond 51x51 using Sparsity", *International Conference on Learning Representations* (**ICLR**), 2023.

7. Qiming Wu, <u>Xiaohan Chen</u>, Yifan Jiang, Zhangyang Wang, "Chasing Better Deep Image Priors between Over-and Under-parameterization", *Transactions on Machine Learning Research* (**TMLR**), 2023.

8. Howard Heaton, <u>Xiaohan Chen</u>, Zhangyang Wang, Wotao Yin, "Safeguarded Learned Convex Optimization", *Proceedings of the AAAI Conference on Artificial Intelligence* (**AAAI**), 2023.

9. Allen-Jasmin Farcas, <u>Xiaohan Chen</u>, Zhangyang Wang, Radu Marculescu, "Model elasticity for hardware heterogeneity in federated learning systems", *Proceedings of the 1st ACM Workshop on Data Privacy and Federated Learning Technologies for Mobile Edge Network* (**FedEdge**), 2022.

10. Ruisi Cai, Zhenyu Zhang, Tianlong Chen, <u>Xiaohan Chen</u>, Zhangyang Wang, "Randomized channel shuffling: Minimal-overhead backdoor attack detection without clean datasets", *In Proceedings of Advances in Neural Information Processing Systems* (**NeurIPS**), 2022.

11. Tianlong Chen, <u>Xiaohan Chen</u>, Wuyang Chen, Howard Heaton, Jialin Liu, Zhangyang Wang, Wotao Yin, "Learning to Optimize: A Primer and A Benchmark", *Journal of Machine Learning Research* (**JMLR**), 2022.

12. <u>Xiaohan Chen</u>, Jason Zhang, Zhangyang Wang, "Peek-a-Boo: What (More) is Disguised in a Randomly Weighted Neural Network, and How to Find It Efficiently", *International Conference on Learning Representations* (**ICLR**), 2022.

13. Shiwei Liu, Tianlong Chen, <u>Xiaohan Chen</u>, Li Shen, Decebal Constantin Mocanu, Zhangyang Wang, Mykola Pechenizkiy, "The Unreasonable Effectiveness of Random Pruning: Return of the Most Naive Baseline for Sparse Training", *International Conference on Learning Representations* (**ICLR**), 2022.

14. Shiwei Liu, Tianlong Chen, Zahra Atashgahi, <u>Xiaohan Chen</u>, Ghada Sokar, Elena Mocanu, Mykola Pechenizkiy, Zhangyang Wang, Decebal Constantin Mocanu, "Deep Ensembling with No Overhead for either Training or Testing: The All-Round Blessings of Dynamic Sparsity", *International Conference on Learning Representations* (**ICLR**), 2022.

15. Sameer Bibikar, <u>Xiaohan Chen</u>, Haris Vikalo, Zhangyang Wang, "Federated dynamic sparse training: Computing less, communicating less, yet learning better", *Proceedings of the AAAI Conference on Artificial Intelligence* (**AAAI**), 2022

16. <u>Xiaohan Chen</u>*, Yang Zhao*, Yue Wang, Pengfei Xu, Haoran You, Chaojian Li, Yonggan Fu, Yingyan Lin, Zhangyang Wang, "SmartDeal: Re-Modeling Deep Network Weights for Efficient Inference and Training", *The IEEE Transactions on Neural Networks and Learning Systems* (**TNNLS**).

17. <u>Xiaohan Chen</u>, Yu Cheng, Shuohang Wang, Zhe Gan, Jingjing Liu, Zhangyang Wang, "The Elastic Lottery Ticket Hypothesis", *In Proceedings of Advances in Neural Information Processing*

Systems (**NeurIPS**), 2021.

18. <u>Xiaohan Chen</u>*, Jialin Liu*, Zhangyang Wang, Wotao Yin, "Hyperparameter Tuning is All You Need for LISTA", *In Proceedings of Advances in Neural Information Processing Systems* (**NeurIPS**), 2021.

19. Xiaolong Ma, Geng Yuan, Xuan Shen, Tianlong Chen, Xuxi Chen, <u>Xiaohan Chen</u>, Ning Liu, Minghai Qin, Sijia Liu, Zhangyang Wang, Yanzhi Wang, "Sanity Checks for Lottery Tickets: Does Your Winning Ticket Really Win the Jackpot?", *In Proceedings of Advances in Neural Information Processing Systems* (**NeurIPS**), 2021.

20. Shiwei Liu, Tianlong Chen, <u>Xiaohan Chen</u>, Zahra Atashgahi, Lu Yin, Huanyu Kou, Li Shen, Mykola Pechenizkiy, Zhangyang Wang, Decebal Constantin Mocanu, "Sparse Training via Boosting Pruning Plasticity with Neuroregeneration", *In Proceedings of Advances in Neural Information Processing Systems* (**NeurIPS**), 2021.

21. <u>Xiaohan Chen</u>, Yu Cheng, Shuohang Wang, Zhe Gan, Zhangyang Wang, Jingjing Liu, "Early-BERT: Efficient BERT Training via Early-bird Lottery Tickets", *The Joint Conference of the 59th Annual Meeting of the Association for Computational Linguistics and the 11th International Joint Conference on Natural Language Processing* (**ACL-IJCNLP**), 2021. Doi: `https://doi.org/10.18653/v1/2021.acl-long.171`.

22. Tianjian Meng*, <u>Xiaohan Chen</u>*, Yifan Jiang, Zhangyang Wang, "A Design Space Study for LISTA and Beyond", *International Conference on Learning Representations* (**ICLR**), 2021.

23. Jiayi Shen*, <u>Xiaohan Chen</u>*, Howard Heaton*, Tianlong Chen, Jialin Liu, Wotao Yin, Zhangyang Wang, "Learning A Minimax Optimizer: A Pilot Study", *International Conference on Learning Representations* (**ICLR**), 2021.

24. Lida Zhang, <u>Xiaohan Chen</u>, Tianlong Chen, Zhangyang Wang, Bobak J Mortazavi, "DynEHR: Dynamic adaptation of models with data heterogeneity in electronic health records", *IEEE EMBS International Conference on Biomedical and Health Informatics*, (**BHI**), 2021

25. <u>Xiaohan Chen</u>, Zhangyang Wang, Siyu Tang, Krikamol Muandet, "MATE: Plugging in Model Awareness to Task Embedding for Meta Learning", *In Proceedings of Advances in Neural Information Processing Systems* (**NeurIPS**), 2020.

26. Haoran You, <u>Xiaohan Chen</u>, Yongan Zhang, Chaojian Li, Sicheng Li, Zihao Liu, Zhangyang Wang, Yingyan Lin, "ShiftAddNet: A Hardware-Inspired Deep Network", *In Proceedings of Advances in Neural Information Processing Systems* (**NeurIPS**), 2020.

27. Zepeng Huo, Arash Pakbin, <u>Xiaohan Chen</u>, Nathan Hurley, Ye Yuan, Xiaoning Qian, Zhangyang Wang, Shuai Huang, Bobak Mortazavi, "Uncertainty Quantification for Deep Context-Aware Mobile Activity Recognition and Unknown Context Discovery", *International Conference on Artificial Intelligence and Statistics* (**AISTATS**), 2020.

28. <u>Xiaohan Chen</u>*, Yang Zhao*, Yue Wang, Chaojian Li, Haoran You, Yonggan Fu, Yuan Xie, Zhangyang Wang, Yingyan Lin, "SmartExchange: Trading Higher-cost Memory Storage/Access for Lower-cost Computation", *IEEE/ACM International Symposium on Computer Architecture* (**ISCA**), 2020.

29. Haoran You, Chaojian Li, Pengfei Xu, Yonggan Fu, Yue Wang, <u>Xiaohan Chen</u>, Richard G Baraniuk, Yingyan Lin, Zhangyang Wang, "Drawing Early-Bird Tickets: Toward More Efficient Training of Deep Networks", *International Conference on Learning Representations* (**ICLR**), 2020.

30. <u>Xiaohan Chen</u>*, Ziyu Jiang*, Yue Wang*, Pengfei Xu, Yang Zhao, Yingyan Lin, Zhangyang Wang, "E2-Train: Energy-Efficient Deep Network Training with Data-, Model-, and Algorithm-Level Saving", *In Proceedings of Advances in Neural Information Processing Systems* (**NeurIPS**), 2019.

31. Ernest Ryu, Jialin Liu, Sicheng Wang, <u>Xiaohan Chen</u>, Zhangyang Wang, Wotao Yin, "Plug-and-Play Methods Provably Converge with Properly Trained Denoisers", *International Conference on*

Machine Learning (**ICML**), 2019.

32. <u>Xiaohan Chen</u>*, Jialin Liu*, Zhangyang Wang, Wotao Yin, "ALISTA: Analytic Weights Are As Good As Learned Weights in LISTA", *International Conference on Learning Representations* (**ICLR**), 2019.

33. <u>Xiaohan Chen</u>*, Jialin Liu*, Zhangyang Wang, Wotao Yin, "Theoretical Linear Convergence of Unfolded ISTA and Its Practical Weights and Thresholds", *In Proceedings of Advances in Neural Information Processing Systems* (**NeurIPS**), 2018.

34. Nitin Bansal, <u>Xiaohan Chen</u>, Zhangyang Wang, "Can We Gain More from Orthogonality Regularizations in Training Deep Networks?", In Proceedings of Advances in Neural Information Processing Systems (**NeurIPS**), 2018.

Honors and Awards

Scholarships
– ICLR Travel Award — Mar, 2019
– NeurIPS Travel Award — Oct, 2018
– AAAI Student Scholarship — Dec, 2017
– Outstanding New Student Award, **Top Class Award** — Sep, 2013

Others
– Qualcomm Innovation Fellowship 2021 Finalist — Jun, 2021
– COMAP's Mathematical Contest in Modeling (MCM), **Honorable Mention** — Apr, 2016
– Outstanding Young Volunteer, USTC — Jul, 2014

Service and Teaching

– *Reviewer*:
  ▲ Top conferences:
    ▷ *Conference on Neural Information Processing Systems* (NeurIPS): 2019, 2020, 2022, 2023
    ▷ *International Conference on Machine Learning* (ICML): 2020, 2021, 2022, 2023
    ▷ *International Conference on Learning Representations* (ICLR): 2020, 2021, 2022, 2023
    ▷ *Computer Vision and Pattern Recognition Conference* (CVPR): 2020, 2021, 2022, 2023
    ▷ *European Conference on Computer Vision* (ECCV): 2020, 2022
    ▷ *The International Conference on Computer Vision* (ICCV): 2019, 2021, 2023
    ▷ *The Association for the Advancement of Artificial Intelligence* (AAAI): 2020, 2021, 2022
    ▷ *Asian Conference on Computer Vision*: 2020
    ▷ *Winter Conference on Applications of Computer Vision* (WACV): 2019, 2020, 2021, 2022, 2023
  ▲ Journals:
    ▷ Four articles for *IEEE Access*
    ▷ Two articles for *IEEE Transactions on Artificial Intelligence*
    ▷ Two articles for *Transactions on Machine Learning Research*
    ▷ One article for *Proceedings of Machine Learning Research*
    ▷ One article for *IEEE Transactions on Pattern Analysis and Machine Intelligence*
    ▷ One article for *IEEE Transactions on Emerging Topics in Computational Intelligence*
    ▷ One article for *IEEE Transactions on Computers*
    ▷ One article for *IEEE Transactions on Circuits and Systems for Video Technology*
– *Teaching Assistant*:
  – MIS 285N, Cognitive Computing, University of Texas at Austin (2021)
  – MIS 286N, Emerging Technologies and Business Innovation, University of Texas at Austin (2021)
  – ECE 381V, Advanced Topics in Computer Vision, University of Texas at Austin (2021)
– *Student Volunteer*: AAAI 2018