

YIFAN CHEN

✉ yifanc@hkbu.edu.hk · 🏠 <https://ychen-stat-ml.github.io/> · 📅 Last updated: March 4, 2025

RESEARCH INTERESTS

I am broadly interested in the general area of **efficient machine learning**, aiming to understand the statistical structures of modern machine learning algorithms and apply these insights to real-world computational challenges.

I especially focus on **non-parametric models** and neural networks with intensive matrix operations, such as **transformers** (language models) and graph neural networks (GNNs).

ACADEMIC POSITIONS AND EDUCATION

Hong Kong Baptist University , Hong Kong, China	Aug 2023 –
• Assistant Professor in Computer Science and Mathematics (affiliate)	
University of Illinois Urbana-Champaign (UIUC) , Illinois, United States	Aug 2018 – Aug 2023
• Ph.D. in Statistics, advisor: Prof. Yun Yang	
• M.S. in Statistics	
	May 2022
Fudan University , Shanghai, China	Sept 2013 – July 2018
• B.S. in Statistics, School of Management	
The University of British Columbia , British Columbia, Canada	Sept 2016 – Dec 2016
• Exchange Student at the UBC Sauder School of Business	

HONORS, AWARDS, AND GRANTS


General Project Grant, Guangdong Basic and Applied Basic Research Foundation	2025 – 2027
Start-up Grant, Hong Kong Baptist University	2023
🏆 <i>Dissertation Completion Fellowships</i> (declined due to early graduation), USD \$25,000 , U of I Graduate College	2023
The Fortieth International Conference on Machine Learning (ICML 2023) Grant Award, USD \$1,500	2023
🏆 Graduated with distinction: <i>Shanghai Outstanding Graduate</i> , Shanghai Municipal Education Commission	2018
Singapore Technologies Engineering Ltd Scholarship (top 5%), CNY ¥15,000 , Fudan University	2015 – 2017
Sumitomo Corporation Scholarship (top 5%), CNY ¥3,000 , Fudan University	2013 – 2014

INDUSTRY EXPERIENCES

Microsoft , Washington, United States	May 2022 – Aug 2022
Research Intern — Mentor: Ritchie Zhao, Bitu Darvish Rouhani	
Study the compression of Mixture-of-Experts Transformers. We reconstruct expert MLPs through optimal transport. The work here motivates the follow-up project [7], published at ICML 2023.	
Amazon , California, United States	Aug 2021 – Dec 2021
Applied Scientist Intern — Mentor: Di Jin, Dilek Hakkani-Tur	
Do research on parameter-efficient fine-tuning, with [9], [11] accepted to EMNLP 2022 Oral, NAACL 2022 Findings respectively. We explore the connection between attention and kernel estimators to guide the parameter assignments in adapters.	

Summary (2021-present): 10 first-authored/supervised papers

Peer-reviewed conference and journal papers

- [1] **Catch Causal Signals from Edges for Label Imbalance in Graph Classification** 
 Fengrui Zhang* , Yujia Yin* , Hongzong Li, Yifan Chen , Tianyi Qu  (Role: writing, co-mentoring)
2025 IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2025)
- [2] **Optimized Gradient Clipping for Noisy Label Learning** 
 Xichen Ye , Yifan Wu , Weizhong Zhang, Xiaoqiang Li , Yifan Chen , Cheng Jin
 (Role: writing, co-mentoring)
The 39th Annual AAAI Conference on Artificial Intelligence (AAAI 2025)
- [3] **Gliding over the Pareto Front with Uniform Designs** 
 Xiaoyuan Zhang, Genghui Li, Xi Lin, Yichi Zhang, Yifan Chen, Qingfu Zhang (Role: proof, writing, co-mentoring)
Thirty-eighth Conference on Neural Information Processing Systems (NeurIPS 2024)
- [4] **LibMOON: A Gradient-based MultiObjective OptimizationN Library in PyTorch** 
 Xiaoyuan Zhang, Liang Zhao, Yingying Yu, Xi Lin, Yifan Chen, Han Zhao, Qingfu Zhang (Role: main idea, writing)
Thirty-eighth Conference on Neural Information Processing Systems (NeurIPS 2024)
- [5] **Hypervolume Maximization: A Geometric View of Pareto Set Learning** 
 Xiaoyuan Zhang, Bo Xue, Xi Lin, Yifan Chen , Qingfu Zhang  (Role: proof, writing, co-mentoring)
Thirty-seventh Conference on Neural Information Processing Systems (NeurIPS 2023)
- [6] **A Gromov–Wasserstein Geometric View of Spectrum-Preserving Graph Coarsening** 
 Yifan Chen, Rentian Yao, Yun Yang, Jie Chen
The Fortieth International Conference on Machine Learning (ICML 2023)
- [7] **NTK-approximating MLP Fusion for Efficient Language Model Fine-tuning** 
 Tianxin Wei*, Zeming Guo* , Yifan Chen* , Jingrui He  (Role: main idea, proof, writing, co-mentoring)
The Fortieth International Conference on Machine Learning (ICML 2023)
- [8] **Calibrate and Debias Layer-wise Sampling for Graph Convolutional Networks** 
 Yifan Chen*, Tianning Xu*, Dilek Hakkani-Tur, Di Jin, Yun Yang, Ruoqing Zhu
Transactions on Machine Learning Research (TMLR), 2023
- [9] **Inducer-tuning: Connecting Prefix-tuning and Adapter-tuning** 
 Yifan Chen*, Devamanyu Hazarika*, Mahdi Namazifar, Yang Liu, Di Jin, Dilek Hakkani-Tur
The 2022 Conference on Empirical Methods in Natural Language Processing (EMNLP 2022) **Oral**
- [10] **Sketching as a Tool for Understanding and Accelerating Self-attention for Long Sequences** 
 Yifan Chen*, Qi Zeng*, Dilek Hakkani-Tur, Di Jin, Heng Ji, Yun Yang
2022 Annual Conference of the North American Chapter of the Association for Computational Linguistics (NAACL 2022) **Oral**
- [11] **Empowering parameter-efficient transfer learning by recognizing the kernel structure in self-attention** 
 Yifan Chen*, Devamanyu Hazarika*, Mahdi Namazifar, Yang Liu, Di Jin, Dilek Hakkani-Tur
2022 Annual Conference of the North American Chapter of the Association for Computational Linguistics (NAACL 2022) Findings
- [12] **Skyformer: Remodel Self-Attention with Gaussian Kernel and Nyström Method** 
 Yifan Chen*, Qi Zeng*, Heng Ji, Yun Yang
Thirty-Fifth Conference on Neural Information Processing Systems (NeurIPS 2021)
- [13] **Accumulations of Projections—A Unified Framework for Random Sketches in Kernel Ridge Regression** 
 Yifan Chen, Yun Yang
The 24th International Conference on Artificial Intelligence and Statistics (AISTATS 2021)
- [14] **Fast Statistical Leverage Score Approximation in Kernel Ridge Regression** 
 Yifan Chen, Yun Yang
The 24th International Conference on Artificial Intelligence and Statistics (AISTATS 2021)
- [15] **Narrowing the Gap between Professionalism and Popularity: An Empirical Investigation on Community QA** 
 Chenghong Zhang, Yifan Chen, Hongyue Lan, Yicheng Zhang, Tian Lu
American Conference on Information Systems (AMCIS 2017) Session on TREOS

Preprints and submissions


- [1] **Sampling-based Randomized Sketching for Approximate Matrix Multiplication**
Yifan Chen, Yun Yang
- [2] **Statistical Leverage Score Approximation for Penalized Kernel Empirical Risk Minimization**
Yifan Chen, Yun Yang

Patents

- [1] **Sanitary wastewater reuse system**
Yifan Chen
China Patent CN202187397U, published 2012-04-11

TEACHING EXPERIENCE

Instructor

- COMP 2027: Applied Linear Algebra for Computing Fall 2024
Co-Instructor: Yang Liu
- COMP 7070: Advanced Topics in Artificial Intelligence and Machine Learning  Spring 2024

Discussion Leader

- STAT 400: Statistics and Probability I Spring 2022, Fall 2022
Instructor: Albert Yu

Teaching Assistant

- STAT 425: Statistical Modeling I (Upper undergraduate level) Spring 2023
Instructor: Prof. Trevor H. Park
- STAT 576: Empirical Process Theory and Weak Convergence (Ph.D. core course) Spring 2021
Instructor: Prof. Sabyasachi Chatterjee
- CSE 428: Statistical Computing (Upper undergraduate level) Fall 2019, Fall 2020
Instructor: Uma Ravat, Prof. Shulei Wang
- STAT 510: Mathematical Statistics (Ph.D. core course) Spring 2020
Instructor: Prof. Yun Yang
- STAT 410: Statistics and Probability II Spring 2019, Summer 2019
Instructor: Prof. Yun Yang, Alexey G Stepanov
- STAT 400: Statistics and Probability I Fall 2018
Instructor: Prof. Hyoeun Lee

MENTORING EXPERIENCE

- Xichen Ye, master student at SHU.
Topic: Noisy Labels.
Outcome: **had a first-author paper published at AAI 2025.**
- Yifan Wu, undergraduate at SHU.
Topic: Noisy Labels.
Outcome: **had a first-author paper published at AAI 2025.**
- Yujia Yin, research assistant at HKBU.
Topic: Causal Learning.
Outcome: **had a first-author paper published at ICASSP 2025.**
- Fengrui Zhang, research assistant at Rutgers.
Topic: Causal Learning.
Outcome: **had a first-author paper published at ICASSP 2025.**
- Mengting Ai, master student at UIUC (now Ph.D. Student at UIUC).
Topic: Efficient Transformers.

- Zeming Guo, undergraduate at UIUC (now Master at Cornell).
Topic: Efficient Transformers.
Outcome: **had a first-author paper published at ICML 2023.**

PROFESSIONAL SERVICES

Session Chair

- HKBU-RIKEN AIP Joint Workshop on AI and ML 2024

Program Committee

- International Conference on Machine Learning (ICML) 2022, 2023
- Neural Information Processing Systems (NeurIPS) 2022, 2023
- AAAI Conference on Artificial Intelligence (AAAI) 2023
- International Conference on Artificial Intelligence and Statistics (AISTATS) 2023
- Annual Conference of the North American Chapter of the Association for Computational Linguistics (NAACL) 2024
- The IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) 2025
- Annual Meeting of the Association for Computational Linguistics (ACL) 2025

Journal Reviewer

- Statistica Sinica
- IEEE Transactions on Big Data
- Computational Statistics & Data Analysis
- Journal of Machine Learning Research
- IEEE Transactions on Information Theory
- Journal of the American Statistical Association

External Conference Reviewer

- The Conference on Information and Knowledge Management (CIKM) 2022

PROFESSIONAL TALKS

- Statistical Approaches Towards Efficient Transformers
The University of Hong Kong, Department of Statistics and Actuarial Science, Hong Kong, Sept 2024
- Approximation Methods for Fine-Tuning and Inference of Transformers
Fudan University, School of Computer Science, Shanghai, China, Jul 2024
Tongji University, School of Mathematical Sciences, Shanghai, China, Jul 2024
- Space-efficient MoE Approximation via Wasserstein Barycenter and Residual Restoration
At HKBU-RIKEN AIP Joint Workshop on Artificial Intelligence and Machine Learning, Hong Kong, May 2024
- A Gromov–Wasserstein Geometric View of Spectrum-Preserving Graph Coarsening
Miami University, Department of Statistics, Remote, Oct 2023
HKBU, Math department, Hong Kong, Aug 2023
At NRC 2023, Toronto, Ontario, Canada, Aug 2023.
- NTK-approximating MLP Fusion for Efficient Language Model Fine-tuning
At the 1st International Conference on AI-generated Content (AIGC2023), Remote, Aug 2023
- Inducer-tuning: Connecting Prefix-tuning and Adapter-tuning
At EMNLP 2022, Remote, Dec 2022
- One Expert with Multiple Instruments
Microsoft Azure, Remote, Aug 2022
- Sketching as a Tool for Understanding and Accelerating Self-attention for Long Sequences
AI Time PhD NAACL Special Session, Remote, Aug 2022
- Sketching as a Tool for Understanding and Accelerating Self-attention for Long Sequences
At NAACL 2022, Seattle, Washington, United States, July 2022
- Empowering parameter-efficient transfer learning by recognizing the kernel structure in self-attention
Amazon Alexa AI, Sunnyvale, California, United States, Dec 2021

- Skyformer: Remodel Self-Attention with Gaussian Kernel and Nyström Method
At NeurIPS 2021, Remote, Dec 2021
- Fast Statistical Leverage Score Approximation in Kernel Ridge Regression
At AISTATS 2021, Remote, Apr 2021