

SHUWEN CHAI

EDUCATION

Northwestern University

Ph.D. candidate in Computer Science Advisor: Miklós Z. Rácz

Evanston, IL

September 2022 – present

- GPA: **4.00 /4.00**

Renmin University of China

Major: Statistics, Bachelor of Science

Beijing, China

- GPA: **3.80/4.00**

September 2018 – July 2022

The University of Hong Kong

School of Science

Hong Kong, China

- GPA: **4.15/4.30**

January 2021 – June 2021

RESEARCH INTEREST

My main research interest lies in the intersection of Statistics and Theoretical Computer Science. The common goals in my recent and ongoing works are working towards the establishment of statistical-computational gaps, developing efficient algorithms or testing procedure to solve estimation or detection problems, etc. I mostly work on various topics related to random networks, including but not limited to

- beyond worst case analysis for NP-hard problems (e.g. graph matching on correlated stochastic block models)
- dynamic evolving networks that mimic real-world dynamics (e.g. preferential attachment graphs)
- dynamic process on the network (e.g. Susceptible-Infected process motivated by epidemiology).

I am also interested in and have worked on confidence intervals, hypothesis testing and trustworthy machine learning. One specific type of hypothesis testing I am actively thinking about is the changepoint detection on both dynamic evolving networks and the dynamic process on a network.

PUBLICATIONS

1. **Efficient Graph Matching for Correlated Stochastic Block Models.** *Advances in Neural Information Processing Systems (NeurIPS)*, 2024. Shuwen Chai, Miklós Rácz.
2. **One-shot Neural Backdoor Erasing via Adversarial Weight Masking.** *Advances in Neural Information Processing Systems (NeurIPS)*, 2022. Shuwen Chai, Jinghui Chen.
3. **Contrastive Active Learning under Class Distribution Mismatch.** *IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)*, 2022. Pan Du, Hui Chen, Suyun Zhao, Shuwen Chai, Hong Chen, Cuiping Li.

MANUSCRIPTS AND WORKING PROJECTS

4. **Adaptive Robust Confidence Intervals in Efron's Gaussian Two-Groups Model**, with Chao Gao and Qiaosen Wang. *To be submitted in early 2026*.
5. **Community Recovery and Changepoint Detection on Preferential Attachment Block Models**, with Miklós Rácz, 2026+.
6. **From Weak Recovery to Exact Recovery: Matching a Growing Number of Correlated Regular Stochastic Block Models**, with Miklós Rácz and Jifan Zhang, 2026+.

AWARDS

- **Best Reviewer Award**, International Conference on Artificial Intelligence and Statistics (AISTATS) 2025.

ACADEMIC SERVICE

I have served as a (sub)reviewer for the following conferences: SODA 2026, APPROX 2025, NeurIPS 2025, and AISTATS (2023-2026).

TEACHING

Teaching Assistant

- Discrete Mathematics for Computer Science, Northwestern University (2024 & 2025 Fall).

Department of Computer Science, Northwestern University, 2233 Tech Drive, Evanston IL 60208

- Introduction to Theory of Computation, Northwestern University (2023 Fall).
- The Practice of Market Research, Renmin University of China (2022 Fall).
- Introduction to Machine Learning, Renmin University of China (2021 Spring).

TALKS AND POSTERS

- (Poster) *Adaptive Robust Confidence Intervals in Efron's Two-Groups Model*, IDEAL workshop on Inference in High Dimensions: Algorithms and Statistics, Evanston IL, USA, Oct. 2025.
- (Poster) *Adaptive Robust Confidence Intervals in Efron's Two-Groups Model*, NITMB-IDEAL Fall 2025 Kickoff Event, Chicago IL, USA, Oct. 2025.
- (Talk) *Efficient Graph Matching for Correlated Stochastic Block Models*, Theory Group Seminar, Northwestern University, Evanston IL, USA, May 2025.
- (Talk) *Efficient Graph Matching for Correlated Stochastic Block Models*, International Conference on Statistics and Data Science, Nice, France, Dec. 2024.
- (Poster) *Efficient Graph Matching for Correlated Stochastic Block Models*, Conference on Neural Information Processing Systems, Vancouver BC, Canada, Dec. 2024.
- (Poster) *One-shot Neural Backdoor Erasing via Adversarial Weight Masking*, Conference on Neural Information Processing Systems, New Orleans LA, USA, Dec. 2022.