FEIYAN MA

mafy21@mails.tsinghua.edu.cn ◇ Personal Website

EDUCATION

Tsinghua University *Sep. 2021 - Jun. 2026 (expected)*
Undergraduate student at Weiyang College Overall GPA: 3.87/4.00 (top 15%)
Major in Mathematics and Physics + Civil Engineering and Systems

SKILLS

Programming R, Python, LaTeX, Git, Linux
Language Chinese (native), English (TOEFL 108 [R30/L26/S23/W29]), French (beginner)

PUBLICATIONS & PREPRINTS

(indicates equal contribution.)*

[**NeurIPS 2025**] Xinyuan Fan*, Feiyan Ma*, Chenlei Leng, Weichi Wu. "Low-Rank Graphon Learning for Networks". [arXiv link]

[**Under Review**] Feiyan Ma, Shihao Wu, Gongjun Xu, Ji Zhu. "ReLaSH: Reconstructing Joint Latent Spaces for Efficient Generation of Synthetic Hypergraphs with Hyperlink Attributes". [to appear]

RESEARCH EXPERIENCE

Low-Rank Approaches to Graphon Learning in Networks Aug 2024 - Sep 2025
Supervised by Prof. Weichi Wu *DSDS, Tsinghua University*

- We propose a novel approach that leverages a low-rank additive representation, yielding both a low-rank connection probability matrix and a low-rank graphon–two goals rarely achieved jointly.
- By exploiting the additive structure of this representation, we develop an efficient sequential fitting algorithm that estimates the low-rank connection matrix using subgraph counts and reconstructs the graphon function through interpolation.
- We provide the convergence rate of our method, and validate its computational efficiency and estimation accuracy through comprehensive simulation studies.

ReLaSH: Reconstructing Joint Latent Spaces for Efficient Generation of Synthetic Hypergraphs with Hyperlink Attributes Apr 2025 - Present
Supervised by Prof. Gongjun Xu and Prof. Ji Zhu *Dept. of Stats., University of Michigan*

- We introduce *ReLaSH* (REconstructing joint LAtent Spaces for Hypergraphs with attributes), a general generative framework for producing realistic synthetic hypergraph data with hyperlink attributes via training a likelihood-based joint embedding model and reconstructing the joint latent space.
- Given a hypergraph dataset, ReLaSH first embeds the hyperlinks and their attributes into a joint latent space by training a likelihood-based model, and then reconstructs this joint latent space using a distribution-free generator. The generation task is completed by decoding sampled embeddings into hyperlinks and attributes through the trained likelihood-based model.
- We theoretically demonstrate consistency and generalizability of ReLaSH. Empirical results on synthetic data and a range of real-world datasets from diverse domains demonstrate its strong performance.

RELEVANT COURSES

Undergraduate-Level Math Courses: Probability Theory (1) (A+), Measures and Integrals (A), Abstract Algebra (A), Topology (A-), Differential Geometry (A), Advanced Topics in Linear Algebra (A-), Basic Functional Analysis (B+).

Statistic Relevant Courses: Numerical Analysis (A), Intro to Optimization Theory (A-), Operation Research (A), Statistical Inference (A-), Financial Statistics (A+), Intro to Biostatistics (A), Topics in Logics (A), Linear Regression Analysis (A-), Reliability Data and Survival Analysis (A).

Graduate-Level Courses: Advanced Mathematical Statistics I (A), Advanced Mathematical Statistics II (A-), Computational Probability (A), Statistical Analysis of Network Data (A), Probability (2) (B+).

HONORS & AWARDS

Tsinghua Scholarship for Science and Technology Innovation Excellence Oct 2025
Tsinghua Scholarship for Comprehensive Excellence Oct 2025
Tsinghua Scholarship for Studying Abroad Jun 2025
Honorable Mention, 2024 Mathematical Contest in Modeling Feb 2024
Gold Medal, The 19th China Girls Mathematical Olympiad (CGMO) Aug 2020
First Prize, National High School Mathematics League, Shanghai Region Sep 2020