FEIYAN MA

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EDUCATION

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

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 May 2025 - Sep 2025
Supervised by Prof. Ji Zhu and Prof. Gongjun Xu *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 Studying Abroad Scholarship, top 20% among all applicants — 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