

# Yinan Bu

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## EDUCATION

**School of the Gifted Young,** Sep.2022 – Jul.2026  
**University of Science and Technology of China(USTC), Hefei, China**  
B.Sc. in **Statistics**

- **GPA: 4.02/4.30 (92.33/100) Major GPA: 4.12/4.30 (93.63/100)**
- **Ranking: 3/116** across **School of Management** and **School of the Gifted Young**;  
1st among female students(across **School of Management, School of the Gifted Young** and **School of Mathematical Sciences**).  
Outperformed all other statistics majors in the **School of Management**.

**Research Interests:** Network Analysis, Statistical Machine Learning, Biostatistics, Optimization Theory  
**Skills:** C, Python (Pytorch), R(Rcpp),  $\LaTeX$ , Mathematica, Matlab

## AWARDS & HONORS

<b>Guo Moruo Scholarship Nomination</b> (most prestigious scholarship at USTC)	2025
<b>China National Scholarship</b> (highest scholarship from Ministry of Education of China)	2025
<b>Yang Ya Alumni Fund Scholarship</b> (top 5 female students in School of the Gifted Young)	2024
<b>Excellent Student Scholarship – Silver</b> (top 10%)	2023

## PUBLICATION

- F. Jiang, **Y. Bu**, S. Wu, G. Xu, J. Zhu. (2025). *Efficient synthetic network generation via latent embedding reconstruction*. Under review at ICLR 2026.

## RESEARCH EXPERIENCES

**Efficient Synthetic Network Generation via Latent Embedding Reconstruction** Jul.2025-Present  
Advisor:  
Prof. **Gongjun Xu** (Professor, Department of Statistics, University of Michigan, Ann Arbor)  
Prof. **Ji Zhu** (Susan A. Murphy Collegiate Professor, Department of Statistics, University of Michigan, Ann Arbor);

- Developed a general, efficient framework for generating synthetic networks by combining latent space network models with a distribution-free generator over learned latent embeddings.
- Built scalable pipelines for a diffusion-based latent embedding generator and a bootstrap-based latent embedding resampler, preserving key network characteristics while enabling efficient training with lower computational cost than many existing deep architectures([GitHub repository](#)).
- Conducted empirical studies on both simulated datasets and real-world datasets, showing that the proposed method efficiently generates networks that more faithfully preserve key characteristics than existing approaches.

**Machine Learning and Hyperdimensional Computing** Apr.2024-Present  
Advisor: Prof. **Xueqin Wang** (Chair Professor, Department of Statistics and Finance , USTC)

- Derived asymptotic information loss in vanilla hyperdimensional computing(HDC) operations and developed Hoeffding bounds for both hypervector similarity and predictive accuracy.
- Designed Feature-Subspace based Hyperdimensional Computing(**FSHDC**), a robust and highly scalable model for fast classification and interpretation. Applied on fMRI/MRI from [UK Biobank](#) and achieved a **+0.20** AUROC improvement over vanilla HDC with strong robustness under class imbalance.
- Integrated **attention** mechanism into the HDC training pipeline, yielding a **30%** accuracy improvement on the [HAR dataset](#) over vanilla HDC and a **15%** improvement over an attention-only baseline.

**Large Scale Optimization and GPU Acceleration** Jan.2024-Feb.2025  
Advisor: Prof. **Xueqin Wang** (Chair Professor, Department of Statistics and Finance , USTC)

- Worked on graph trend filtering (minimizing the  $\ell_1$  norm of discrete graph differences) to recover piecewise-smooth signals; examined the ADMM trade-off between convergence speed and subproblem solvability.
- Proposed Differential Operator Grouping-based ADMM(**Doge-ADMM**), grouping differential operators to get closed-form subproblems and parallel updates.
- Built a parallel implementation for first- and second-order cases and achieved up to  $30\times$  speedup over state-of-the-art methods([GitHub repository](#)).

## ACADEMIC PROJECTS

### Analysis of the Government Pension Fund of Norway Jan.2024-Feb.2025

Supervisor: Prof. [Canhong Wen](#) (Department of Statistics and Finance, USTC)

- Independently designed, implemented, and deployed an RShiny website for the Norwegian Government Pension Fund Global (NBIM) with interactive Plotly charts and a Leaflet world map ([live demo](#)).
- Conducted overall analysis combining statistical summaries, maps and interpreted trends with embedded figures and map snapshots ([GitHub repository](#)).

### Uncertainty-Aware Time-Series Forecasting via Conformal Prediction Dec.2024-Jan.2025

Supervisor: Prof. [Yu Chen](#) (Department of Statistics and Finance, USTC)

- Reproduced Stankeviciute et al. (2021) conformal prediction framework for probabilistic time-series forecasting (CF-RNN), implementing model-agnostic, distribution-free prediction intervals with an end-to-end calibration/evaluation pipeline.
- Conducted experiments on a range of simulated and real-world datasets (AR/ARIMA, sales, air quality, COVID-19), demonstrating robust uncertainty quantification with competitive interval widths and accuracy versus standard baselines.

## CORE COURSES

### Probability and Statistics:

Probability	91	Mathematical Statistics	91	Applied Stochastic Processes	94
Regression Analysis	98	Multivariate Analysis A	96	Time Series Analysis A	96
Non-parametric Statistics	95				

### Mathematics:

Mathematical Analysis I	95	Mathematical Analysis II	92	Mathematical Analysis III	93
Linear Algebra I	93	Linear Algebra II	91	Differential Equations	93
Real Analysis	86	Complex Analysis	95	Functional Analysis	99

### Learning, Optimization & Games:

Machine Learning	92	Fundamentals of Statistical Algorithm	94	A Primer in Game Theory	93
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### Computer Science:

C Programming Language	95	Applied Statistical Software	96		
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## ADDITIONAL INFORMATION

### Teaching Experiences:

- C Programming Language, *Instructor: Prof. Lixiang Tan* Sep.2024-Feb.2025
- Linear Algebra I, *Instructor: Prof. Junchao Shentu* Mar.2025-Jun.2025

### Standardized Tests:

- TOEFL:108 (R: 28, L: 30, S: 23, W: 27)

### Leadership & Activities:

- Excellent member of the football team of School of the Gifted Young 2022-2025
- Winner of 3 gold medals in track and field at USTC Sports Games 2023-2025
- Flute player at the school Chinese orchestra 2022-2025
- Member of the Debate team 2022-2025