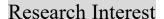
### Xu Hu

Senior Undergraduate @ AHU / Visiting Student @ NCSU



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- Data Augmentation & Generation
- Time Series Forecasting & Implementation
- Diffusion Model & Multi-Modal
- Brain Imaging/MRI & Mental Illness

### Reference

• Prof. Xiaolei Fang (North Carolina State University)- Advisor of Research Intern

xfang8@ncsu.edu

• Prof.Shu-Cherng Fang (North Carolina State University)- Advisor of Research Intern

fang@ncsu.edu

• Prof. Vince D. Calhoun (TReNDS; GSU & GAtech & Emory) - Collaborator

vcalhoun@gatech.edu

• Prof.Zhengyang Zhou (USTC)- Advisor of the Summer Research

zzy0929@ustc.edu.cn

• Prof.Zhifu Tao (Anhui University)- Undergraduate Tutor

jeff.tao@ahu.edu.cn

### **Education Background**

Anhui University (Project "211"), Hefei, China

2021-2025

- B.E.c Economic Statistics, Department of Big Data and Statistics
- GPA: 4.27/5.00 WES: TBD Major Rank: Top 0.95%
- Main Courses: Mathematics Analysis 1&2 (90&94), Advanced Algebra(87), Probability&Mathematical Statistics(89), Operation Research(97), Statistics(94), Bayesian Statistics(100), R Programming(95), Python Programming(95), Data Mining(93), Applied Statistical Analysis(95), Statistical Forecasting&Decision(96), Econometrics(Intermediate) (96), Time Series(91)

### **Publications**

[1] Hu Xu, Yu Jianwen, Xu Qin, Tao Zhifu, "Volatility information in high-frequency financial interval-valued time series: A direct modeling pattern". the Fluctuation and Noise Letters 2024, SCI: Q4.

[2] TBD (2024)

[3] TBD (2024)

### Research Experience

#### ISE, Edward P. FITTS Department, North Carolina State University

Raleigh, USA

Student Intern, under the supervision of Prof. Shu-Cherng Fang and Prof. Xiaolei Fang 08/2024-12/2024

### Adaptive Diffusion Models for Industrial Irregular Time Series Analysis

- Applied conditional diffusion models to sparse/irregular/missing time series data in industrial settings.
- Implemented domain adaptation, replacing Gaussian noise with Brownian motion-based noise to match real-world sensor data characteristics.

#### TReNDS lab, ECE, GSU&Georgia Tech&Emory

Atlanta, USA

Research Intern, under the supervision of Prof. Vince D.Calhoun

05/2024-07/2024

### Multi-model Latent Diffusion Based on the FNC to Generate GM for Early Diagnosis of Schizophrenia Using the Brain Image/MRI

• Utilizing an improved Diffusion Transformer (DiT) to achieve reverse generation from Functional Network Connectivity (FNC) to Gray Matter (GM).

- Introducing FNC matrix as a condition in the DiT model to guide the GM generation process.
- Be applied to diagnose the probability of schizophrenia by scanning the brain, instead of relying on the function of brains.

# Data Science and Analytic Thrust, HK University of Science and TechnologyGuangzhou, ChinaResearch Intern, under the supervision of Prof. Yuxuan Liang and Prof.Zhenyang Zhou07/2024–08/2024

### Spatial-Temporal Selective State Space(ST-Mamba) Model for Traffic Flow Prediction

- Be the first model without using graph modeling in the space-temporal model.
- Effectively capture the long-range dependency for traffic flow data.
- Employ the Mamba block to improve computational efficiency and accuracy.
- By ablation experiments, find some new conclusions of the SSM.

### Department of Big Data and Statistics, Anhui University

Hefei, China

Undergraduate's Research Project, under the supervision of Prof. Zhifu Tao

## Volatility Information in High-Frequency Financial Interval-Valued Time Series: A Direct Modeling Pattern

- Developed a novel VAR-NN forecasting model combining Vector Autoregressive process, volatility information, and neural networks.
- Introduced four types of interval-valued data volatility information for more accurate predictions.
- Outperformed traditional methods in forecasting high-frequency financial data.

### **Competition Awards**

### 2023 ICM - American Undergraduate Mathematical Modeling Competition - Finalist

02/2023

Propose a solution about the network science and operation research

#### Award Global Grand Prize Nomination (top 0.15%)

- Applied Canonical Correlation Analysis to the United Nations' 17 Sustainable Development Goals.
- Use some advanced econometrics methods to analyse the factors influencing the progress.
- Utilized an LSTM to predict achievable goals over the next decade.
- Concluded with a sensitivity analysis, affirming the robustness of the model.

### Honorary & Service & Leadership

### • The Student Assistant of the President in Anhui University

The first junior undergraduate selected

06/2022-06/2023

• "Award Excellence Project & Excellence Leadership" from Nanyang Technological University

The leader of the classroom & the best project

07/2023-08/2023

• The Member of a Startup Company "Empower Planet"

Presentation for investment & Field visit to agricultural aid bases

04/2023-08/2023

### Skills

#### **Professional Qualification:**

ACCA (2022): Pass the exam of BA,MA,FA; BEC Medium pass

Computer Skills: Python, MATLAB, R, PyTorch

Language: IELTS 7(6.5); GRE: TBD