

# Wenwu GONG

Research Keywords

Contact Information

Biography

Education

Honours and Awards

Projects

Publications

 Scholar

❑ Interpretable Neural Network

❑ Spatiotemporal LLM

❑ Learning to Optimization

❑ Inverse Imaging Problems

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🏠 HomePage

I am a **Postdoctoral** at Southern University of Science and Technology (SUSTech), where my research focuses on **Mathematical Theory for Data Science** and **Learning to Optimization**. Currently, I am exploring hybrid frameworks that **combine physics-based models with data-driven techniques** to develop robust, scalable, and interpretable solutions for computational imaging problems.

🏛️ Southern University of Science and Technology

🎓 *Ph.D. in Mathematics*

**Affiliation:** *Data Science in Department of Statistics and Data Science*

Shenzhen

Sep. 2020 - June 2024

🏛️ Harbin Institute of Technology

🎓 *Master of Science in Mathematics*

**Affiliation:** *Probability and Statistics in School of Mathematics*

Shenzhen

Sep. 2018 - June. 2020

🏛️ Nanchang University

🎓 *Bachelor of Science in Mathematics*

**Affiliation:** *Applied Mathematics in School of Mathematics and Computer Sciences*

Nanchang

Sep. 2014 - May. 2018

SUSTech Presidential Postdoctoral Fellowship

🏆 Nomination for Top Ten Graduate Students

🏆 Outstanding Graduate Student

🏆 National Scholarships

International Training Program of Guangdong Province

🏆 Innovative Practice Scholarship

🏆 National Postgraduate Statistical Modeling Competition

校长卓越博士后

7 (13)

1 (24)

国家奖学金

HKUST (P.G.)

RMB 10,000

Second Prize

July 2024

May 2024

Dec. 2023

Oct. 2023

June 2023

May 2021

Dec. 2020

• 模型和数据双驱动的低秩张量分解研究

2025.03 - 2026.09 中国博士后科学基金面上项目 省部级项目 主持

• 不同管控措施下新型冠状病毒肺炎疫情对第三产业影响的研究

2020.07 - 2021.12 南方科技大学创新创业项目 校级项目, **82000** 主持

**Journal Articles**

5. Wenwu Gong, Zhejun Huang, Lili Yang (2025). **TuckerAPP: A Novel Spatiotemporal Tucker Decomposition Approach for Traffic Imputation**. *Signal Processing*. 110383  
**JCR-Q2 IF: 3.6 中科院 2 区** <https://doi.org/10.1016/j.sigpro.2025.110383>

4. Zhenqing Wu, Wenwu Gong, Ziyang Yu, Liuxin Zhu and Lili Yang. (2025). **Replica exchange enhanced adaptively weighted stochastic gradient Langevin dynamics for Bayesian sampling and optimization**. *Scientific Reports*. 15: 16914.  
**JCR-Q1 IF: 3.9 Co-author** <https://doi.org/10.1038/s41598-025-01735-3>

3. Wenwu Gong, Zhejun Huang, Lili Yang (2023). **Accurate regularized Tucker decomposition for image restoration**. *Applied Mathematical Modeling*. 123: 75-86.  
**JCR-Q1 IF: 5 中科院 1 区** <https://doi.org/10.1016/j.apm.2023.06.031>

2. Wenwu Gong, Jie Jiang, and Lili Yang. (2022). **Dynamic risk assessment of compound hazards based on VFS-IEM-IDM: A case study of Typhoon-Rainstorm hazards in Shenzhen, China.** *Natural Hazards and Earth System Sciences*. 22(10): 3271-3283.  
**JCR-Q1 IF: 4.6 中科院 2 区** <https://doi.org/10.5194/nhess-22-3271-2022>
1. Fanyu Meng, Wenwu Gong, Jun Liang, Xian Li, Yiping Zeng and Lili Yang. (2021). **Impact of different control policies for COVID-19 outbreak on the air transportation industry: A comparison between China, the U.S., and Singapore.** *PLoS One*. 16(3): e0248361.  
**JCR-Q2 IF: 3.7 Co-first author** <https://doi.org/10.1371/journal.pone.0248361>

### Conference Proceedings

7. ICCBD+AI 2025 Xinyu Shi, Wenwu Gong<sup>†</sup>, Lili Yang (2026). **POI-LLM: Leveraging POI enhanced large language models for spatial-temporal modeling.** *IEEE International Conference on Computer, Big Data and Artificial Intelligence*, Xiamen, China  
**Poster Best Paper** Modeling Spatio-Temporal Data in the AI Era
6. ICCBD+AI 2025 Yunshan Li, Wenwu Gong<sup>†</sup>, Lili Yang (2026). **Transfer learning-based spatiotemporal urban mobility forecasting under abnormal situations.** *IEEE International Conference on Computer, Big Data and Artificial Intelligence*, Xiamen, China  
**Poster** Modeling Spatio-Temporal Data in the AI Era
5. ICCBD+AI 2024 Lang Mo, Wenwu Gong, Lili Yang (2025). **Overlapping Tenso-Train completion with TV regularization for image reconstruction.** *IEEE International Conference on Computer, Big Data and Artificial Intelligence*, Jingdezhen, China  
**Oral Best Paper** Representation of Multimedia Big Data
4. ICASSP 2024: Wenwu Gong, Zhejun Huang, Lili Yang (2024). **Enhanced low-rank and sparse Tucker decomposition for image completion.** *IEEE International Conference on Acoustics, Speech and Signal Processing*, Seoul, Korea, 2024, 2425-2429.  
**Poster CCF B** Computational Imaging
3. ICAC 2024 Jiaxin Lu, Wenwu Gong, Lili Yang (2024). **Low-Rank autoregressive Tucker decomposition for traffic data imputation.** *International Conference on Automation and Computing*, Sunderland, UK.  
**Oral** Data-driven Information Technologies for Complex Systems
2. ICIC 2024: Rongping Huang, Wenwu Gong, Jiaxin Lu, and Lili Yang. (2024). **BACP: Bayesian augmented CP factorization for traffic data imputation.** *International Conference On Intelligent Computing*, Tianjin, China.  
**Oral CCF C** Knowledge Discovery and Data Mining
1. ITSC 2023: Wenwu Gong, Zhejun Huang, Lili Yang (2023). **LSPTD: Low-rank and spatiotemporal priors enhanced Tucker decomposition for internet traffic data imputation.** *IEEE International Conference on Intelligent Transportation System*, Bilbao, Spain, 2023, 460-465.  
**Oral CCF B1** Advances in Urban Traffic Control Theory and Practice

### Preprints & Under Review

3. Qianqian Wang, Ruili Wang, Yunshan Li, Zhenqing Wu, Wenwu Gong<sup>†</sup> and Lili Yang (2025). **CLEAR: Causal Learning for Environment-Aware Recommendation.**  
Under review
2. Wenwu Gong and Lili Yang (2025). **LRTuckerRep: Low-rank Tucker Representation Model for Multi-dimensional Data Completion.**  
arXiv:2508.03755 Under review
1. Yunshan Li, Wenwu Gong, Qianqian Wang, Chao Wang, Lili Yang (2025). **3DeepRep: 3D Deep Low-rank Tensor Representation for Hyperspectral Image Inpainting.**  
arXiv:2506.16735

Talks and  
Presentations

- 3. Nov. 2025 Low-rank Tucker Representation Model for Multi-dimensional Data Completion. 2025 8th International Conference on Digital Medicine and Image Processing, Washington, Tokyo, Japan.  
*AI-Driven Multimodal Medical Data Analysis and Clinical Decision Support*
- 2. Jan. 2025 Low-Rank bi-directional neighbor Tucker decomposition for traffic data imputation. TRB Annual Meeting, Washington, D.C. USA.  
**Top-tier** *Applications and Innovations in Urban Travel Data*
- 1. Mar. 2024 Spatiotemporal Tucker decomposition approach for traffic imputation. Graduate Academic Forum in SUSTech.

Teaching  
Activities  
TA

- Probability Theory and Mathematical Statistics Sep. 2019 - May 2021
- Tensor Decomposition and Its Applications Mar. 2023 - June 2023

Mentorship  
协助指导

- Sep. 2023 – Xinyu SHI, Master student  
硕士论文: Applications of Multimodal Large Models in Spatiotemporal Data Mining
- Sep. 2023 – Xiongpeng XIA, Master student  
硕士论文: 基于多尺度 Transformer 的长时序预测
- Sep. 2022 - June 2024 Jiaxin LU, Master student 南方科技大学十佳毕业研究生  
硕士论文: Spatio-Temporal Data Mining of Urban Transportation based on Tensor Learning  
毕业去向: 北京大学 (深圳研究生院)
- Sep. 2021 - June 2023 Rongping HUANG, Master student  
硕士论文: Bayesian-based Tensor Recovery for Traffic Data Imputation  
毕业去向: 滴普科技