Su Jiaji

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Education

Jan 2024 | **National University of Singapore**, Singapore
Doctor of Philosophy in Statistics.
Advisor: Dr. YAO Zhigang

Jun 2018 | **Zhejiang University**, Hangzhou, Zhejiang, China
Bachelor of Natural Science in Statistics
GPA: 3.70 / 4.0

Working

Oct 2023 – Now | *Research Fellow* | Advisor: Dr. YAO Zhigang
Department of Statistics & Data Science
National University of Singapore

Aug 2022 – Oct 2023 | *Student Research Assistant* | Advisor: Dr. YAO Zhigang
Department of Statistics & Data Science
National University of Singapore

Ongoing projects

Since Jan 2024 | *Principal decomposition with nested submanifolds*
Joint work with Dr. YAO Zhigang.
This project aims to extend the principles of Principal Component Analysis (PCA) into a nonlinear context. The primary objective is to fit a series of principal submanifolds, each with progressively lower dimensions, to effectively capture the majority of the variation within a sample data cloud. This approach allows for a more nuanced understanding of complex, nonlinear data structures compared to traditional methods.

Since Jan 2024 | *Low-dimension structure analysis based on UK Biobank*
Joint work with Dr. YAO Zhigang & Dr. LI Bingjie.
This project aims to utilize the manifold-fitting approach to analyze extensive health datasets, specifically to discover novel low-dimensional structural patterns within population data. The UK Biobank, a comprehensive long-term biobank study, comprises over 10,000 variables collected from roughly 500,000 participants. Given the intricate interdependencies among these variables, manifold modeling emerges as a powerful method for capturing and articulating this complex structure. By detecting and leveraging these low-dimensional patterns, the project seeks to provide a more refined representation of population health and improve the precision of risk assessments in medical diagnoses.

Preprints & Publications †Equal Contribution; *Correspondence

†Li, B., †**Su**, **J**., †Lin, R., *Yau, S.-T., & *Yao, Z. (2025). Manifold fitting reveals metabolomic heterogeneity and disease associations in uk biobank populations. *Submitted*.

Su, **J**. & *Yao, Z. (2025). Principal decomposition with nested submanifolds. *arXiv preprint arXiv:2502.10010*.

*†Yao, Z., †**Su**, **J**., & *†Yau, S.-T. (2024). Manifold fitting with cyclegan. *Proceedings of the National Academy of Sciences*, *121*(5), e2311436121.

Su, **J**., *Yao, Z., Li, C., & Zhang, Y. (2023). A statistical approach to estimating adsorption-isotherm parameters in gradient-elution preparative liquid chromatography. *The Annals of Applied Statistics*, *17*(4), 3476–3499.

*Yao, Z., **Su**, **J**., Li, B., & Yau, S.-T. (2023). Manifold fitting. *arXiv preprint arXiv:2304.07680*.

Talks & Presentations

Jan. 2025 Shanghai & Sanya	The Second Symposium of Geometry and Statistics in China *Shanghai Institute for Mathematics and Interdisciplinary Sciences* & *The Tsinghua Sanya International Mathematics Forum*
Oct. 2024 Singapore	Interactions of Statistics and Geometry (ISAG) II *Institute for Mathematical Sciences, National University of Singapore*
Jun. 2024 Shanghai	Shanghai Institute for Mathematics and Interdisciplinary Sciences *The Principal Nested Submanifolds*
Jul 2023 Beijing	School of Mathematics and Statistics, Beijing Institute of Technology *A statistical approach to estimating adsorption-isotherm parameters in gradient-elution preparative liquid chromatography*

Visiting

Jun 2024, –Jul 2024	*Visiting Researcher* Shanghai Institute for Mathematics and Interdisciplinary Sciences, China
Dec 2024, – Jan 2025	*Visiting Researcher* Shanghai Institute for Mathematics and Interdisciplinary Sciences, China

Honors & Awards

Aug 2018	NUS Research Scholarships, NUS
Dec 2015	Second-class Scholarship for Outstanding Students, ZJU

Teaching

Teaching assistant at National University of Singapore:

21-22 SS	ST2334 DSA1101 ST2137
21-22 FW	ST5213 DSA1101
20-21 SS	ST2334 ST3232
20-21 FW	ST2334 ST5225
19-20 SS	ST2131 ST3239
19-20 FW	ST4231
18-19 SS	ST2131