Su Jiaji

Level 7, Block S16, 6 Science Drive 2
National University of Singapore, Singapore 117546

sujiaji.github.io
su_jiaji@nus.edu.sg

Education

Jan 2024 | **Doctor of Philosophy in Statistics**
Department of Statistics & Data Science
National University of Singapore, Singapore
Thesis Advisor: Dr. YAO Zhigang

Jun 2018 | **Bachelor of Natural Science in Statistics**
School of Mathematical Science
Zhejiang University, Hangzhou, China

Professional Experience

Since Oct 2023 | **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

Selected Ongoing Projects

Since Jan 2024 | **Principal Decomposition with Nested Submanifolds**

- Develops a nonlinear generalization of PCA by fitting nested submanifolds of decreasing dimension.
- Aims to capture key variation in high-dimensional data with greater flexibility than linear methods.
- Provides insights into hierarchical or nonlinear structure in complex datasets.

Since Jan 2024 | **Low-dimension Structure Analysis Based on UK Biobank**

- Applies manifold-fitting methods to large-scale biomedical data, with a focus on the UK Biobank.
- Aims to uncover low-dimensional structures within high-dimensional population health data.
- Leverages these structures to improve population stratification and refine medical risk assessments.

Preprints & Publications

*Equal Contribution; #Correspondence

Preprints:

*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*. (*Minor Revision at PNAS*).

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

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

Published:

#**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.

Talks & Presentations

Jan 2025	The Second Symposium of Geometry and Statistics in China
Shanghai & Sanya	*Shanghai Institute for Mathematics and Interdisciplinary Sciences* & *The Tsinghua Sanya International Mathematics Forum*
Oct 2024	Interactions of Statistics and Geometry (ISAG) II
Singapore	*Institute for Mathematical Sciences, National University of Singapore*
Jun 2024	Talk: 'The Principal Nested Submanifolds'
Shanghai	Shanghai Institute for Mathematics and Interdisciplinary Sciences
Jul 2023	Talk: 'Estimating Adsorption-isotherm Parameters'
Beijing	School of Mathematics and Statistics, Beijing Institute of Technology

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:

Semester	**Courses**	
2021–22 Sem 2	ST2334	Probability and Statistics
	DSA1101	Introduction to Data Science
	ST2137	Statistical Computing and Programming
2021–22 Sem 1	ST5213	Advanced Categorical Data Analysis
	DSA1101	Introduction to Data Science
2020–21 Sem 2	ST2334	Probability and Statistics
	ST3232	Design and Analysis of Experiments
2020–21 Sem 1	ST2334	Probability and Statistics
	ST5225	Statistical Analysis of Networks
2019–20 Sem 2	ST2131	Probability
	ST3239	Survey Methodology
2019–20 Sem 1	ST4231	Computer Intensive Statistical Methods
2018–19 Sem 2	ST2131	Probability