HANG ZHOU

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EDUCATION

Department of Statistics, UC Davis *July 2022 - Now*
Postdoctoral Researcher
Advisor: Prof. Hans-Georg Müller and Prof. Jane-Ling Wang

School of Mathematical Sciences, Peking University *Sept 2017 - June 2022*
Ph.D., Statistics
Advisor: Prof. Fang Yao

Department of Mathematics, Nankai University *Sept 2013 - July 2017*
B.Sc., Statistics

RESEARCH INTERESTS

Functional and longitudinal data analysis, Object data inference, NeuroImage data analysis, Methodology and theory for machine learning, Data mining and graph learning, Dynamic system modeling.

From my Ph.D. research in functional data analysis to my current work with object data and machine learning, I have consistently focused on **leveraging the intrinsic structure of data to develop statistical models and address scientific problems**. Advancements in data collection techniques have led to the emergence of complex structured data in various fields, including neuroimaging, health science, energy, transportation and information science. The technical and theoretical challenges presented by these applications have motivated me to explore and formulate generalized statistical methodologies that are compatible with the natural geometry of the data and to develop a unified theoretical framework.

PUBLICATIONS

Peer-Reviewed Journal Articles

1. **Hang Zhou**, Fang Yao and Huiming Zhang. Functional linear regression for discretely observed data: from ideal to reality. *Biometrika* 110.2: 381-393, 2023. https://doi.org/10.1093/biomet/asac053

2. **Hang Zhou**, Dongyi Wei and Fang Yao. Theory of functional principal component analysis for noisy and discretely observed data. In minor revision at *Annals of Statistics*, 2024+. https://doi.org/10.48550/arXiv.2209.08768

3. **Hang Zhou** and Hans-Georg Müller. Conformal inference for random objects. In major revision at *Annals of Statistics*, 2024+. https://doi.org/10.48550/arXiv.2405.00294

4. Shunxing Yan, **Hang Zhou** and Fang Yao. Deep regression for repeated measurements. *Journal of American Statistical Association*, accepted 2024+.

5. **Hang Zhou**, Zhenhua Lin and Fang Yao. Intrinsic Wasserstein correlation analysis. *Statistica Sinica,* in press, 2024+. https://doi.org/10.5705/ss.202023.0147

6. Álvaro Gajardo, Hans-Georg Müller and **Hang Zhou**. Wasserstein-Fréchet integration of conditional distributions. *In minor revision at Electronic Journal of Statistics*, 2024+.

7. Fan Zhang, **Hang Zhou**, Xian-Sheng Hua, Chong Chen and Xiao Luo. Hope: A hierarchical perspective for semi-supervised 2D-3D cross-Modal retrieval. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 2024. https://doi.org/10.1109/TPAMI.2024.3412760

8. **Hang Zhou**, Jonas Mueller, Mayank Kumar, Jane-Ling Wang and Jing Lei. Detecting errors in a numerical response via any regression model. *Journal of Data-centric Machine Learning Research*, 2024. https://openreview.net/forum?id=CIQ5iemeTw

Conference Papers

1. Xiao Luo, Yiyang Gu, Huiyu Jiang, **Hang Zhou**, Jinsheng Huang, Wei Ju, Zhiping Xiao, Ming Zhang, and Yizhou Sun. PGODE: Towards high-quality system dynamics modeling. In *The Forty-first International Conference on Machine Learning* (ICML). https://openreview.net/forum?id=jrE7geZekq

2. Jingyang Yuan, Gongbo Sun, Zhiping Xiao, **Hang Zhou**, Xiao Luo, Junyu Luo, Yusheng Zhao, Wei Ju, Ming Zhang. EGODE: An Event-attended Graph ODE Framework for Modeling Rigid Dynamics. In *The Thirty-eighth Annual Conference on Neural Information Processing Systems* (NeurIPS). https://openreview.net/forum?id=js5vZtyoIQ

3. Xiao Luo, Junyu Luo, Huiyu Jiang, **Hang Zhou**, Zhiping Xiao, Wei Ju, Carl Yang, Ming Zhang, Yizhou Sun. Future Matters for Present: Towards Effective Physical Simulation over Meshes. In *ACM Conference on Knowledge Discovery and Data Mining* (KDD). https://openreview.net/forum?id=GqwQOPiSYk

Pre-Prints and Papers in Preparation

1. **Hang Zhou** and Hans-Georg Müller. Optimal transport representations and functional principal components for distribution-valued processes. *airXiv preprint: arXiv:2310.20088*, 2024+.

2. **Hang Zhou**, Yidong Zhou and Hans-Georg Müller. Quantifying centrality for complex data. *submitted*.

3. Wookyeong Song, **Hang Zhou**, Yidong Zhou and Hans-Georg Müller. Tools for the analysis of random objects. Invited paper at *Harvard Data Science Review*, in preparation.

TEACHING EXPERIENCE

Instructor in Charge at UC Davis:

1. Spring 2024, STA131B Mathematical Statistics. An upper-level undergraduate course aimed at students majoring in statistics and related areas. Teaching evaluation: 4.71 / 5.00.

2. Summer Session I 2024, STA 100 Applied Statistics for Biological Sciences. A Lower-level undergraduate course aimed at students majoring in biological sciences and pre-med. Teaching evaluation: 4.67 / 5.00.

Teaching Assistant at Peking University:

1. Spring 2021, Spring 2020, Fall 2020 and Fall 2019, Advanced linear algebra. Upper-level undergraduate course aimed at students majoring in math, with a two-hour discussion every week.

2. Spring 2019 and Spring 2018, Calculus B. Lower-level undergraduate course aimed at students majoring in business and management, with a one-hour discussion every week.

3. Fall 2019, Linear algebra. Lower-level undergraduate course aimed at students majoring in business and management, with a one-hour discussion every week.

PROFESSIONAL SERVICE

- Co-Organizer of an invited session, *ICSA Canada Chapter Symposium*, Jun 7-9, Niagara Falls, ON, Canada.
- Journal Reviewer for Annals of Statistics (3), Journal of American Statistical Association (5), Biometrika (1), Statistica Sinica (2), Bioinformatics (2).
- Conference Reviewer for ICML 2023 (3), NeurIPS 2024 (6), ICLR 2024 (1).

PRESENTATIONS

1. Statistical tools for Brain imaging analysis. *Resonance fall meeting, Jackson WY, Nov 21-24, 2024*
2. Statistical tools for analyzing complex data in Neuromodeling. *Neuromodeling Analysis Workshop supported by Bill & Melinda Gates Foundation, Majorca, Spain, Oct 25-27, 2024*
3. Conformal inference for random objects. *Joint Statistical Meeting*, Aug 3-8, 2024
4. Conformal inference for random objects. *ICSA Canada Chapter Symposium*, Jun 7-9, 2024
5. Centrality regions for complex data. *Neuromodeling Analysis Workshop supported by Bill & Melinda Gates Foundation, Dubai. Apr. 18, 2024*
6. Compositional data analysis for brain imagining data. *Neuromodeling Analysis Workshop supported by Bill & Melinda Gates Foundation, Vail, CO, US. Sept. 17, 2023*
7. Theory of functional principal components analysis for noisy and discretely observed data. *IMS New Researchers Conference 2023*, Toronto, Canada. Aug. 3, 2023 [**5 minutes lightning talk**]
8. Theory of functional principal components analysis for noisy and discretely observed data. *Emerging New Topics in Functional Data Analysis*, NUS, Singapore. Jul. 20, 2023 [**invited**]
9. Theory of functional principal components analysis for noisy and discretely observed data. *Joint Conference on Statistics and Data Science in China*, Beijing, China. Jul. 11, 2023 [**invited**]

AWARDS AND SCHOLARSHIPS

Outstanding Poster Award in 2021 Peking-Tsinghua Joint Statistics Colloquium	*2020*
Third prize in the 7th-Mathematics competition of Chinese College Student	*2015*
Government Scholarship, Tianjin	*2015*
First-class scholarship, Nankai University	*2014*

SOFTWARE

Programming Languages: R, Python, MATLAB, C++

1. fdapace: Functional Data Analysis and Empirical Dynamics: Maintainer of the Matlab version (July 2022 – present); Developer of the R version.
2. fdaconcur: Concurrent Regression and History Index Models for Functional Data: Developer of the R version.