

Hao-Xuan Sun

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EMPLOYMENT

School of Mathematics
Assistant Professor

HARBIN INSTITUTE OF TECHNOLOGY
Jul. 2025 - now

EDUCATION

Academy for Advanced Interdisciplinary Studies
PhD in Statistics, supervised by Prof. Song Xi Chen

PEKING UNIVERSITY
Sep. 2019 - Jun. 2025

School of Arts
B.S. in Arts (Double Degree)

PEKING UNIVERSITY
Sep. 2016 - Jun. 2019

School of Mathematical Sciences
B.S. in Statistics

PEKING UNIVERSITY
Sep. 2015 - Jun. 2019

CITATION PROFILE

H-Index 4, I-10 Index 4, Citations 78 (Web of Science, without self citations); 225 (Google Scholar)

PUBLICATIONS

* Indicating co-first author

- **Sun, H-X.**, Wang, S., Zheng, X. and Chen, S.X. (2024) High-dimensional Ensemble Kalman Filter with Localization, Inflation and Iterative Updates. *Quarterly Journal of the Royal Meteorological Society*. 150(765), 4870–4884.
- Xu, N., Hu, M., Li, X., Song K., Qiu Y., **Sun, H-X.**, Wang, Y., Zeng, L., Li, M., Wang, H., Hu, S., Zong, T., Bai, Y., Zhang, Z., Li, S., Shuai, S., Chen, Y. and Guo, S. (2024) Resolving Ultraviolet-visible Spectra for Complex Dissolved Mixtures of Multitudinous Organic Matters in Aerosols. *Analytical Chemistry*. 96 (5), 1834-1842.
- Huang, Y., Guo, B., **Sun, H-X.**, Liu, H. and Chen. S.X. (2021) Relative Importance of Meteorological Variables on Air Quality and Role of Boundary Layer Height. *Atmospheric Environment*. 267: 118737.
- Yan, H.*, Zhu, Y.*, Gu, J.*., Huang, Y.*., **Sun, H-X.***, Zhang, X., Wang, Y., Qiu, Y., Chen, S.X. (2021) Better Strategies for Containing COVID-19 Pandemic – A Study of 25 Countries via a vSIADR Model. *Proceeding of the Royal Society A*. 477(2248): 20200440.
- Gu, J., Yan, H., Huang, Y., Zhu, Y., **Sun, H-X.**, Qiu, Y. and Chen, S.X. (2020). Comparing Containment Measures among Nations by Epidemiological Effects of COVID-19. *National Science Review*. 7(12): 1847-1851.
- **Sun, H-X.**, Qiu, Y., Yan, H., Huang, Y., Zhu, Y., Gu, J. and Chen, S.X. (2020). Tracking Reproductivity of COVID-19 Epidemic in China with Varying Coefficient SIR Model (with discussion). *Journal of Data Science*. 18(3): 455-472.

MANUSCRIPT

* Indicating co-first author

- Wang, S.*., Chen, S.X. and **Sun, H-X.*** (2026+) High Dimensional Ensemble Kalman Filter. Under review.
- **Sun, H-X.**, Chen, S.X. and Qiu, Y. (2026+) Localization Estimator for High-dimensional Tensor Covariance Matrices. Under review.
- Cao, Y., Bai, J., Xu, R., Jin, Z., Wu, J., **Sun, H-X.**, Zhu, R., Lin, D., Wang, Y., Zhou, T. and Liu, K. (2026+) Facilitating Sustainable Shale Oil Exploration Through Transfer Learning. Under review.
- Wang, Z., **Sun, H-X.**, and Jing, Z. (2026+) Augmented In Situ Ocean Observing Capacity Could Cause an Artificial Intensification of Extreme Warm Water Events Globally. Under review.
- **Sun, H-X.** (2026+) On the role of Forecast Bias in Ensemble Kalman Filter – Numerical Evidence on Lorenz-96 Model and Test-Enhanced Assimilation Scheme. In process.
- **Sun, H-X.** and Ye, Y. (2026+) Modified Cholesky Decomposition-Based Localization for Ensemble Kalman Filter. In process.

TECHNICAL REPORTS

- Li, H., Liu, J., Wang, J., Zhan, H., Chen, H., Bian, M., Feng, Y., Yang, Q., Yan, X., Peng, A., **Sun, H-X.**, and Chen, S.X. (2024). Air Quality Assessment Report XI: Regional Air Quality Assessment of the 3+130 Cities. Center for Statistics at Peking University.

- Luo, S., Chen, H., Wang, J., Zhan, H., Lin, H., Liu, J., Ding, J., Wang, B., Yan, X., Dai, H., **Sun, H-X.**, Guo, B. and Chen, S.X. (2023). Air Quality Assessment Report X: Regional Air Quality Assessment of the 3+110 Cities. Center for Statistics at Peking University.
- **Sun, H-X.**, Luo, S., Zhang, X., Zhan, H., Lin, H., Chen, H., Lai, H., Tong, P., Guo, B. and Chen, S.X. (2022). Air Quality Assessment Report IX: Regional Air Quality Assessment of the 3+99 Cities. Center for Statistics at Peking University.
- **Sun, H-X.**, Luo, S., You, W., Wang, Y., Zhan, H., Wang, X., Huang, Y., He, J., Guo, B. and Chen, S.X. (2021). Air Quality Assessment Report VIII: Regional Air Quality Assessment of the 3+95 Cities. Center for Statistics at Peking University.
- **Sun, H-X.**, You, W., Guo, B., Luo, S., Zheng, X., Han, T., Wang, X., Liu, R., Huang, Y., He, J., Chen, L., Wang, H. and Chen, S.X. (2020). Air Quality Assessment Report VII: Regional Air Quality Assessment of the 2+66 Cities. Center for Statistics at Peking University.
- **Sun, H-X.**, Guo, B., Wang, X., Huang Y. and Chen, S.X. (2019). Assessment of Air Quality in Shandong Province from 2014 to 2018. Center for Statistics at Peking University.
- Liu, H., Ye, F., **Sun, H-X.**, Guo, B., Liu R., Xiao, J., He, J., Zheng, X., Wang, H. and Chen, S.X. (2019). Air Quality Assessment Report VI: Regional Air Quality Assessment of the 2+43 Cities. Center for Statistics at Peking University.

TALKS

2025 International Chinese Statistical Association (ICSA) China Conference TBA	Shenzhen, China Jun. 2026
The First Symposium on Ocean Statistics and Data Science <i>Covariance Estimation of High-Dimensional Ocean Tensor Data</i>	Xiamen, China Jan. 2026
The 17th Symposium on Ocean Data Assimilation and Numerical Modeling <i>High-dimensional Ensemble Kalman Filter</i>	Guangzhou, China Nov. 2025
11th International Symposium on Data Assimilation (ISDA) <i>High-dimensional Ensemble Kalman Filter</i>	Melbourne, Australia Oct. 2025
3rd Joint Conference on Statistics and Data Science (JCSDS) <i>Localization Estimator for High-dimensional Tensor Data</i>	Hangzhou, China Jul. 2025
2025 International Chinese Statistical Association (ICSA) China Conference <i>High-dimensional Ensemble Kalman Filter</i>	Zhuhai, China Jun. 2025
13th China National Conference on Probability and Statistics <i>Ocean Data Assimilation System</i>	Xiamen, China Nov. 2024
Workshop on Digital Twin and Uncertainty Quantification (DTUQ) <i>High-dimensional Ensemble Kalman Filter with Localization, Inflation and Iterative Update</i>	Kunming, China Aug. 2024
2nd Joint Conference on Statistics and Data Science (JCSDS) <i>High-dimensional Ensemble Kalman Filter with Localization, Inflation and Iterative Update</i>	Kunming, China Jul. 2024

AWARDS AND HONORS

• Academic Excellence Award, Peking University	Oct 2024
• Merit Student of School, Peking University	Oct 2020
• Academic Scholarship, Peking University	Oct 2020
• Merit Graduate of School of Mathematical Sciences, Peking University	Jul 2019
• Yizheng Scholarship, Peking University	Sep 2017
• First Prize (1/32), Jiang-Zehan Mathematical Modeling Contest, Peking University	May 2017

RESEARCH EXPERIENCE

Artificial Intelligence-Guided Methods for Shale Oil Development <i>China National Petroleum Corporation Collaboration Project. Co-PI. RMB 500,000.</i>	Oct. 2025-Present
South China Sea Research Voyage <i>Scientific Researcher on board</i>	Aug. 2025-Sep.2025
Glider Network Observation on Kuroshio Extension <i>Shared Voyage Plan of National Foundation Committee. NORC2024-584, contributed</i>	Aug. 2024-Sep.2024
Multi-layer Interaction Data Integration in Western Pacific Ocean <i>National Natural Science Foundation of China. No.92358303, contributed</i>	2023-Present
High-resolution Ensemble Kalman Filtering and Carbon Flux Fused Algorithm <i>National Natural Science Foundation of China. No.12292983, contributed</i>	2023-Present
Statistical Inference for Varying Coefficient Epidemiological Models <i>National Natural Science Foundation of China. No.12071013, participant (7/7)</i>	2021-2024
Statistical Models for Air Quality Assessment, <i>China National Key Research Fund. 2016YFC0207701, contributed</i>	2019-2020

TEACHING ASSISTANT

R Programming <i>Postgraduate course by Assoc. Prof. Minya Xu</i>	Mar. 2021 - May. 2021
Data Analysis and Statistical Software <i>Undergraduate course by Assoc. Prof. Minya Xu</i>	Sep. 2020 - Jan. 2021

ADDITIONAL SKILLS

- Language Skills: Mandarin (native), English (fluent).
- Programming Skills: R (current), Matlab, Python, L^AT_EX.