Hu Sun

PHD CANDIDATE IN STATISTICS AT UNIVERSITY OF MICHIGAN, ANN ARBOR

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Education

University of Michigan *Ann Arbor*
PH.D. IN STATISTICS *Aug 2020 - present*
- Advisor: Prof. Yang Chen
- Research Area: Tensor/Functional Data Analysis, Spatio-Temporal Statistics, Astro-statistics.

University of Michigan *Ann Arbor*
M.S. IN APPLIED STATISTICS *Aug 2018 - May 2020*
- Advisor: Prof. Yang Chen

University of Oxford *Oxford, UK*
VISITING STUDENT IN ECONOMICS *Oct 2016 - Jun 2017*
- Enrolled in Pembroke College

Xiamen University *Xiamen, China*
B.A. IN ECONOMICS *Aug 2014 - Jun 2018*
- Thesis: Self-Confidence, Attribution Bias and their Implications on Job Applications.

Professional Experience

2023	**Quantitative Researcher Intern**, IMC Trading, Chicago
2022-2023	**Graduate Student Research Assistant**, University of Michigan, Ann Arbor
2020-2021	**Graduate Student Instructor**, University of Michigan, Ann Arbor
2017	**Global Technology Intern**, Bank of America, Beijing

Publications

PUBLISHED

Wang, Z., Zou, S., **Sun, H.**, & Chen, Y. (2023). Forecast Global Ionospheric TEC: Apply Modified U-Net on VISTA TEC Data Set. *Space Weather*, 21(8), e2023SW003494.

Sun, H., Manchester, W., Jin, M., Liu, Y., & Chen, Y. (2023). Tensor Gaussian Process with Contraction for Multi-Channel Imaging Analysis. *International Conference on Machine Learning (ICML)*, PMLR 202:32913-32935.

Sun, H., Chen, Y., Zou, S., Ren, J., Chang, Y., Wang, Z., & Coster, A. (2023). Complete Global Total Electron Content Map Dataset based on a Video Imputation Algorithm VISTA. *Scientific Data*, 10(1), 236.

Sun, H., Hua, Z., Ren, J., Zou, S., Sun, Y., & Chen, Y. (2022). Matrix Completion Methods for the Total Electron Content Video Reconstruction. *The Annals of Applied Statistics*, 16(3), 1333-1358.

Sun, Z., Bobra, M. G., Wang, X., Wang, Y., **Sun, H.**, Gombosi, T., Chen, Y., & Hero, A. (2022). Predicting Solar Flares using CNN and LSTM on Two Solar Cycles of Active Region Data. *The Astrophysical Journal*, 931(2), 163.

Sun, H., Manchester IV, W., & Chen, Y. (2021). Improved and Interpretable Solar Flare Predictions with Spatial and Topological Features of the Polarity Inversion Line Masked Magnetograms. *Space Weather*, 19(12), e2021SW002837.

Zou, S., Ren, J., Wang, Z., **Sun, H.**, & Chen, Y. (2021). Impact of Storm-Enhanced Density (SED) on Ion Upflow Fluxes during Geomagnetic Storm. *Frontiers in Astronomy and Space Sciences*, 8, 746429.

Jiao, Z., **Sun, H.**, Wang, X., Manchester, W., Gombosi, T., Hero, A., & Chen, Y. (2020). Solar Flare Intensity Prediction with Machine Learning Models. *Space Weather*, 18(7), e2020SW002440.

Wang, X., Chen, Y., Toth, G., Manchester, W. B., Gombosi, T. I., Hero, A. O., Jiao, Z., **Sun, H.**, Jin, M., & Liu, Y. (2020). Predicting Solar Flares with Machine Learning: Investigating Solar Cycle Dependence. *The Astrophysical Journal*, 895(1), 3.

IN REVIEW

Sun, H., Shang, Z., & Chen, Y. (2023). Matrix Autoregressive Model with Vector Time Series Covariates for Spatio-Temporal Data. *arXiv preprint* arXiv:2305.15671.

Sun, H., Manchester, W., Jiao, Z., Wang, X., & Chen, Y. (2019). Interpreting LSTM Prediction on Solar Flare Eruption with Time-Series Clustering. *arXiv preprint* arXiv:1912.12360.

Awards & Fellowships

2023	**Best Visit Day Poster Presentation Award**, Department of Statistics, U of Michigan	
2021	**Oustanding GSI Team Award**, Department of Statistics, U of Michigan	
2020	**Departmental Fellowship**, Department of Statistics, U of Michigan	
2019	**Oustanding First Year Master Student**, Department of Statistics, U of Michigan	
2018	**Best Undergraduate Thesis Award**, School of Economics, Xiamen University	
2018	**Minxin Fund Scholarship**, Minxin Fund	*¥5,000*
2016	**Oxford Prospect Program Fellowship**, Xiamen University	*¥100,000*
2016	**Global Top 20, Ace Manager Financial Case Study International Competition**, BNP Paribas	
2016	**Minxin Fund Scholarship**, Minxin Fund	*¥5,000*
2015	**National Finalist, Chinese National English Speaking Contest**, FLTRP	
2015	**First Place, Chinese National English Speaking Contest, Provincial Final**, FLTRP	
2015	**Dean's List Award**, School of Economics, Xiamen University	
2014	**Dean's List Award**, School of Economics, Xiamen University	
2013	**Second Prize, Chinese Chemistry Olympiad, Provincial Round**, Chinese Chemical Society	
2013	**First Prize, Zhejiang Chemistry Olympiad**, Zhejiang Chemical Society	

Talks & Presentations

TENSOR GAUSSIAN PROCESS WITH CONTRACTION FOR MULTI-CHANNEL IMAGING ANALYSIS

1. 40th International Conference on Machine Learning (ICML). Jul, 2023. Honolulu, HI, USA.
2. Michigan Student Symposium for Interdisciplinary Statistical Sciences (MSSISS). Mar, 2023. Ann Arbor, MI, USA.
3. American Geophysical Union (AGU) Meeting. Dec, 2022. Virtual.

MATRIX AUTO-REGRESSIVE MODEL WITH VECTOR TIME-SERIES COVARIATES FOR SPATIO-TEMPORAL DATA

1. 16th International Conference of the ERCIM WG on Computational and Methodological Statistics. Dec, 2023. Virtual.
2. INFORMS Annual Meeting. Oct, 2022. Indianapolis, IN, USA.
3. Department of Mathematical Sciences, New Jersey Institute of Technology. Apr, 2022. Virtual.

MATRIX COMPLETION METHOD FOR THE TOTAL ELECTRON CONTENT VIDEO RECONSTRUCTION

1. American Geophysical Union (AGU) Meeting. Dec, 2022. Virtual.
2. Asia Oceania Geosciences Society (AOGS). Aug, 2022. Virtual.
3. Magnetosphere Online Seminar Series. Jul, 2022. Virtual.
4. Jet Propulsion Laboratory (JPL). Jun, 2021. Virtual.
5. CHASC Astro-statistics Seminar Series, Harvard University. Apr, 2021. Virtual.

INTERPRETABLE SOLAR FLARE PREDICTION WITH SPATIAL AND TOPOLOGICAL DATA ANALYSIS

1. American Geophysical Union (AGU) Meeting. Dec, 2021. Virtual.
2. Department of Computer Science, Georgia State University. Sept, 2021. Virtual.
3. Joint Statistical Meeting (JSM). Aug, 2021. Virtual.

4. Conference on Applications of Statistical Methods and Machine Learning in the Space Sciences, Boulder, Colorado. May, 2021. Virtual.

INTERPRETATION OF LSTM PREDICTION ON SOLAR FLARE ERUPTION

1. American Geophysical Union (AGU) Meeting. Dec, 2020. Virtual Poster.
2. Michigan Student Symposium for Interdisciplinary Statistical Sciences (MSSISS). Mar, 2020. Ann Arbor, MI, USA.
3. W.W. Hansen Experimental Physics Lab, Stanford University. Oct, 2019. Palo Alto, CA, USA.

Teaching Experience

FA 2021   **STATS 510: Probability and Distribution Theory**, TA
WT 2021   **STATS 503: Statistical Learning II: Multivariate Analysis**, TA
FA 2020   **STATS 426: Introduction to Theoretical Statistics**, TA
WT 2020   **STATS 406: Computational Methods in Statistics and Data Science**, TA