Hu Sun

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Education

Ph.D. in Statistics @ *University of Michigan* 2020-2024
- ❖ Research: Spatio-Temporal Statistics, Tensor Data Analysis; GPA: 4.00/4.00

M.S. in Applied Statistics @ *University of Michigan* 2018-2020
- ❖ Award: Outstanding First-Year Master Student; GPA: 4.00/4.00

Visiting Student in Economics @ *University of Oxford* 2016-2017
- ❖ Award: Oxford Prospect Fellowship; GPA: First-Class at Oxford scale

B.A. in Economics @ *Xiamen University* 2014-2018
- ❖ Award: Best Undergraduate Thesis Award; GPA: 3.92/4.00; Rank: 1/47

Selected Research Experience

Matrix-valued Time Series Autoregression with Auxiliary Data 2021-2023
- ❖ Proposed a novel semi-parametric, partial-linear autoregression model named *MARAC* for matrix-valued time series with associated vector time series covariates. Validated model with theoretical analysis and application to remote sensing spatio-temporal data.

Tensor Completion Method for Spatio-Temporal Data 2020-2022
- ❖ Proposed a novel spatio-temporal tensor completion model named *VISTA* that guarantees spatial and temporal smoothness, reaching superior performances over competing methods in both simulated and real geophysical datasets. [Project Homepage]
- ❖ Created an online open source database (reaching over 2,000+ downloads), based on the algorithm and a raw geophysical dataset with 80%+ missingness, for scientific researches.

Deep Learning based Solar Flare Prediction Model 2019-2022
- ❖ Constructed CNN and LSTM based solar flare classification/prediction model. Achieved state of the art prediction accuracy in a series of benchmark datasets. Interpreted solar flare precursors from CNN model with Grad-CAM and Topological Data Analysis method.

Working Experience

Quantitative Researcher Intern @ *IMC Trading* Summer 2023

Graduate Student Instructor @ *University of Michigan* 2020-2022
- ❖ Served as Teaching Assistant for two graduate-level and two undergraduate-level statistics courses. Taught weekly lab sessions in statistical learning to 50+ master students.
- ❖ Award: Best Graduate Student Instructor Team Award in 2021 for Statistical Learning II.

Selected Publications ♠ : Statistics Paper ♥ : Scientific Paper

♠ **Sun, H.**, Shang, Z., & Chen, Y., (2023). Matrix Autoregressive Model with Vector Time Series Covariates for Spatio-Temporal Data. *Submitted for review*.

♠ **Sun, H.**, Manchester, W., Meng, J., Liu, Y., & Chen, Y., (2023). Tensor Gaussian Process with Contraction for Multi-Channel Imaging Analysis. *International Conference on Machine Learning*.

♥ **Sun, H.**, et al., (2023). Complete Global Total Electron Content Map Dataset based on a Video Imputation Algorithm VISTA. *Scientific Data*, 10(1), 236.

♠ **Sun, H.**, et al., (2022). Matrix Completion Methods for the Total Electron Content Video Reconstruction. *Annals of Applied Statistics*, 16(3), 1333-1358.

♥ **Sun, H.**, Manchester IV, W. B., & 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).

♥ 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).

Technical Skills

Programming: Python, R, MATLAB, C++; Language: English (TOEFL 119/120), Mandarin.