SIJIE HE

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OBJECTIVE

Ph.D. candidate seeking a machine learning related **summer internship** to apply my knowledge on ***deep learning, spatiotemporal data analysis, and causal learning*** on real-world applications.

EDUCATION

Ph.D., Computer Science and Engineering   Aug. 2016 - Jun. 2021 (Expected)
University of Minnesota, GPA: 4.00/4.00   Minneapolis, Minnesota
Advisor: Prof. Arindam Banerjee
Machine learning for prediction and structure learning on spatiotemporal data with applications in climate science.

Master of Electrical Engineering (Excellent Graduate)   Aug. 2014 - Jun. 2016
Harbin Institute of Technology (Member of C9 League)   Harbin, China
GPA: 3.84/4.00, Rank: 1/130
Thesis: Flight modes recognition and tracking based on uninhabited aerial vehicle telemetry data.

Bachelor of Electrical Engineering (Excellent Graduate)   Aug. 2010 - Jun. 2014
Harbin Institute of Technology, GPA: 3.91/4.00, Rank: 3/125   Harbin, China
Thesis: Fault diagnosis method based on condition monitoring data.

WORK EXPERIENCE

General Electric Global Research Center   Jun. 2019 - Aug. 2019
Research Intern - Machine Learning, Mentored by Dr. Hao Huang   San Ramon, California
Developed a novel deep learning model for anomaly detection and causal learning on multivariate time series. The model achieved state-of-the-art performance, and, by discovering the causal relationship between time series, is uniquely able to identify the root cause of anomalies.

SELECTED RESEARCH PROJECTS

Sub-Seasonal climate forecasting with machine learning   Present
· Currently building novel sequence-to-sequence models for sub-seasonal climate forecasting (forecasting 14-28 days ahead of time) that handles long-term temporal dependencies in spatiotemporal data.
· Built python library for benchmarking spatiotemporal prediction and real-time evaluation.
· Introduced the "Imagenet" dataset of sub-seasonal forecasting, integrating sources of climate data.

Interpretable predictive modeling for climate variables   Sep.2017 - Aug. 2018
· Proposed Weighted Lasso (AAAI-2019, CI Workshop-2018) for solving linear regression problems with spatial-correlated covariates and derived its non-asymptotic estimation error bound with finite samples.
· Weighted Lasso outperforms gradient boosting tree (GBT) and deep learning models in terms of accuracy on high-dimensional regression problems with limited sample size.
· The method yields interpretable variable selection for land climate prediction using sea surface temperatures.

High-dimensional dependency structure learning   Jan.2017 - Aug. 2017
· Proposed an efficient and scalable algorithm ACLIME-ADMM for adaptive structure learning of high-dimensional undirected graphical models (ICDM-2017).
· ACLIME-ADMM recovers the underlying dependency structure of synthetic advection-diffusion processes and real-world global atmospheric circulation.

SKILLS

Technical Skills	Python, Pytorch, TensorFlow, R, C, C++, CUDA, and Verilog HDL
Other Skills	Collaboration, Cooperation, Public Speaking, Presentation

PUBLICATIONS

Sijie He and Hao Huang. Causal analysis of anomaly in multivariate and nonlinear time series (Under review).

Sijie He, Xinyan Li, Vidyashankar Sivakumar, and Arindam Banerjee. Interpretable predictive modeling for climate variables with weighted lasso. _AAAI Conference on Artificial Intelligence_, 2019 (Acceptance rate: 16.2%, selected for oral presentation).

Sijie He, Xinyan Li, Vidyashankar Sivakumar, and Arindam Banerjee. Land climate prediction using sea surface temperatures. In _Proceedings of the 7th International Workshop on Climate Informatics._ Springer, 2018 (Spotlight presentation, acceptance rate: 7/45).

Jamal Golmohammadi, Imme Ebert-Uphoff, _Sijie He_, Yi Deng, and Arindam Banerjee. High-dimensional dependency structure learning for physical processes. In _2017 IEEE International Conference on Data Mining (ICDM)_, pages 883–888, 2017 (Acceptance rate: 19.9%).

Sijie He, Datong Liu, and Yu Peng. Flight mode recognition method of the uninhabited aerial vehicle based on telemetric data. _Chinese Journal of Scientific Instrument_, 37(9):2004–2013, 2016 (2016 Best paper award, acceptance rate: 10%).

Sijie He, Yu Peng, and Datong Liu. Fault diagnosis for discrete monitoring data based on fusion algorithm. In _12th IEEE International Conference on Electronic Measurement & Instruments (ICEMI)_, pages 125–130, 2015 (Best presentation in PHM subsection).

HONORS & AWARDS

Student Travel award, AAAI.	Jan. 2019
Student Travel award, CI Workshop.	Sep. 2018
Student Travel Award, ICDM.	Nov. 2017
Quality Metrics Fellowship for Graduate Study, University of Minnesota.	2016 - 2017
2016 Best Paper award, Chinese Journal of Scientific Instrument.	Aug. 2017
Best Graduate Thesis Award in Harbin Institute of Technology 2016.	Jul. 2016
National Scholarship for Graduate Students in China.	Nov. 2015

TEACHING EXPERIENCE

Teaching Assistant

CSCI 5304 Computational Aspects of Matrix Theory.	Sept. 2018 - Dec. 2018
Prof. Yousef Saad.	University of Minnesota
System Reliability Engineering and Technology.	May. 2015 - Aug. 2015
Prof. Haitao Liao.	Harbin Institute of Technology

RELEVANT COURSEWORK

Machine Learning, Data Mining, Artificial Intelligence, Convex Optimization, Applied Parallel Programming (CUDA), Database Management Systems, Digital Signal Processing, Design and Analysis of Algorithms, Advanced Sensing Systems, Stochastic Process.