Will Wei Sun

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Appointments	Associate Professor (with tenure) of Management and Statistics (Courtesy), Daniels School of Business, Purdue University, _2023 -_
	Assistant Professor of Management and Statistics (Courtesy), Daniels School of Business, Purdue University, _2019 - 2023_
	Assistant Professor, Miami Business School, _2016 - 2019_
	Research Scientist, Advertising Science Team, Yahoo Labs, _2015 - 2016_

Education	**Purdue University**, West Lafayette, IN, USA	
	Ph.D. in Statistics,	_Aug. 2011 - May 2015_
	M.S. in Statistics and Computer Science,	_Aug. 2012 - May 2014_
	Princeton University, Princeton, NJ, USA	
	Visiting Student of Department of ORFE,	_Sep. 2014 - May 2015_
	University of Illinois at Chicago, Chicago, IL, USA	
	M.S. in Statistics,	_Aug. 2009 - May 2011_
	Nankai University, Tianjin, China	
	B.S. in Statistics,	_Sep. 2005 - Jul. 2009_

Research Interests	**Machine Learning**: statistical reinforcement learning; tensor learning; online learning
	Data Science: dynamic pricing; dynamic assortment selection; two-sided matching markets; online advertising; recommender systems; neuroscience

Journal Publications	*: former/current student co-authors

18. Yiyun Luo*, **Will Wei Sun**, and Yufeng Liu (2023), "Distribution-free Contextual Dynamic Pricing", _Mathematics of Operations Research_, Accepted.

17. Pratik Ramprasad*, Yuantong Li*, Zhuoran Yang, Zhaoran Wang, **Will Wei Sun**, and Guang Cheng (2022), "Online Bootstrap Inference For Policy Evaluation In Reinforcement Learning", _Journal of the American Statistical Association_, 1-14.

16. Hilda S Ibriga* and **Will Wei Sun** (2022), "Covariate-assisted Sparse Tensor Completion", _Journal of the American Statistical Association_, 1-15.

15. Emma Zhang, **Will Wei Sun**, and Lexin Li (2022), "Generalized Connectivity Matrix Response Regression with Applications in Brain Connectivity Studies", _Journal of Computational and Graphical Statistics_, 1-11.

14. Jie Zhou*, **Will Wei Sun**, Emma Zhang, and Lexin Li (2021), "Partially Observed Dynamic Tensor Response Regression", _Journal of the American Statistical Association_, 1-16.

13. Botao Hao*, Boxiang Wang*, Pengyuan Wang, Emma Jingfei Zhang, Jian Yang, and **Will Wei Sun** (2021), "Sparse Tensor Additive Regression", _Journal of Machine Learning Research_[1], 22, 1-43.

12. Emma Zhang, **Will Wei Sun**, and Lexin Li (2020), "Mixed-Effect Time-Varying Stochastic Block Model and Application in Brain Connectivity Analysis", _Journal of the American Statistical Association_, 115, 2022-2036.

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[1] Journal of Machine Learning Research impact factor (2021): 3.7

11. Eric Chi, Brain Gaines*, **Will Wei Sun**, Hua Zhou, and Jian Yang (2020), "Convex Co-clustering of Tensors", *Journal of Machine Learning Research*, 21, 1-58.

10. Xiang Lv*, **Will Wei Sun**, Zhaoran Wang, Han Liu, Jian Yang, and Guang Cheng (2020), "Tensor Graphical Model: Non-convex Optimization and Statistical Inference", *IEEE Transactions on Pattern Analysis and Machine Intelligence*[2], 42, 2024-2037.

9. Will Wei Sun and Lexin Li (2019), "Dynamic Tensor Clustering", *Journal of the American Statistical Association*, 14, 1894-1907.

8. Botao Hao*, **Will Wei Sun**, Yufeng Liu, and Guang Cheng (2018), "Simultaneous Clustering and Estimation of Heterogeneous Graphical Models", *Journal of Machine Learning Research*, 18, 1-58.

7. Will Wei Sun, Guang Cheng, and Yufeng Liu (2018), "Stability-Enhanced Large-Margin Classifier Selection", *Statistica Sinica*, 28, 1-25.

6. Binhuan Wang, Yilong Zhang, **Will Wei Sun**, and Yixin Fang (2018), "Sparse Convex Clustering", *Journal of Computational and Graphical Statistics*, 27, 393-403.

5. Will Wei Sun and Lexin Li (2017), "STORE: Sparse Tensor Response Regression and Neuroimaging Analysis", *Journal of Machine Learning Research*, 18, 1-37.

4. Will Wei Sun, Junwei Lu, Han Liu, and Guang Cheng (2017), "Provable Sparse Tensor Decomposition", *Journal of the Royal Statistical Society: Series B*, 79, 899-916.

3. Will Wei Sun, Xinye Qiao, and Guang Cheng (2016), "Stabilized Nearest Neighbor Classifier and Its Statistical Properties", *Journal of the American Statistical Association*, 111, 1254-1265.

2. Wei Sun, Junhui Wang, and Yixin Fang (2013), "Consistent Selection of Tuning Parameters via Variable Selection Stability", *Journal of Machine Learning Research*, 13, 3419-3440.

1. Wei Sun, Junhui Wang, and Yixin Fang (2012), "Regularized K-means Clustering of High-dimensional Data and Its Asymptotic Consistency", *Electronic Journal of Statistics*, 6, 148-167.

Refereed Conference Publications

5. Yiyun Luo*, **Will Wei Sun**, and Yufeng Liu (2022), "Contextual Dynamic Pricing with Unknown Noise: Explore-then-UCB Strategy and Improved Regrets", *Advances in Neural Information Processing Systems (NeurIPS 2022)*. [25% acceptance]

4. Will Wei Sun, Junwei Lu, and Han Liu (2018), "Sketching Method for Large Scale Combinatorial Inference", *Advances in Neural Information Processing Systems (NeurIPS 2018)*. [21% acceptance]

3. Wei Sun, Zhaoran Wang, Han Liu, and Guang Cheng (2015), "Non-convex Statistical Optimization for Sparse Tensor Graphical Model", *Advances in Neural Information Processing Systems (NeurIPS 2015)*. [22% acceptance]

2. Wei Sun, Pengyuan Wang, Dawei Yin, Jian Yang, and Yi Chang (2015), "Causal Inference via Sparse Additive Models with Application to Online Advertising", *National Conference of the American Association for Artificial Intelligence (AAAI 2015)*. [26% acceptance]

1. Pengyuan Wang, **Wei Sun**, Dawei Yin, Jian Yang, and Yi Chang (2015), "Robust Tree-based Causal Inference for Complex Ad Effectiveness Analysis", *ACM Interna-*

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[2]IEEE Transactions on Pattern Analysis and Machine Intelligence impact factor (2021): 16.4

tional Conference on Web Search and Data Mining (WSDM 2015). [16% acceptance]

Selected Submitted Manuscripts	**7.** Qiyu Han*, **Will Wei Sun**, and Yichen Zhang (2023+), "Online Statistical Inference for Matrix Contextual Bandit ", *Annals of Statistics*, Under revision.

6. Biao Cai*, Emma Zhang, and **Will Wei Sun** (2023+), "Heterogeneous Tensor Mixture Model in High Dimensions", *Operations Research*, Under major revision.

5. Jie Zhou*, Botao Hao, Zheng Wen, Emma Zhang, and **Will Wei Sun** (2023+), "Stochastic Low-rank Tensor Bandits for Multi-dimensional Online Decision Making", *Journal of the American Statistical Association*, Under major revision.

4. Chi-Hua Wang*, Zhanyu Wang*, **Will Wei Sun**, and Guang Cheng (2023+), "Online Regularization for High-Dimensional Dynamic Pricing Algorithms", *Journal of the American Statistical Association*, Major revision submitted.

3. Yuantong Li*, Chi-Hua Wang*, Guang Cheng, and **Will Wei Sun** (2023+), "Rate-Optimal Contextual Online Matching Bandit", Submitted.

2. Shirong Xu*, **Will Wei Sun**, and Guang Cheng (2023+), "Ranking Differential Privacy", Submitted.

1. Yiyun Luo*, **Will Wei Sun**, and Yufeng Liu (2023+), "Dynamic Assortment Selection with Position Effects", Submitted.

Book Chapters **1. Will Wei Sun**, Botao Hao*, and Lexin Li (2021), "Tensors in Modern Statistical Learning", Wiley StatsRef: Statistics Reference Online.

Grants

- "Trustworthy Reinforcement Learning for Online Decision Making", National Science Foundation, $450,000, 2022-2025, PI: Will Wei Sun; Co-PI: Yufeng Liu (UNC).

- "Design of Markets and Services Based on Learned User Behavior", Ross-Lynn Research Scholar Funds, $126,700, 2022-2024, PIs: Thanh Nguyen, Will Wei Sun, Mohit Tawarmalani.

- "Statistical Theory and Method of Large Tensor Data", Office of Naval Research, $150,551, PI, 2020-2022.

- "Tensor Bandit for Online Interactive Recommendation", Purdue Research Foundation, $8,000, PI, 2020.

- "Efficient Online Learning in Multidimensional Decision Problems", Adobe Research Gift Award, $10,000, PI, 2019.

- "Artificial Intelligence For Early Diagnosis of Alzheimer's Disease", University of Miami, Provost's Research Award, $12,000, PI, 2018.

- "Large Scale Ad Clustering via Spectral Decomposition", University of Miami, Provost's Research Award, $17,000, PI, 2017.

Mentees **Postdoc Fellow**:
- Dr. Riddhiman Bhattacharya, PhD in Statistics, UMN, *2022-2024*
  Jointly supervised with Thanh Nguyen and Mohit Tawarmalani

Current PhD Students:
- Pangpang Liu, Quantitative Methods, Purdue, *2022-*
- Danyang Wang (joint with Lingsong Zhang), Statistics, Purdue, *2022-*

- Pratik Ramprasad (joint with Qifan Song), Statistics, Purdue, *2020-*
- Qiyu Han, Quantitative Methods, Purdue, *2019-*

Former PhD Students and Postdocs:
- Yuantong Li (joint with Guang Cheng), Statistics, *2022*
  Current: PhD student, UCLA.
- Dr. Shirong Xu, Postdoc, Management, Purdue, *2022*
  Current: Assistant Adjunct Professor, UCLA.
- Jie Zhou (joint with Emma Zhang), PhD, Miami Business School, *2021*
  Current: Research Scientist, Amazon.
- Hilda Ibriga (joint with Bruce Craig), PhD, Statistics, Purdue, *2021*
  Current: Research Scientist, Eli Lilly and Company.

Former Summer Interns at Yahoo Labs:
- Boxiang Wang, PhD candidate of Statistics at UMN, *2016*
  Current: Assistant Professor of Statistics at University of Iowa.
- Forough Arabshahi, PhD candidate of Computer Science at UCI, *2016*
  Current: Research Scientist, Facebook.

Teaching

MGMT 571, Data Mining, Purdue University
- Core course of Master of Science in Business Analytics and Information Management
- Focus on business applications of data mining algorithms.
- Overall evaluation (out of 5): 4.8 (19F), 4.7 (20F), 4.5 (21S), 4.6 (21F), 4.7 (22F)

MGMT 571, Data Mining (Online Program), Purdue University
- Elective course of Online Master of Science in Business Analytics and Online MBA
- New online course developed by me; consists of 30 recorded videos.
- Overall evaluation: 4.4/5 (20F), 4.3/5 (21F), 4.3/5 (22F)

MGMT 690, Doctoral Seminar in Statistical Machine Learning, Purdue University
- PhD-level course for students in Quantitative Methods
- Topics include high-dimensional statistics, supervised learning, tensor learning
- No evaluation due to a school-wide policy under Covid-19.

MAS 681, Statistical Machine Learning, Miami Business School
- PhD-level course for students in Management Science and Biostatistics
- Topics include deep learning, supervised learning, unsupervised learning
- Overall evaluation: 4.8/5 (18S), 5/5 (18F)

MAS 648, Data Mining, Miami Business School
- Core course of Master of Science in Business Analytics
- Focus on business applications of data mining algorithms.
- Overall evaluation: 4.3/5 (18F)

MAS 311, Probability and Statistics, Miami Business School
- Core course of B.S.B.A. in Business Analytics
- Overall evaluation scores: 4.6/5 (17S), 4.3/5 (18S)

Honors

Salgo-Noren Outstanding Master's Teaching Award, First runner-up	*2023*
Distinguished Teacher, Krannert School of Management	*2019, 2020, 2021*
Jay N. Ross Young Faculty Scholar, Krannert School of Management	*2021*
Adobe Research Gift Award	*2019*
University of Miami Provost Research Award	*2017, 2018*

Institute of Mathematical Statistics Laha Travel Award	*2013, 2015*
I.W. Burr Award, Purdue University	*2015*
Lynn Fellowship, Purdue University	*2011 - 2012*

Presentations

Invited Conference Talks
- Joint Statistical Meetings (JSM), Toronto, Canada — *Aug., 2023*
- ICSA International Conference, Hong Kong — *July, 2023*
- ICSA Applied Statistics Symposium, Ann Arbor, Michigan, — *June, 2023*
- INFORMS Annual Meeting, Indianapolis — *Oct., 2022*
- Joint Statistical Meetings (JSM), DC — *Aug., 2022*
- ICSA Canada Chapter Symposium, Alberta — *Jul., 2022*
- ICSA Applied Statistics Symposium, FL — *Jun., 2022*
- INFORMS Annual Meeting (Virtual) — *Nov., 2021*
- INFORMS Annual Meeting (Virtual) — *Nov., 2020*
- The 11th ICSA International Conference, Zhejiang, China — *Dec., 2019*
- Joint Statistical Meetings (JSM), Denver, Colorado — *Jul., 2019*
- POMS Annual Conference, DC — *May, 2019*
- INFORMS Annual Meeting, AZ — *Nov., 2018*
- Conference on Statistical Learning and Data Science, NY — *Jun., 2018*
- ICSA Applied Statistics Symposium, NJ — *Jun., 2018*
- International Conference on Econometrics and Statistics, Hongkong — *Jun., 2018*
- IISA International Conference on Statistics, FL — *May, 2018*
- CMStatistics, London, UK — *Dec., 2017*
- Joint Statistical Meetings, Baltimore, MD — *Aug., 2017*
- ICSA Applied Statistics Symposium, Chicago, IL — *Jun., 2017*
- International Conference on Econometrics and Statistics, Hongkong — *Jun., 2017*
- Conference on Statistical Learning and Data Science, NC — *Jun., 2016*
- ICSA Applied Statistics Symposium, Atlanta, GA — *Jun., 2016*

Invited Seminar Talks
- Google Research, — *Jan., 2023*
- Biostatistics, UC Berkeley, — *Jan., 2023*
- Quantitative Methods, Purdue University, — *Sep, 2022*
- Statistics, Shanghai University of Finance and Economics, — *Jul., 2022*
- Online Causal Inference Seminar, — *Mar., 2022*
- Mendoza College of Business, University of Notre Dame, — *Feb., 2022*
- Statistics, University of Virginia, — *Oct., 2021*
- Statistics, The Chinese University of Hong Kong, — *Sep., 2021*
- Supply Chain and Operations Management, Purdue University, — *Sep., 2021*
- Data Science, The Chinese University of Hong Kong, Shenzhen, — *Jul., 2021*
- Statistics, Shanghai University of Finance and Economics, — *Jul., 2021*
- Quantitative Methods, Purdue University, — *Jan., 2019*
- Statistics, Purdue University, — *Jan., 2019*
- Mathematical Sciences, New Jersey Institute of Technology, — *Sep., 2017*
- Statistics, University of Wisconsin-Madison, — *Sep., 2017*
- The Institute of Statistics, Nankai University, China, — *Jun., 2017*
- School of Finance and Statistics, East University Normal University, — *Jun., 2017*
- Biostatistics, University of Miami, — *Apr., 2017*
- Statistics, Florida State University, — *Apr., 2016*
- Statistics, North Carolina State University, — *Feb., 2016*
- Krannert School of Management, Purdue University, — *Jan., 2016*
- Management Science, University of Miami, — *Dec., 2015*
- Math and Statistics, University of Massachusetts Amherst, — *Dec., 2015*
- Biostatistics, New York University, — *Mar. 2015*

• Machine Learning Seminar, Binghamton University,	*Sep., 2014*
• Yahoo Labs, Sunnyvale, CA,	*Aug., 2014*

Industrial Experience

Yahoo Labs, Sunnyvale, CA
Research Scientist   *Jun. 2015 - Aug. 2016*
- Worked on personalized advertising based on web-scale data via Hadoop and Pig.
- Developed time series forecasting for Yahoo's traffic via ensemble machine learning.
- Proposed a new budget pacing algorithm in real time bidding system to improve advertisers' return on investment (ROI).

Yahoo Labs, Sunnyvale, CA
Research Scientist Intern   *Jun. 2014 - Aug. 2014*
- Proposed an efficient and robust tree-based causal inference framework for assessing the impact of complex advertising treatments from millions of users.
- Developed a sparse additive model equipped with Gaussian copula to model multivariate non-gaussian advertising treatments.

Patents

"Systems and Methods for Measuring Complex Online Strategy Effectiveness", United States Patent Application 20160189202, Yahoo! Inc., December, 2014.

Software

1. **pass**, R package for prediction and stability selection of tuning parameters
2. **snn**, R package for stabilized nearest neighbor classifier
3. **Tlasso**, R package for sparse tensor graphical models
4. **scvxclustr**, R package for sparse convex clustering

Professional Service

Associate Editor:
Statistical Analysis and Data Mining,   *2018-*

Conference Invited Session Organizer:

• ICSA International Conference, Hong Kong	*Jul., 2023*
• INFORMS Annual Meeting, Indianapolis	*Oct., 2022*
• Joint Statistical Meetings (JSM), DC	*Aug., 2022*
• Joint Statistical Meetings (JSM), Seattle, WA	*Jul., 2021*
• Conference on Statistical Learning and Data Science, Irvine, CA	*May, 2020*
• Joint Statistical Meetings (JSM), Denver, Co	*Jul., 2019*
• ASA's Symposium on Data Science and Statistics (SDSS), Seattle, WA	*May, 2019*
• IMS Asia Pacific Rim Meeting (IMS-APRM), Singapore	*Jun., 2018*
• Computational and Methodological Statistics (CMStatistics), UK	*Dec., 2017*

Journal Reviewer:
Journal of the American Statistical Association (25), Annals of Statistics (4), Journal of the Royal Statistical Society: Series B (4), Journal of Machine Learning Research (12), Management Science (1), Information Systems Research (1), IEEE Transactions on Information Theory (2), Math Programming (1), Technometrics (2), Annals of Applied Statistics (2), Biometrics (3), Electronic Journal of Statistics (5), Statistica Sinica (5), Journal of Multivariate Analysis (5)

Refereed Machine Learning Conference Reviewer:
NeurIPS 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023;
ICML 2018, 2019, 2020, 2021, 2022, 2023;
ICLR 2018, 2019, 2020, 2021, 2022, 2023;
AAAI 2019, 2020, 2021; AISTAT 2018; WWW 2016; CIKM 2016

Grant Reviewer:
NSA-AMS, 2015; NSF-MMS, 2021

Student Paper Award Reviewer:
ASA Statistical Learning and Data Science Student Paper Competition, 2023
ASA Statistical Learning and Data Science Student Paper Competition, 2022

University Committee and Administrative Responsibilities:
- Faculty Hiring Committee, Purdue University, 2022-2023
- PhD in Analytics Advisory Committee, Purdue University, 2022
- Faculty Hiring Co-chair, Purdue University, 2021-2022
- PhD Student Recruitment Committee, Purdue University, 2019-2023
- Data Analytics Research and Teaching Committee, Purdue University, 2019-2021
- Krannert Online Case Competition, Purdue University, 2021
- Faculty Hiring Committee, Purdue University, 2019-2020
- PhD Coordinator of Management Science, University of Miami, 2018-2019
- Departmental Seminar Organizer, University of Miami, 2016-2019
- PhD Student Recruitment Committee, University of Miami, 2016-2019
- Faculty Hiring Committee, University of Miami, 2017-2018

Memberships:
- The Institute for Operations Research and the Management Sciences (INFORMS)
- Institute of Mathematical Statistics (IMS)
- American Statistical Association (ASA)