

YUYAN WANG

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ACADEMIC EMPLOYMENT

Assistant Professor of Marketing, Stanford University Graduate School of Business 2023 - present

EDUCATION

Princeton University, Princeton, NJ *Sept. 2012 - June 2016*

- **Ph.D.** in Statistics, Department of Operations Research & Financial Engineering

University of Science and Technology of China (USTC), Hefei, China *Sept. 2008 - July 2012*

- **B.S Honors** in Statistics, Special Class for the Gifted Young. GPA: 3.95/4.0
- Guo Moruo Scholarship (<1%, highest award for undergrad) and National Scholarship (<1%, twice)

RESEARCH INTERESTS

Topics: Machine Learning, Recommender Systems and Personalization, Consumer Modeling, Long-Term Optimization, Algorithmic Fairness

Methodologies: Deep Learning, Reinforcement Learning, Statistical Machine Learning, High-Dimensional Statistics, Causal Inference, Field Experiment, Big Data Analytics

WORKING PAPERS

- Wang, Y., Tao L., Zhang X.. “Recommending for a Three-Sided Food Delivery Marketplace: A Multi-Objective Hierarchical Approach.”
 - *Major Revision (1st round review) at Marketing Science. **Best Paper Award** at [CIST 2022](#).*
- Li, P., Wang, Y., Chi, E.H., Chen, M. “Prompt Tuning Large Language Models on Personalized Aspect Extraction for Recommendations.”
- Li, P., Wang, Y., Chi, E.H., Chen, M. “Hierarchical Reinforcement Learning for Modeling User Novelty-Seeking Intent in Recommender Systems.”

JOURNAL PUBLICATIONS

- Li, Q., Cheng, G., Fan, J., Wang, Y. (2018). “Embracing the Blessing of Dimensionality in Factor Models.” *Journal of the American Statistical Association*, 113.521 (2018): 380-389. (*JASA*).
- Fan, J., Li, Q., Wang, Y. (Alphabetical order) (2017). “Estimation of High-Dimensional Mean Regression in Absence of Symmetry and Light-tail Assumptions.” *Journal of the Royal Statistical Society: Series B (Statistical Methodology)* 79.1 (2017): 247-265. (*JRSS-B*).
- Lin, N., Jing, R., Wang, Y., Yonekura E., Fan, J., Xue, L. (2017). “A statistical investigation of the dependence of tropical cyclone intensity change on the surrounding environment.” *Monthly Weather Review*, 145 (7), 2813-2831.

CONFERENCE PUBLICATIONS

- Chang B., Karatzoglou A., Wang, Y., Xu, C., Chi, E.H., Chen, M.. “Latent User Intent Modeling for Sequential Recommenders.” *Proceedings of the ACM Web Conference 2023 (theWebConf 2023)*.
 - Full paper with oral presentation; Acceptance rate: 19.8%.
- Wang, Y., Sharma, M., Badam, S., Xu, C., Sun, Q., Richardson, L., Chung, L., Chi, E.H., Chen, M.. “Surrogate for Long-Term User Experience in Recommender Systems.” *Proceedings of the 28th ACM SIGKDD Conference on Knowledge Discovery & Data Mining (KDD 2022)*.
 - Top Computer Science conference. Full paper with oral presentation; Acceptance rate: 15.0%.
 - Work was highlighted by [an invited talk at KDD 2022](#).
 - Short version accepted to BayLearn 2022.
- Wang, Y., Tao L., Zhang X.. “Recommending for a Multi-Sided Marketplace with Heterogeneous Contents.” *Sixteenth ACM Conference on Recommender Systems (Recsys 2022)*.
 - Top Recommender Systems conference. 4-page short paper with oral presentation; Acceptance rate: 28.0%. Media coverage: [Shaped](#).
- Wang, Y., Zhao, Z., Dai B., Fifty, C., Lin, D., Hong L., Li, W., Chi, E.H.. “Can Small Heads Help? Understanding and Improving Multi-Task Generalization.” *Proceedings of the ACM Web Conference 2022 (WWW / theWebConf 2022)*.
 - Full paper with oral presentation; Acceptance rate: 17.7%.
- Wang, J., Le, Y., Chang, B., Wang, Y., Chi, E.H., Chen, M.. “Learning to Augment for Casual User Recommendation.” *Proceedings of the ACM Web Conference 2022 (WWW / theWebConf 2022)*.
 - Full paper with oral presentation; Acceptance rate: 17.7%.
- Oberst, M., D'Amour A., Chen M., Wang, Y., Sontag D., Yadlowsky S. Bias-robust Integration of Observational and Experimental Estimators. *American Causal Inference Conference (ACIC 2022)*.
 - Journal version on arXiv: <https://arxiv.org/pdf/2205.10467.pdf>.

- Wang, Y., Wang, X., Beutel, A., Prost, F., Chen, J., Chi, E. H.. “Understanding and Improving Fairness-Accuracy Trade-offs in Multi-Task Learning.” *Proceedings of the 27th ACM SIGKDD Conference on Knowledge Discovery & Data Mining (KDD 2021)*.
 - *Top Computer Science conference. Full paper with oral presentation; Acceptance rate: 15.4%.*
 - *Short version accepted to BayLearn 2021.*
- Chen, M., Wang, Y., Xu C., Le, Y., Sharma, M., Richardson, L., Wu S., Chi, E.H.. “Values of User Exploration in Recommender Systems.” *Fifteenth ACM Conference on Recommender Systems (Recsys 2021)*.
 - *Top Recommender Systems conference. Full paper with oral presentation; Acceptance rate: 18.4%.*
- Chen, Z., Wang, Y., Lin, D., Cheng, D.Z., Hong, L., Chi, E.H., Cui, C.. “Beyond Point Estimate: Inferring Ensemble Prediction Variation from Neuron Activation Strength in Recommender Systems.” *Proceedings of the 14th ACM International Conference on Web Search and Data Mining (WSDM 2021)*.
 - *Full paper with oral presentation; Acceptance rate: 18.6%.*

PATENTS & BLOGS

- Wang, Y., Zhang, X., Liu, I., Ning, Y., Peng, C. (2021). “Multi-layer Optimization for a Multi-sided Network Service.” **U.S. Patent No. 11,127,066**. Washington, DC: U.S. Patent and Trademark Office.
- Zhang, X., Zhang, S., Wang, Y., Gogate, M., Ning, Y., Peng, C. Liu, I., Lee, C. (2021). “Optimizing Listing Efficiency and Efficacy for a Delivery Coordination System.” **U.S. Patent No. 11,157,579**. Washington, DC: U.S. Patent and Trademark Office.
- Wang, Y., Ning, Y., Liu, I., Zhang, X. (2018). “Food Discovery with Uber Eats: Recommending for the Marketplace.” *Uber Engineering Blog*.
 - *Media coverage: [Top 10 machine learning articles of the month](#).*

INVITED TALKS & CONFERENCE PRESENTATIONS

- “Recommending for a Multi-Sided Marketplace: A Multi-Objective Hierarchical Approach.”
 - Warrington College of Business, University of Florida. Jan 2024 (scheduled).
 - SICS, Haas School of Business, UC Berkeley. June 2023.
 - School of Business, University of California, Riverside. Feb 2023.
 - Coupang, Inc. May 2023.
 - Stern School of Business, New York University. Nov 2022.
 - The Wharton School, University of Pennsylvania. Nov 2022.
 - Stanford Graduate School of Business. Nov 2022.
 - Kellogg School of Management, Northwestern University. Oct 2022.
 - 2022 INFORMS Annual Meeting. October 2022.
 - Conference on Information Systems and Technology (CIST) 2022 (**Best Paper Award**).
 - SC Johnson College of Business, Cornell University (virtual). Oct 2022.
 - Naveen Jindal School of Management, UT Dallas. Oct 2022.

- 16th ACM Conference on Recommender Systems (Recsys 2022). Sept 2022.
 - HKUST Business school (virtual), Sept 2022.
 - CUHK Business school (virtual), Sept 2022.
 - ISMS Marketing Science Conference 2022 (virtual). June 2022.
- “Surrogate for Long-Term User Experience in Recommender Systems.”
 - Bay Area Machine Learning Symposium (BayLearn) 2022. October 2022.
 - Google Search Tech Talk. September 2022.
 - 28th ACM SIGKDD Conference on Knowledge Discovery and Data Mining. August 2022.
 - Google Research Brain Dump. February 2022.
 - Google Research Conference 2021. October 2021.
 - Google Research Reinforcement Learning Workshop. July 2021.
- “Can Small Heads Help? Understanding and Improving Multi-Task Generalization.”
 - Snap Inc Tech Talks. November 2022.
 - ACM The Web Conference 2022. April 2022.
- “User Intent Modeling in Recommender Systems.”
 - CONSEQUENCES+REVEAL '22: Causality, Counterfactuals, Sequential Decision-Making & Reinforcement Learning, 16th ACM Conference on Recommender Systems (Recsys 2022 Workshop). September 2022 (*Invited Speaker and Panelist*).
- “Moonshot Ally: Assistive Machine Learning for Long-Term User Journeys.”
 - Google Brain Summit. Sept 2022.
- “Understanding and Improving Fairness-Accuracy Trade-offs in Multi-Task Learning.”
 - Mays Business School, Texas A&M University. July 2022.
 - ISMS Marketing Science Conference 2022 (virtual). June 2022.
 - Bay Area Machine Learning Symposium (BayLearn) 2021. October 2021.
 - 27th ACM SIGKDD Conference on Knowledge Discovery and Data Mining. August 2021.
 - Faire Wholesale, Inc. July 2021.
- “Food Discovery with Uber Eats: Recommending for the Marketplace.”
 - SigOpt. August 2019.
 - Facebook Research. June 2019.
 - Airbnb. June 2019.
- “Uber Eats Restaurant Ranking and Recommendation.”
 - Moving the World with Data Meetup. San Francisco, CA, October 2018.
 - AI Applications @ Uber Eats Meetup. San Francisco, CA, October 2017.
- “Robust Approximate Lasso for High-Dimensional Regression.”
 - IBM Thomas J. Watson Research Center. February 2016.
 - Yale University. September 2015.

- 2015 Joint Statistical Meetings (JSM), August 2015.
- NSF Workshop for Empr Process and Mod Stat Decision Theory. May 2015.
- “Bayesian time series for online query frequency prediction.”
 - Internet Services & Research Center, Microsoft Research, August 2015.

TEACHING EXPERIENCE

Guest Lecture / Tutorials

- A Gentle Introduction to Recommender Systems.
 - Yale School of Management (SOM). Apr 2023
 - USC Marshall School of Business. Feb 2023
 - Stern School of Business, New York University. June 2022
 - Heinz College, Carnegie Mellon University. Sept 2021
- Experimentation and A/B Testing Best Practices.
 - Uber Technologies. Oct 2018

Mentorship

- Mentor for Undergraduate Consortium at KDD 2022 (KDD-UC) June 2022 - June 2023
- [CSRMP](#) mentor for students from historically marginalized groups. Nov. 2021 - May 2023
- Mentor for one **student researcher** and two **interns** at Google Brain May 2021 - May 2023
- Mentor for two **full-time** team members and one **intern** at Uber. June 2017 - Sept 2019

Assistant Instructor at Princeton University

- ORF 504: Financial Econometrics Spring 2016
- ORF 245: Fundamentals of Statistics Spring 2014, Spring 2015, Fall 2015
- ORF 405: Regression and Applied Time Series Analysis Fall 2013, Fall 2014

INDUSTRY EXPERIENCE

Google Brain, Mountain View, CA Oct 2019 – May 2023

- Selected projects:

Surrogate for Long-Term Consumer Experience in Recommender Systems

- Developed a framework to identify sequential and temporal consumer behavior patterns that are predictive of long-term consumer experience in recommender systems, which is a sparse, noisy and long-horizon signal that is hard to optimize directly. Online large-scale field experiments on an RL-based recommendation system demonstrated significant improvements in key business metrics including consumer growth and retention, achieving 20% of the annual goal of a 10-person team.
- Paper accepted to KDD 2022. Quote from a Vice President at Google: “This is an excellent paper. I think the entire Core Experiences team (900+ employees) would benefit from reading it, and I would like to send it to everyone in the Core Experiences team.”

Understanding and Modeling Consumer Intent for Long-Term Optimization

- Developed a framework for extracting consumer intents (e.g. exploration or variety-seeking intent) on the personalized platforms, and a scalable personalized diversification framework based on the predicted intents for long-term optimization.

- [Invited talk at Recsys 2022](#). Work deployed globally with significant movement in consumer retention.

Uber Technologies Inc., San Francisco, CA

Sept 2016 - Sept 2019

- Tech lead on Uber Eats home feed ranking and recommendation; Founding member of Uber Eats Data Science team which became a team of 80+ during my time there. Selected projects:

Multi-Objective Recommendation for a Three-Sided Marketplace

- Developed a personalized multi-objective optimization framework for Uber Eats restaurant recommendation. Online A/B experiments showed significant increases in consumer retention, basket value and orders for global markets, which translate to \$xx million weekly gain in revenue. My work was deployed globally as the recommender system for Uber Eats' homepage.
- Patented the work as first author.
- **Media Coverage:** First-authored [tech blog](#) was selected as [top 10 machine learning articles of the month](#) (0.7%) by an independent publisher. Won "Most Impressive Business Impact" award by Uber.

Holistic Optimization with Heterogeneous & Hierarchical Contents

- Proposed and developed *HRank*, a holistic recommendation framework for personalized optimal homepage layout, combining machine learning and probabilistic modeling for consumers' browsing behavior on heterogeneous and hierarchical contents.
- *HRank* was deployed globally, which brought a significant increase in consumer conversion rate, amounting to \$xx million weekly gain in revenue.
- My work was featured in Uber's company-wide Machine Learning Orientation video which was circulated among 500+ ML engineers and applied scientists.

Microsoft Research, Redmond, WA

June 2015 - Aug 2015

Morgan Stanley, New York City, NY

June 2014 - Aug 2014

ACADEMIC SERVICES

Program Committee Member: Recsys	2023 - Present
Reviewer: Recsys, KDD, NeurIPS, ICML, CIKM, TheWebConf.	2019 - Present
Reviewer: Google PhD Fellowship.	2021 – 2022
Session chair, Conference on Information Systems and Technology (CIST) 2022.	June 2022
Organizer and session chair, Workshop on Action, Task and User Journey Modeling.	Oct 2022
Session chair, ISMS Marketing Science Conference 2022.	June 2022
Session chair, Long-term Dynamics for Responsible Recommendation Systems Workshop'21.	Nov 2021
TPC member, Reinforcement Learning for Real Life (RL4RealLife) Workshop @ ICML 2021.	July 2021

SELECTED AWARDS

Best Paper Award, CIST 2022	Oct 2022
Cummins Merit Fellowship, Princeton University	Jan 2013
Guo Moruo Scholarship, USTC (<1%, highest award for undergrad)	May 2012
Outstanding Research Award, USTC	Feb 2012
CSST Award, UCLA (6 out of 90)	Sept 2011
National Scholarship, Ministry of Education of China (<1%)	Nov 2010, Nov 2009