YUYAN WANG

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ACADEMIC EMPLOYMENT

Assistant Professor of Marketing, Stanford University Graduate School of Business *July 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 Multi-Sided 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