

YIJIA WANG

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EDUCATION

Ph.D. in Operations Research, *University of Pittsburgh*, Sep. 2016 – Apr. 2022

Advisor: Daniel R. Jiang

M.A. in Management Science and Engineering, *Tianjin University*, Sep. 2013 – Apr. 2016

Advisor: Weihua Liu

B.S. in Logistics Engineering & B.S. Finance (Minor), *Tianjin University*, Sep. 2009 – Jun. 2013

Ranking: 1/23

SKILLS

Certificates: Machine Learning, Causal Inference, Deep Learning, Supply Chain Management, Statistics, Data Analysis, Markov Decision Processes, Markov Chain Monte Carlo, Bayesian Optimization, Reinforcement Learning

Programming Languages: Python, SQL, Matlab, Spark, Scala, R

APIs: Linux, AWS, ETL, EMR, Redshift, PySpark, Tensorflow, Pytorch, Gurobi, CPLEX, Tableau

Languages: English, Chinese

INDUSTRIAL EXPERIENCE

Amazon, Seattle, WA.

May. 2022 - Now

Applied Scientist in SCOT (Supply Chain Optimization Technologies)

Manager: Siamak Rajabi (Senior Manager, Research Science, siamakr@amazon.com)

- Utilized SQL, Python, AWS technologies (S3, Sagemaker, and Athena) and ETL processes to conduct a comprehensive analysis and visualization of customer search data, product demand data, and the interrelatedness of substitutable products.
- Implemented Machine Learning and Causal Inference methods to estimate the demand for products that were suppressed in search ranking results due to inventory unavailability.
- Risk Control: Developed group-level metrics of substitutable products that reflect the risk of out-of-stock for search ranking. This information will be taken into consideration by the business to take appropriate action.

Major Tools and Languages: Python, SQL, AWS, ETL, EMR, Redshift, Spark, Scala

Amazon, Seattle, WA.

May. - Aug. 2021

Applied Scientist Intern

Mentor: Cynthia Hu (Senior Applied Scientist, yhmz@amazon.com)

- Applied regression models and Causal Inference methods to analyze the product substitute effect on demand shaping (suppress out-of-stock products in search results), with the result being used to correct the estimated lost demand for out-of-stock products.

Major Tools and Languages: Python, SQL, AWS, ETL, Redshift

SigOpt, an Intel company, San Francisco, CA.

May. - Aug. 2019

Research Engineer Intern

Manager & Mentor: Michael McCourt (Head of Engineer, mccourt@sigopt.com)

- Applied noisy EI (a method of Bayesian optimization) to improve the performance of the API for noisy problems.
- Applied additive Gaussian processes for optimizing high dimensional problems and improved the performance of the API by 20% on average.
- Utilized data analysis and data visualization tools to prove the performance of the applied algorithms.

Major Tools and Languages: Python, AWS

RESEARCH & TEACHING EXPERIENCE

Research Assistant, *University of Pittsburgh*, 2016 Fall – 2022 Spring.

- Utilized various programming languages such as Python, R, and Matlab to effectively analyze and visually represent data across multiple fields, with specific emphasis on topics including, but not limited to, opioid overdose and naloxone (an overdose reversal drug) distribution, as well as energy pricing and demand analysis.
- Deployed the fast-slow structure of Markov decision processes, proposed approximate dynamic programming methodologies and algorithms to efficiently solve the problems. The algorithms can be applied to real-world problems including the service allocation for a multi-class queue, multi-armed bandits, energy demand response, and so on. Algorithms were implemented in Python.
- Focusing on discrete inventory and dispensing problems of public health with stochastic demand, developed a structural actor-critic algorithm, which was implemented in Matlab and Python and performs at least 20% better than benchmarks within limited CPU time. The algorithm was applied to naloxone dispensing problem in a case study.
- Studied the exploration problem with expensive interactions in reinforcement learning, developed subgoals with intrinsic rewards to efficiently solve it and proposed a Bayes-optimal algorithm. Algorithms were implemented in Python.

Teaching Assistant & Recitation Instructor, *University of Pittsburgh*, 2017 Spring – 2018 Summer.

- Courses: Probability and Statistics (Undergraduate); Simulation Modeling (Undergraduate).
Had 80+ hours of recitation and 80+ office hours; graded 2000+ homework; designed in-class tests.
- Provided mentorship and guidance to a class of undergraduates on the proper use of Tableau.
- Provided guidance and direction to two senior undergraduates on their research projects.

SELECTED PUBLICATIONS & WORKING PAPERS

Approximate Dynamic Programming & Machine Learning

1. **Wang, Yijia**, and Daniel R. Jiang. "Faster Approximate Dynamic Programming by Freezing Slow States." arXiv preprint arXiv:2301.00922 (2023). Submitted to Management Science.
2. **Wang, Yijia**, and Daniel R. Jiang. "Structured Actor-Critic for Managing Public Health Points-of-Dispensing." arXiv preprint arXiv:1806.02490 (2022). Under revision.
3. Dong, Chaosheng, Jin, Xiaojie, Gao, Weihao, **Wang, Yijia**, Zhang, Hongyi, Wu, Xiang, Yang, Jianchao, and Liu, Xiaobing. "One Backward from Ten Forward, Subsampling for Large-Scale Deep Learning." The first International Workshop on Data-Efficient Machine Learning (DeMaL), 2021.
4. Dong, Chaosheng, **Wang, Yijia**, and Bo Zeng. "Inverse multiobjective optimization through online learning." arXiv preprint arXiv:2010.06140 (2020). Submitted to ICLR 2023.
5. **Wang, Yijia**, Matthias Poloczek, and Daniel R. Jiang. "Exploration via Cost-Aware Subgoal Design." arXiv preprint arXiv:1910.09143 (2019). Submitted to TMLR.

Supply Chain Management & Game Theory

6. Liu, Weihua, Yang Liu, Donglei Zhu, **Yijia Wang**, and Zhicheng Liang. "The influences of demand disruption on logistics service supply chain coordination: A comparison of three coordination modes." International Journal of Production Economics 179 (2016): 59-76.
7. Liu, Weihua, and **Yijia Wang**. "Quality control game model in logistics service supply chain based on different combinations of risk attitude." International Journal of Production Economics 161 (2015): 181-191.
8. Liu, Weihua, **Yijia Wang**, Zhicheng Liang, and Xiaoyan Liu. "The influence analysis of number of functional logistics service providers on quality supervision game in LSSC with compensation strategy." In Abstract and Applied Analysis, vol. 2014. Hindawi, 2014.