

# 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:** Statistics, Data Analysis, Machine Learning, Causal Inference, Bayesian Reasoning, Markov Decision Processes, Markov Chain Monte Carlo, Deep Learning, Reinforcement Learning

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

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

**Languages:** English, Chinese

## INDUSTRIAL EXPERIENCE

**Amazon**, Seattle, WA.

May. 2022 - Now

Applied Scientist in SCOT (Supply Chain Optimization Technologies)

- Analyzed and visualized customers' search data, products' demand data, and the correlation among substitutable products using SQL, Python, AWS (S3, Sagemaker, and Athena), and ETL.
  - Applied Machine Learning methods to estimate the lost demand for products that are suppressed in the search ranking results due to out-of-stock.
  - Developed group-level metrics of substitutable products that reflect the risk of out-of-stock for search ranking.
- Major Tools and Languages: Python, SQL, AWS, ETL, EMR, Redshift, Spark, Scala

**Amazon**, Seattle, WA.

May. - Aug. 2021

Applied Scientist Intern

- Applied regression models and Causal Inference methods to analyze the product substitute effect on demand shaping (suppress out-of-stock products in search results), the result is used for correcting 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

- 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. One project was to analyze the supply and demand of overdose reversal drugs in Pittsburgh. My guidance was mainly in data collection and data analysis, including the usage of data analysis tools like Matlab and Tableau. The other project was to build a model and propose algorithms for wildfire mitigation. My guidance was mainly in literature search, model building, providing ideas for the algorithms, as well as the usage of Python for experiments.

## 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. 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.
3. Dong, Chaosheng, **Wang, Yijia**, and Bo Zeng. "Inverse multiobjective optimization through online learning." arXiv preprint arXiv:2010.06140 (2020).  
Submitted to ICLR 2023
4. **Wang, Yijia**, Matthias Poloczek, and Daniel R. Jiang. "Exploration via Cost-Aware Subgoal Design." arXiv preprint arXiv:1910.09143 (2019).  
Submitted to TMLR
5. **Wang, Yijia**, and Daniel R. Jiang. "Structured Actor-Critic for Managing Public Health Points-of-Dispensing." arXiv preprint arXiv:1806.02490 (2018).

### 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.