Ruihao Zhu

Cornell SC Johnson College of Business
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Academic Employment

Cornell University
SC Johnson College of Business & Nolan School of Hotel Administration
Operations, Technology, and Information Management Area
Assistant Professor 2022-now

Purdue University
Krannert School of Management
Department of Supply Chain and Operations Management
Assistant Professor 2021-2022

Education

Massachusetts Institute of Technology
Interdisciplinary Ph.D. in Controls and Statistics, 2021

Shanghai Jiao Tong University
B.Eng. in Electrical and Computer Engineering, 2015

University of Michigan, Ann Arbor
B.Eng. in Computer Science and Engineering, 2015

Research Interests

My research seeks to develop novel data science methodologies to improve decision-making in online platforms, supply chain & logistics, and revenue management

Awards

Finalist, INFORMS Data Mining Society Best Theoretical Paper Award, 2024
Finalist, INFORMS Conference on Quality, Statistics, and Reliability Best Paper Competition, 2024
Honorable Mention, INFORMS George B. Dantzig Dissertation Award, 2022
2^{nd} *Place*, INFORMS Innovative Applications in Analytics Award, 2022
Finalist, INFORMS Service Science Section Best Cluster Paper Award, 2021
Honorable Mention, INFORMS George E. Nicholson Student Paper Competition, 2019
Finalist, POMS-JD.com Best Data-Driven Research Paper Competition, 2019

Thesis

Data-Driven Operations in Changing Environments
– *Honorable Mention*, INFORMS George B. Dantzig Dissertation Award, 2022

Journal Papers

Learning to Price Supply Chain Contracts against a Learning Retailer
X. Zhao, R. Zhu, and W. Haskell
Management Science (Accepted)

Temporal Fairness in Learning and Earning: Price Protection Guarantee and Phase Transitions
Q. Feng, R. Zhu, and S. Jasin
Operations Research (Accepted) [Journal]
– Preliminary version presented in ACM EC 2023 and Market Innovation Workshop 2023 (oral presentation)

Model-Free Non-Stationary RL: Near-Optimal Regret and Applications in Multi-Agent RL and Inventory Control
W. Mao, K. Zhang, R. Zhu, D. Simchi-Levi, and T. Basar
Management Science (Accepted) [Journal]
– Preliminary version presented in ICML 2021

Calibrating Sales Forecast in a Pandemic Using Competitive Online Non-Parametric Regression
D. Simchi-Levi, R. Sun, M. Wu, and R. Zhu
Management Science 70(10):6502-6518 (2023) [Journal]
– *2nd Place*, INFORMS Innovative Applications in Analytics Award, 2022
– *Finalist*, INFORMS Service Science Section Best Cluster Paper Award, 2021
– Preliminary version presented in MSOM Supply Chain Management SIG Meeting 2021

Non-Stationary Reinforcement Learning: The Blessing of (More) Optimism
W. C. Cheung, D. Simchi-Levi, and R. Zhu
Management Science 69(10):5722-5739 (2023) [Journal]
– Preliminary version presented in ICML 2020

Joint Patient Selection and Scheduling under No-Shows: Theory and Application in Proton Therapy
S. Saghafian, N. Trichakis, R. Zhu, and H. Shih
Production and Operations Management 32(2):547–563 (2023) [Journal]

Hedging the Drift: Learning to Optimize under Non-Stationarity
W. C. Cheung, D. Simchi-Levi, and R. Zhu
Management Science 68(3):1696-1713 (2021) [Journal]
– *Honorable Mention*, INFORMS George E. Nicholson Student Paper Competition, 2019
– *Finalist*, POMS-JD.com Best Data-Driven Research Paper Competition, 2019
– Preliminary version presented in AISTATS 2019 and MSOM Service Oper-

ations SIG Meeting 2019

Meta-Dynamic Pricing: Transfer Learning Across Experiments
H. Bastani, D. Simchi-Levi, and R. Zhu
Management Science 68(3):1865-1881 (2021) [Journal]
– Preliminary version presented in INFORMS RM&P Conference Spotlighted Track 2019

Working Papers

PRINCIPRO: Data-Driven Algorithms for Joint Pricing and Inventory Control under Price Protection
Q. Feng and R. Zhu
Major Revision, ***Management Science***
– Preliminary version presented in WINE 2023

Risk-Aware Linear Bandits: Theory and Applications in Smart Order Routing
J. Ji, R. Xu, and R. Zhu
Major Revision, ***Operations Research***
– Preliminary version presented in ICAIF 2022 and INFORMS Workshop on Data Science 2022

Sailing through the Dark: Provably Sample-Efficient Inventory Control
H. Qin, D. Simchi-Levi, and R. Zhu
Major Revision, ***Management Science***

Satisficing Exploration in Bandit Optimization
Q. Feng, T. Ma, and R. Zhu
– *Finalist*, INFORMS Data Mining Society Best Theoretical Paper Award, 2024
– Preliminary version presented in INFORMS Workshop on Data Science 2024

Safe Data Collection for Offline and Online Policy Learning
R. Zhu and B. Kveton
– Preliminary version presented in AISTATS 2022, MIT 2021 Conference on Digital Experimentation (CODE@MIT), and INFORMS Workshop on Data Science 2022

Refereed Conference Papers

User Experience Design Professionals' Perceptions of Generative Artificial Intelligence
J. Li, H. Cao, L. Lin, Y. Hou, R. Zhu, A. El Ali
*Proceedings of the 2024 CHI conference on Human Factors in Computing Systems (**CHI 2024**)*

PRINCIPRO: Data-Driven Algorithms for Joint Pricing and Inven-

tory Control under Price Protection
Q. Feng and R. Zhu
*Proceedings of the 19th Conference on Web and Internet Economics (**WINE 2023**)*

MERIT: A Merchant Incentive Ranking Model for Hotel Search & Ranking
S. Quan, H. Tan, S. Liu, Z. Zheng, R. Zhu, L. Li, Q. Lu, and F. Wu
*Proceedings of the 32nd ACM International Conference on Information and Knowledge Management (**CIKM 2023**)*

Temporal Fairness in Learning and Earning: Price Protection Guarantee and Phase Transitions
Q. Feng, R. Zhu, and S. Jasin
*Proceedings of the 24th ACM Conference on Economics and Computationg (**EC 2023**)*

LINet: A Location and Intention-Aware Neural Network for Hotel Group Recommendation
R. Zhu, D. Lv, Y. Yu, R. Zhu, Z. Zheng, K. Bu, Q. Lu, and F. Wu
*Proceedings of the ACM Web Conference 2023 (**WWW 2023**)*

Risk-Aware Linear Bandits with Application in Smart Order Routing
J. Ji, R. Xu, and R. Zhu
*Proceedings of the Third ACM International Conference on AI in Finance (**ICAIF 2022**)*

Safe Optimal Design with Applications in Off-Policy Learning
R. Zhu and B. Kveton
*Proceedings of the 25^{th} International Conference on Artificial Intelligence and Statistics (**AISTATS 2022**)*

Near-Optimal Model-Free Reinforcement Learning in Non-Stationary Episodic MDPs
W. Mao, K. Zhang, R. Zhu, D. Simchi-Levi, and T. Basar
*Proceedings of the 38^{th} International Conference on Machine Learning (**ICML 2021**)*

Reinforcement Learning for Non-Stationary Markov Decision Processes: The Blessing of (More) Optimism
W. C. Cheung, D. Simchi-Levi, and R. Zhu
*Proceedings of the 37^{th} International Conference on Machine Learning (**ICML 2020**)*

Learning to Optimize Under Non-Stationarity
W. C. Cheung, D. Simchi-Levi, and R. Zhu
*Proceedings of the 22nd International Conference on Artificial Intelligence and Statistics (**AISTATS 2019**)*

Coresets for Differentially Private K-means Clustering and Applications to Privacy in Mobile Sensor Networks
D. Feldman, C. Xiang, R. Zhu, and D. Rus
*Proceedings of the 26th ACM/IEEE International Conference on Information Processing in Sensor Networks (**IPSN 2017**)*

Threshold Bandits, With and Without Censored Feedback
J. Abernethy, K. Amin, and R. Zhu
*Advances in Neural Information Processing Systems 29 (**NIPS 2016**)*

Differentially Private and Strategy-Proof Spectrum Auction with Approximate Revenue Maximization
R. Zhu and K. G. Shin
*Proceedings of the 2015 IEEE International Conference on Computer Communications (**INFOCOM 2015**)*

Differentially Private Spectrum Auction Mechanism with Approximate Revenue Maximization
R. Zhu, Z. Li, F. Wu, K. G. Shin, and G. Chen
*Proceedings of the 15th ACM International Symposium on Mobile Ad Hoc Networking and Computing (**MobiHoc 2014**)*

STAMP: A Strategy-Proof Auction Mechanism for Spatially Reusable Items
R. Zhu, F. Wu, and G. Chen
*Proceedings of the 2013 IEEE Global Communications Conference (**GLOBECOM 2013**)*

SAFE: A Strategy-Proof Auction Mechanism for Multi-Radio, Multi-Channel Spectrum Allocation
R. Zhu, F. Wu, and G. Chen
*Proceedings of International Conference on Wireless Algorithms, Systems, and Applications (**WASA 2013**)*

Industry Experience

Amazon
Research Intern, 2020

Google
Research Intern, 2019

Teaching

Cornell HADM 2021/3010 Service Operations Management
Instructor, undergraduate core class
– 2024, Enrollment: 226, Rating: 4.25/5.0
– 2023, Enrollment: 147, Rating: 4.47/5.0

Purdue MGMT 36100 Operations Management
Instructor, undergraduate core class
– 2021, Enrollment: 135, Rating: 4.5/5.0

MIT 15.774 The Analytics of Operations Management
Teaching Assistant, elective for MBA, Master of Business Analytics, Supply Chain Management, and Leaders for Global Operations
– 2019, Enrollment: 61, Rating: 6.0/7.0

Service

Senior Program Committee: ACM International Conference on AI in Finance(ICAIF) 2022-24

Program Committee: INFORMS Data Science Workshop 2024

Journal Reviewer: Management Science, Operations Research, Manufacturing & Service Operations Management, Mathematics of Operations Research, Production and Operations Management, Journal of Machine Learning Research (JMLR), Transactions on Machine Learning Research (TMLR), IEEE Journal on Selected Areas in Information Theory (JSAIT)

Conference Reviewer: MSOM Service Operations SIG 2020-22, International Conference on Machine Learning (ICML) 2020-2021, Conference on Neural Information Processing Systems (NeurIPS) 2019-2021, International Conference on Algorithmic Learning Theory (ALT) 2019

Cornell SC Johnson College of Business OTIM PhD Admissions Committee (2023-24)

Cornell SC Johnson College of Business Internal Ad Hoc Committee (IAHC) for Re-Appointment 2024

Coordinator of MIT Data Science Lab seminar series (2019-21)