YIMING ZHANG

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EDUCATION

Michael G. Foster School of Business, University of Washington — Seattle, WA
PhD, Operations Management — 2017−2022 (expected)
Advisor: Prof. Yong-Pin Zhou
Co-advisor: Prof. Qiuping Yu

School of Management, University of Science and Technology of China — Hefei, Anhui
BS, Statistics — 2013−2017

RESEARCH EXPERIENCE

Applications
Empirical Operations Management, Data-driven Service Operations, Digital Platforms, Behavioral Operations

Methodologies
Causal Inference, Field Experiments, Dynamic Programming, Machine Learning

Academic Journal Article

1. "Delay Information in Virtual Queues: A Large-Scale Field Experiment on a Major Ride-Sharing Platform," with Qiuping Yu and Yong-Pin Zhou. Accepted, ***Management Science***, Fast-Track.(Link)
   - Finalist, 2021 INFORMS Behavioral Operations Management Best Working Paper Award (winner to be announced)
   - Finalist, 2021 INFORMS Service Science Best Paper Award Competition (winner to be announced)
   - Second Place, 2021 CSAMSE Practice Award (Link)
   - Featured in Harvard Business Review (January/February 2021 print issue) (Link)
   - Featured in Harvard Business Review (digital article, October 2020) (Link)
   - Selected to present at Harvard Business School (COER) 2020, Market Innovation Workshop 2021, Columbia University

Working Paper

1. "The Granularity of Wait Time Information: Large-Scale Field Experiments on a Major Ride-Sharing Platform," with Qiuping Yu and Yong-Pin Zhou.
   - In preparation for submission to ***Management Science***. Field experiments were conducted in 2019. Here is the slides at M&SOM 2021 (Slides)
   - Insights from this paper, together with the paper above, were implemented on the platform, which led to an 80% improvement in their customers' wait experience.
   - **Abstract:** When informing customers about their estimated wait, some firms provide highly granular WTI with a point estimate (e.g., "Your wait time is 4 minutes"), while others provide less granular WTI with intervals (e.g., "Your wait time is 3−5 minutes"). First, when the interval widens, decreasing the granularity of WTI affords firms more flexibility to manage customer expectations (the *flexibility effect*). Second, a wider interval introduces harmful uncertainties into a customer's waiting

experience (the *uncertainty effect*). Third, decreasing the granularity of WTI might change the magnitude, which is the center of the displayed wait time interval (the *magnitude effect*). Collaborating with our partner ride-sharing platform, we studied how the granularity of WTI impacts customers' abandonment and explored the trade-offs between the flexibility effect, the uncertainty effect, and the magnitude effect.

Firstly, we conducted a randomized field experiment on over 838,000 rides whereby we considered a neutral point estimate, narrow interval, and a wide interval. The neutral point estimate was the predicted average wait time (in minutes) based on the platform's forecasting algorithm, while both the narrow and wide intervals were symmetrical and centered on the neutral point estimate. We showed that when the congestion level was moderate (wait time of $4-7$ minutes), interval estimates did not impact abandonment compared to the point estimate, which suggested that the flexibility effect cancelled out the harmful uncertainty effect. When the congestion level was high (> 7 minutes), however, the wide intervals increased customer abandonment compared to the other two treatments. This suggested that the uncertainty effect dominated the flexibility effect when the congestion level was high. To further understand the mechanisms and optimize the interval bounds, we conducted second and complementary randomized field experiment where we only extended the upper or lower bound. In the experiment, we compared the neutral interval (that were symmetrical and centered on the neutral point estimate), the left-extended interval – extending the lower bound of the neutral interval, and the right-extended interval – extending the upper bound of the neutral interval. Note that, when comparing the left-extended or right-extended intervals to the neutral interval, besides the flexibility and uncertainty effects, they were also different in magnitude. We continued to find that increasing the width of the wait time interval could increase abandonment due to the uncertainty effect. We further showed that the uncertainty effect dominated the magnitude effect when the lower bound of the interval is extended. Our results suggest that providing narrow wait time interval can be beneficial compared to point estimates but providing wide intervals may be harmful. Furthermore, while firms should avoid using left-extended wait time interval, providing slightly right-extended wait time interval may be beneficial. Currently, this paper is in preparation for submission.

2. "Optimizing Real-Time Compensation for Waiting: Field Experiments on a Major Ride-Sharing Platform," with Qiuping Yu and Yong-Pin Zhou.

   - Field experiments are completed, and preliminary results are available.
   - **Abstract:** Some service firms offer real-time monetary compensation to customers if they agree to wait at least a certain amount of time. On the collaborated platform, waiting customers may receive a message informing them that a discount will be applied to the ride if they wait a specified time and complete the entire ride. In this paper, we study how firms can optimize such compensation schemes in terms of who to provide the compensation to, how much to provide, and the timing of the compensation. To answer these questions, we simultaneously conducted two independent field experiments to investigate when to compensate customers and how much compensation to provide. One experiment randomized the customers to pre-specified wait times of 23, 38, or 53 seconds, and the other randomized the compensation amount to one unit, two units, or three units. Not surprisingly, we found that more generous compensation is more effective in reducing customer abandonment. We also found that customers' likelihood of abandonment declined when they were close to receiving or had received the compensation. Moreover, the earlier the compensation was offered, the smaller the proportion of customers who chose to abandon. We are further investigating the underlying mechanisms of our findings and exploring the interaction effects between compensation time and compensation amount.

PRESENTATIONS

1. "The Granularity of Wait Time Information: Large-Scale Field Experiments on a Major Ride-Sharing Platform"

- 2021 M&SOM Annual Conference, Kelley School of Business, Indiana University
- 2021 INFORMS Annual Conference, Anaheim, CA (scheduled)

2. "Delay Information in Virtual Queues: A Large-Scale Field Experiment on a Major Ride-Sharing Platform"
   - 2021 CSAMSE Conference, virtual
   - 2021 University of Washington, IS&OM Department Seminar
3. "The Display Format of Wait Time Information: A Field Experiments on a Major Ride-Sharing Platform."
   - 2020 INFORMS Annual Conference, virtual

TEACHING EXPERIENCE

Teaching Assistant: Undergraduate Courses

- OPMGT 301 Principles of Operations Management
  - Two sessions; session capacity: 80 students
  - Most recent evaluation: Winter 2019 (4.3/5.0)
- QMETH 201 Introduction to Statistical Methods
  - Two sessions; session capacity: 40 students; weekly in-person or virtual review sessions
  - Most recent evaluations: Spring 2019 (4.5/5.0, in-person session), Spring 2021 (4.0/5.0, virtual session)

Teaching Assistant: MBA Courses

- QMETH 505 Decision Modeling, Technology Management MBA (TMMBA)
  - One session; session capacity: 40 students; biweekly virtual review sessions
  - Most recent evaluation: Summer 2021 (4.4/5.0)
- QMETH 551 Modeling With Spreadsheets
  - Two sessions; session capacity: 40 students
  - Most recent evaluation: Winter 2021 (4.6/5.0)
- QMETH 510 Statistical Analysis of Data, Technology Management MBA (TMMBA)
  - One session; session capacity: 50 students; three scheduled virtual review sessions
  - Most recent evaluation: Winter 2021 (no teaching evaluation was collected)

Teaching Assistant: Executive MBA Courses

- EMBA 510 Statistics
  - One Session; session capacity: 40 students; weekly virtual review sessions
  - Most recent evaluation: Spring 2020 (4.3/5.0)
- EMBA 530 Decision Models for Management
  - Two sessions; session capacity: 40 students; biweekly in-person review sessions
  - Most recent evaluation: Winter 2020 (4.3/5.0)

WORK EXPERIENCE

DiDi Chuxing Beijing, China
Research Intern, Marketplace Technology Summer 2018, Summer 2019, Summer 2020−Present
Mentor: Kuiming Yan, Principle Algorithm Engineer

HONORS AND AWARDS

"Delay Information in Virtual Queues: A Large-Scale Field Experiment on a Major Ride-Sharing Platform"

- Finalist, 2021 INFORMS Behavioral Operations Management Best Working Paper Award 2021
- Finalist, 2021 INFORMS Service Science Best Paper Award Competition 2021
- Second Place, 2021 CSAMSE Practice Award 2021

Edna Benson PhD Fellowship 2017−2021
Excellent Student Scholarship 2015−2016
Guosheng Sun Leadership Scholarship 2014−2015
Outstanding Student Cadre Award 2014−2015
Responsibility Scholarship from Aegon-Industrial Fund 2013−2014
Freshman Scholarship (Gold Award) 2013−2014

COURSE TRAINING

Operations Management
Advanced Research Topics in Operations Management

- Topics: Causal Inference and Validity, Experimental Design and Analysis, Literature Survey in Behavioral Operations Management

Stochastic Models and Queuing
Advanced Topics in Inventory Management
Stochastic Model for Business
Mathematical Programming

Information Systems
Advanced Research Topics in Information Systems I

- Topics: (Latent) Instrumental Variables, Discrete Choice Models, Bayesian Learning, Hidden Markov Models

Advanced Research Topics in Information Systems II

- Topics: Social Networks, Applied Network Theories, Randomized Experiments

Economics and Econometrics
Advanced Microeconomics I
Advanced Microeconomics II
Advanced Microeconomics III
Econometrics I
Econometrics II
Econometrics III
Applied Microeconometrics

Industrial Engineering and Computer Science
Healthcare Modeling and Decision Making
Data-Driven Optimization
Machine Learning

COMPUTER SKILLS

R, Stata, Python, SQL, SAS, Matlab, LaTeX

REFERENCES

Yong-Pin Zhou (Chair of Dissertation Committee)
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