

Hai Wang

CONTACT INFORMATION

Heinz College, Carnegie Mellon University
5000 Forbes Avenue, Office 2101J
Pittsburgh, PA 15213

E-mail: haiwang@cmu.edu
Phone: (412) 915-9333
<http://www.wang-hai.net>

ACADEMIC POSITIONS

Carnegie Mellon University Pittsburgh, Pennsylvania, USA
Heinz College of Information Systems and Public Policy 2019 – Present
Visiting Assistant Professor

Singapore Management University Singapore
School of Information Systems 2015 – Present
Assistant Professor

EDUCATION

Massachusetts Institute of Technology Cambridge, Massachusetts, USA
Ph.D. in Operations Research 2012 – 2015

Co-advisors: Amedeo Odoni, Cynthia Barnhart (MIT's Chancellor)
Thesis Committee: Amedeo Odoni, Cynthia Barnhart, Patrick Jaillet

Massachusetts Institute of Technology Cambridge, Massachusetts, USA
Master of Science in Operations Research 2010 – 2012
Master of Science in Transportation 2009 – 2012

Tsinghua University Beijing, China
Bachelor of Science (Highest Honors) in Civil Engineering 2005 – 2009
Rank: 1st/90

RESEARCH INTERESTS

Domains

1. Smart Cities and Urban Systems
2. Innovative Transportation and Mobility
3. Shared Services and Sharing Economy
4. Logistics and Healthcare

Methodologies

1. Data-driven Optimization
2. Large-scale Data Analytics
3. Advanced Computing Methods
4. Machine Learning

SELECTED JOURNAL PUBLICATION

1. Ke, J., Yang, H., Li, X., Wang*, H. and Ye, J., 2020. Pricing and Equilibrium in On-Demand Ride-Pooling Markets. **Transportation Research Part B: Methodological**, 139, 411-431.
2. Ho, K., Wang, H., DeTrempe, P., Sarton, T. and Tomita, K., 2020. Semi-Analytical Model for Design and Analysis of On-Orbit Servicing Architecture. **Journal of Spacecraft and Rockets** (in press).
3. Yang, H., Shao, C., Wang*, H. and Ye, J., 2020. Integrated Reward Scheme and Surge Pricing in a Ride-Sourcing Market. **Transportation Research Part B: Methodological**, 134, 126-142.
4. Wang, H. and Yang, H., 2019. Ride-Sourcing Systems: A Framework and Review. **Transportation Research Part B: Methodological**, 129, 122-155.
5. Bai, J., So, K., Tang, C., Chen, X. and Wang, H., 2019. Coordinating Supply and Demand on an On-Demand Service Platform with Impatient Customers. **Manufacturing and Service Operations Management**, 21(3), 556-570.
6. Sun, H., Wang*, H. and Wan, Z., 2019. Model and Analysis of Labor Supply for Ride-Sharing Platforms in the Presence of Sample Self-Selection and Endogeneity. **Transportation Research Part B: Methodological**, 125, 76-93.

7. Chen, Y. and Wang*, H., 2018. Pricing for a Last-Mile Transportation System. **Transportation Research Part B: Methodological**, 107, 57-69.
8. Luo, Y. and Wang#, H., 2017. Core Determining Class and Inequality Selection. **American Economic Review: Papers and Proceedings**, 107(5), 274-277.
9. Wang*, H., 2017. Routing and Scheduling for a Last-Mile Transportation System. **Transportation Science**, 53(1), 131-147.
10. Wang*, H. and Odoni, A., 2014. Approximating the Performance of a Last-Mile Transportation System. **Transportation Science**, 50(2), 659-675.

BOOK CHAPTERS

1. Bai, J., So, K., Tang, C., Chen, X. and Wang, H. Time-Based Payout Ratio for Coordinating Supply and Demand on an On-Demand Service Platform. **Sharing Economy: Making Supply Meet Demand**, M. Hu (Ed.), in **Springer Series in Supply Chain Management**, C. Tang (Series Ed.), 2019.
2. Sun, H., Wang, H. and Wan, Z. Model and Analysis of Service Labor Supply for Shared Transportation. **Business Management with Big Data**, J. Chen (Ed.) (in press), 2020.

CONFERENCE AND OTHER PUBLICATION

1. Wang, H. and Wang, Z., 2020. Short-Term Repositioning for Empty Vehicles on Ride-Sourcing Platforms. *Proceedings of the INFORMS TSL Second Triennial Conference*.
2. Zheng, Y., Wang, H., Zheng, Z., Luo, H. and Ooi, O., 2020. Validation of Prognostic Accuracy of the SOFA Score, SIRS Criteria, and qSOFA Score for In-Hospital Mortality among Cardiac-, Thoracic-, and Vascular-Surgery Patients Admitted to a Cardiothoracic Intensive Care Unit. *Journal of Cardiac Surgery*, 35(1), 118-127
3. Lyu, G., Cheung, W., Teo, C. and Wang*, H., 2019. Matching Passengers and Drivers with Multiple Objectives in Ride Sharing Markets. *Proceedings of the Tenth Triennial Symposium on Transportation Analysis (TRISTAN X)*.
4. Kulkarni, K., Lau, H., Wang, H., Sivabalasingam, S. and Tran, K., 2018. Design and Implementation of Decision Support for Traffic Management at Multipurpose Port Gates. *Proceedings of the 2018 Winter Simulation Conference*.
5. Wang*, H., Jin, J. and Yang, J., 2018. Optimization of a Cyclic Express Subway Service. *Proceedings of the 6th Intl. Symposium on Reliability Engineering and Risk Management*.
6. Kulkarni, K., Tran, K., Wang, H. and Lau, H., 2017. Efficient Gate System Operations for a Multi-Purpose Port using Simulation Optimization. *Proceedings of the 2017 Winter Simulation Conference*.
7. Wang*, H., Jin, J. and Lin, M., 2013. Solving the Railway Yard Operation Problem: Greedy Heuristics, Integer Programming Models, and Waiting Time Approximations. *Technical Report for 2013 INFORMS RAS (Railway Application Society) Problem Solving Competition (First Prize Winner)*.
8. Wang*, H. and Odoni, A., 2013. Approximate Design Parameters for a Last-Mile Transportation System. *Proceedings of the Eighth Triennial Symposium on Transportation Analysis (TRISTAN VIII)*.

WORKING PAPERS

1. Cheung, W., Lyu, G., Teo, C. and Wang#, H. "Online Planning with Offline Forecasting," under preparation for resubmission to *Management Science*.
2. Jin, J., Meng, Q. and Wang#, H. "Feeder Vessel Routing and Transshipment Coordination at a Congested Hub Port," under review in *Transportation Research Part B: Methodological*.
3. Lyu, G., Cheung, W., Teo, C. and Wang*, H. "Multi-Objective Online Optimization: A Case of Real-Time Matching in Ride-Sourcing Markets," under review.
4. Chen, Y. and Wang*, H. "Why Are Fairness Concerns So Important? Lessons from a Shared Last-Mile Transportation System," under review.

5. He, Y., Luo, Q., Wang#, H. and Zheng, Z. “Estimating Patient Health Transition from Data Censored by Treatment-Effect-Based Policy.”
6. Luo, Y. and Wang#, H. “Identifying and Computing the Exact Core-Determining Class.”
7. Sun, H., Wang*, H. and Wan, Z. “Flexible Labor Supply Behavior on Ride-Sharing Platforms.”
8. Luo, Y. and Wang#, H. “Improving Adaptivity Using Multiple Models in a Dynamic Environment.”
9. Shehadeh, K., Wang#, H. and Zhang, P.Y. “Stochastic Optimization Approaches to Fleet Allocation for Last-Mile Transportation System under Demand Uncertainty.”
10. Zhu, Z., Ke, J. and Wang, H. “Optimizing Spatial-Temporal Subsidies for Ride-Sourcing Drivers with Self-Relocation Using a Mean-Field Markov Decision Process Model.”
11. Zhou, Y., Yang, H., Ke, J., Wang, H. and Li, X. “Competition and Platform-Integration in Ride-Sourcing Markets.”

HONORS AND AWARDS

1. Fellow, Chan Wui & Yunyin **Rising Star Workshop** in Mobility and Transportation 2019
2. Singapore Management University **Lee Kong Chian Fellowship for Research Excellence** 2018, 2019
3. **Best Paper Award**, The 10th International Workshop on Computational Transportation Science (CTS) 2018
4. Singapore Management University **Junior Faculty Teaching Excellence Award** 2017
5. Short-list Nominee for Goodwin Medal of **MIT Best Teaching Assistant** 2014
6. Semifinalist in MIT 100K Entrepreneurship Competition (Project: Shared Logistics) 2014
7. **First Prize** Winner in INFORMS RAS Problem Solving Competition 2013
8. MIT Chyn Duog Shish Memorial Fellowship for Excellent Ph.D. Student 2009
9. Graduation with Highest Honors (**Top 1%**), Tsinghua University 2009
10. **Ranked 1st** in Department of Civil Engineering, Tsinghua University 2009
11. National Award for Excellent Graduate, China Civil Engineering Society 2009
12. Jiang Nanxiang **Presidential Fellowship**, Tsinghua University 2008
13. National Scholarship, Ministry of Education, China 2008
14. First Class Honors Fellowship, Tsinghua University 2005 – 2008
15. **Ranked 1st** in NCEE Subject of Comprehensive Science, Sichuan, China 2005

TEACHING EXPERIENCE

1. Instructor, **Carnegie Mellon University**
 - Decision Making Under Uncertainty 2019 – 2020
Last student evaluation: 4.67/5.0
2. Instructor, **Singapore Management University**
 - Spreadsheet Modeling and Analytics Fall 2020
 - Computer as an Analysis Tool 2015 – 2019
Last student evaluation: 6.78/7.0
 - Big Data and Entrepreneurship: Methodology and Case Studies 2016 – 2019
3. Guest Lecturer, **Massachusetts Institute of Technology**
 - Deep Learning for Urban Mobility Oct. 2019
4. Guest Lecturer, **Carnegie Mellon University**
 - Innovative and Sustainable Operations Apr. 2020

- Decision Analytics for Business and Policy Mar. 2020
- 5. Guest Lecturer, **Singapore Management University**
 - Case Study in Translational Artificial Intelligence Oct. 2018
 - Coaching for a Business Plan Competition Jul. 2016
- 6. Guest Lecturer, **Tsinghua University**
 - Urban Operations Research May 2017
- 7. Guest Lecturer, **Singapore University of Technology and Design**
 - Optimization Oct. 2017
- 8. Teaching Assistant, **Massachusetts Institute of Technology**
 - Logistical and Transportation Planning Methods (Urban O.R.) Fall 2012, 2013
 - Last Student Evaluation: 6.90/7.0

RESEARCH GRANTS

1. Mobility21 (A National University Transportation Center of Department of Transportation, USA). Co-Principal Investigator. Project Title: Joint Optimization of School Bus Routes and Last Mile Services. 2020 – 2021. Award Amount: US\$93,379.
2. Singapore-MIT Alliance for Research and Technology Centre (SMART), Future Urban Mobility Group. Principal Investigator. Project Title: Matching in On-Demand Shared Transportation. 2019 – 2020. Award Amount: SG\$50,040.
3. Singapore MOE Tier 2 Academic Research Fund, Co-Principal Investigator. Project Title: Optimal Control of Medical Treatment using Predictive Information in ICUs. 2019 – 2022. Award Amount: SG\$620,532.
4. Didi Chuxing (the largest shared mobility platform in China), Principal Investigator. Project Title: Optimizing Driver Incentives through Understanding Driver Behavior. 2017 – 2018. Award Amount: SG\$10,000.
5. Didi Chuxing, Co-Principal Investigator. Project Title: Deep Learning Dynamic Demand Estimation and Pricing for Two-Sided Platform. 2017 – 2018. Award Amount: US\$15,000.
6. Singapore MOE Tier 1 Academic Research Fund, Co-Principal Investigator. Project Title: Predictive Data Analytics and Real-Time Risk Monitoring for Intensive Care Units. 2017 – 2019. Award Amount: SG\$149,710.
7. Singapore MOE Tier 1 Academic Research Fund, Principal Investigator. Project Title: Pricing and Design of a Last-Mile Transportation System with Multi-Type Users. 2016 – 2018. Award Amount: SG\$130,923.

PROFESSIONAL SERVICE

1. Editorial Service for Academic Journals
 - **Guest Editor. Transportation Research Part B: Methodological.** Special Issue on Innovative Shared Transportation 2018 – 2020
2. Referee for Academic Journals and Peer-reviewed Conferences (in alphabetical order)
 - AAAI Conference on Artificial Intelligence
 - Computers and Industrial Engineering
 - Electronic Commerce Research and Applications
 - EURO Journal on Transportation and Logistics
 - IEEE Access
 - IEEE Transactions on Automation Science and Engineering
 - IEEE Transactions on Intelligent Transportation Systems
 - IISE Transactions
 - Information Systems Research

- INFORMS Journal on Optimization
 - INFORMS TSL Triennial Conference
 - International Journal of Industrial Organization
 - International Journal of Sustainable Transportation
 - ISTTT Conference
 - Journal of Economics and Management Strategy
 - Journal of Transport and Land Use
 - Management Science
 - Manufacturing and Service Operations Management
 - Mathematical Problems in Engineering
 - Naval Research Logistics
 - Networks and Spatial Economics
 - Omega: The International Journal of Management Science
 - Production and Operations Management
 - Public Transport
 - Service Science
 - Transportation Research Board Annual Meeting
 - Transportation Research Part A: Policy and Practice
 - Transportation Research Part B: Methodological
 - Transportation Research Part C: Emerging Technologies
 - Transportation Research Part E: Logistics and Transportation Review
 - Transportation Research Record
 - Transport Reviews
 - Transportation Science
 - Transportmetrica A: Transport Science
3. Scientific Committee Member for Conferences
- The 8th INFORMS TSL Workshop, Ahmedabad, India
 - INFORMS TSL Second Triennial Conference, Arlington, Virginia, USA
 - The 11th POMS-HK International Conference, Hong Kong, China
 - The 10th POMS-HK International Conference, Hong Kong, China
4. Referee for Academic and Professional Organizations
- Netherlands Organisation for Scientific Research
 - Hong Kong Research Grants Council
 - POMS-China Best Student Paper Competition
 - POMS-HK Best Student Paper Competition
5. Chair of Invited Session for Conferences
- | | |
|---|-----------|
| • INFORMS 2020 Annual Meeting, National Harbor, Maryland, USA | Nov. 2020 |
| • IFORS 2020 Conference, Seoul, Korea | Jun. 2020 |
| • The 11th POMS-HK International Conference, Hong Kong, China | Jan. 2020 |
| • INFORMS 2019 Annual Meeting, Seattle, Washington, USA | Oct. 2019 |
| • The 10th POMS-HK International Conference, Hong Kong, China | Jan. 2019 |
| • INFORMS 2018 Annual Meeting, Phoenix, Arizona, USA | Nov. 2018 |
| • The 6th INFORMS TSL Workshop, Hong Kong, China | Jan. 2018 |
| • INFORMS 2016 Annual Meeting, Nashville, Tennessee, USA | Nov. 2016 |
| • INFORMS 2014 Annual Meeting, San Francisco, California, USA | Oct. 2014 |
6. Member of Academic and Professional Organizations
- INFORMS (Institute for Operations Research and the Management Sciences)
 - TRB (Transportation Research Board)
 - AEA (American Economic Association)
 - TSL (Transportation Science and Logistics Society)

OTHER SERVICE

1. Co-founder and Chair, MIT-China Innovation and Entrepreneurship Forum 2011 – 2017
2. Vice President, Boston Tsinghua Alumni Association 2012 – 2015
3. Director, Harvard SEED Community on Citizenship and Social Innovation 2012 – 2013
4. Co-president, MIT Chinese Students and Scholars Association 2011 – 2012

INDUSTRY EXPERIENCE

1. Visiting Scientist, Didi Chuxing, Beijing, China Jun. 2017 – Jul. 2017
2. Visiting Scientist, Federal Aviation Administration (FAA), Washington, D.C., USA Jun. 2012 – Jul. 2012
3. Consultant Intern, CPG Corporation, Singapore Jun. 2008 – Aug. 2008

CONFERENCE PRESENTATIONS

1. INFORMS 2020 Annual Meeting, National Harbor, Maryland, USA Nov. 2020
2. The 11th POMS-HK International Conference, Hong Kong, China Jan. 2020
3. INFORMS 2019 Annual Meeting, Seattle, Washington, USA Oct. 2019
4. The 12th International Conference of the Chinese Scholars Association for Management Science and Engineering (CSAMSE), Chengdu, Sichuan, China Jul. 2019
5. The 10th Triennial Symposium on Transportation Analysis (TRISTAN X), Hamilton Island, Australia Jun. 2019
6. Chan Wui & Yunyin Rising Star Workshop in Transportation, Bellagio, Italy Jun. 2019
7. The 10th POMS-HK International Conference, Hong Kong, China Jan. 2019
8. The 5th Young Scholar Workshop on Management Science, Xiamen, Fujian, China Jan. 2019
9. INFORMS 2018 Annual Meeting, Phoenix, Arizona, USA Nov. 2018
10. The 16th Annual Meeting of the Society of Management Science and Engineering of China, Kunming, Yunan, China Oct. 2018
11. The 10th International Workshop on Computational Transportation Science (CTS), Beijing, China Jul. 2018
12. The 11th International Conference of the Chinese Scholars Association for Management Science and Engineering (CSAMSE), Ningbo, Zhejiang, China Jul. 2018
13. Tsinghua-JD-POMS International Workshop, Qingdao, Shandong, China Jun. 2018
14. The 6th INFORMS TSL Workshop, Hong Kong, China Jan. 2018
15. The 9th POMS-HK International Conference, Hong Kong, China Jan. 2018
16. INFORMS TSL First Triennial Conference, Chicago, Illinois, USA Jul. 2017
17. AEA 2017 Annual Meeting, Chicago, Illinois, USA Jan. 2017
18. TRB 2017 Annual Meeting, Washington, D.C., USA Jan. 2017
19. INFORMS 2016 Annual Meeting, Nashville, Tennessee, USA Nov. 2016
20. INFORMS 2015 Annual Meeting, Philadelphia, Pennsylvania, USA Nov. 2015
21. Future Urban Mobility Symposium 2015, Singapore-MIT Alliance for Research and Technology, Singapore Jul. 2015
22. INFORMS 2014 Annual Meeting, San Francisco, California, USA Oct. 2014
23. Future Urban Mobility Symposium 2014, Singapore-MIT Alliance for Research and Technology, Singapore Jan. 2014
24. INFORMS 2013 Annual Meeting, Minneapolis, Minnesota, USA Oct. 2013
25. The 8th Triennial Symposium on Transportation Analysis (TRISTAN VIII), San Pedro de Atacama, Chile Jun. 2013

INVITED SEMINARS

1. New York University, Center for Connected Cities with Smart Transportation Mar. 2020
2. Carnegie Mellon University, Department of Civil and Environmental Engineering Jan. 2020
3. Hong Kong University of Science and Technology,
Department of Civil and Environmental Engineering Jan. 2020
4. Tsinghua University, School of Public Policy and Management Dec. 2019
5. University of California, Berkeley,
Department of Industrial Engineering and Operations Research Nov. 2019
6. Carnegie Mellon University, Tepper School of Business Nov. 2019
7. MIT, Department of Urban Studies and Planning Oct. 2019
8. Carnegie Mellon University, Department of Computer Science Sep. 2019
9. Carnegie Mellon University,
Heinz College of Information Systems and Public Policy Sep. 2019
10. Singapore Management University, Lee Kong Chian School of Business Aug. 2019
11. University of Science and Technology of China, School of Management Jul. 2019
12. Tongji University, School of Economics and Management Jul. 2019
13. Southeast University, School of Transportation Jul. 2019
14. Singapore-MIT Alliance for Research and Technology Centre (SMART),
Future Urban Mobility Group Jul. 2019
15. Southwestern University of Finance and Economics,
School of Business Administration Jul. 2019
16. Hong Kong University of Science and Technology,
HKUST-DiDi Joint Research Laboratory May 2019
17. Sichuan University, School of Business May 2019
18. Zhejiang University, Institute of Intelligent Transportation Systems Apr. 2019
19. Chinese University of Hong Kong (Shenzhen),
School of Management and Economics Apr. 2019
20. Tsinghua University, School of Economics and Management Dec. 2018
21. Beijing Jiaotong University, State Key Lab of Rail Traffic Control and Safety Dec. 2018
22. Chongqing University, School of Economics and Business Administration Dec. 2018
23. Nanjing University of Aeronautics and Astronautics, School of Civil Aviation Dec. 2018
24. Southwest Jiaotong University, School of Transportation and Logistics Dec. 2018
25. Tsinghua University, Department of Civil Engineering Dec. 2018
26. Shanghai Jiao Tong University, Antai School of Economics and Management Jul. 2018
27. Chinese University of Hong Kong, CUHK Business School Mar. 2018
28. City University of Hong Kong, Department of Systems Engineering
and Engineering Management Jan. 2018
29. Shanghai Jiao Tong University, Department of Transportation Engineering Dec. 2017
30. University of Electronic Science and Technology of China, School of Management
and Economics Nov. 2017
31. University of Illinois at Urbana-Champaign, Department of Civil
and Environmental Engineering Jul. 2017
32. Southwestern University of Finance and Economics,
School of Business Administration Jul. 2017
33. Shanghai University of Finance and Economics, School of Urban
and Regional Science Jun. 2017
34. Nanyang Technological University, Nanyang Business School May 2017
35. Shanghai Jiao Tong University, Department of Transportation Engineering May 2017
36. Zhejiang University, School of Public Affairs Apr. 2016

- | | |
|--|-----------|
| 37. Zhejiang University, College of Civil Engineering and Architecture | Mar. 2016 |
| 38. Shanghai Jiao Tong University, Department of Transportation Engineering | Aug. 2015 |
| 39. Singapore University of Technology and Design, Engineering Systems and Design Pillar | Mar. 2015 |
| 40. Shanghai Jiao Tong University, Antai School of Economics and Management | Mar. 2015 |
| 41. Tsinghua University, Department of Industrial Engineering | Mar. 2015 |
| 42. Singapore Management University, School of Information Systems | Feb. 2015 |
| 43. National University of Singapore, NUS Business School | Feb. 2015 |

INDUSTRY TALKS

- | | |
|--|-----------|
| 1. LalaMove Corp. (Huolala), Shenzhen, Guangdong, China | Jan. 2020 |
| 2. Uber Inc., San Francisco, California, USA | Nov. 2019 |
| 3. Lyft Inc., San Francisco, California, USA | Nov. 2019 |
| 4. Upwork Inc., Santa Clara, California, USA | Nov. 2019 |
| 5. Didi Chuxing Corp., Mountain View, California, USA | Nov. 2019 |
| 6. Douban Inc., Beijing, China | Apr. 2019 |
| 7. Didi Chuxing Corp., Team of Supply Incentives, Beijing, China | Jun. 2018 |
| 8. Didi Chuxing Corp., Team of Pricing, Beijing, China | Jun. 2018 |
| 9. Jingdong Corp. (JD.com), Beijing, China | Jun. 2018 |
| 10. Didi Chuxing Corp., Operations Innovation Center, Beijing, China | May 2018 |
| 11. Didi Chuxing Corp., DiDi Research Lab, Beijing, Beijing, China | May 2017 |

PERSONAL

1. Programmer using MATLAB, Java, Python, Gurobi/CPLEX
2. Top Goal Scorer, MIT Intramural Soccer League
3. Half-marathon Runner