Yunhan Zheng

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EDUCATION

Sep 2021 - Feb 2024 **Massachusetts Institute of Technology (MIT), USA**
PhD, Interdepartmental Program in Transportation
- *Advisor:* Professor Jinhua Zhao
- *Research Topic:* Assessing the Environmental, Economic, and Social Impacts of Sustainable Mobility Solutions

Sep 2018 - Jul 2021 **Massachusetts Institute of Technology (MIT), USA**
Master of City Planning & Master of Science in Transportation
- *Advisor:* Professor Jinhua Zhao
- *Research Topic* Computational Fairness in Travel Demand Modeling
- *GPA: 4.9*/5.0

Sep 2014 - Jul 2018 **Peking University (PKU), China**
Bachelor of Urban Management, School of Government, *GPA: 3.93/4.0*
Bachelor of Economics, National School of Development, *GPA: 3.87/4.0*

PROFESSIONAL EXPERIENCE

Feb 2024 - Aug 2024 (Expected) **Singapore-MIT Alliance for Research and Technology, Singapore**
Postdoc Associate
- *Project:* Integrated Human-Machine Intelligence for Economic Growth | AI for Human Capital Development in Future of Work

2018-present **Massachusetts Institute of Technology, Cambridge, MA, USA**
Graduate Research Assistant at MIT Transit Lab
- *Collaboration Agencies:* Singapore-MIT Alliance for Research and Technology | World Resources Institute (WRI) | MIT Energy Initiative | U.S. Energy Foundation | The Barr Foundation

2016-2018 **Peking University, Beijing, China**
Undergraduate Research Assistant
- *Collaboration Agency:* National Development and Reform Commission (NDRC), strategic development planning for Miyun District.

2017 **Columbia University, New York, NY, USA**
Visiting Student

RESEARCH INTERESTS

Research Areas: Urban and Transportation Economics, Urban Computing, Transportation Policies, Intelligent Transportation System

Research Vision: Evaluate environmental, economic and social impacts of emerging transportation tools, employing interdisciplinary approaches and advanced methodologies (econometrics, machine learning, deep learning). Assess effectiveness of congestion pricing, EV charging infrastructure, teleworking promotion, and vehicle registration restrictions. Develop bias-mitigation algorithms and decision-making processes to enhance fairness and equity in transportation planning and policy-making. Generate evidence-based insights to shape transportation policies addressing sustainability, congestion, livability, equity, and computational fairness.

PUBLICATIONS

(* indicates corresponding author; † indicates co-first authors**)**

Publications

2024 **Infrequent activities predict economic outcomes in major American cities**
Shenhao Wang†, Yunhan Zheng†, Guang Wang, Takahiro Yabe, Esteban Moro, Alex 'Sandy' Pentland
Nature Cities

2024 **Deep hybrid model with satellite imagery: how to combine demand modeling and computer vision for behavior analysis?**
Qingyi Wang, Shenhao Wang*, Yunhan Zheng, Hongzhou Lin, Xiaohu Zhang, Jinhua Zhao, Joan Walker
Transportation Research Part B: Methodological, *179*, 102869. (SCI, IF: 6.8)

2023 **Impacts of congestion pricing on ride-hailing ridership: evidence from Chicago**
Yunhan Zheng*, Patrick Meredith-Karam, Anson Stewart, Hui Kong, Jinhua Zhao.
Transportation Research Part A: Policy and Practice, *170*, 103639. (SSCI/SCI, IF: 6.4)

2023 **Examining the interactions between working from home, travel behavior and change in car ownership due to the impact of COVID-19**
Yunhan Zheng*, Nicholas S Caros, Jim Aloisi, Jinhua Zhao.
Travel Behaviour and Society, *33*, 100634. (SSCI, IF: 5.2)

2023 **Fairness-enhancing deep learning for ride-hailing demand prediction**
Yunhan Zheng, Qingyi Wang, Dingyi Zhuang, Shenhao Wang*, Jinhua Zhao
IEEE Open Journal of Intelligent Transportation Systems, *vol. 4*, pp. 551-569. (ESCI, IF: 2.6)

2022 **Gender differences in the user satisfaction and service quality improvement priority of public transit bus system in Porto Alegre, Brazil**
Yunhan Zheng, Hui Kong*, Guillermo Petzhold, Mariana M. Barcelos, Christopher P. Zegras, Jinhua Zhao.
Travel Behaviour and Society, *28*, 22-37. (SSCI, IF: 5.2)

2021 **Equality of opportunity in travel behavior prediction with deep neural networks and discrete choice models**
Yunhan Zheng, Shenhao Wang*, Jinhua Zhao

Transportation Research Part C: Emerging Technologies, 132, 103410. (SCI, IF: 8.3)

2021 **Measuring policy leakage of Beijing's car ownership restriction**
Yunhan Zheng, Joanna Moody, Shenhao Wang, Jinhua Zhao*
Transportation Research Part A: Policy and Practice, 148, 223-236 (SSCI/SCI, IF: 6.4)

2021 **User satisfaction and service quality improvement priority of bus rapid transit in Belo Horizonte, Brazil**
Yunhan Zheng, Hui Kong*, Guillermo Petzhold, Mariana M. Barcelos, Christopher P. Zegras, Jinhua Zhao.
Case Studies on Transport Policy, 9(4), 1900-1911. (ESCI, IF: 2.5)

2021 **Dispersion of agglomeration through high-speed rail in China**
Wanli Fang, Yunhan Zheng, Mi Diao, Jinhua Zhao.
In *Urban Form and Accessibility (pp. 327-357).* Elsevier.

Forthcoming

Under Revision **Impacts of remote work on vehicle miles traveled and transit ridership in the United States**
Yunhan Zheng, Shenhao Wang*, Lun Liu, Jim Aloisi, Jinhua Zhao
(Under revision for *Nature Cities*)

Under Review **Effects of EV charging stations on economic vitality of local businesses**
Yunhan Zheng*, David R. Keith, Shenhao Wang, Mi Diao, Jinhua Zhao
(Under review in *Nature Communications*)

Working **Robust Discrete Choice Model for Travel Behavior Prediction With Data Uncertainties**
Baichuan Mo, Yunhan Zheng*, Xiaotong Guo, Ruoyun Ma, Jinhua Zhao

Working **Fairness-Enhancing Vehicle Rebalancing in the Ride-hailing System**
Xiaotong Guo, Hanyong Xu, Dingyi Zhuang, Yunhan Zheng*, Jinhua Zhao

Working **Causal effects of job-housing imbalance on remote work**
Donhang Li, Yunhan Zheng*, Jinhua Zhao

Working **Influence of the built environment on individual preferences and decision-making in remote work settings**
Meilin Yang, Yunhan Zheng*, Jinhua Zhao

INVITED TALKS & GUEST LECTURES

Jan 2024 **Measuring, Evaluating, and Enhancing Algorithmic Fairness in Traffic Demand Prediction and Traffic Service Provision**
At the 6th Peking University Intelligent Discipline Youth Forum, Peking University

May 2023 **Algorithmic Fairness in Travel Demand Prediction**
At MIT Mobility Initiative Forum

Apr 2023 **Algorithmic Fairness in Travel Demand Prediction**
At Urban Artificial Intelligence Laboratory, University of Florida

Apr 2021 **Measuring policy leakage of Beijing's car ownership restriction**
In "11.478 Behavioral Science and Urban Mobility" class, MIT

Nov 2017 **Public-Private Partnerships in the Water Industry**
At the 4th Student Forum on National Country Governance, Shanghai, China

TEACHING EXPERIENCE

Fall 2023 **Class "Behavioral Science, Artificial Intelligence, and Urban Mobility"**
Teaching assistant, at MIT Department of Urban Studies and Planning

Fall 2017 **Class "Economic Geography"**
Teaching assistant, at School of Government of Peking University

CONFERENCE PRESENTATIONS

Nov 2022 **Fairness-enhancing spatiotemporal demand prediction for ride-hailing services**
ACSP 2022 Annual Conference, Toronto, Canada

Jan 2021 **Race, gender, and income disparity in travel behavior prediction with machine learning**
Transportation Research Board (TRB) 100th Annual Conference, Washington, D.C., USA

Jan 2021 **User satisfaction and service quality improvement priority of bus rapid transit in Belo Horizonte, Brazil**
Transportation Research Board (TRB) 100th Annual Conference, Washington, D.C., USA

Jan 2020 **Measuring policy leakage of Beijing's car ownership restriction in neighboring cities**
Transportation Research Board (TRB) 99th Annual Conference, Washington, D.C., USA

Oct 2019 **Nudging price information in China's residential real estate market**
ACSP 2019 59th Annual Conference, Greenville, USA

SELECTED AWARDS AND HONORS

2018 - 2019 **DUSP Graduate Student Fellowship**, MIT

2018 **Outstanding Graduates**, Peking University
Top 10% of all graduates at PKU

2017 **National Scholarship,** Peking University
Top 3% of all undergraduate students at PKU

2017 **Silver Medalist**, National Competition of City Governance, Shanghai, China
Team leader, Silver Medalist out of 54 teams

2015 & 2016 **Leo KoGuan Scholarship**, Peking University
Top 10% of all undergraduates

ACADEMIC SERVICE

Journal Referees	Transportation Research Part A | Transportation | Journal of Public Transportation | Journal of Advanced Transportation
Conference Referees	Transportation Research Board Annual Meeting (TRB)

SKILLS

Programming	Python, R, Julia, ArcGIS, QGIS, SQL, JavaScript, STATA, MS Office
Machine Learning Framework	Pytorch, TensorFlow
Analytical Skills	Econometrics, Statistics, Deep Learning, Computer Vision, Spatial Visualization and Data Management, Discrete Choice Analysis, Web Scrapping, Hypothesis Testing, Transportation Policy Analysis