

# Yunhan Zheng

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## EDUCATION

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- 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

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- Feb 2024-present **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
- 2018-2023 **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

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**Research Areas:** Urban and Transportation Economics, Urban Computing and Machine Learning, Travel Decisions and Urban Network, Transportation Policies, Intelligent Transportation System

**Research Vision:** My research area is the intersection of Causal Inference, Urban Computing, and Travel Decisions: (1) Causal Inference, Transportation Economics and Policy: Leveraging advanced causal inference methods for the assessment of emerging transportation tools like congestion pricing, EV charging infrastructure, and teleworking on mobility, environment, economy, and social equity. (2) Urban Computing and Machine Learning: Developing machine learning algorithms to predict and nudge travel behaviors; developing bias-mitigation methods to enhance fairness and equity in machine learning algorithms. (3) Travel Decisions and Urban Network: Combining statistical modeling, deep learning computation, and network theory for the modeling and analysis of individual travel decisions and urban networks.

## PUBLICATIONS

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

### Publications

- 2024 **Effects of EV charging stations on economic vitality of local businesses**  
Yunhan Zheng\*, David R. Keith, Shenhao Wang, Mi Diao, Jinhua Zhao  
*Nature Communications*, 15, 7437.
- 2024 **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  
*Nature Cities*, 1-13.
- 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*, 1(4), 305-314. († indicates co-first authors)
- 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 Review **Robust Discrete Choice Model for Travel Behavior Prediction With Data Uncertainties**  
 Baichuan Mo, Yunhan Zheng\*, Xiaotong Guo, Ruoyun Ma, Jinhua Zhao
- Under Review **Fairness-Enhancing Vehicle Rebalancing in the Ride-hailing System**  
 Xiaotong Guo, Hanyong Xu, Dingyi Zhuang, Yunhan Zheng\*, Jinhua Zhao
- Under Review **Influence of the built environment on individual preferences and decision-making in remote work settings**  
 Meilin Yang, Yunhan Zheng\*, Jinhua Zhao
- Working **Causal effects of job-housing imbalance on remote work**  
 Donhang Li, Yunhan Zheng\*, Jinhua Zhao

### **INVITED TALKS & GUEST LECTURES**

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- Jan 2024 **Measuring, Evaluating, and Enhancing Algorithmic Fairness in Traffic Demand Prediction and Traffic Service Provision**  
 At the 6<sup>th</sup> 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**

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- 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**

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- 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) 100<sup>th</sup> 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) 100<sup>th</sup> Annual Conference, Washington, D.C., USA
- Jan 2020 **Measuring policy leakage of Beijing’s car ownership restriction in neighboring cities**  
Transportation Research Board (TRB) 99<sup>th</sup> 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**

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- 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

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Journal Referees    Transportation Research Part A | Transportation | Journal of Public Transportation |  
Journal of Advanced Transportation

Conference    Transportation Research Board Annual Meeting (TRB)  
Referees

## SKILLS

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**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