

Qixiu Cheng, PhD

University of Bristol Business School, University of Bristol, Bristol, BS8 1PY, UK

Phone: +(44) 7956-933630 Email: qixiu.cheng@bristol.ac.uk ORCID: 0000-0001-8772-7584

Personal Website: <https://chengtraffic.github.io>

Working Experience

Assistant Professor (UK Lecturer), University of Bristol Business School, University of Bristol, Bristol, UK, 09/2023 – present

Research Assistant Professor, Department of Logistics & Maritime Studies, The Hong Kong Polytechnic University, Hong Kong, China, 04/2022 – 08/2023

Postdoctoral Fellow, Department of Logistics & Maritime Studies, The Hong Kong Polytechnic University, Hong Kong, China, 05/2021 – 04/2022

Educational Background

Certificate in University Teaching, The Hong Kong Polytechnic University, Hong Kong, China, 11/2022

PhD, Transportation Engineering, Southeast University (SEU), China, 02/2017 – 03/2021

- Thesis title: Dynamic Traffic Assignment and its Application in Congestion Pricing

Visiting Student, Arizona State University, USA, 03/2019 – 04/2020

MSc, Transportation Systems Engineering, Monash University, Australia, 03/2015 – 06/2017

MPhil, Transportation Engineering, Southeast University, China, 09/2014 – 12/2016

- Thesis title: The Optimal Toll Rate of Distance-Based Dynamic Congestion Pricing

BEng, Civil Engineering, Changsha University of Science & Technology, China, 09/2010 – 06/2014

Research Interests

Macroscopic and Microscopic Traffic Flow Theory

Freeway Traffic Management and Control

Transportation Network Modelling and Optimization

Transportation Big Data Analytics and Urban Informatics

Teaching Experience

Instructor, University of Bristol, Bristol, UK

- Course: EFIM30051 Data Analytics and Artificial Intelligence for Business (Fall 2023)

Instructor, The Hong Kong Polytechnic University, Hong Kong, China

- Course: LGT3102 Management Science (Spring 2023)

Graduate Teaching Assistant, Southeast University, China

- Course: Modelling Transportation Systems (Spring 2016, Spring 2017, Spring 2018)

Journal Papers

1. **Cheng, Q.**, Lin, Y., Zhou, X., & Liu, Z. (2024). Analytical formulation for explaining the variation of traffic states: A fundamental diagram modeling perspective with stochastic parameters. *European Journal of Operational Research*, 312(1), 182-197.
2. Huo, J., Liu, Z., Chen, J., **Cheng, Q.**, & Meng, Q. (2023). Bayesian optimization for congestion pricing problems: A general framework and its instability. *Transportation Research Part B*, 169, 1-28.
3. Xing, J., Liu, R., Zhang, Y., Choudhury, C.F., Fu, X., & **Cheng, Q.*** (2023). Urban network-wide traffic volume estimation under sparse deployment of detectors. Accepted by *Transportmetrica A*. DOI: 10.1080/23249935.2023.2197511.
4. Wang, Z., Shi, Y., Tong, W., Gu, Z., & **Cheng, Q.*** (2023). Car-following models for human-driven vehicles and autonomous vehicles: A systematic review. *ASCE Journal of Transportation Engineering, Part A*, 149(8), 04023075.

5. Zhang, K., Zhang, H., **Cheng, Q.**, Chen, X., Wang, Z., & Liu, Z. (2023). A customized two-stage parallel algorithm for solving the combined modal split and traffic assignment problem. *Computers & Operations Research*, 154, 106193.
6. Zhang, Y., **Cheng, Q.***, Liu, Y., & Liu, Z. (2023). Full-scale spatio-temporal traffic flow estimation for city-wide networks: A transfer learning based approach. *Transportmetrica B*, 11(1), 869-895.
7. **Cheng, Q.**, Liu, Z., Guo, J., Wu, X., Pendyala, R., Belezamo, B., & Zhou, X. (2022). Estimating key traffic state parameters through parsimonious spatial queue models. *Transportation Research Part C*, 137, 103596. **(ESI Highly Cited Paper)**
8. **Cheng, Q.***, Chen, Y., & Liu, Z. (2022). A bi-level programming model for the optimal lane reservation problem. *Expert Systems with Applications*, 189, 116147.
9. Liu, Z., Wang, Y., **Cheng, Q.**, & Yang, H. (2022). Analysis of the information entropy on traffic flows. *IEEE Transactions on Intelligent Transportation Systems*, 23(10), 18012-18023.
10. Zhang, Y., Li, L., Zhang, W., & **Cheng, Q.*** (2022). GATC and DeepCut: Deep spatiotemporal feature extraction and clustering for large-scale transportation network partition. *Physica A*, 606, 128110.
11. Xing, J., Wu, W., **Cheng, Q.***, & Liu, R. (2022). Traffic state estimation of urban road network by multi-source data fusion: Review and new insights. *Physica A*, 595, 127079.
12. Wang, Y., **Cheng, Q.**, Wang, M., & Liu, Z. (2022). Weibull-distribution-based neural network for capacity estimation. *ASCE Journal of Transportation Engineering, Part A*, 148(4), 04022009.
13. Zhou, X., **Cheng, Q.**, Wu, X., Li, P., Belezamo, B., Lu, J., & Abbasi, M. (2022). A meso-to-macro cross-resolution approach for connecting polynomial arrival queue model to volume-delay function with inflow-demand-to-capacity ratio. *Multimodal Transportation*, 1(2), 100017. **(Best Paper Award)**
14. **Cheng, Q.**, Liu, Z., Lin, Y., & Zhou, X. (2021). An s-shaped three-parameter (S3) traffic stream model with consistent car following relationship. *Transportation Research Part B*, 153, 246-271.
15. Liu, Z., Wang, Z., **Cheng, Q.**, Yin, R., & Wang, M. (2021). Estimation of urban network capacity with second-best constraints for multimodal transport systems. *Transportation Research Part B*, 152, 276-294.
16. Chen, Y., Song, X., **Cheng, Q.***, An, Q., & Zhang, Y. (2021). A cordon-based reservation system for urban traffic management. *Physica A*, 582, 126276.
17. An, Q., Fu, X., Huang, D., **Cheng, Q.**, & Liu, Z. (2020). Analysis of adding-runs strategy for peak-hour regular bus services. *Transportation Research Part E*, 143, 102100.
18. **Cheng, Q.**, Wang, S., Liu, Z., & Yuan, Y. (2019). Surrogate-based simulation optimization approach for day-to-day dynamics model calibration with real data. *Transportation Research Part C*, 105, 422-438.
19. Liu, Z., Liu, Y., Meng, Q., & **Cheng, Q.** (2019). A tailored machine learning approach for urban transport network flow estimation. *Transportation Research Part C*, 108, 130-150.
20. **Cheng, Q.**, Liu, Z., & Szeto, W. Y. (2019). A cell-based dynamic congestion pricing considering travel distance and congestion level. *Transportmetrica B*, 7(1), 1286-1304.
21. **Cheng, Q.**, Xing, J., Yi, W., Liu, Z., & Fu, X. (2019). Distance-based congestion pricing with day-to-day dynamics. *Transportation Research Part B*, 119, 1-15.
22. **Cheng, Q.**, Liu, Z., & Selimoune, A. (2018). Nonlinear distance-based dynamic pricing considering congestion-level correction. *International Journal of Transportation*, 6(2), 1-8.
23. Gu, Z., Liu, Z., **Cheng, Q.**, & Saberi, M. (2018). Congestion pricing practices and public acceptance: a review of evidence. *Case Studies on Transport Policy*, 6(1), 94-101.
24. **Cheng, Q.**, Liu, Z., Liu, F., & Jia, R. (2017). Urban dynamic congestion pricing: An overview and emerging research needs. *International Journal of Urban Sciences*, 21(S1), 3-18.
25. Liu, Z., Wang, S., Zhou, B., & **Cheng, Q.** (2017). Robust optimization of distance-based tolls in a network considering stochastic day to day dynamics. *Transportation Research Part C*, 79, 58-72.

Patents (in Chinese)

1. **Cheng, Q.**, Wang, Y., Wang, Z., Liu, P., Gu, Z., Zhang, Q., Qu, X., & Liu, Z. Car-following behavior prediction based on the deep learning and multi-dimensional data fusion method. CN202210876936.
2. Huang, K., Chen, W., **Cheng, Q.**, Qin, W., & Liu, Z. A signal control method for pedestrian queuing demand estimation at crosswalk safety island. CN202210892264.
3. Liu, Z., Selimoune, A., Wang, Z., **Cheng, Q.**, Liu, P., Wan, J., Zhang, Q., & Liu, S. Data-driven car-following behavior prediction based on drivers' characteristics. CN202210884305.

4. Liu, Z., **Cheng, Q.**, Zhang, H., & Zhang, Q. A multiscale demand-and-supply modeling approach for oversaturated transportation systems based on queueing theory. *CN202110350726.8*.
5. Liu, Z., **Cheng, Q.**, Liu, Y., Wei, W., Yu, J., & Li, Z. A method for forecasting the day-to-day dynamic traffic demand based on the neural networks. *CN201810431068.3*.
6. Liu, Z., Wang, L., **Cheng, Q.**, & Yu, J. A method for calculating the optimal toll rate of dynamic congestion pricing based on the cell transmission model. *CN201810418436.0*.
7. Liu, Z., **Cheng, Q.**, Bie, Y., Jing, W., Huang, D., & Huang, K. Congestion charging optimal toll rate determining method based on trial-and-error method and motor vehicle flow. *CN201510883352.0*.

Professional Services and Memberships

Editorial Services

- Section Editor-in-Chief of Current Social Sciences (Transportation Section), 06/2022 – present
- Associate Editor of Urban Resilience and Sustainability, 11/2022 – present
- Academic Editor of Advances in Civil Engineering, 11/2022 – present
- Editorial Board Editor of Multimodal Transportation, 01/2023 – present
- Young Academic Editor of Journal of Traffic and Transportation Engineering (English Edition), 06/2022 – present
- Associate Editor of the 23rd COTA International Conference for Transportation Professionals (CICTP2023), 07/2023
- Lead Guest Editor for the Special Issue of “Intelligence in Urban Transportation” in Electronic Research Archive (IF 1.604, JCR Q1 in Mathematics), 06/2022 – present
- Lead Guest Editor for the Special Issue of “Sustainable, Resilient and Smart Mobility” in Sustainability (IF 3.889, JCR Q2 in Environmental Sciences), 06/2022 – present
- Lead Guest Editor for the Special Issue of “Data-Driven Modelling and Learning for Smart and Sustainable Transportation” in IET Intelligent Transport Systems (IF 2.568, JCR Q3 in Transportation Science & Technology), 10/2022 – present
- Lead Guest Editor for the Research Topic of “Transportation Network Modeling in an Era of Automated and Connected Vehicles” in Frontiers in Future Transportation, 07/2022 – present
- Lead Guest Editor for the Special Issue of “Mobility and Transport for Smart Cities” in Urban Resilience and Sustainability, 01/2023 – present
- Guest Editor for the Special Issue of “Advanced Data Intelligence Theory and Practice in Transportation 2023” in Journal of Advanced Transportation, 07/2023 – present
- Guest Editor for the Research Topic of “Emerging Technologies in Future Maritime Transportation” in Frontiers in Future Transportation, 03/2023 – present
- Guest Editor for the Special Issue of “Intelligence and Digitalization in Multimodal Transportation Systems” in Multimodal Transportation, 10/2022 – present

Memberships

- Member of Transportation Research Board (TRB) Standing Committee on Urban Transportation Data and Information Systems (AED20), 04/2023 – present
- Member of Institute of Electrical and Electronics Engineers (IEEE), 10/2022 – present
- Member of IEEE Intelligent Transportation Systems Society, 10/2022 – present
- Member of China Highway and Transportation Society (CHTS), 12/2021 – present
- Student Member of Institute for Operations Research and the Management Sciences (INFORMS), 09/2019 – 08/2020

Committee Member for International Conferences

- Academic Committee Member of the 23rd COTA International Conference for Transportation Professionals (CICTP2023), Beijing, China, 07/2023
- Scientific Committee Member of the 4th International Symposium on Multimodal Transportation (ISMT), Nanjing, China, 12/2021

Appointment as External Assessors

- Israel Science Foundation (ISF)

Referee for Academic Journals and Peer-reviewed Conferences

- Annual Meeting of Transportation Research Board
- Annual Meeting of COTA International Conference of Transportation Professionals
- Annual Meeting of World Transport Convention
- Applied Sciences
- Case Studies on Transport Policy
- Cleaner Logistics and Supply Chain
- Communications in Transportation Research
- Discrete Dynamics in Nature and Society
- Energies
- Engineering Applications of Artificial Intelligence
- Frontiers in Future Transportation
- Frontiers in Sustainable Cities
- IEEE Intelligent Transportation Systems Magazine
- IET Intelligent Transport Systems
- Journal of Advanced Transportation
- Journal of Intelligent Transportation Systems: Technology, Planning, and Operations
- Journal of Traffic and Transportation Engineering (English Edition)
- Journal of Transportation Engineering Part A: Systems
- KSCE Journal of Civil Engineering
- Multimodal Transportation
- Operational Research: An International Journal
- Physica A: Statistical Mechanics and its Applications
- Scientific Reports
- Sustainability
- Sustainability Analytics and Modeling
- Sustainable and Resilient Infrastructure
- Transport Policy
- Transportation Letters: The International Journal of Transportation Research
- Transportation Research Part A: Policy and Practice
- Transportation Research Part B: Methodological
- Transportation Research Part C: Emerging Technologies
- Transportation Research Part D: Transport and Environment
- Transportation Research Part E: Logistics and Transportation Review
- Transportation Research Record: Journal of the Transportation Research Board
- Transportation Science
- Transportmetrica B: Transport Dynamics
- Utilities Policy

Research Grants

Funded

- Travel time reliability analysis with a frequency domain decomposition approach. Departmental General Research Fund of The Hong Kong Polytechnic University. 02/2023-01/2024. Award Amount: HKD \$63.552k. **PI.**
- Day-to-day dynamics with mixed traffic flow considering autonomous vehicles. Guangdong Basic and Applied Basic Research Fund. 10/2022-09/2025. Award Amount: RMB ¥100k. **PI.**
- Stochastic fundamental diagram and freeway capacity: Model formulation, parameter calibration, and potential applications. Start-up Fund for RAPs under the Strategic Hiring Scheme of The Hong Kong Polytechnic University. 06/2022-06/2024. Award Amount: HKD \$250k. **PI.**
- Day-to-day dynamic flow evolution process for multimodal transport network. Graduate Scientific Research Innovation Project of Jiangsu Province. 04/2017-12/2020. Award Amount: RMB ¥30k. **PI.**

- Dynamic traffic assignment and its application in urban congestion pricing. Scientific Research Foundation of Graduate School of Southeast University. 10/2018-12/2020. Award Amount: RMB ¥42k. **PI**.

Honors & Awards

- Best Doctoral Dissertation Award of the 14th International Workshop on Computational Transportation Science (CTS 2023), 2023
- Best Academic Report Award of the 11th Transportation Research Forum (Shanghai), 2022
- Best Paper Award of Multimodal Transportation, 2022
- Outstanding Reviewer Award of Multimodal Transportation, 2022
- Outstanding Submittal Award of “TRB 2017 Transportation Data Analytics Contest”, Awarded by TRB Effects of Information and Communication Technologies on Travel Choices Committee, 2017
- Best Paper Award of the 2nd Transportation Research Congress, 2017
- Outstanding Student Scholarship, Southeast University, 2015~2020
- Excellent Graduate, Hunan Province, 2014
- Outstanding Volunteer, Hunan Province, 2013
- Outstanding Student Scholarship, Changsha University of Science & Technology, 2011~2014

Postdoc and Visiting Scholar Supervision

Postdoctoral Fellows

- Dr. Ruyang Yin (PhD in Monash University), 2023

Technical Skills

- Programming Language & Scientific Application: Python, Matlab, Cplex, Gurobi
- Simulation Software: Vissim, Visum, Cube, TransCAD

1 September 2023