

Chengyuan ZHANG

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CONTACT

- Homepage: <https://chengyuan-zhang.github.io>; Google Scholar: [\[Link\]](#)
- Personal email: enzozy@gmail.com; Work email: chengyuan.zhang@mail.mcgill.ca;

EDUCATION

McGill University

Ph.D. Candidate (20'-26'), supervised by Prof. Lijun Sun

Montréal, Québec, Canada

Sept. 2020 - May 2026 (expected)

- **Dissertation:** "From Micro Interactions to Traffic Flow: Stochastic Driver Models for Realistic Traffic Simulation"
- **Cumulative GPA:** 4.00/4.00;
- **Courses:** [COMP588@McGill](#), [IFT6135@UdeM](#), [ECSE683@McGill](#), [COMP540@McGill](#), [CTV1532H@UofT](#)
- Fast tracked to the Ph.D. program in 2022 winter with 4.00/4.00 Master's GPA;

Chongqing University

B.S. in Vehicle Engineering

Chongqing, China

Sept. 2015 – June 2019

- **Selected scholarships and awards:** National Scholarship, 2017; Outstanding Undergraduate Thesis Award, 2019; Outstanding Graduate of Chongqing University, 2019; Outstanding Student Award (top 3%), 2018 and 2017;
- Selected to **Excellent Student Program** (top 5%, on basis of outstanding academic performance;)
- Completed extensive coursework in **Electronics Science and Technology** (2015-2016.)

University of Pennsylvania

Visiting Student

Philadelphia, Pennsylvania, USA

Jan. 2018 – Feb. 2018

ACADEMIC EXPERIENCE

Carnegie Mellon University (Robotics Institute)

Visiting Student Researcher (supervised by Prof. Changliu Liu)

Pittsburgh, Pennsylvania, USA

Jan. 2023 – Aug. 2023

University of California, Berkeley (Department of Mechanical Engineering)

Visiting Student Researcher (supervised by Prof. Masayoshi Tomizuka)

Berkeley, California, USA

Sept. 2019 – Jan. 2020

Carnegie Mellon University (Department of Mechanical Engineering)

Visiting Student Researcher (supervised by Prof. Ding Zhao)

Pittsburgh, Pennsylvania, USA

July 2018 – Oct. 2018

PREPRINTS

- [1] **Zhang, C.**, Wu, C., & Sun, L. (2025). Markov Regime-Switching Intelligent Driver Model for Interpretable Car-Following Behavior. arXiv preprint arXiv:2506.14762. [\[arXiv\]](#)
- [2] **Zhang, C.**, He, Z., Wu, C., & Sun, L. (2025). When Context Is Not Enough: Modeling Unexplained Variability in Car-Following Behavior. arXiv preprint arXiv:2507.07012. [\[arXiv\]](#)

JOURNALS (CHRONOLOGICAL ORDER)

- [1] Chen, X., **Zhang, C.**, Zhao, X. L., Saunier, N., & Sun, L. (2025). Forecasting Sparse Movement Speed of Urban Road Networks with Nonstationary Temporal Matrix Factorization. Transportation Science. [\[TranSci\]](#) [\[arXiv\]](#) [\[slides\]](#) [\[Github\]](#) [\[blog\]](#)
- [2] **Zhang, C.**, Wang, W., & Sun, L. (2024). Calibrating Car-Following Models via Bayesian Dynamic Regression. Transportation research part C: emerging technologies. (ISTTT25 Special Issue) [\[TR PartC\]](#) [\[arXiv\]](#) [\[Github\]](#)

- [3] **Zhang, C.**, & Sun, L. (2024). Bayesian Calibration of the Intelligent Driver Model. *IEEE Transactions on Intelligent Transportation Systems*. [[IEEE TITS](#)][[arXiv](#)] [[Github](#)] [[presentation](#)] [[poster](#)]
- [4] Chen, X., **Zhang, C.**, Cheng, Z., Hou, Y., & Sun, L. (2023). A Bayesian Gaussian Mixture Model for Probabilistic Modeling of Car-Following Behaviors. *IEEE Transactions on Intelligent Transportation Systems*. [[IEEE TITS](#)]
- [5] Chen, X., **Zhang, C.** (equal contributions), Chen, X., Saunier, N., & Sun, L. (2022). Discovering dynamic patterns from spatiotemporal data with time-varying low-rank autoregression. *IEEE Transactions on Knowledge and Data Engineering*, 36(2), 504-517.[[IEEE TKDE](#)] [[arXiv](#)] [[data & code](#)] [[blog](#)]
- [6] **Zhang, C.**, Zhu, J., Wang, W., & Xi, J. (2020). Spatiotemporal Learning of Multivehicle Interaction Patterns in Lane-Change Scenarios. *IEEE Transactions on Intelligent Transportation Systems*. [[demo](#)] [[IEEE TITS](#)] [[project website](#)] [[Github](#)]
- [7] **Zhang, C.**, Zhang, X., Ye, H., Wei, M., & Ning, X. (2019). An Efficient Parking Solution: A Cam-Linkage Double-Parallelogram Mechanism Based 1-Degrees of Freedom Stack Parking System. *Journal of Mechanisms and Robotics*, 11(4), 045001. [[demo](#)] [[ASME JMR](#)]
- [8] **Zhang, C.**, & Xiao, J. (2018). Chaotic Behavior and Feedback Control of Magnetorheological Suspension System with Fractional-Order Derivative. *Journal of Computational and Nonlinear Dynamics*, 13(2), 021007. [[ASME JCND](#)]

CONFERENCES (CHRONOLOGICAL ORDER)

- [1] **Zhang, C.**, Chen, K. (equal contributions), Zhu, M., Yang, H., & Sun, L. (2024). Learning Car-Following Behaviors Using Bayesian Matrix Normal Mixture Regression. *2024 IEEE Intelligent Vehicles Symposium (IV)*. [[arXiv](#)][[IEEE IV](#)]
- [2] **Zhang, C.**, Chen, R., Zhu, J., Wang, W., Liu, C., & Sun, L. (2023). Interactive Car-Following: Matters but NOT Always. *2023 IEEE Intelligent Transportation Systems Conference (ITSC)*. [[arXiv](#)][[IEEE ITSC](#)]
- [3] Wang, W., **Zhang, C.**, Wang, P., & Chan, C. (2020). Learning Representations for Multi-Vehicle Spatiotemporal Interactions with Semi-Stochastic Potential Fields. *2020 IEEE Intelligent Vehicles Symposium (IV)*. [[IEEE IV](#)]
- [4] **Zhang, C.**, Zhu, J., Wang, W., & Zhao, D. (2019). A General Framework of Learning Multi-Vehicle Interaction Patterns from Videos. *2019 IEEE Intelligent Transportation Systems Conference (ITSC)*. [[IEEE ITSC](#)]

BOOKS

- [1] Wang, W., Wang, L., **Zhang, C.**, Liu, C., & Sun, L. (2022). Social Interactions for Autonomous Driving: A Review and Perspectives. *Foundations and Trends in Robotics: Vol. 10, No. 3-4, pp 197–376*. [[ebook](#)] [[arXiv](#)]
- [2] Chen, X., Jin, J., Liao, Q., **Zhang, C.**, Chen, X. Academic Writing with LaTeX (in Chinese), 2023. [[ebook](#)] [[link](#)]

PATENT

- [1] [CN108222589B](#), Cam-connecting rod type mechanical three-dimensional parking device. **Zhang, C.**, Zhang, X., Ye, H., Shi, J., Wang, M., & Ning, X. *Chongqing University*.

FUNDING PROGRAM

- [1] “Quantitative Evaluation and Modeling of Action-Reaction Cycles in Interactive Human Driving Behaviors”, NSERC Alliance International Catalyst Grant, \$25,000, trainee, 2022-2023.
- [2] “Quantitative Evaluation and Modeling of Action-Reaction Cycles in Interactive Human Driving Behaviors”, FRQNT Fellowship, \$100,000, 2023-2026.
- [3] “Discovering Spatiotemporal Interactive Driving Behaviours in Traffic Scenes”, FRQNT Fellowship, \$17,500, 2022-2023.
- [4] “Statistical Modeling Framework to Understand Dynamic Traffic Patterns from Video Data”, IVADO Fellowship, \$40,000, 2020-2022.

TEACHING EXPERIENCE

Traffic Engineering and Simulation (by Prof. Lijun Sun)
Teaching Assistant, Department of Civil Engineering, McGill University

2022 Fall, 2023 Fall, 2025 Fall

Basics of Machine Learning and Data Analysis (by Prof. Pradeep Ravikumar)
Teaching Assistant (Online), Department of Computer Science, Carnegie Mellon University

2022 Fall

Statistical Machine Learning (by Prof. Dino Sejdinovic) *2020 Spring, 2020 Summer, and 2022 Summer*
Teaching Assistant (Online), Department of Statistics, Oxford University

ACADEMIC ACTIVITIES

- (Co-)Chair/(Co-)Organizer:
 - 2nd SIAM workshop on IEEE IV24', Jeju Shinhwa World, Jeju Island, Korea, 2024. [[Website](#)]
 - 1st SIAM workshop on IEEE IV23', Anchorage, Alaska, USA, 2023. [[Website](#)]
- Journal Reviewer:
 - Transportation Science;
 - Transportation Research Part B: Methodological;
 - Transportation Research Part C: Emerging Technologies;
 - Artificial Intelligence for Transportation;
 - IEEE Transactions on Intelligent Transportation Systems;
 - IEEE Transactions on Intelligent Vehicles;
 - IEEE Transactions on Consumer Electronics;
 - IEEE Transactions on Cybernetics;
 - IEEE Sensors Journal;
 - European Journal of Operational Research;
 - Travel Behaviour and Society;
 - ASME Journal of Mechanism and Robotics;
 - ASME Journal of Mechanism Design;
 - Physica A: Statistical Mechanics and its Applications;
 - Automotive Innovation;
 - Advanced Engineering Informatics;
 - Journal of Traffic and Transportation Engineering;
 - Nonlinear Dynamics;
- Conference Reviewer:
 - IEEE International Conference on Intelligent Transportation Systems (ITSC), 22-24;
 - IEEE Intelligent Vehicles Symposium (IV), 23-24;
 - Symposium on Machine Learning for Autonomous Driving; [[NeurIPS'23](#)] [[AAAI'25](#)]
 - Transportation Research Board Annual Meeting;
 - The 5th Symposium on Management of Future Mobility and Urban Traffic Systems (MFTS), 2024;
 - RSS 2024 Workshop on Autonomous Vehicles Across Scales (AVAS), 2024; [[RSS'24](#)]
 - Bayesian Decision-making and Uncertainty Workshop; [[NeurIPS'24](#)]
 - International Symposium on Transportation Data & Modelling (ISTDM), 2025;
- IEEE Graduate Student member;
- IEEE Intelligent Transportation Systems Society (ITSS) Student member;
- Student member of Chinese Overseas Transportation Association (COTA);
- Student member of Interuniversity Research Centre on Enterprise Networks, Logistics and Transportation (CIRRELT);
- Member of the Society of Automotive Engineers (SAE) of China;

AWARDS & COMPETITIVE FELLOWSHIPS/SCHOLARSHIPS

- The Honorable Mention Award for the 2024 Clifford Spiegelman Student Paper Competition, 2024 [[Link](#)]
- Graduate Mobility Award, McGill University, 2022-2023
- Graduate Research Enhancement and Travel Awards, McGill University, 2023

- Ron Rice Memorial Award, McGill University, 2023
- Mitacs Globalink Research Award - Abroad, 2022-2023
- McGill Engineering Doctoral Award (MEDA), CAD \$111,000, McGill University, 2022-2025
- FRQNT Master's Scholarship (B1X), CAD \$17,500, 2022-2023 [\[Link\]](#)
- FRQNT Doctoral Scholarship (B2X), CAD \$100,000, 2023-2027 [\[Link\]](#)
- CIRRELT Doctoral Scholarship of Excellence - Final Stages, CAD \$7,500, 2025 [\[Link\]](#)
- CIRRELT Doctoral Scholarship of Excellence - Early Stages, CAD \$4,000, 2023 [\[Link\]](#)
- CIRRELT Master's Scholarship of Excellence, CAD \$3,500, 2022
- Graduate Excellence Fellowship Awards, McGill University, 2020
- IVADO Excellence Scholarships - Msc, CAD \$40,000, 2020-2022
- Outstanding Team Award & Best Application Award at DeeCamp, China, 2019
- Outstanding Graduate of Chongqing University, 2019
- First Prize in the 2018 National College Mechanical Innovation Competition (TOP #10 in China), 2018
- National Scholarship, China, 2017
- First Prize in the Chongqing University Physics Contest (#1/500 in Chongqing University), 2015

OPEN-SOURCED PACKAGES

- [1] https://github.com/Chengyuan-Zhang/IDM_Bayesian_Calibration;
- [2] https://github.com/Chengyuan-Zhang/Gaussian_Velocity_Field;