

# Chengyuan ZHANG

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## CONTACT

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- Homepage: <https://chengyuan-zhang.github.io>; Google Scholar: [\[Link\]](#)
- Personal email: [enzocy@gmail.com](mailto:enzocy@gmail.com); Work email: [chengyuan.zhang@mail.mcgill.ca](mailto:chengyuan.zhang@mail.mcgill.ca);
- Room 396, Macdonald Engineering Building, 817 Sherbrooke St W, Montreal, Quebec H3A 0C3, CANADA;

## EDUCATION

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### McGill University

Montréal, Québec, Canada

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

Sept. 2020 - May 2026 (expected)

- **Dissertation:** Stochastic Modeling and Simulations of Car-Following Behaviors
- **Cumulative GPA:** 4.00/4.00;
- **Courses:** [COMP588@McGill](#), [IFT6135@UdeM](#), [ECSE683@McGill](#), [COMP540@McGill](#), [CIV1532H@UofT](#)
- Fast tracked to the Ph.D. program in 2022 winter with 4.00/4.00 Master's GPA;

### Chongqing University

Chongqing, China

*B.S. in Vehicle Engineering*

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

Philadelphia, Pennsylvania, USA

*Visiting Student*

Jan. 2018 – Feb. 2018

## ACADEMIC EXPERIENCE

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### Carnegie Mellon University (Robotics Institute)

Pittsburgh, Pennsylvania, USA

*Visiting Student Researcher (supervised by Prof. Changliu Liu)*

Jan. 2023 – Aug. 2023

### University of California, Berkeley (Department of Mechanical Engineering)

Berkeley, California, USA

*Visiting Student Researcher (supervised by Prof. Masayoshi Tomizuka)*

Sept. 2019 – Jan. 2020

### Carnegie Mellon University (Department of Mechanical Engineering)

Pittsburgh, Pennsylvania, USA

*Visiting Student Researcher (supervised by Prof. Ding Zhao)*

July 2018 – Oct. 2018

## PREPRINTS

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- [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)

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- [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* (accepted). [[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)

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- [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

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- [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

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- [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*.

## TEACHING EXPERIENCE

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**Traffic Engineering and Simulation (by Prof. Lijun Sun)** 2022 Fall, 2023 Fall, 2025 Fall  
 Teaching Assistant, Department of Civil Engineering, McGill University

**Basics of Machine Learning and Data Analysis (by Prof. Pradeep Ravikumar)** 2022 Fall  
 Teaching Assistant (Online), Department of Computer Science, Carnegie Mellon University

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

## ACADEMIC ACTIVITIES

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- (Co-)Chair/(Co-)Ornaizer:
  - 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 & SCHOLARSHIPS

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- 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