# Xianyuan **Zhan**

CURRICULUM VITAE

*Institute for AI Industry Research (AIR), Tsinghua University*

*12/F, Block C, Qidi Science and Technology Mansion, Haidian District, Beijing, China*

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## Research Interests

Real-World Reinforcement Learning / Imitation Learning, Foundation Models for Decision-Making, Embodied AI, Complex Industrial System Optimization, Autonomous Driving

## Education

**Doctor of Philosophy**                                                                    *Jan. 2013 - Aug. 2017*

PURDUE UNIVERSITY

Transportation Systems, Civil Engineering. Advisor: Dr. Satish V. Ukkusuri

**Master of Science**                                                                        *Jan. 2014 - Dec. 2016*

PURDUE UNIVERSITY

Computer Science

**Master of Science in Engineering**                                                 *Aug. 2011 - Dec. 2012*

PURDUE UNIVERSITY

Transportation Systems, Civil Engineering

**Bachelor of Engineering**                                                              *Aug. 2007 - Jul. 2011*

TSINGHUA UNIVERSITY                                                                              *Beijing, China*

Civil Engineering

## Professional Experience

**Research Associate Professor**                                                     *Dec. 2024 - Present*

TSINGHUA UNIVERSITY                                                                              *Beijing, China*

Institute for AI Industry Research

**Dual-Appointed Young Researcher**                                             *Oct. 2022 - Sep. 2025*

SHANGHAI ARTIFICIAL INTELLIGENCE LABORATORY                                        *Shanghai, China*

**Research Assistant Professor**                                                      *Jul. 2021 - Dec. 2024*

TSINGHUA UNIVERSITY                                                                              *Beijing, China*

Institute for AI Industry Research

**Data Scientist**                                                                            *Jan. 2018 - Jun. 2021*

JD TECHNOLOGY                                                                                    *Beijing, China*

JD Intelligent City Research

**Associate Researcher**                                                                  *Aug. 2017 - Jan. 2018*

MICROSOFT RESEARCH ASIA                                                                        *Beijing, China*

Urban Computing Group

**Visiting Research Fellow**                                                             *May. - Aug. 2015*

MICROSOFT RESEARCH ASIA                                                                        *Beijing, China*

Mentor: Dr. Yu Zheng

**Research Assistant** *Aug. 2011 - Aug. 2017*

Purdue University *West Lafayette, US*

Lyles School of Civil Engineering

## Honors & Awards

| | | |
|---|---|---|
| 2025 | 1st Place in IROS 2025 AGIBot World Challenge | *IROS 2025* |
| 2024 | Beijing Academy of Artificial Intelligence (BAAI) Young Scientist | *BAAI* |
| 2024 | Outstanding Paper Awards at ICML 2024 Workshop on Multi-modal Foundation Model meets Embodied AI (MFM-EAI) (**two papers**) | *ICML 2024 MFM-EAI Workshop* |
| 2023 | 2nd Prize of Science and Technology Progress Award of Chinese Association of Automation (CCA) | *CCA* |
| 2022 | 2022 Global Top Chinese Young Scholars in Artificial Intelligence (AI+X) | *Baidu* |
| 2022 | 3rd Prize of Wu Wen Jun AI Science & Technology Award | *CAAI* |
| 2021 | Committee Member of Intelligent Vehicles of China Computer Federation (CCF-IV) | *CCF* |
| 2020 | 2019 Synced Machine Intelligence Awards: 30 Best AI Use Cases of the Year | *SYNCED* |
| 2018 | Artificial Intelligence Innovation Award | *CAIS 2018* |
| 2018 | Committee Member of Technical Committee on Artificial Intelligence & Pattern Recognition of China Computer Federation (CCF-AI) | *CCF* |
| 2016 | James S. McDonnell Foundation (JSMF) Postdoctoral Fellowship Award in Studying Complex Systems | *James S. McDonnell Foundation* |
| 2014 | Pai Tao Yeh Fellowship | *Purdue University* |
| 2013 | Pai Tao Yeh Fellowship | *Purdue University* |
| 2010 | 2nd Prize of Fifth National Competition of Transport Science and Technology | *China* |
| 2010 | Gammon Scholarship | *Tsinghua University* |
| 2009 | Zheng Ge Ru Scholarship | *Tsinghua University* |
| 2008 | Gammon Scholarship | *Tsinghua University* |

## Publications

### Conference Proceedings

1. Zheng, J., Li, J., Wang, Z., Liu, D., Kang, X., Feng, Y., Zheng, Y., Zou, J., Chen, Y., Zeng, J., Wang, T., Zhang, Y., Liu, J., **Zhan, X.** X-VLA: Soft-Prompted Transformer as Scalable Cross-Embodiment Vision-Language-Action Model. In the *Fourteenth International Conference on Learning Representations (ICLR 2026)*.

2. Liang, R., Zheng, Y., Zheng, K., Tan, T., Li, J., Mao, L., Wang, Z., Chen, G., Ye, H., Liu, J., Wang, J., **Zhan, X.** Dichotomous Diffusion Policy Optimization. In the *Fourteenth International Conference on Learning Representations (ICLR 2026)*.

3. Cheng, P., Wu, Z., Li, J., He, Z., Xu, H., Sun, W., Lin, Y., Liu, Y., **Zhan, X.** Sample Efficient Offline RL via T-Symmetry Enforced Latent State-Stitching. In the *Fourteenth International Conference on Learning Representations (ICLR 2026)*.

4. Li, P., Zheng, Y., Wang, Y., Wang, H., Zhao, H., Liu, J., **Zhan, X.**, Zhan, K., Lang, X. Discrete Diffusion for Reflective Vision-Language-Action Models in Autonomous Driving. In the *Fourteenth International Conference on Learning Representations (ICLR 2026)*.

5. Niu, H, Chen, Q., Liu, T., Li, J., Zhou, G., Zhang, Y., Hu, J., **Zhan, X.** xTED: Cross-Domain Adaptation via Diffusion-Based Trajectory Editing. In the *25th International Conference on Autonomous Agents and Multi-Agent Systems (AAMAS 2026)* (Extended Abstract).

6. Zheng, K., Teyssier, L., Zheng, Y., Luo, Y., **Zhan, X.** Towards Robust Zero-Shot Reinforcement Learning. In the *Thirty-Ninth Annual Conference on Neural Information Processing Systems (NeurIPS 2025)*.

7. Tan, T., Zheng, Y., Liang, R., Wang, Z., Zheng, K., Zheng, J., Li, J., **Zhan, X.**, Liu, J. Flow Matching-Based Autonomous Driving Planning with Advanced Interactive Behavior Modeling. In the *Thirty-Ninth Annual Conference on Neural Information Processing Systems (NeurIPS 2025)*.

8. Xu, H., Mao, L., Jin, H., Zhang, W., **Zhan, X.**, Zhang, A. Uni-RL: Unifying Online and Offline RL via Implicit Value Regularization. In the *Thirty-Ninth Annual Conference on Neural Information Processing Systems (NeurIPS 2025)*.

9. Liu, D., Niu, H., Wang, Z., Zheng, J., Zheng, Y., Ou, Z., Hu, J., Li, J., **Zhan, X.** Efficient Robotic Policy Learning via Latent

Space Backward Planning. In the *42nd International Conference on Machine Learning (ICML 2025)*.

10. Zheng, J., Li, J., Liu, D., Zheng, Y., Wang, Z., Ou, Z., Liu, Y., Liu, J., Zheng, Y., **Zhan, X.** Universal Actions for Enhanced Embodied Foundation Models. In the *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2025*.

11. Li, J, Wang, Z., Zheng, J., Zhou, X., Wang, G., Song, G., Liu, Y., Liu, J., Zhang, Y., **Zhan, X.** Robo-MUTUAL: Robotic Multimodal Task Specification via Unimodal Learning. In the *2025 IEEE International Conference on Robotics & Automation (ICRA 2025)*.

12. Niu, H., Ji, T., Liu, B., Zhao, H., Zhu, X., Zheng, J., Huang, P., Zhou, G., Hu, J., **Zhan, X.** H2O+: An Improved Framework for Hybrid Offline-and-Online RL with Dynamics Gaps. In the *2025 IEEE International Conference on Robotics & Automation (ICRA 2025)*.

13. **Zhan, X.**, Zhu, X., Cheng, P., Hu, X., He, Z., Geng, H., Leng, J., Zheng, H., Liu, C., Hong, T., Liang, Y., Liu, Y., Zhao, F. Data Center Cooling System Optimization Using Offline Reinforcement Learning. In the *Thirteenth International Conference on Learning Representations (ICLR 2025)*.

14. Zheng, Y., Liang, R., Zheng, K., Zheng, J., Mao, L., Li, J., Gu, W., Ai, R., Li, S., **Zhan, X.**, Liu, J. Diffusion-Based Planning for Autonomous Driving with Flexible Guidance. In the *Thirteenth International Conference on Learning Representations (ICLR 2025)* **(oral)**.

15. Liu, T., Li, J., Zheng, Y., Niu, H., Lan, Y., Xu, X., **Zhan, X.** Skill Expansion and Composition in Parameter Space. In the *Thirteenth International Conference on Learning Representations (ICLR 2025)*.

16. Wang, G., Niu, H., Li, J., Jiang, L., Hu, J., **Zhan, X.** Are Expressive Models Truly Necessary for Offline RL? In the *Thirty-Ninth AAAI Conference on Artificial Intelligence (AAAI 2025)* **(oral)**.

17. Mao, L., Xu, H., Zhang, W., **Zhan, X.**, Zhang, A. Diffusion-DICE: In-Sample Diffusion Guidance for Offline Reinforcement Learning. In the *Thirty-Eighth Annual Conference on Neural Information Processing Systems (NeurIPS 2024)*.

18. Zheng, J., Li, J., Cheng, S., Zheng, Y., Li, J., Liu, J., Liu, Y., Liu, J., **Zhan, X.** Instruction-Guided Visual Masking. In the *Thirty-Eighth Annual Conference on Neural Information Processing Systems (NeurIPS 2024)* **(Outstanding paper award of ICML 2024 MFM-EAI Workshop)**.

19. Qin, H., **Zhan, X.**, Li, Y., Zheng, Y. FlexSSL : A Generic and Efficient Framework for Semi-Supervised Learning. In the *27th European Conference on Artificial Intelligence (ECAI-2024)*.

20. Yin, J., **Zhan, X.**, Ji, T., Xu, B., He, Y., Zhang, D., Li, L. Motion Planning Integrated with Vehicle-terrain Interactions for Off-road Autonomous Ground Vehicles. In the *27th IEEE International Conference on Intelligent Transportation Systems (ITSC 2024)*.

21. Geng, H., Sun, Y., Li, Y., Leng, J., Zhu, X., **Zhan, X.**, Li, Y., Zhao, F., Liu, Y. TESLA: Thermally Safe, Load-Aware, and Energy-Efficient Cooling Control System for Data Centers. In the *53rd International Conference on Parallel Processing (ICPP 2024)*.

22. Luo, Y., Sun, F., Ji, T., **Zhan, X.** Bidirectional-Reachable Hierarchical Reinforcement Learning with Mutually Responsive Policies. In the *1st Reinforcement Learning Conference (RLC 2024)*.

23. Li, J., Zheng, J., Zheng, Y., Mao, L., Hu, X., Cheng, S., Niu, H., Liu, J., Liu, Y., Liu, J., Zhang, Y. Q., **Zhan, X.** DecisionNCE: Embodied Multimodal Representations via Implicit Preference Learning. In the *41st International Conference on Machine Learning (ICML 2024)* **(Outstanding paper award of ICML 2024 MFM-EAI Workshop)**.

24. Luo, Y., Ji, T., Sun, F., Zhang, J., Xu, H., **Zhan, X.** OMPO: A Unified Framework for Reinforcement Learning under Policy and Dynamics Shifts. In the *41st International Conference on Machine Learning (ICML 2024)* **(oral)**.

25. Luo, Y., Ji, T., Sun, F., Zhang, J., Xu, H., **Zhan, X.** Offline-Boosted Actor-Critic: Adaptively Blending Optimal Historical Behaviors in Deep Off-Policy RL. In the *41st International Conference on Machine Learning (ICML 2024)*.

26. Ji, T., Luo, Y., Sun, F., **Zhan, X.**, Zhang, J., Xu, H. Seizing Serendipity: Exploiting the Value of Past Success in Off-Policy Actor-Critic. In the *41st International Conference on Machine Learning (ICML 2024)*.

27. Niu, H., Hu, J., Zhou, G., **Zhan, X.** A Comprehensive Survey of Cross-Domain Policy Transfer for Embodied Agents. In the *33rd International Joint Conference on Artificial Intelligence (IJCAI 2024)* **(oral)**.

28. Mao, L., Xu, H., Zhang, W., **Zhan, X.** Revealing the Mystery of Distribution Correction Estimation via Orthogonal-gradient Update. In the *Twelfth International Conference on Learning Representations (ICLR 2024)* **(spotlight)**.

29. Hu, X., Li, J., **Zhan, X.**, Jia, Q., Zhang, Y. Query-Policy Misalignment in Preference-Based Reinforcement Learning. In the *Twelfth International Conference on Learning Representations (ICLR 2024)* **(spotlight)**.

30. Zheng, Y., Li, J., Yu, D., Yang, Y., Li, S., **Zhan, X.**, Liu, J. Safe Offline Reinforcement Learning with Feasibility-Guided

Diffusion Model. In the *Twelfth International Conference on Learning Representations (ICLR 2024)*.

31. Wang, G., Cheng, S., **Zhan, X.**, Li, X., Song, S., Liu, Y. OpenChat: Advancing Open-source Language Models with Mixed-Quality Data. In the *Twelfth International Conference on Learning Representations (ICLR 2024)*.

32. Cheng, P.*, **Zhan, X.***, Wu, Z., Zhang, W., Song, S., Wang, H., Lin, Y., Jiang, L. Look Beneath the Surface: Exploiting Fundamental Symmetry for Sample-Efficient Offline Reinforcement Learning. In the *Thirty-seventh Annual Conference on Neural Information Processing Systems (NeurIPS 2023)*.

33. Wang, X., Xu, H., Zheng, Y., and **Zhan, X.** Offline Multi-Agent Reinforcement Learning with Implicit Global-to-Local Value Regularization. In the *Thirty-seventh Annual Conference on Neural Information Processing Systems (NeurIPS 2023)*.

34. Hu, X., Jiang, L., Li, J., Yang, Z., Wang, Z., Chan, V., **Zhan, X.** Offline RL with No OOD Actions: In-Sample Learning via Implicit Value Regularization. In the *Eleventh International Conference on Learning Representations (ICLR 2023)* **(oral)**.

35. Li, J., **Zhan, X.**, Xu, H., Zhu, X., Liu, J., and Zhang, Y. When Data Geometry Meets Deep Function: Generalizing Offline Reinforcement Learning. In the *Eleventh International Conference on Learning Representations (ICLR 2023)*.

36. Li, J., Hu, X., Xu, H., Liu, J., **Zhan, X.**, Jia, Q., Zhang, Y. Mind the Gap: Offline Policy Optimization for Imperfect Rewards. In the *Eleventh International Conference on Learning Representations (ICLR 2023)*.

37. Jiang, L., Wang, X., Yang, A., Wang, X., Jin, X., Wang, W., Ye, X., Ouyang, Y., and **Zhan, X.** An Efficient Multi-Agent Optimization Approach for Coordinated Massive MIMO Beamforming. In *IEEE International Conference on Communications (ICC 2023)*.

38. Wang, X. and **Zhan, X.** Offline Multi-Agent Reinforcement Learning with Coupled Value Factorization. In the *22nd International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2023)* (Extended Abstract).

39. Xu, H., Li, J., Li, J. and **Zhan, X.** A Policy-Guided Imitation Approach for Offline Reinforcement Learning. In the *Thirty-Sixth Annual Conference on Neural Information Processing Systems (NeurIPS 2022)* **(oral)**.

40. Niu, H., Sharma, S., Qiu, Y., Li, M., Zhou, G., Hu, J. and **Zhan, X.** When to Trust Your Simulator: Dynamics-Aware Hybrid Offline-and-Online Reinforcement Learning. In the *Thirty-Sixth Annual Conference on Neural Information Processing Systems (NeurIPS 2022)* **(spotlight)**.

41. Wang, G., Niu, H., Zhu, D., Hu, J., **Zhan, X.**, and Zhou, G. A Versatile and Efficient Reinforcement Learning Framework for Autonomous Driving. In *NeurIPS 2022 Reinforcement Learning for Real Life (RL4RealLife) Workshop*.

42. Zhang, W., Xu, H., Niu, H., Cheng, P., Li, M., Zhou, G., and **Zhan, X.** Discriminator-Guided Model-Based Offline Imitation Learning. In the *6th Annual Conference on Robot Learning (CoRL 2022)*.

43. Yu, Q., Lou, J., **Zhan, X.**, Li, Q., Liu, J., Zuo W. and Liu Y. Adversarial Contrastive Learning via Asymmetric InfoNCE. In the *17th European Conference on Computer Vision (ECCV 2022)*, 17(5), 53-69.

44. Xu, H., **Zhan, X.**, Yin, H., and Qin, H. Discriminator-Weighted Offline Imitation Learning from Suboptimal Demonstrations. In the *Thirty-ninth International Conference on Machine Learning (ICML22)*, 24725-24742.

45. **Zhan, X.**, Zhu, X. and Xu, H. Model-Based Offline Planning with Trajectory Pruning. In the *Thirty-First International Joint Conference on Artificial Intelligence (IJCAI-22), 3695-3701*.

46. **Zhan, X.**, Xu, H., Zhang, Y., Zhu, X. and Yin, H. DeepThermal: Combustion Optimization for Thermal Power Generating Units Using Offline Reinforcement Learning. In the *Thirty-Sixth AAAI Conference on Artificial Intelligence (AAAI2022)* 36(4), 4680-4688 **(Spotlight paper at ICML 2021 RL4RealLife workshop)**.

47. Xu, H., **Zhan, X.**, and Zhu, X. Constraints Penalized Q-Learning for Safe Offline Reinforcement Learning. In the *Thirty-Sixth AAAI Conference on Artificial Intelligence (AAAI2022)* 36(8), 8753-8760 **(Spotlight paper at ICML 2021 RL4RealLife workshop)**.

48. Xu, H., **Zhan, X.**, Li, J., and Yin, H. Offline Reinforcement Learning with Soft Behavior Regularization. In *NeurIPS 2021 Offline RL Workshop*.

49. Qin, H., **Zhan, X.**, Li, Y., Yang, X. and Zheng, Y. Network-Wide Traffic States Imputation Using Self-interested Coalitional Learning. In *Proceedings of the 27th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD'21)*, 1370-1378.

50. Qin, H., Ke, S., Yang, X., Xu, H., **Zhan, X.**, and Zheng, Y. Robust Spatio-Temporal Purchase Prediction via Deep Meta Learning. In *Proceedings of the AAAI Conference on Artificial Intelligence (AAAI2021)* 35 (5), 4312-4319.

51. Yang, C., Zhang, Y., **Zhan, X.**, Ukkusuri, S. V., and Qiu, W. Activity Chain Inference Using Travel Survey and Mobile Phone data. In *Proceedings of Transportation Research Board Meeting*, Washington D.C., January 2017.

52. Zischg, J., Klinkhamer, C., **Zhan, X.**, Krueger, E., Ukkusuri, S., Rao, P. S. C., Rauch, W. and Sitzenfrei, R. Evolution of Complex Network Topologies in Urban Water Infrastructure. In *World Environmental and Water Resources Congress 2017*, Sacramento, May 2017.

53. **Zhan, X.**, Ukkusuri, S. V. A Probabilistic Urban Link Travel Time Estimation Model Using Large-scale Taxi Trip Data. In *Proceedings of 94th Transportation Research Board Meeting*, Washington D.C., January 2015.

54. **Zhan, X.**, Qian, X., Ukkusuri, S. V. Measuring the Efficiency of Urban Taxi Service System. In *Proceedings of the 3rd ACM SIGKDD International Workshop on Urban Computing*, New York, August 2014.

55. Qian, X., **Zhan, X.**, Ukkusuri, S. Characterizing Urban Dynamics Using Large Scale Taxicab Data. In *Proceedings of 93nd Transportation Research Board Meeting*, Washington D.C., January 2014.

56. **Zhan, X.**, Ukkusuri, S. V.. Multi-User Class, Simultaneous Route and Departure Time Choice Dynamic Traffic Assignment with an Embedded Spatial Queuing Model. *5th International Symposium on Dynamic Traffic Assignment*. Salerno, Italy, June, 2014.

57. Hasan, S., **Zhan, X.**, and Ukkusuri, S. V. Understanding Urban Human Activity and Mobility Patterns Using Large-scale Location-based Data from Online Social Media. *Proceedings of the 2nd ACM SIGKDD International Workshop on Urban Computing*, 2013.

## Journal Publications

1. Li, J., Lin, S., Shi, T., Tian, C., Mei, Y., Song, J., **Zhan, X.**, Li, R., 2025. A Fully Data-Driven Approach for Realistic Traffic Signal Control Using Offline Reinforcement Learning. *Data Science for Transportation*, 7(3), 1-18.

2. Liu, S., Weng, D., Tian, Y., Deng, Z., Xu, H., Zhu, X., Yin, H., **Zhan, X.**, Wu, Y., 2023. ECoalVis: Visual Analysis of Control Strategies in Coal-fired Power Plants. In *IEEE Transactions on Visualization and Computer Graphics*, 29(1), 1091-1101.

3. Feng, J., Jiang, L., Yu, X., Xu, H., Sun, X., Wang, J., **Zhan, X.**, Chan., W., 2022. Curriculum Goal-conditioned Imitation for Offline Reinforcement Learning. In *IEEE Transactions on Games*.

4. Qin, H., **Zhan, X.**, and Zheng, Y., 2022. CSCAD: Correlation Structure-based Collective Anomaly Detection in Complex System. In *IEEE Transactions on Knowledge and Data Engineering (TKDE)*.

5. **Zhan, X.**, Li, R., and Ukkusuri, S. V., 2020. Link-based Traffic State Estimation and Prediction for Arterial Networks Using License-plate Recognition Data. *Transportation Research Part C: Emerging Technologies*, 117, 102660.

6. Yang, C., Zhang, Y., **Zhan, X.**, Ukkusuri, S. V. and Chen, Y., 2020. Fusing Mobile Phone and Travel Survey Data to Model Urban Activity Dynamics. In *Journal of Advanced Transportation*.

7. **Zhan, X.**, and Ukkusuri, S. V., 2019. Spatial Dependency of Urban Sprawl and the Underlying Road Network Structure. *Journal of Urban Planning and Development*, 145(4), 04019014.

8. Zischg, J., Klinkhamer, C., **Zhan, X.**, Rao, S. C., and Sitzenfrei, R., 2019. A Century of Topological Co-Evolution of Complex Infrastructure Networks in an Alpine City. *Complexity*, 2019, 2096749.

9. Gehlot, H., **Zhan, X.**, Qian, X., Thompson, C., Kulkarni, M. and Ukkusuri, S. V., 2018. A-Rescue 2.0: A High Fidelity, Parallel, Agent-based Evacuation Simulator. *Journal of Computing in Civil Engineering*, 33(2), 04018059.

10. **Zhan, X.**, Ukkusuri, S. V., and Rao, S. C., 2017. Dynamics of Functional Failures and Recovery in Complex Road Networks. *Physical Review E*, 96(5), 052301.

11. **Zhan, X.**, and Ukkusuri, S. V., 2017. Multiclass, Simultaneous Route and Departure Time Choice Dynamic Traffic Assignment with an Embedded Spatial Queuing Model. *Transportmetrica B: Transport Dynamics*, doi: 10.1080/21680566.2017.1354738.

12. Mo, B., Li, R., **Zhan, X.**, 2017. Speed Profile Estimation Using License Plate Recognition Data. *Transportation Research Part C: Emerging Technology*, 82, 358–378.

13. Kreuger, E., Klinkhamer, C., Urich C., **Zhan, X.**, and Rao, S. C., 2017. Generic Patterns in the Evolution of Urban Water Networks: Evidence from a Large Asian City. *Physical Review E*, 95(3), 032312.

14. Li, R. Ye, Z., Li. B. and **Zhan, X.**, 2017. Simulation of Hard Shoulder Running Combined with Queue Warning During Traffic Accident with CTM model. *IET Intelligent Transport Systems*, 11(9), 553-560.

15. **Zhan, X.**, Zheng, Y., Yi, X., and Ukkusuri, S. V., 2016. Citywide Traffic Volume Estimation Using Trajectory Data. *IEEE Transactions on Knowledge and Data Engineering (TKDE)*, 29(2), 272-285.

16. **Zhan, X.**, Qian, X., Ukkusuri, S. V., 2016. A Graph Based Approach to Measure the Efficiency of Urban Taxi Service System. *IEEE Transactions on Intelligent Transportation Systems*, 17(9), 2479-2489.

17. **Zhan, X.**, Ukkusuri, S., V., Yang, C., 2016. A Bayesian Mixture Model for Short-term Average Link Travel Time Estimation Using Large-scale Limited Information Trip-based Data. *Automation in Construction*, 72(3), 237-246.

18. Mesa-Arango, R., **Zhan, X.**, Ukkusuri, S. V., Mitra, A., 2016. Direct Transportation Economic Impacts of Highway Networks Disruptions Using Public Data from United States. *Journal of Transportation Safety & Security*, 8(1), 36-55.

19. Hasan, S., Ukkusuri, S., **Zhan, X.**, 2016. Understanding Social Influence in Activity-Location Choice and Life-Style Patterns Using Geo-location Data from Social Media. *Frontiers in ICT*, 3:10, doi: 10.3389/fict.2016.00010.

20. Aziz, H. M., Ukkusuri, S., **Zhan, X.**, 2016. Determining the Impact of Personal Mobility Carbon Allowance Schemes in Transportation Networks. *Network and Spatial Economics*, 17(2), 505-545.

21. Ukkusuri, S., Hasan, S., Doan, K., Luong, B., **Zhan, X.**, Murray-Tuite, P., Yin, W., 2016. A-RESCUE: An Agent-based Regional Evacuation Simulator Coupled with User Enriched Behavior. *Network and Spatial Economics*, 17(1), 197-223.

22. **Zhan, X.**, Aziz, H. M., Ukkusuri, S. V., 2015. An Efficient Parallel Sampling Technique for Multivariate Poisson-Lognormal Model: Analysis with Two Crash Count Datasets. *Analytic Methods in Accident Research*, 8, 45-60.

23. **Zhan, X.**, Li, R., Ukkusuri, S. V., 2015. Lane-based Real Time Queue Length Estimation Using License Plate Recognition Data. *Transportation Research Part C: Emerging Technology*, 57, 85-102.

24. **Zhan, X.**, Ukkusuri, S., V., Zhu, F., 2014. Inferring Urban Land Use Using Large-Scale Social Media Check-in Data. *Network and Spatial Economics*, 14, 647-667.

25. **Zhan, X.**, Hasan, S., Ukkusuri, S. V., Kamga, C., 2013. Urban Link Travel Time Estimation Using Large-scale Taxi Data with Partial Information. *Transportation Research Part C: Emerging Technologies*, 33, 37-49.

26. Ukkusuri, S., **Zhan, X.**, Sadri A., Ye, Q., 2013. Exploring Crisis Informatics Using Social Media Data: A Study on 2013 Oklahoma Tornado. *Transportation Research Record*, 2459, 110-118.

### CONTRIBUTED BOOK CHAPTERS

1. **Zhan, X.** *Miscellaneous Topics: Offline Reinforcement Learning*. In Reinforcement Learning for Sequential Decision and Optimal Control. Springer Verlag, Singapore, 2022.

2. Qian, X, **Zhan, X.**, Ukkusuri, S. V. *Characterizing Urban Dynamics Using Large Scale Taxicab Data*. In Engineering and Applied Sciences Optimization: Vol. 38, 17-32, Springer International Publishing, 2015.

3. Ukkusuri, S. V., Hasan, S., and **Zhan, X.** *Checking the Urban Pulse: Social Media Data Analytics for Transportation Applications*. In Best Practices for Transportation Agency Use of Social Media Data. Taylor and Francis/CRC Press, 2013.

### THESES

1. Novel Approaches to Model Congestion Evolution and Dependencies in Complex Road Networks. Ph.D. Dissertation, Purdue University, 2017.

2. Understanding the Aggregate Level Urban Activity Patterns Using Large-Scale Geo-Location Data. MS Thesis, Purdue University, 2012.

3. A Cellular Automaton Based Microscopic Traffic Flow Simulation Model for Abnormal Traffic Flow. Undergraduate Thesis, Tsinghua University, 2011.

# Talks & Presentations

1. Data-Driven Decision Making for Physical World Tasks. Invited talk in the IPAI Seminar Series at Purdue University. December 2025, West Lafayette, US.

2. Towards Generalizable Embodied Foundation Models. Invited talk at Institute of Automation, Chinese Academy of Sciences. November 2025.

3. Autonomous Driving Decision-Making and Planning with Generative Models. Invited talk at FISITA Intelligent Safety Conference China 2025 (ISCC 2025). September 2025, Xi'an, China.

4. Towards Real-World Deployable Data-Driven Reinforcement Learning. Invited talk at CCFAI 2025. August 2025, Kunming, China.

5. Towards Real-World Deployable Data-Driven Reinforcement Learning. Invited talk at RLDM 2025. June 2025, Dublin, Ireland.

6. Towards Real-World Deployable Reinforcement Learning. Invited talk at NTU. May 2024, Singapore.

7. Towards Real-World Deployable Data-Driven Reinforcement Learning. Invited talk at Shanxi University. August 2024, Taiyuan, China.

8. Towards Generalizable and Data-Efficient Embodied Decision-Making. Invited talk at iDLab, Tsinghua University.

July 2024, Beijing, China.

9. Towards Generalizable and Data-Efficient Embodied Decision-Making. Invited talk at *Workshop on Computational Sustainability in Digital Infrastructure*. June 2024, NTU, Singapore.

10. Towards Generalizable and Data-Efficient Embodied Decision-Making. Invited talk at *ChinaMAS 2024*. May 2024, Taiyuan, China.

11. End-to-End Autonomous Driving: From a Decision-Making Perspective. Talk at *Haomo & AIR Open Course*. September 2023.

12. Offline RL and Beyond: Towards Generalizable Data-Driven Reinforcement Learning. Invited talk at Institute of Automation, Chinese Academy of Sciences. August 2023.

13. Data-Driven Decision Making for Real-World Scenarios. Invited talk at UMNI Lab, Purdue University. April 2023.

14. Frontiers in Offline RL Research. Invited talk at iDLab, Tsinghua University. Jan 2023, Beijing, China.

15. Data-Driven Decision Making for Real-World Scenarios. Invited talk at *DataFun Summit 2022*. September 2022, Beijing, China.

16. Data-Driven Decision Making for Real-World Scenarios. Invited talk at *Didi Tech Salon*. August 2022, Beijing, China.

17. Data-Driven Decision Making for Real-World Scenarios. Invited talk at *Haomo AI Day*. April 2022, Beijing, China.

18. DeepThermal: Combustion Optimization for Thermal Power Generating Units Using Offline Reinforcement Learning. *Thirty-Sixth AAAI Conference on Artificial Intelligence (AAAI2022)*. February 2022

19. Discriminator-Weighted Offline Imitation Learning from Suboptimal Demonstrations. *NeurIPS 2021 Deep RL Workshop*. December 2021.

20. Podcast interview at "TalkRL: The Reinforcement Learning Podcast" with Robin Chauhan. August 30, 2021.

21. Offline RL and Its Potential Applications in Healthcare Decision Making. Guest lecture at DeeCamp 2021. June 2021, online.

22. Network-Wide Traffic State Inference Using Emerging Urban Data Sources. Guest lecture at University of Central Florida. March 2021, online.

23. Application of Deep Reinforcement Learning in Control Optimization of Thermal Power Plants. *IEEE Services - Industry Symposium*. October 2020.

24. Urban Computing: Building Intelligent Cities with Big Data and AI. Invited talk at Tsinghua University. November 2019, Beijing, China.

25. Data-driven Methods in Urban Applications: New Problems, New Directions and New Approaches. Invited talk at Tsinghua University. December 2018, Beijing, China.

26. Spatio-Temporal Deep Learning in Intelligent Cities. *Smart Cities and Urban Computing Forum, China National Computer Congress (CNCC 2018)*. October 2018, Hangzhou.

27. Data-driven Optimization Models for Logistics in Urban Applications. *3rd Workshop on Applications of the Mathematical Modeling in Enterprises*. July 2018, University of Chinese Academy of Sciences, Beijing.

28. Data-driven Methods in Urban Transportation Applications. Invited talk at Tsinghua University. September 2017, Beijing, China.

29. A Vertex Split-Recovery Model for Congestion Evolution Process on Road Networks. *INFORMS 2016*. November 2016, Nashville.

30. Traffic State Estimation for Arterial Networks Using License-plate Recognition Data. *INFORMS 2016*. November 2016, Nashville.

31. A Node Split-Recovery Model for Congestion Evolution Process on Road Networks. *Resilience Week 2016*. August 2016, Chicago.

32. A Node Splitting-Recovery Model for Congestion Evolution Process on Road Networks. *4th International Symposium on Water, Feedbacks, and Complexity*. March 2016, Purdue University.

33. A Bayesian Mixture Model for Short-term Average Link Travel Time Estimation Using Large-scale Limited Information Trip-based Data. *INFORMS 2015*, November 2015, Philadelphia.

34. A Graph-based Approach to Measure the Efficiency of Urban Taxi Service System. *INFORMS 2015*, November 2015, Philadelphia.

35. Measuring the Efficiency of Urban Taxi Service System. *KDD 2014 International Workshop on Urban Computing*, August 2014, New York.

36. Urban Link Travel Time Estimation Using Large-scale Taxi Data with Partial Information. *MPE 2013+ Workshop on*

*Sustainable Human Environments*. April 2014, Rutgers University.

37. Multiclass Dynamic User Equilibrium with a Path Based Cell Transmission Model for General Traffic Networks. *IN-FORMS 2013*, October 2013, Minneapolis.

38. Real Time Link Travel Time Estimation Using License-plate Recognition Data. *INFORMS 2013*, October 2013, Minneapolis.

# Research Projects

### Diffusion-Based Autonomous Driving Planning Model
*2025-2026*

Funded by Xiaomi Auto

Research project manager for developing high-performance diffusion-based autonomous driving planning models and RL post-training frameworks.

### Closed-Loop Model Fine-Tuning for Autonomous Driving
*2022-2025*

National Key Research and Development Program of China (Grant 2022YFB2502904)

Technical lead for developing data-driven policy fine-tuning methods for autonomous driving models. Five research papers have been published in NeurIPS 2023, ICLR 2024, 2025, IJCAI 2024, ICRA 2025.

### Data-Driven Decision Making Under Complex Autonomous Driving Scenarios
*2022-2025*

Funded by Haomo.ai

Research project manager for developing data-driven decision-making models under complex autonomous driving scenarios. Five research papers have been published in NeurIPS 2022, CoRL 2022, and ICLR 2023, 2024, 2025.

### Key Technology Research on AI+Energy Efficiency Optimization and Integrated Energy Management in Data Centers
*2022-2026*

Funded by Global Data Solutions Limited

Technical leader for developing deployable data-driven AI models for data center energy saving optimization. Four research papers have been published in NeurIPS 2023 (two papers), AAMAS 2023, ICLR 2025.

### Key Technology Research on AI-driven Data Center Server Energy Saving Optimization
*2022-2024*

Funded by Intel Corporation

Technical leader for developing data-driven AI models for data center energy saving optimization.

### Traffic Flow Forecasting Technology: Principle Analysis and Technical Solutions
*2022-2023*

Funded by Baidu Inc

Research project manager for developing traffic flow forecasting and data-driven traffic signal control optimization frameworks. One research paper has been published in Data Science for Transportation.

### 5G Massive MIMO Wireless Network Optimization
*2021-2023*

Funded by AsiaInfo

Technical lead for developing optimization algorithms to optimize 5G Massive MIMO Beamforming configurations. The developed optimization algorithms have been successfully deployed on 5,000 5G base stations in Tianjin and Hunan Province by AsiaInfo. Two research papers are published in NeurIPS 2022 and ICC 2023.

**Artificial Intelligence-based Optimization System for Thermal Power Generating Units**

*2018-2020*

Funded by CNH Energy and JD Intelligent City Research

Research project manager for developing a deep reinforcement learning model and system to optimize power generation efficiency for thermal power generating units in power plants. Two research papers are published in *AAAI2022*. This research has already finished software productization in JD Technology and been deployed in **6** power plants and **9** TPGUs in China.

**Bridging Information, Uncertainty and Decision-Making in Hurricanes Using an Interdisciplinary Perspective**

*2015 - 2017*

Funded by National Science Foundation (NSF)

Project leader for developing parallelized large-scale agent-based traffic simulator for hurricane evacuation in urban road networks. Corresponding research paper is published in Journal of Computing in Civil Engineering.

# Academic Activities

### Member of Editorial Board
- Data Science for Transportation: *Editorial Board Member*
- Frontiers in Built Environment - Transportation and Transit Systems: *Review Editor*

### Organization Committee Member of Conferences
- 2025 Multi-disciplinary Conference on Reinforcement Learning and Decision Making (RLDM 2025): *Spotlight and Poster Chair*
- FISITA Intelligent Safety Conference China (ISCC 2024, 2025): *Technical Committee Member*

### Area Chair (AC) / Senior Program Committee (SPC) of Conferences
- Conference on Neural Information Processing Systems (NeurIPS): AC of NeurIPS 2024, 2025
- International Conference on Learning Representations (ICLR): AC of ICLR 2026
- AAAI Conference on Artificial Intelligence (AAAI): SPC of AAAI 2026

### Reviewer of Conferences
- International Conference on Learning Representations (ICLR): ICLR 2024, 2025
- Conference on Neural Information Processing Systems (NeurIPS): NeurIPS 2022 (**top reviewer**), 2023
- International Conference on Machine Learning (ICML): ICML 2022, 2023, 2024, 2025, 2026
- AAAI Conference on Artificial Intelligence (AAAI): AAAI 2021, 2022, 2023, 2024, 2025
- International Joint Conference on Artificial Intelligence (IJCAI): IJCAI 2023, 2024
- International Conference on Artificial Intelligence and Statistics (AISTATS): AISTATS 2025, 2026
- SIGKDD Conference on Knowledge Discovery and Data Mining (KDD): KDD 2025
- IEEE International Conference on Robotics and Automation (ICRA): ICRA 2023, 2024
- Reinforcement Learning Conference (RLC): RLC 2024, 2025
- IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS): IROS 2022
- China Conference on Data Mining (CCDM): CCDM 2021,2022
- IEEE International Conference on Intelligent Transportation (ITSC)
- IEEE Conference on Decision and Control
- Transportation Research Board Annual Meeting

### Reviewer of Journals
- IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)
- IEEE Transactions on Neural Networks and Learning Systems (TNNLS)
- IEEE Transactions on Knowledge and Data Engineering (TKDE)
- IEEE Transactions on Artificial Intelligence (TAI)
- IEEE Transactions on Big Data (TBD)
- IEEE Transactions on Knowledge Discovery from Data (TKDD)

- IEEE Transactions on Intelligent Transportation Systems (ITS)
- IEEE Transactions on Systems, Man and Cybernetics: Systems (SMC)
- IEEE Transactions on Mobile Computing (TMC)
- IEEE Transactions on Green Communications and Networking (TGCN)
- IEEE Transactions on Automation Science and Engineering (T-ASE)
- IEEE Transactions on Industry Applications Society (IAS)
- IEEE Transactions on Cloud Computing (TCC)
- IEEE Transactions on Vehicular Technology (VT)
- IEEE Transactions on Industrial Informatics
- IEEE Signal Processing Letters
- IEEE Internet of Things Journal
- IEEE Journal of Biomedical and Health Informatics
- IEEE Access
- IEEE/CAA Journal of Automatica Sinica
- ACM Transactions on Intelligent Systems and Technology (TIST)
- Science China Information Sciences
- Expert Systems With Applications
- Engineering Applications of Artificial Intelligence
- Computers & Industrial Engineering
- Frontiers of Computer Science
- Robotica
- 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
- Transportmetrica B: Transport Dynamics
- Scientific Report
- PLOS ONE
- European Journal of Operational Research
- Network and Spatial Economics
- Transportation
- Journal of Advanced Transportation
- Environment and Planning B: Urban Analytics and City Science
- IET Intelligent Transport Systems
- Applied Energy
- Sustainable Energy, Grids and Networks
- Journal of Electrical Power and Energy Systems
- Journal of Physics: Complexity
- Nuclear Science and Techniques

# Teaching Experience

### Course Lecturer at Tsinghua University

TSINGHUA UNIVERSITY

- **Future Automobiles (Global Open Course)** (Fall 2021): Data-driven Methods for Intelligent Urban Transportation Systems

### Courses as Teaching Assistant at Purdue University

LYLES SCHOOL OF CIVIL ENGINEERING, PURDUE UNIVERSITY

- **CE 597** (Fall 2015): The Science and Business of Logistics Systems
- **CE 398** (Spring 2013): Introduction to Civil Engineering System Design

### Co-Instructor of a Summer Course
*Jun 2016*

SCHOOL OF TRANSPORTATION ENGINEERING, TONGJI UNIVERSITY, CHINA

- **Summer Course**: Big Data Transportation Analytics

### Instructor at Workshop
*Jun. - Jul. 2015*

KOREA UNIVERSITY, SEOUL, SOUTH KOREA

Synthesis Workshop on "Dynamics of Structure and Functions of Complex Networks"

### Advised/Co-Advised PhD Students
*2021 - Present*

INSTITUTE FOR AI INDUSTRY RESEARCH (AIR), TSINGHUA UNIVERSITY

- Tianyi Li (2024-present), Undergraduate student at Tsinghua University, China
- Yinan Zheng (2023-present), PhD student at Tsinghua University, China
- Jinliang Zheng (2023-present), PhD student at Tsinghua University, China
- Jianxiong Li (2021-present), PhD student at Tsinghua University, China

### Supervised Research Interns
*2021 - Present*

INSTITUTE FOR AI INDUSTRY RESEARCH (AIR), TSINGHUA UNIVERSITY

- Zhihao Wang (2024-present), Master student at Peking University, China
- Dongxiu Liu (2024-present), Master student at Beijing University of Posts and Telecommunications, China
- Kexin Zheng (2024-2026), Undergraduate student at Chinese University of Hong Kong, China
- Peng Cheng (2021-present), PhD student at Beijing Jiaotong University, China
- Haoyi Niu (2021-2025), Master student at Tsinghua University, China (Current: PhD student at UC Berkeley, USA)
- Guanming Wang (2024), Undergraduate student at University College London, UK
- Liyuan Mao (2023-2024), PhD student at Shanghai Jiao Tong University, China
- Tianying Ji (2022-2024), PhD student at Tsinghua University, China
- Wenjia Zhang (2021-2024), PhD student at Tsinghua University, China
- Yu Luo (2022-2024), PhD student at Tsinghua University, China (Current: Research Scientist at Huawei)
- Xiangsen Wang (2022-2023), Master student at Beijing Jiaotong University, China (Current: Algorithm Engineer at Baidu)
- Weiye Xi (2021-2022), Undergraduate student at Tsinghua University, China (Current: PhD student at Columbia University, USA)
- Jiang Li (2021-2022), Master student at Tsinghua University (Current: PhD student at McGill University, Canada)
- Yiwen Qiu (2021-2022), Undergraduate student at Tsinghua University (Current: Master student at Carnegie Mellon University, USA)
- Yong Wang (2021), PhD student at Beijing Institute of Technology, China (Current: Postdoc at Hong Kong University, China)

### Supervised Interns
*2018 - 2021*

JD INTELLIGENT CITY RESEARCH

- Huilin Qin (2018-2021), PhD student at Xidian University, China (Current: Faculty at Beijing Normal University, China)
- Haoran Xu (2018-2021), Master student at Xidian University, China (Current: PhD student at UT Austin, USA)

### Supervised Interns
*2017*

MICROSOFT RESEARCH ASIA

- Huilin Qin (2017-2018), PhD student at Xidian University, China (Current: Faculty at Beijing Normal University, China)

### Supervised Exchange Undergraduate Students at Purdue
*2015*

LYLES SCHOOL OF CIVIL ENGINEERING, PURDUE UNIVERSITY

- Jingxing Wang (Jan. - Feb. 2015), from Tsinghua University, China
- Xiaodong Qian (Jun. - Sep. 2015), from Tsinghua University, China
- Victorial Mutran (Jul. - Aug. 2015), from Universidade do Estado do Pará, Brazil

## Membership & Affiliations

### Committee Member
*2018 - Present*

Technical Committee on Artificial Intelligence & Pattern Recognition of China Computer Federation (CCF-AI)

### Committee Member
*2021 - Present*

Executive Committee on Intelligent Vehicles of China Computer Federation (CCF)

**Member**                                                          *2024 - Present*
Association for Computing Machinery (ACM)

**Member**                                                          *2020 - Present*
Institute of Electrical and Electronics Engineers (IEEE)

**Member**                                                          *2018 - Present*
China Computer Federation (CCF)

**Co-chair**                                                          *2012 - 2014*
Tsinghua University Alumni Association of Purdue University