

# GUO Xusen, Ph.D. Candidate

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## Research Interests:

LLM Agents, Multi-Agent Cooperation, Urban Sensing, and Urban Simulation.

## Education


- 2023.09 – Now ■ **Ph.D., Intelligent Transportation, HKUST (Guangzhou)**  
Research Topics: *LLM-based multi-agent, ITS, Urban simulation, Urban sensing.*
- 2017.08 – 2020.07 ■ **Master, Computer Science, Sun Yat-Sen University**  
Thesis: *3D Streaming-based Object Detection and Tracking in Autonomous Driving.*
- 2013.08 – 2017.07 ■ **Bachelor, Material Chemistry, Sun Yat-Sen University**  
Thesis: *Molecular sieve structure prediction based on computer simulation.*

## Research Publications

### Journal Articles



- [1] X. Guo, Q. Zhang, J. Jiang, M. Peng, M. Zhu, and H. F. Yang, “Towards explainable traffic flow prediction with large language models,” *Communications in Transportation Research*, vol. 4, p. 100 150, 2024, ISSN: 2772-4247. [DOI: https://doi.org/10.1016/j.commtr.2024.100150](https://doi.org/10.1016/j.commtr.2024.100150).
- [2] X. Guo, X. Yang, M. Peng, H. Lu, M. Zhu, and H. Yang, “Automating traffic model enhancement with ai research agent,” *Transportation Research Part C: Emerging Technologies*, vol. 178, p. 105 187, 2025, ISSN: 0968-090X. [DOI: https://doi.org/10.1016/j.trc.2025.105187](https://doi.org/10.1016/j.trc.2025.105187).
- [3] M. Peng, X. Guo, X. Chen, K. Chen, M. Zhu, et al., “LC-LLM: Explainable lane-change intention and trajectory predictions with large language models,” *Communications in Transportation Research*, vol. 5, p. 100 170, 2025, ISSN: 2772-4247. [DOI: https://doi.org/10.1016/j.commtr.2025.100170](https://doi.org/10.1016/j.commtr.2025.100170).
- [4] M. Peng, K. Chen, X. Guo, Q. Zhang, H. Zhong, M. Zhu, et al., “Diffusion models for intelligent transportation systems: A survey,” *IEEE Transactions on Intelligent Transportation Systems*, vol. 26, no. 12, pp. 21 526–21 543, 2025. [DOI: 10.1109/TITS.2025.3613178](https://doi.org/10.1109/TITS.2025.3613178).
- [5] Z. Shi, X. Guo, H. Lu, M. Peng, et al., “Coordinated pandemic control with large language model agents as policymaking assistants,” *arXiv preprint arXiv:2601.09264*, 2026.
- [6] M. Peng, Y. Xie, X. Guo, R. Yao, H. Yang, and J. Ma, “Ld-scene: LLM-guided diffusion for controllable generation of adversarial safety-critical driving scenarios,” *Transportation Research Part C: Emerging Technologies*, 2026.
- [7] J. Hu, X. Guo, J. Chen, X. Liu, J. Qu, et al., “Zeolite LTA structure generation by coordination sequence and vertex symbol,” *Microporous and Mesoporous Materials*, vol. 298, p. 110 050, 2020, ISSN: 1387-1811. [DOI: https://doi.org/10.1016/j.micromeso.2020.110050](https://doi.org/10.1016/j.micromeso.2020.110050).
- [8] L. Cheng, N. Liu, X. Guo, Y. Shen, Z. Meng, K. Huang, et al., “A novel rain removal approach for outdoor dynamic vision sensor event videos,” *Frontiers in Neurorobotics*, vol. 16, p. 928 707, 2022.
- [9] R. Wang, D. Wang, D. Kang, X. Guo, C. Guo, et al., “An artificial intelligent platform for live cell identification and the detection of cross-contamination,” *Annals of Translational Medicine*, vol. 8, no. 11, p. 697, 2020.

### Conference Proceedings

- [1] **X. Guo**, M. Peng, H. Lu, H. Yang, J. Ma, and Y. Liang, “Agentsense: LLMs empower generalizable and explainable web-based participatory urban sensing,” in *arXiv preprint arXiv:2603.24014. ACL 2026 (under review)*.
- [2] **X. Guo**, M. Peng, X. Hao, X. Zou, Y. Liang, et al., “Agentsense: LLMs empower generalizable and explainable web-based participatory urban sensing,” in *The ACM Web Conference (WWW)*, 2026.
- [3] X. Hao, G. Li, D. Wu, **X. Guo**, Y. Liang, et al., “Enhancing ride-hailing forecasting at didi with multi-view geospatial representation learning from the web,” in *The ACM Web Conference (WWW)*, 2026.
- [4] **X. Guo**, M. Peng, X. Hao, X. Zou, Y. Liang, et al., “Towards responsible and explainable traffic flow prediction with large language models,” in *Transportation Research Board, (Oral)*, 2025.
- [5] M. Peng, R. Yao, **X. Guo**, Y. Xie, X. Chen, and J. Ma, “Safety-critical traffic simulation with guided latent diffusion model,” in *2025 IEEE 29th International Conference on Intelligent Transportation Systems (ITSC). IEEE*, 2025.
- [6] M. Peng, R. Yao, **X. Guo**, and J. Ma, “Nuplan-r: A closed-loop planning benchmark for autonomous driving via reactive multi-agent simulation,” 2026.
- [7] **X. Guo**, J. Gu, S. Guo, Z. Xu, H. Kai, et al., “3d object detection and tracking based on streaming data,” in *2020 IEEE International Conference on Robotics and Automation (ICRA)*, 2020, pp. 8376–8382.  DOI: 10.1109/ICRA40945.2020.9197183.







## Industrial Experience

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- 2023.05 – 2023.08  **Banma.ai**. Senior Perception Algorithm Engineer, responsible for developing and deploying obstacle perception algorithms for *Autonomous Parking Assistance systems*, including leading the development of fisheye-based obstacle detection models with BEV projection and optimizing them for real-time deployment on onboard chips with ultra-low resource consumption (10 FLOPs).
- 2020.09 – 2023.05  **Waytous Technology**. Perception Algorithm Engineer, responsible for developing vehicle-road cooperative perception algorithms for mining scenarios, including designing a unified *vehicle-road-cloud post-fusion framework* with hot-swapping capability, developing real-time *roadside perception algorithms* (object detection, tracking, and trajectory prediction), building an integrated training and deployment platform that improved 3D detection accuracy from 84.6% to 96.2% at 50Hz, and implementing a LIDAR-based truck *load measurement system* with 98.6% accuracy.

## Awards and Achievements

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- 2026  *ACM SpatialDI 2026 Outstanding Academic Poster Award.*
- 2017-2019  *Second-level Excellent Graduate Student Scholarship, Sun Yat-Sen University.*
- 2018  *AIIA Cup: Medical Artificial Intelligence Challenge First Prize.*
- 2017  *Graduate Student Recommended Exemption, Sun Yat-Sen University.*
- 2016  *First Prize of Undergraduate Research Competition, Sun Yat-Sen University.*
- 2014-2016  *Second-level Excellent Student Scholarship, Sun Yat-Sen University.*