

# Baoshen Guo

**Email:** guobaoshen@seu.edu.cn

**URL:** baoshenguo.com

**Advisor:** Shuai Wang

**Address:** 305-McConnell Engineering Building, McGill

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## BIOGRAPHY & RESEARCH INTERESTS

- I am a final-year Ph.D. student at Southeast University, under the supervision of Prof. Shuai Wang. I am also working with Prof. Desheng Zhang and Prof. Tian He in research.
- From May, 2023, I am a visiting student and a Graduate Research Trainee at Cyber-Physical Lab, McGill University, under supervision of Prof. Xue (Steve) Liu.
- *Research Interests:* I am interested in integrating human knowledge and mobility behaviors into the Multi-agent Reinforcement Learning framework to improve the safety, robustness, and efficiency of decision-making processes in urban logistics and smart cities.
- *Research Goal:* My long-term research goal is to build **Robust, Interpretable, Safe, and Efficient (RISE)** decision-making technologies and AI model for real-world systems (e.g., Urban logistics and Transportation).
- *Industrial Experience:* Two years of research internship experience to deploy data-driven learning-based sensing and decision-making models at Alibaba and JD Logistics (hosted by Tian He and Desheng Zhang).

## EDUCATION

McGill University, Canada Visiting Student & <i>Graduate Research Trainee</i>	May, 2023 - present
Southeast University, China Ph.D. in Computer Science	Sep. 2020 - present
Southeast University, China Master of Computer Science	Sep. 2019 - Jun. 2020
Southeast University, China Bachelor of Computer Science and Engineering	Sep. 2015 - Jun. 2019 <i>with Outstanding Thesis Award</i>

## HONORS & AWARDS

- Outstanding Paper Award, IEEE RTSS, 2021
- Best Student Paper Award of ICA3PP, 2023
- Distinguish Paper Award for WePos, IoT Committee of Chinese Institute of Electronics, 2023.
- China National Doctoral Scholarship, 2023
- Education Foundation Scholarship of Southeast University, 2022
- Outstanding Thesis Award, Southeast University, 2019
- KDD 2024 Student Travel Award, 2024

## SELECTED PUBLICATIONS

### Conference Papers

- [C1] **Baoshen Guo**, Xining Song, Shuai Wang, Wei Gong, Tian He, Xue Liu.  
**KDD'24** *Multi-task Conditional Attention Network for Conversion Prediction in Logistics Advertising*  
 In 30th ACM SIGKDD Conference on Knowledge Discovery and Data Mining
- [C2] **Baoshen Guo**, Shuai Wang, Haotian Wang, Yunhuai Liu, Fanshuo Kong, Desheng Zhang, Tian He.  
**KDD'23** *Towards Equitable Assignment: Data-Driven Delivery Zone Partition at Last-mile Logistics*  
 In 29th ACM SIGKDD Conference on Knowledge Discovery and Data Mining
- [C3] **Baoshen Guo**, Shuai Wang, Yi Ding, Guang Wang, Suining He, Desheng Zhang, Tian He.  
**RTSS'21** *Concurrent Order Dispatch for Instant Delivery with Time-Constrained Actor-Critic Reinforcement Learning*  
 In IEEE Real-Time Systems Symposium **Outstanding Paper Award**
- [C4] **Baoshen Guo**, Weijian Zuo, Shuai Wang, Yi Ding, Tian He, Desheng Zhang.  
**UbiComp'22** *WePos: Weak-supervised Indoor Positioning with Unlabeled WiFi for On-demand Delivery*  
 In ACM International Joint Conference on Pervasive & Ubiquitous Computing
- [C5] **Baoshen Guo**, Weijian Zuo, Shuai Wang, Xiaolei Zhou, Tian He.  
**ICA3PP'23** *Attention Enhanced Package Pick-up Time Prediction via Heterogeneous Behavior Modeling*  
 IEEE ICA3PP 2023 **Best Student Paper Award**
- [C6] Lin Jiang, Shuai Wang, **Baoshen Guo**, Hai Wang, Desheng Zhang, Guang Wang.  
**KDD'23** *FairCod: A Fairness-aware Concurrent Dispatch System for Large-scale Instant Delivery Services*  
 In 29th ACM SIGKDD Conference on Knowledge Discovery and Data Mining
- [C7] Yi Ding, **Baoshen Guo**, Lin Zheng, M. Lu, Desheng Zhang, S. Wang, Sang H. Son, Tian He.  
**UbiComp'21** *A City-Wide Crowdsourcing Delivery System with Reinforcement Learning*  
 In ACM International Joint Conference on Pervasive & Ubiquitous Computing
- [C8] Hai Wang, **Baoshen Guo**, Shuai Wang, Tian He, Desheng Zhang.  
**UbiComp'21** *CSMC: Cellular Signal Map Construction via Mobile Crowdsensing*  
 In ACM International Joint Conference on Pervasive & Ubiquitous Computing
- [C9] Shuai Wang, Junke Lu, **Baoshen Guo**, Zheng Dong.  
**KDD'22** *RT-VeD: Real-Time VoI Detection on Edge Nodes with an Adaptive Selection Framework*  
 In 28th ACM SIGKDD Conference on Knowledge Discovery and Data Mining
- [C10] Hua Yan, Shuai Wang, Yu Yang, **Baoshen Guo**, Tian He, Desheng Zhang.  
**ICDE'22** *O<sup>2</sup>-SiteRec: Store Site Recommendation under the O2O Model via Multi-graph Attention Networks*  
 In IEEE 37th International Conference on Data Engineering (ICDE)
- [C11] Wenjun Lyu, Kexin Zhang, **Baoshen Guo**, Desheng Zhang, et al.  
**CIKM'22** *Towards Fair Workload Assessment via Homogeneous Order Grouping in Last-mile Delivery*
- [C12] Zhiqing Hong, Guang Wang, Wenjun Lyu, **Baoshen Guo**, Desheng Zhang, et al.  
**Sigspatial'22** *CoMiner: Nationwide Behavior-driven Unsupervised Spatial Coordinate Mining from Uncertain Delivery Events*

**Journal Article**

- [J1]            Zhiqing Hong, Guang Wang, Wenjun Lyu, **Baoshen Guo**, Yi Ding, Haotian Wang, Shuai Wang, Yunhuai Liu, Desheng Zhang.  
**TKDE'24**        *Nationwide Behavior-Aware Coordinates Mining from Uncertain Delivery Events.*
- [J2]            Shuai Wang<sup>§</sup>, **Baoshen Guo**<sup>\*§</sup>, Yi Ding, Guang Wang, Suining He, Desheng Zhang, Tian He.  
**TMC'23**        *Time-Constrained Actor-Critic Reinforcement Learning for Concurrent Order Dispatch in On-demand Delivery.* \* **Corresponding Author**, <sup>§</sup> **Equal Contribution**
- [J3]            Shuai Wang, Shijie Hu, **Baoshen Guo**<sup>\*</sup>, Guang Wang.  
**TBD'23**        *Cross-Region Courier Displacement for On-Demand Delivery With Multi-Agent Reinforcement Learning.* \* **Corresponding Author**
- [J4]            Zhiyuan Zhou, Xiaolei Zhou, **Baoshen Guo**, Shuai Wang, Tian He.  
**TOSN'24**        *Multi-sensor Data-driven Route Prediction in Instant Delivery with a 3-Conversion Network.*

**RESEARCH EXPERIENCE**

- Designed learning-based human behavior modeling algorithms to extract human operation patterns in Community Group Purchase services and conduct order tasks grouping and allocation under demand uncertainty.
- Designed data-driven road partition system to optimize package pickup and delivery process in JD logistics. We evaluated the system with citywide order data and deployed it to the real-world delivery road Management System of JD Logistics to evaluate the effectiveness of our design.
- *Reinforcement Learning based Concurrent Order Dispatch for the Instant Delivery Service (Eleme)*: We model the *concurrent* order dispatch as a sequential decision-making problem. A time-constrained actor-critic-based order dispatch system (*TCAC [RTSS'21]*) is designed considering the spatial-temporal distribution of supplies and demands, delivery deadline, couriers' uncertain route choices, and contextual factors. We evaluated the dispatch and prediction algorithms with real-world data from 36 million orders and 42,000 couriers.
- Designed learning algorithms to conduct merchant-level positioning for couriers leveraging massive unlabeled WiFi data, where the locations of WiFi APs are unknown. We design an end-to-end weak-supervised representation learning-based positioning framework to infer real-time couriers' merchant-level positions.

**PROFESSIONAL ACTIVITIES****PC member & Reviewer**

- KDD 2024, WWW 2024; WWW 2024-industry track; AAAI 2024; KDD 2023; IEEE ICPADS 2021
- IMWUT 2022, 2023, 2024; TOSN; TON; Computer Communications

**Teaching Assistant**

- Database Principles (**Rennes Graduate school of Southeast University, 2019 Fall**)