

Junhui GAO

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Research Interest

Big Data, Robotics, Machine Learning, Crowdsensing, and Crowd Intelligent Cooperation with Human and Robots.

Education & Research Experience

Northwestern Polytechnical University, Xi'an, China

July 2023 – Present

Research Assistant in School of Computer Science

Research Fields:

- Big Data
- Robotics
- Machine Learning
- Crowdsourcing Applications in Intelligent Transportation and Logistics

Northwestern Polytechnical University, Xi'an, China

September 2019 – July 2023

B.E. in Computer Science and Technology (CS Ranking: TOP 1% in China, 43 in the world (ARWU))

- Grade Point Average (GPA): 3.541/4.1
- Average Score: 87.23/100
- IELTS: 7.0 in August 2024

Research Papers

I am the **first author** of papers [1],[3]-[6] and the **co-primary author** of paper [2].

[1] **Junhui Gao** et al., “Cooperative Air-Ground Instant Delivery by UAVs and Crowdsourced Taxi,” IEEE International Conference on Data Engineering (ICDE, CCF-A) 2024, DOI: 10.1109/ICDE60146.2024.00120.

- *Collaborative delivery by UAVs and taxis.*
- *A data-driven collaborative delivery strategy is designed.*
- *A neural network model is built to predict potential delivery requirements.*

[2] Yan Pan*, **Junhui Gao*** et al., “Pioneering Cooperative Air-Ground Instant Delivery using UAVs and Crowdsourced Couriers,” ACM Ubicomp/IMWUT (CCF-A), Accepted.

- *UAVs and crowdsourced couriers cooperate for instant delivery.*
- *Courier delivery preference model and UAV delivery are designed and guide the courier recruitment strategy.*
- *A data-driven algorithm is designed to dispatch the instant deliveries.*

*: The authors contribute equally

[3] **Junhui Gao** et al., “Towards Efficient Urban Emergency Response Using UAVs Riding Crowdsourced Buses,” IEEE Internet of Things Journal (JCR Q1), 2024. DOI: 10.1109/JIOT.2024.3382120.

- *A bus-UAV cooperation model is designed to complete urban emergency response.*
- *Two kinds of coverage paradigms of UAV are proposed.*
- *A neural network prediction model is built to predict potential urban emergencies.*
- *This paper is the extension of the MobiCom poster.*

[4] **Junhui Gao** et al., “Sharing Instant Delivery UAVs for Crowdsensing: A Data-Driven Performance Study,” Computers & Industrial Engineering (JCR Q1), 2024. DOI: 10.1016/j.cie.2024.110100.

- *UAVs are shared to complete instant delivery and crowdsensing tasks.*
- *Two data-driven algorithms are proposed to navigate UAVs for different crowdsensing tasks.*
- *A SVM model is built to predict urban stochastic events.*
- *This paper is the extension of the ICNP poster.*

[5] **Junhui Gao** et al., “Poster: Leveraging public buses to relay UAVs for on-demand applications,” ACM MobiCom (CCF-A), 2022. DOI: 10.1145/3495243.3558279.

- *In order to improve the response performance of on-demand applications like accidents in the city and reduce the response delay, we propose a multi-UAV model mounted on the bus to respond to the on-demand applications.*
- *Using a large-scale bus trajectory data collected from more than 13,000 buses.*
- *Optimizing the response performance by sampling-based UAV navigation algorithm and greedy buses determined algorithm.*

[6] **Junhui Gao** et al., "Poster: Data-Driven Studies of UAV-sharing in Parcel Delivery and Surveillance," IEEE International Conference on Network Protocols (ICNP, CCF-B), 2022. DOI: 10.1109/ICNP55882.2022.9940417.

- *UAVs are now widely used for a variety of tasks, we combine the applications of the UAVs in delivery and surveillance, and then propose a UAV-sharing system.*
- *Using a large-scale delivery data-set collected in Shanghai by Alibaba.*
- *Response delay and response probability are optimized.*

Research Project

**Provincial College Students' Innovative Entrepreneurial
Training Project in Shaanxi Province**

May 2022-May 2023

Title: Prediction and response to emergency events in smart cities based on occurrence patterns.

Position: Principal Investigator

Grant No.: S202210699671

- *A neural network model is established to predict emergency events.*
- *A reinforcement learning model is established to schedule UAVs to respond the emergency events.*

Awards

- Outstanding Undergraduate of Northwestern Polytechnical University (2020)
- Second Prize Scholarship of Northwestern Polytechnical University (2020)
- Second Prize of the NWPU Press Cup Mathematical Modeling Competition (2021)