Zhengqiu Zhu

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Zhengqiu Zhu is an assistant professor at College of Systems Engineering, National University of Defense Technology (NUDT). He received his Ph.D. from the Crowd Computing and Simulation Intelligence group of NUDT in 2023. He was also a visiting Ph.D. student with the research group of Multiscale Networked Systems, University of Amsterdam, The Netherlands for two years. Zhengqiu is interested in developing novel crowd-based sensing and computing techniques, focusing on spatial crowdsensing, embodied intelligence and human-centered AI. His research also contributes to autonomous sourcing seeking methods by UAVs and UGVs, especially in the context of urban management.

Research

Crowd Computing, Embodied Intelligence, Task Assignment, Human-Centered AI

Education

University of Amsterdam, Visiting PhD, Computer Science — 2020.02 - 2022.02
Research: Crowd Computing, Task Allocation, Data Fusion — Amsterdam, The Netherland

National University of Defense Technology, PhD, Management Science and Technology — 2018.12 - 2023.06
Research: Crowdsensing, Crowd Computing, Task Planning — Changsha, China

National University of Defense Technology, MSc, Control Science and Technology — 2016.09 - 2018.12
Research: Modeling and Simulation, Intelligent Decision-Making, Emergency Management — Changsha, China

National University of Defense Technology, Bachelor of Engineering — 2012.09 - 2016.06
Simulation Engineering — Changsha, China

Activities

Organization:

- **Cover Contributor of The Innovation**: Volume 4 Issue 6 (No.3), Volume 4 Issue 2 (No.6), Volume 3 Issue 5 (No.1), Volume 3 Issue 4 (No.13)
- Publicity chair: Annual Meeting of the Artificial Society Special Committee (2023, 2021, 2019)
- Sub-forum Chair: 34th China Simulation Conference (China Simulation Conference 2022)
- Local chair of CCLD: China Conference on Large Foundation Model and Decision Intelligence (CCLD 2024)

Conference Presentations: ICWE 2024, Parallel Intelligence Conference 2023, China Simulation Conference 2023, EMGIS 2020, EMGIS 2018/2017, Asia Simulation Conference 2016, etc.

Journal/Conference Reviewer: The Innovation, IEEE Transactions on Intelligent Vehicles, IEEE Transactions on Computational Social Systems, IEEE Transactions on Parallel and Distributed Systems, IEEE Transactions on Vehicular Technology, Information Sciences, Energy, WWW, EMGIS

Teaching

- 2020, 2021, 2022 NUDT Master's Course - Simulation Seminar (guest lectures)
- 2023 NUDT Undergraduate Course – System Simulation (teaching assistant)
- Bachelor Dissertations:
  - Research on Hazardous Gas Leak Source Tracing Methods Based on Mobile Sensors, 2019.
  - Research on Active Source Localization Methods in Complex Urban Environments, 2020.
  - Simulation of infectious disease spread in large transportation hubs based on complex dynamic spatial-temporal networks, 2022.
- Master Dissertations:
  - Source Term Estimation Methods Research of Hazardous Gas based on Neural Network and Optimization Algorithms, 2020.
  - Research on Patrolling Method of Chemical Cluster Based on Game Theory, 2020.
  - Research on autonomous source searching under weak-sensing condition, 2021.

- Research on Simulation of Large-scale Disease Spread and Evaluation of Mitigation Strategies Based on Geographic Information, 2021.
- Active source searching methods in the unknown scenario, 2022.

Selected Publications (since 2020)

- Runkang Guo, Bin Chen, Qi Zhang, Yong Zhao, Xiao Wang, and **Zhengqiu Zhu**†. Data-driven Crowd Simulation Framework Integrating Physics-informed Machine Learning with Navigation Potential Fields, IEEE Transaction on Computational Social Systems, Under Review. *(†corresponding)*
- **Zhengqiu Zhu**, Yong Zhao, Sihang Qiu, et al. Conversational Crowdsensing in the Age of Industry 5.0: A Parallel Intelligence and Large Models Powered Novel Sensing Approach. IEEE Transaction on Computational Social Systems, 2024.
- **Zhengqiu Zhu**, Yatai Ji, Sihang Qiu, et al. A Prototype Design of LLM-Based Autonomous Web Crowdsensing. ICWE 2024.
- Yong Zhao*, **Zhengqiu Zhu***, Bin Chen*, Sihang Qiu*, et al. Towards parallel intelligence: An interdisciplinary solution for complex systems. **The Innovation, 2023**. *(*equal contribution, Cover Paper)*
- Yong Zhao, Cong Hu, **Zhengqiu Zhu**, et al. Crowd sensing intelligence for ITS: Participants, methods, and stages. IEEE Transactions on Intelligent Vehicles, 2023.
- Yong Zhao, **Zhengqiu Zhu**†, Bin Chen. Cost-Quality Aware Compressive Mobile Crowdsensing. Springer Book, 2023. *(†corresponding)*
- Runkang Ruo, Bin Chen, **Zhengqiu Zhu**†, et al. Simulation of COVID-19 outbreak in Nanjing Lukou airport based on complex dynamical networks. Complex System Modeling and Simulation *(†corresponding)*
- Yong Zhao, **Zhengqiu Zhu**, Bin Chen, Sihang Qiu. Leveraging Human-AI Collaboration in Crowd-Powered Source Search: A Preliminary Study. Journal of Social Computing, 2023.
- **Zhengqiu Zhu**, Xiao Wang, Yong Zhao, et al. Crowdsensing intelligence by decentralized autonomous vehicles organizations and operations. IEEE Transactions on Intelligent Vehicles, 2022.
- **Zhengqiu Zhu**, Yong Zhao, Bin Chen, et al. A crowd-aided vehicular hybrid sensing framework for intelligent transportation systems. IEEE Transactions on Intelligent Vehicles, 2022.
- Yong Zhao, **Zhengqiu Zhu**, Bin Chen, Sihang Qiu. Crowd-powered source searching in complex environments. Chinese CSCW 2022. *(Best student Paper)*
- **Zhengqiu Zhu**, Bin Chen, Hailiang Chen, et al. Strategy Evaluation and Optimization with an Artificial Society towards a Pareto Optimum. **The Innovation, 2022**. *(Cover Paper)*
- **Zhengqiu Zhu**, Chuan Ai, Hailiang Chen, et al. Understanding the necessity and economic benefits of lockdown measures to contain COVID-19. IEEE Transactions on Computational Social Systems, 2022.
- Yatai Ji, Yong Zhao, Bin Chen, **Zhengqiu Zhu**, et al. Source searching in unknown obstructed environments through source estimation, target determination, and path planning. Building and Environment, 2022.
- Yong Zhao*, Bin Chen*, Xianghan Wang*, **Zhengqiu Zhu***, et al. A deep reinforcement learning based searching method for source localization. Information Sciences, 2022. *(*equal contribution)*
- Hailiang Chen*, **Zhengqiu Zhu***, Chuan Ai*, et al. Evaluating the mitigation strategies of COVID-19 by the application of the CO2 emission data through high-resolution agent-based computational experiments. Environmental Research, 2022. *(*equal contribution)*
- **Zhengqiu Zhu**, Bin Chen, Yong Zhao, Yatai Ji. Multi-sensing paradigm based urban air quality monitoring and hazardous gas source analyzing: a review. Journal of safety science and resilience, 2021.
- Feiran Chen, Bin Chen, **Zhengqiu Zhu**, et al. An extended area-partition-involved collaborative patrolling game in chemical clusters considering attackers' bounded rationality and parameter uncertainty. Process Safety and Environmental Protection, 2021.
- Feiran Chen, Bin Chen, **Zhengqiu Zhu**, et al. A cost-beneficial area-partition-involved collaborative patrolling game in a large-scale chemical cluster. Process Safety and Environmental Protection, 2021.
- Yong Zhao, Bin Chen, **Zhengqiu Zhu**, et al. Searching the diffusive source in an unknown obstructed environment by cognitive strategies with forbidden areas, Building and Environment, 2020.
- **Zhengqiu Zhu**, Bin Chen, Yong Zhao. A cost aware crowdsensing approach for urban air quality sensing and computing. Proceedings of the 6th ACM SIGSPATIAL International Workshop on EMGIS 2020.
- Yong Zhao, Bin Chen, **Zhenqqiu Zhu**, et al. Entrotaxis-Jump as a hybrid search algorithm for seeking an unknown emission source in a large-scale area with road network constraint. Expert Systems with Applications, 2020.
- **Zhengqiu Zhu**, Bin Chen, Wenbin Liu, et al. A cost-quality beneficial cell selection approach for sparse mobile crowdsensing with diverse sensing costs. IEEE Internet of Things Journal, 2020.