

# Wenhan Wu

**Date of birth:** May 11, 1998

**Nationality:** Chinese

**Current position:** Fifth-year Ph.D. student

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## Education Background

2015/09-2019/06	<b>Central South University (CSU), School of Automation</b> <i>Bachelor Degree in Engineering</i> Average score: 92.97/100 (TOP 0.5%) Supervisor: <b>Prof. Keke Huang</b>	Changsha, China
Since 2019/08	<b>Tsinghua University (THU), Department of Automation</b> <i>Ph.D. student in Control Science and Engineering</i> GPA: 3.85/4.00 (TOP 10%) Supervisor: <b>Prof. Xiaoping Zheng</b>	Beijing, China
Since 2023/04	<b>Humboldt-Universität zu Berlin (HUB), Department of Biology</b> <i>Joint Ph.D. student in Theoretical Biology</i> Supervisor: <b>Prof. Pawel Romanczuk</b>	Berlin, Germany

## Research Interests

- Network Science:** Reconstructing the potential structure of complex networks  
(2018-2019, Part of the **Bachelor Thesis**, under the supervision of **Prof. Keke Huang**)
- Crowd Evacuation:** Simulating the evacuation process of heterogenous individuals  
(2019-2021, Part of the **Ph.D. Thesis**, under the supervision of **Prof. Xiaoping Zheng**)
- Pedestrian Subgroup:** Modeling the movement behavior of pedestrian subgroups  
(2020-2023, Part of the **Ph.D. Thesis**, under the supervision of **Prof. Xiaoping Zheng**)
- Decision Making:** Exploring the decision making of subgroups when facing obstacles  
(2022-2023, Part of the **Ph.D. Thesis**, under the supervision of **Prof. Xiaoping Zheng**)
- Behavioral Contagion:** Studying the behavioral contagion of fish groups during startle cascades  
(Since 2023, **Joint Ph.D. research**, under the supervision of **Prof. Pawel Romanczuk**)
- Collective behavior:** Analyzing the self-organization of pedestrian random walk in corridors  
(Since 2022, **Collaborative research**, under the supervision of **Prof. Guy Theraulaz** and **Prof. Clément Sire**)

## Research Publications

- Wenhan Wu<sup>#</sup>**, Maoyin Chen, Jinghai Li, Binglu Liu, Xiaoping Zheng\*. An Extended Social Force Model via Pedestrian Heterogeneity Affecting the Self-driven Force. *IEEE Transactions on Intelligent Transportation Systems*, 2021, 23(7): 7974-7986. (Impact Factor = 8.5, ICR Q1, First author)
- Wenhan Wu<sup>#</sup>**, Jinghai Li, Wenfeng Yi, Xiaoping Zheng\*. Modeling Crowd Evacuation via Behavioral Heterogeneity-Based Social Force Model. *IEEE Transactions on Intelligent Transportation Systems*, 2022, 23(9): 15476-15486. (Impact Factor = 8.5, ICR Q1, First author)
- Wenhan Wu<sup>#</sup>**, Xiaoping Zheng\*. A Systematic Analysis of Subgroup Research in Pedestrian and Evacuation Dynamics. *IEEE Transactions on Intelligent Transportation Systems*, 2023, 25(2): 1225-1246. (Impact Factor =

### 8.5, ICR Q1, First author)

4. **Wenhan Wu**<sup>#</sup>, Wenfeng Yi, Xiaolu Wang, Erhui Wang, Xiaoping Zheng\*. Experimental study on the decision-making and motion behavior of subgroups when facing a static obstacle during movement. *Expert Systems with Applications*, 2023, 242: 122761. (Impact Factor = 8.5, ICR Q1, First author)
5. **Wenhan Wu**<sup>#</sup>, Wenfeng Yi, Xiaolu Wang, Xiaoping Zheng\*. A Force-based Model for Adaptively Controlling the Spatial Configuration of Pedestrian Subgroups at Non-extreme Densities. *Transportation Research Part C: Emerging Technologies*, 2023, 152: 104154. (Impact Factor = 8.3, ICR Q1, First author)
6. **Wenhan Wu**<sup>#</sup>, Wenfeng Yi, Jinghai Li, Maoyin Chen, Xiaoping Zheng\*. Automatic Identification of Human Subgroups in Time-Dependent Pedestrian Flow Networks. *IEEE Transactions on Multimedia*, 2023, 26: 166-177. (Impact Factor = 7.3, ICR Q1, First author)
7. Xiaoping Zheng<sup>#</sup>, **Wenhan Wu**<sup>#</sup>, Wenfeng Deng, Chunhua Yang, Keke Huang\*. Reconstruction of Tree Network via Evolutionary Game Data Analysis. *IEEE Transactions on Cybernetics*, 2020, 52(7): 6083-6094. (Impact Factor = 11.8, ICR Q1, Co-first author)
8. **Wenhan Wu**<sup>#</sup>, Wenfeng Yi, Jinghai Li, Maoyin Chen, Xiaoping Zheng\*. Simulating the Evacuation Process Involving Multitype Disabled Pedestrians. *IEEE Transactions on Computational Social Systems*, 2022, 10(5): 2400-2410. (Impact Factor = 5.0, ICR Q1, First author)
9. **Wenhan Wu**<sup>#</sup>, Maoyin Chen, Jinghai Li, Binglu Liu, Xiaolu Wang, Xiaoping Zheng\*. Visual Information-Based Social Force Model for Crowd Evacuation. *Tsinghua Science and Technology*, 2021, 27(3): 619-629. (Impact Factor = 6.6, ICR Q1, First author)
10. Wenfeng Yi<sup>#</sup>, **Wenhan Wu**, Xiaolu Wang, Xiaoping Zheng\*. Modeling the Mutual Anticipation in Human Crowds With Attention Distractions. *IEEE Transactions on Intelligent Transportation Systems*, 2023, 24(9): 10108-10117. (Impact Factor = 8.5, ICR Q1, Second author)
11. Wenfeng Yi<sup>#</sup>, **Wenhan Wu**, Jinghai Li, Xiaolu Wang, Xiaoping Zheng\*. An extended queueing model based on vision and morality for crowd evacuation. *Physica A: Statistical Mechanics and its Applications*, 2022, 604: 127658. (Impact Factor = 3.3, ICR Q2, Second author)
12. Jinghai Li<sup>#</sup>, Maoyin Chen, **Wenhan Wu**, Binglu Liu, Xiaoping Zheng\*. Height map-based social force model for stairway evacuation. *Safety Science*, 2021, 133: 105027. (Impact Factor = 6.1, ICR Q1, Third author)
13. Wenfeng Deng<sup>#</sup>, Chunhua Yang, Keke Huang\*, **Wenhan Wu**. A two-stage reconstruction method for complex networked system with hidden nodes. *Chaos: An Interdisciplinary Journal of Nonlinear Science*, 2022, 32(5): 053105. (Impact Factor = 2.9, ICR Q1, Fourth author)

## Award and Honors

1.	2016/12 & 2018/12	<b>National Scholarship</b> for Undergraduate Students (×2)
2.	2016/10 & 2017/10 & 2018/10	<b>Premium Scholarship</b> for Academic Year (×3)
3.	2022/12	<b>National Scholarship</b> for Doctoral Students (×1)
4.	2021/10 & 2023/10	Comprehensive <b>First Prize Scholarship</b> (×2)

## Research Skills

1.	Research Software	<b>MATLAB/Simulink</b> , Eclipse, PyCharm, <b>VS Code</b>
2.	Programming Code	<b>MATLAB</b> , <b>Python</b> , C/C++, R, <b>LaTeX</b>
3.	Operating System (OS)	<b>Windows</b> , Linux
4.	Language Skill	Chinese (Native language), <b>English</b>