Dr. Wenhan Wu

Gender: Male
Nationality: Chinese
Date of birth: May 11, 1998
Current position: Postdoctoral Fellow
E-mail: wenhanwu@mit.edu
Website: https://wenhanwu1998.github.io/

Employment

2025/03-present	**Massachusetts Institute of Technology (MIT), Senseable City Lab** *Postdoctoral Fellow* *Supervisor:* ***Paolo Santi and Fábio Duarte***	Dubai, UAE Boston, USA

Education Background

2015/09-2019/06	**Central South University (CSU), School of Automation** *Bachelor of Engineering* *Average Score: 92.97/100 (TOP 0.5%)* *Supervisor:* ***Prof. Keke Huang***	Changsha, China
2019/09-2024/12	**Tsinghua University (THU), Department of Automation** *Doctor of Philosophy in Engineering* *GPA: 3.86/4.00 (TOP 10%)* *Supervisor:* ***Prof. Xiaoping Zheng***	Beijing, China
2023/04-2024/04	**Humboldt-Universität zu Berlin (HUB), Department of Biology** *Joint PhD Student in Collective Information Processing Lab* *Supervisor:* ***Prof. Pawel Romanczuk***	Berlin, Germany

Research Publications

Total Journal Articles (24): As First# & Corresponding* Author (17) and Other Author (7)

Topic 1: Modeling of Heterogeneous Individuals in Crowd Evacuation

1. **Wenhan Wu**#, 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.
2. **Wenhan Wu**#, 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.
3. **Wenhan Wu**#, 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.

Topic 2: Identification, Laws, Modeling and Experiments of Human Subgroups

4. Jingwei Ge#, **Wenhan Wu***. How subgroups affect the power law governing pedestrian avoidance interactions, 2025, (Under Review).
5. Wenfeng Yi#, **Wenhan Wu***. Higher-Order Social Networks and Order Transitions in Evacuation: A Hypergraph Emotion–Motion Framework, 2025, (Under Review).
6. **Wenhan Wu**#, Wenfeng Yi, Erhui Wang, Xiaolu Wang, Xiaoping Zheng*. How Social Attributes Affect the Movement Process of Subgroups When Facing a Static Obstacle. ***IEEE Transactions on Computational Social Systems***, 2024, 12(2): 658-670.
7. **Wenhan Wu**#, 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.

8. **Wenhan Wu**#, Wenfeng Yi, Xiaolu Wang, Erhui Wang, Xiaoping Zheng*. A Vision-driven Model Based on Cognitive Heuristics for Simulating Subgroup Behaviors During Evacuation. ***IEEE Transactions on Intelligent Transportation Systems***, 2024, 25(11): 16048-16058.
9. **Wenhan Wu**#, 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.
10. **Wenhan Wu**#, 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.
11. **Wenhan Wu**#, Xiaoping Zheng*. A Systematic Analysis of Subgroup Research in Pedestrian and Evacuation Dynamics. ***IEEE Transactions on Intelligent Transportation Systems***, 2023, 25(2): 1225-1246.

Topic 3: Behavioral Contagion Process in Animal Groups and Human Crowds

12. **Wenhan Wu**#, Wenfeng Yi*. How Interaction Neighborhoods Affect Crowd Behavior in Panic Evacuation: From Individualistic to Herding, 2025, (Under Review)
13. **Wenhan Wu**#, Wenfeng Yi*. Modeling the dynamical process of behavioral contagion in human crowds during evacuation. ***Reliability Engineering & System Safety***, 2025, 266: 111649.
14. **Wenhan Wu**#, Xiaoping Zheng*, Pawel Romanczuk*. Escape cascades as a behavioral contagion process with adaptive network dynamics. ***Physical Review Research***, 2025, 7: 013300.
15. **Wenhan Wu**#, 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.

Topic 4: Phase Transition from Disorder to Order in Crowd Evacuation

16. Wenfeng Yi#, **Wenhan Wu***. Control strategies for order-disorder phase transition in crowd evacuation. ***Reliability Engineering & System Safety***, 2025, 266: 111688.
17. Wenfeng Yi#, **Wenhan Wu**, Xiaolu Wang, Xiaoping Zheng*. Phase Transitions in Pedestrian Evacuation: A Dynamic Modeling With Small-World Networks. ***IEEE Transactions on Intelligent Transportation Systems***, 2024, 25(11): 18025-18037.
18. Wenfeng Yi#, **Wenhan Wu**, Xiaolu Wang, Erhui Wang, Xiaoping Zheng*. Order–disorder phase transitions in front of the exit during human crowd evacuations. ***Transportation Research Part C: Emerging Technologies***, 2024, 163: 104649.
19. Wenfeng Yi#, **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.
20. Wenfeng Yi#, **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.

Topic 5: Other Topics (Complex Network, Stairway Evacuation, Swarm Robotics)

21. Wenfeng Yi#, **Wenhan Wu**, Maoyin Chen, Xiaoping Zheng*. Human Morality Difference when Programming and Actually Operating Autonomous Machines. ***Tsinghua Science and Technology***, 2025, 30(4): 1648-1658.
22. Wenfeng Deng#, 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.

23. Jinghai Li#, Maoyin Chen, **Wenhan Wu**, Binglu Liu, Xiaoping Zheng*. Height map-based social force model for stairway evacuation. ***Safety Science***, 2021, 133: 105027.
24. Xiaoping Zheng#, **Wenhan Wu**#, Wenfeng Deng, Chunhua Yang, Keke Huang*. Reconstruction of Tree Network via Evolutionary Game Data Analysis. ***IEEE Transactions on Cybernetics***, 2020, 52(7): 6083-6094.

Award and Honors

1.	2016/12 & 2018/12	**National Scholarship** for Undergraduate Students, Central South University
2.	2016/10 & 2017/10 & 2018/10	Academic Excellence Scholarship (**Grand Prize**), Central South University
3.	2022/12	**National Scholarship** for Doctoral Students, Tsinghua University
4.	2021/10 & 2023/10 & 2024/11	Academic Excellence Scholarship (**First Prize**), Tsinghua University
5.	2025/01	Zheng Weimin Scholarship (**First Prize**), Tsinghua University
6.	2024/12	Outstanding PhD Graduates, Beijing General Colleges and Universities

Conference and Workshop

1. 2025/10/23–2025/10/24: **"MIT Senseable City Open Lab"**, Venice Biennale, Venice, Italy. (**Presentation**)
2. 2024/05/27–2024/05/31: **"Collective Motions of Animals and Robots"**, Research Institute Scientists De Cargèse, Cargèse, Corsica Island, France. (**Poster Presentation**)
3. 2024/02/15–2024/02/17: **25th Seminar "Pattern formation in Biophysics and Chemistry"**, Berlin Center for Studies of Complex Chemical Systems, Erfurt, Germany. (**Workshop**)

Research Skills

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

Update Time: 2025/11/25