
Mengqiao Xu



*Tenured Associate Professor,
Supervisor of Doctorate Candidates, Supervisor of Master's Candidates
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Personal information

Nationality: Chinese

Languages: Chinese, English

Year of Birth: 1990

Research interest: Global maritime transportation networks, Data-driven maritime shipping logistics, Complex network analysis.

Scientific profile: Dr. Mengqiao Xu currently serves as a tenured Associate Professor at the School of Economics and Management at Dalian University of Technology. She has been selected for Dalian City's High-Level Young Talents program. Over the past decade, her research has been dedicated to the fields of data-driven analysis of global maritime shipping networks, as well as network science theories and methodologies. Dr. Xu has contributed as the first author or corresponding author to publications of relevant work in important journals, such as Nature Communications, Reliability Engineering & System Safety, Transportation Research Part E/D, EPJ Data Science, IEEE Transactions on Network Science and Engineering, and Global Networks.

Scientific Awards: China General Chamber of Commerce Science and Technology Award in 2023 (Second-Class Prize), Wiley Top Cited Article in 2023.

Positions

- 2024.12 – , Tenured Associate Professor, School of Economics and Management, Dalian University of Technology
- 2020.07 – 2024.12, Associate Professor, School of Economics and Management, Dalian University of Technology
- 2016.11 – 2020.06, Postdoctoral Research Fellow, School of Economics and Management, Dalian University of Technology

Education

Mengqiao completed her higher education in Dalian Maritime University (China), which is a prestigious maritime university in the world and is the only key maritime institution under Ministry of Transport of the People's Republic of China. From there, she got systematic and scientific training in the field of maritime transportation and obtained a PhD in Management Science and Engineering (in 2016), a master's degree in Transportation Planning and Management (in 2013), and a bachelor's degree in Shipping Management (in 2011). She won the award "Excellent

Publications

➤ **(Co-)first[#] and/or (co-)corresponding* authorships:**

- [18] Rui Luo, Jie Bao, Hing Cheung So, Suqun Cao, **Mengqiao Xu***. Graph online change point detection based on fréchet statistics. *Neurocomputing*. 2025: 131874. (SCI, Q1, IF = 6.5)
- [17] **Mengqiao Xu***, Yihui Shen, Yifan Zhu, Li Hong, Mengzhi Ma, Linyuan Lü*, Kevin X. Li*. Identification of critical sets of ports in cascading failures of global liner shipping network. *Transportation Research Part E: Logistics and Transportation Review*. 2025, 200: 104184. (SCI, Q1, IF = 8.3, AJG 3)
- [16] Li Hong, **Mengqiao Xu***, Yu Liu, Xuemei Zhang, Changjun Fan. A deep learning dismantling approach for understanding the structural vulnerability of complex networks. *Chaos, Solitons & Fractals*, 2025, 194: 116148. (SCI, Q1, IF = 5.3)
- [15] Li Hong, Yu Liu, **Mengqiao Xu***, and Wenhui Deng. Combining deep reinforcement learning with heuristics to solve the traveling salesman problem. *Chinese Physics B*, 2025, Vol. 34(1): 018705. (SCI, Q2, IF = 1.5)
- [14] **Mengqiao Xu***, Yifan Zhu, Kaishuo Liu, Adolf K. Y. Ng. Assessing resilience of global liner shipping network to tropical cyclones. *Transportation Research Part D: Transport and Environment*, 2024: 104189 (SCI, SSCI, Q1, IF = 7.6, AJG 3)
- [13] Mengqiao Xu*, Wenhui Deng, Yifan Zhu, Linyuan Lü*, 2023. Assessing and improving the structural robustness of global liner shipping system: A motif-based network science approach. *Reliability Engineering and System Safety*, 2023, 240: 109576. (SCI Q1, IF = 8.1, ABS 3)
- [12] Xu, M.* , Zhu, Y., Deng, W., Shen Y., & Li, T.* Assessing the efficiency and vulnerability of global liner shipping network. *Global Networks*, 2023, 1–27. <https://doi.org/10.1111/glob.12445> (SSCI Q1, IF = 2.4, ABS 3, **Wiley Top Cited Article in 2023**)
- [11] Xueming Liu, Yue Xu, Mengqiao Xu *, Wenhui Deng, Linqiang Pan, Adolf K. Y. Ng. Two-Hop Biconnected Components in the Global Liner Shipping Network Reveal International Trade Statuses. *IEEE Transactions on Network Science and Engineering*, 2023, 10(3): 1564-1574. (SCI Q1, IF = 6.6)
- [10] Xiujuan Xu, Yifan Zhu, **Mengqiao Xu ***, Wenhui Deng, Yuqing Zuo. Vulnerability analysis of the global liner shipping network: from static structure to cascading failure dynamics. *Ocean & Coastal Management*, 2022, 229: 106325.
- [9] Timothy LaRock, **Mengqiao Xu ***, Tina Eliassi-Rad. A Path-based Approach to Analyzing the Global Liner Shipping Network. *EPJ Data Science*, 2022,11:18.
- [8] **Mengqiao Xu**, Qian Pan, Haoxiang Xia, Naoki Masuda*. Estimating international trade statuses of individual countries from a global liner shipping network. *Royal Society Open Science*, 2020, 7: 200386.
- [7] **Mengqiao Xu[#]***, Qian Pan[#], Alessandro Muscoloni, Haoxiang Xia*, Carlo Vittorio Cannistraci*. Modular gateway-ness connectivity and structural core organization in maritime network science. *Nature Communications*, 2020.
- [6] Sadamori Kojaku[#], **Mengqiao Xu #**, Haoxiang Xia, Naoki Masuda*. Multiscale core-periphery structure in a global liner shipping network. *Scientific Reports*, 2019, 9(1): 404.
- [5] **Mengqiao Xu***, Ling Zhang, Wen Li, Haoxiang Xia. Mobility pattern of taxi passengers at intra-urban scale: empirical study of three cities. *Journal of Systems Science and Information*, 2017, 5(6), 537-555.
- [4] **Mengqiao Xu***, Haoxiang Xia. Hub dependency and vulnerability of China's overseas connections. In: Cesar Ducruet (Ed.), *Advances in Shipping Data Analysis and Modeling: Tracking and Mapping Maritime Flows in the*

Age of Big Data, 2017. London: Routledge. (Book chapter)

[3] **Mengqiao Xu***, Zhenfu Li, Yanlei Shi, Xiaoling Zhang, Shufei Jiang. Evolution of regional inequality in the global shipping network. *Journal of Transport Geography*, 2015, 44: 1-12.

[2] Zhenfu Li, **Mengqiao Xu***, Yanlei Shi. Centrality in global shipping network basing on worldwide shipping areas. *GeoJournal*, 2015, 80(1): 47-60.

[1] **Mengqiao Xu***, Zhenfu Li, Yanlei Shi, Xiaoling Zhang, Shufei Jiang. Spatial linkage of global container shipping network. *Journal of Shanghai Maritime University*, 2015, 36(3): 6-12. (in Chinese)

➤ **Other authorships:**

[16] Mengying Geng, Ling Zhang, Min Hui, Yiming Huang, Feng Qing, **Mengqiao Xu**, Changjun Fan*, Guang quan Cheng. An efficient logic-guided attack strategy on logical-physical coupled networks. *Chaos, Solitons & Fractals*, 2025, 202: 117396. (SCI, Q1, IF = 5.3)

[15] S Jiang, L Liu, P Peng, **M Xu**, R Yan*. Prediction of vessel arrival time to port: a review of current studies. *Maritime Policy & Management*, 2025, 1-26. (SSCI, Q2, IF = 3.7, AJG 2)

[14] Liang Zhao, **Mengqiao Xu**, Lei Liu, Yong Bai, Mingyang Zhang* & Ran Yan*. Intelligent shipping: integrating autonomous maneuvering and maritime knowledge in the Singapore-Rotterdam Corridor. *Communications Engineering*, 2025, 4:11. (Nature portfolio)

[13] Tao Li, Yu Qin, **Mengqiao Xu**, Yanjie Zhou*, Lili Rong. Spatio-temporal vulnerability of high-speed rail line network in China. *Transportation Research Part D: Transport and Environment*, 2024: 104338 (SCI, SSCI, Q1, IF = 7.6, AJG 3 星, 中科院 1 区 Top)

[12] Tao Li, Yu Qin, Mengqiao Xu, Yanjie Zhou*, Lili Rong. Spatio-temporal vulnerability of high-speed rail line network in China. *Transportation Research Part D: Transport and Environment*, 2024, 131: 104338.

[11] Zhenfu Li, Wanying Li, **Mengqiao Xu**. Centrality of Maritime Silk Road Container Shipping Network. *Navigation of China*, 2018, 41(3): 126-131, 137. (in Chinese)

[10] Zhenfu Li, Shiyan Liu, **Mengqiao Xu**. Structural Vulnerability of Chinese Inland Waterway Container Shipping Network. *Areal Research and Development*, 2018, 37(3): 13-18. (in Chinese)

[9] Zhenfu Li, Aimei Liang, **Mengqiao Xu**. Author network of Arctic social science research in China. *World Regional Studies*, 2018, 27(3): 33-44. (in Chinese)

[8] Zhenfu Li, Yanlei Shi, **Mengqiao Xu**, Xiaoling Zhang, Shufei Jiang. Hierarchical structure in the global liner shipping network. *Systems Engineering - Theory & Practice*, 2016, 36(4): 981-988 (in Chinese)

[7] Zhenfu Li, Yanlei Shi, **Mengqiao Xu**, Xiaoling Zhang. Position of the Asian Container Ports in Global Liner Shipping Network. *Economic Geography*, 2016, 36(3): 91-98. (in Chinese)

[6] Zhenfu Li, Shufei Jiang, **Mengqiao Xu**, Yanlei Shi, Xiaoling Zhang. On the Shipping Network Evolution Under the Arctic Route. *Complex Systems and Complexity Science*, 2015, 12(4):55-60 (in Chinese)

[5] Zhenfu Li, Xiaoling Zhang, **Mengqiao Xu**, Yanlei Shi, Shufei Jiang. Hierarchies in East Asian Container Port System. *Systems Engineering*, 2015,33(12):78-84. (in Chinese)

[4] Zhenfu Li, Xiaoling Zhang, **Mengqiao Xu**, Yanlei Shi. Containerization in East Asian container port system. *Journal of Beijing Jiaotong University*, 2015, 39(3): 48-55. (in Chinese)

[3] Zhengfu Li, Wenya Wang, **Mengqiao Xu**. PT-based China's Right Strategy Choice on Arctic Route. *World Regional Studies*, 2015, 24(3): 50-58. (in Chinese)

[2] Zhenfu Li, He Li, **Mengqiao Xu**, Yanlei Shi. Comparison research on reachability of the global shipping network. *Journal of Dalian Maritime University*, 2014, 40(1): 101-104. (in Chinese)

[1] Zhenfu Li, He Li, **Mengqiao Xu**, Yi Li. Research on the Evolution and Future Tendency of Global Shipping Network. *Pacific Journal*, 2014, 22(5): 95-105. (in Chinese)

Research Grants

[6] Commissioned Project by a Leading State-Owned Enterprise in the Port & Shipping Industry of China. Research on Key Technologies for xxxxxxxxxx, 2025/04 – 2025/11. Grant: 1,140,000 (RMB). Project role: PI.

[5] National Natural Science Foundation of China, Project no. 72571047. Resilience assessment of global liner shipping dynamic network under port disruptions, 2026/01-2029/12. Grant: 400,000 RMB. Project role: PI.

[4] National Natural Science Foundation of China, Project no. 72101046, "Data driven study of the evolution mechanism and invulnerability of global liner shipping network", 2022/01 - 2024/12. Grant: 300,000 RMB. Project role: PI

[3] Fundamental research funds for the central universities (China), Project no. DUT20RC(3)046, "On the embeddedness of the Chinese ports into global shipping networks", 2020/08-2023/07. Grant: 200,000 RMB. Project role: PI

[2] China Postdoctoral Science Foundation, Project no. 2017M621141, "Structural complexity of the global shipping networks and China's international shipping", 2017/11-2020/06. Grant: 50,000 RMB. Project role: PI

[1] Joint-research project applied to the University of Tokyo, Project no.: 766, "Understanding human mobility patterns and urban geography", 2017/07-2023/07. Project role: PI

Scientific Talks

➤ Invited talks:

[16] Data-Driven Modeling and Analysis of the Global Maritime Shipping Complex Network. Parallel Session "Port and Shipping Systems Engineering in the AI Era", The 17th National Conference on Management Science & Systems Science for Young Scholars. August 22-24, 2025, Dalian, China. (in Chinese)

[15] Assessing resilience of global liner shipping network to tropical cyclones. Shanghai Maritime University, 2025/1/16, online. (in Chinese)

[14] Assessing resilience of global liner shipping network to tropical cyclones. Dalian Maritime University, 2024/12/13, online. (in Chinese)

[13] Assessing resilience of global liner shipping network to tropical cyclones. Hangzhou Normal University, 2024/12/06, Hangzhou, China. (in Chinese)

[12] Data-driven Analysis of Vulnerability of the Global Liner Shipping System: Complex-Network-Based Modeling and Computation. China University of Petroleum (East China), Dec 4, 2023, online. (in Chinese)

[11] Data-driven Analysis of the Complex System of Global Liner Shipping: Complex-Network-Based Modeling and Computation. *2023 China Automation Conference Special Forum on "Computational Society and Social Intelligence"*. Nov 17-19, 2023, Chongqing, China. (in Chinese)

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- [10] Data-driven Analysis of Vulnerability of the Global Liner Shipping System: Complex-Network-Based Modeling and Computation. National University of Defense Technology. Nov 17, 2023, Changsha, China. (in Chinese)
- [9] Data-driven Analysis of Vulnerability of the Global Liner Shipping System: Complex-Network-Based Modeling and Computation. International Conference on Transport and Supply Chain Resilience and Digital Transformation, November 14-15, 2023, BNU-HKBU United International College (UIC), Zhuhai, China.
- [8] A path-based approach to analyzing the global liner shipping network. *6th Chinese Systems Science Conference (CSSC2022)*, 12-13 Nov 2022, Shanghai, China. (in Chinese)
- [7] Global liner shipping network analysis: structure and dynamics. Institute of Marine Sustainable Development, Liaoning Normal University, 20 Sep 2022, Dalian, China. (in Chinese)
- [6] Cutting-edge research in complex network analysis and its application to the global maritime transportation system. 26 January, 2022, Tohoku University, Sendai, Japan.
- [5] Applications of network science to analyzing the global maritime shipping system. *5th Chinese Systems Science Conference (CSSC2021)*, 22-23 May 2021, China, Nanjing. (in Chinese)
- [4] Modular gateway-ness connectivity and structural core organization in maritime network science. 9 July 2020, Dalian Maritime University, Dalian, China. (in Chinese)
- [3] Modular gateway-ness connectivity and structural core organization in maritime network science. *Socioeconomic networks and network science workshop*, 3-4 July 2020, Waseda University, Tokyo, Japan.
- [2] The global liner shipping network architecture exhibits a crucial structural core which supports world trade. *Network Science Workshop and the kick-off conference for the Center for Computational Social Science (CCSS) of Kobe University*, 25-26 October 2018, Kobe University. Kobe, Japan.
- [1] Hub dependency and vulnerability of China's overseas connections. *2nd International Workshop on Maritime Flows and Networks*, 25-27 April 2016, French National Center for Scientific Research, Paris, France.

➤ **Contributed talks:**

- [9] Vulnerability analysis of the global liner shipping network: from static structure to cascading failure dynamics. 2024 World Transport Convention, 2024/6/26-29, Qingdao, China. (in Chinese)
- [8] Two-hop Biconnected Components in the Global Liner Shipping Network Reveal International Trade Statuses. *7th Chinese Systems Science Conference (CSSC2023)*, May 20-21, 2023, Chongqing, China. (in Chinese)
- [7] Estimating international trade status of countries from global liner shipping networks. 2022 World Transport Convention, 4-7 November 2022, Wuhan, China. (oral presentation, online)
- [6] Complex Network Analysis of the Global Liner Shipping System. *11th International Forum on Shipping, Ports, and Airports (IFSPA 2022)*, 16-20 May 2022, Hong Kong (oral presentation, online)
- [5] Data-driven analysis of the global liner shipping system: a network science perspective. *The 10th International Conference on Logistics and Maritime Systems (LOGMS 2021)*, 28-31 October 2021, Zhoushan, China (oral presentation)
- [4] Estimating international trade statuses of individual countries from a global liner shipping network. *NetSci 2019*, 27-31 May 2019, Burlington, USA. (poster presentation)
- [3] The global liner shipping network architecture encloses a crucial structural core for the international trade.

NetSci 2018, 11-15 June 2018, Paris, France. (poster and oral presentations)

[2] An empirical study of the global liner shipping network: Topological structure and spatial organization.

NetSci-X 2018, 5-8 January 2018, Hangzhou, China. (oral presentation)

[1] Hub dependency and vulnerability of global-local connectivity in the world liner shipping network: An empirical case study. *NetSci 2017*, 19-23 June 2017, Indianapolis, USA. (poster and oral presentations)

Academic Services

➤ **Affiliations to Academic Associations**

[3] **Technical Committee on Computational Society and Social Intelligence, Chinese Association of Automation. Founding Member, Deputy Secretary (2025.01-present)**

[2] Network Science Branch, Chinese Society of Operational Research, Economic Mathematics and Systems Engineering. Council Member (2024.08 - present)

[1] Belt and Road Global Research Network (B&R-GRN). Member (2021-present)

➤ **Academic conference organization**

[1] **Chair of the Organizing Committee.** Academic Conference of the “First Conference and Workshop on Social Intelligence.” Hosted by: Chinese Association of Automation; Organized by: School of Economics and Management, Dalian University of Technology; Key Laboratory of Social Computing and Cognitive Intelligence, Ministry of Education; Key Laboratory of Integrated Electronic System Technologies, Ministry of Education; School of Cyber Security, University of Science and Technology of China; Institute of Data Space Research, Hefei Comprehensive National Science Center. September 11-13, 2024, Dalian, China. (Approximately 120 participants attended the conference).

➤ **Journal Editor**

I am an academic editor for the section ‘Urban & Industrial Complexity’ of the journal “PLOS Complex Systems”.

➤ **Peer-Review Activities**

Invited reviewer for scientific journals including:

Nature Climate Change (SCI, Q1), Nature Communications (SCI, Q1), Transportation Research Part E/D (SCI, Q1), Reliability Engineering and System Safety (SCI, Q1), Expert Systems with Applications (SCI, Q1), Computers & Industrial Engineering (SCI, Q1), Journal of Transport Geography (SSCI, Q1), Electronic Research Archive (SCI, Q1), Ocean & Coastal Management (SCI, Q1), Transport Policy (SSCI, Q1), etc.

➤ **Other Professional Services**

[4] Committee member. I am a member of the technical committee of the subsection “Maritime Logistics and Supply Chains” in the section “Waterborne Transportation” of the 2024 World Transport Convention.

[3] Session Chair. *7th Chinese Systems Science Conference (CSSC2023)*, May 20-21, 2023, Chongqing, China. Chaired the session entitled “Advances at the Frontier of Machine Learning” and the session entitled “Complexity of Transportation and Energy Systems”.

[2] Session Chair. *6th Chinese Systems Science Conference (CSSC2022)*, 12-13 Nov 2022, Shanghai, China. Chaired the session entitled “*Network higher-order structure and dynamics*”.

[1] Session Chair. *The 10th International Conference on Logistics and Maritime Systems (LOGMS 2021)*, 28-31 October 2021, Zhoushan, China. Chaired session entitled “*Data Driven Analysis*”.

Graduates (full sample)

- **[5] Master student: Yihui Shen.** Academic year: Sep 2022 – June 2025 at Dalian University of Technology. Major: Management Science and Engineering. Title of thesis: Research on the Identification of Critical Sets of Ports in Cascading failures of Global Liner Shipping Network.

Awards: “Outstanding Master's Thesis Award of Dalian University of Technology” for the graduating class of 2025.

Destination after graduation: Tencent Technology (Shenzhen) Co., Ltd. (a leading internet company)

- **[4] Master student: Xuemei Zhang.** Academic year: Sep 2022 – June 2025 at Dalian University of Technology. Major: Software Engineering. Title of thesis: Port Congestion Prediction in the Container Shipping Network Based on Deep Learning.

Destination after graduation: Zhejiang Four-Port Linkage Development Co., Ltd. (A Chinese state-owned tech company and a domestic leader in smart logistics cloud platforms for maritime and multimodal transport).

- **[3] Master student: Wenhui Deng.** Academic year: Sep 2021 – June 2024 at Dalian University of Technology. Major: System Engineering. Title of thesis: Research on the Critical Ports Identification and Robustness Improvement Strategies of Global Liner Shipping Network.

Awards: “National Scholarship for Graduate Students” in 2023, “Outstanding Graduate Student of Dalian University of Technology” for the academic year 2022-2023, “Outstanding Graduate of Dalian University of Technology” for the graduating class of 2024, “Outstanding Master's Thesis Award of Dalian University of Technology” for the graduating class of 2024.

Destination after graduation: COSCO SHIPPING LINES (Ningbo) CO., LTD.

- **[2] Master student: Yuqing Zuo.** Academic year: Sep 2020 – June 2023 at Dalian University of Technology. Major: Technical Economics and Management. Title of thesis: Port Position Enhancement Strategies from the Perspective of Global Maritime Shipping Network – A Case Study of Yangpu Port

Destination after graduation: China National Petroleum Corporation (Guangdong Sales Branch),

- **[1] Master student: Yifan Zhu.** Academic year: Sep 2020 – June 2023 at Dalian University of Technology. Major: Software Engineering. Title of thesis: Study on vulnerability of the global liner shipping network.

Awards: “National Scholarship for Graduate Students” in 2022, “Outstanding Graduate Student of Dalian

University of Technology” for the academic year 2021-2022, “Outstanding Graduate of Dalian University of Technology” for the graduating class of 2023, and “Outstanding Graduate of Liaoning Province” for the graduating class of 2023.

Destination after graduation: PhD program in my research group, majoring in Management Science and Engineering.