Peng Yang

Academic Qualifications:

01/09/2007-30/06/2011, Ph.D. in Management Science and Engineering, Department of Industrial Engineering, Tsinghua University

01/09/2004-30/06/2007, M.S. in Mechanical Manufacture and Automation (Recommendation for direct admission), College of Mechanical Engineering, Chongqing University

01/09/2000-30/06/2004, B.S. in Mechanical Design, Manufacturing and Automation, College of Mechanical Engineering, Chongqing University (Minor: Business Administration, Chongqing University)

Professional Experience:

03/2019-present Associate Professor/Ph.D. Supervisor, Institution of Data and Information, Tsinghua Shenzhen International Graduate School, Tsinghua University

08/2013-03/2019 Lecturer, Associate Professor/Ph.D. Supervisor, Division of Logistics and Transportation, Graduate School at Shenzhen, Tsinghua University

01/07/2011-21/08/2013 Post-doctoral Fellow, Division of Logistics and Transportation, Graduate School at Shenzhen, Tsinghua University

Biography:

Dr. Peng Yang is a faculty member at Tsinghua University whose research sits at the intersection of smart logistics and advanced analytics. His work focuses on smart logistics, robotic warehousing systems, AI-driven warehousing and logistics, sustainable warehousing and logistics, and transportation/logistics facility planning. He has secured more than ten competitive research grants from national and regional agencies—including the National Key R&D Program, the National Natural Science Foundation of China, and the Shenzhen Science & Technology Program—and has published 30+ peer-reviewed articles in leading journals such as Transportation Science, IISE Transactions, and Transportation Research Part E.

On the education front, he teaches Applied Statistics and Modeling and Analysis of Warehousing Systems courses that consistently rank in the top 5 % of university evaluations; the latter is officially awarded a “Excellent Course of Tsinghua University.” His MOOC “Modeling and Analysis on Warehousing Systems”—one of the first online courses dedicated to warehousing—has attracted over 28,000 learners, more than half of them international, and is now used by 17

universities worldwide. It is among the first cohort of China's National Demonstration Online Courses for engineering graduate students. His mentoring record includes numerous Tsinghua Outstanding Master's Theses and Outstanding Graduate awards.

Dr. Peng Yang currently serves as a Standing Director of the China Society of Logistics, an Area Editor of Computers & Industrial Engineering, Associate editor for Operations Management Research, and a member of the IFAC Technical Committee 5.2 on Management and Control in Manufacturing and Logistics. Dr. Peng Yang is a recipient of the 2021 Young Teacher Teaching Excellence Award of Tsinghua University (10 university-wide), which is the highest teaching honor for Young Teachers at Tsinghua University, and the 2024 Science & Technology Innovation Youth Award from the China Federation of Logistics & Purchasing (25 nation-wide).

Selected Publications in Recent Five Years:

[1] **Peng Yang**, Shanshan Song, Li Huang, Yeming Gong, Zuo-Jun Max Shen. Deploying pickers and robots in cobot-based collaborative order picking systems. IISE Transactions.2025.DOI: 10.1080/24725854.2025.2501036.

[2] Rong Wang, Peiran Tao, Rui Chen, Taoxing Zhu and **Peng Yang***. Retrieval scheduling in four-directional shuttle-based compact storage and retrieval systems with heterogeneous lifts. Computers & Industrial Engineering, 2025. DOI:10.1016/j.cie.2025.111559

[3] Yuexin Kang, Rong Wang, Zhizhen Qin, **Peng Yang***, Yimo Yan. Warehouses with heterogeneous robots collaboration: operational policies and performance analysis. International Journal of Production Research,2025,DOI: 10.1080/00207543.2025.2513576.

[4] Peiran Tao, Rong Wang, **Peng Yang*** and Yeming Gong. Energy-efficient scheduling of multi-shuttle automated storage and retrieval systems considering heterogeneous unit loads. Naval Research Logistics,2025.DOI: 10.1002/nav.70040.

[5] Jie Wang and **Peng Yang***. Multi-period integrated production and delivery scheduling to enhance online orders fulfillment considering due dates. Flexible Services and Manufacturing Journal. 2025,DOI:10.1007/s10696-025-09608-7.

[6] Zhenxiao Wang, Fen Xu, Li Xiao* and **Peng Yang**. Optimal production, fuel economy investment and credit trading decisions under dual-credit policy. OMEGA-INTERNATIONAL JOURNAL OF MANAGEMENT SCIENCE. 2025.DOI:10.1016/j.omega.2025.103375

[7] Xiaolong Zhou,Binjia Li, **Peng Yang***. Ergonomic Workload Assessment of Order Picking Operations Based on Machine Learning with sEMG Signals.IFAC-PapersOnLine.2025 (59),10:422-427.

[8] Zhizhen Qin, **Peng Yang***, Yeming Gong, René B. M. de Koster. Performance Analysis of Multi-Tote Storage and Retrieval Autonomous Mobile Robot Systems. Transportation Science,2024, DOI: 10.1287/trsc.2023.0397.

[9] Zhizhen Qin, Yuexin Kang, **Peng Yang***. Making better order fulfillment in multi-tote storage and retrieval autonomous mobile robot systems. Transportation Research Part E: Logistics and Transportation Review,2024, DOI: 10.1016/j.tre.2024.103752.

[10] Yuexin Kang, Zhiqiang Qu, and **Peng Yang***. Enhancing E-Commerce Warehouse Order Fulfillment Through Predictive Order Reservation Using Machine Learning. IEEE Transactions on Automation Science and Engineering, 2024, DOI: 10.1109/TASE.2024.3428541.

[11] Huiwen Bai, **Peng Yang**, Zhizhen Qin, Mingyao Qi, Wangqi Xiong. Order sequencing, tote scheduling, and robot routing optimization in multi-totestorage and retrieval autonomous mobile robot systems. International Journal of Production Research,2024,DOI: 10.1080/00207543.2024.2361436.

[12] Teh Khai Jen&, Rong Wang&, **Peng Yang***.Determining the I/O point policy in a robotic live-cube compact storage system. International Journal of Production Research,2024,DOI: 10.1080/00207543.2024.2318021

[13] Jie Wang, Qiusen Wang, **Peng Yang***, et al. Energy consumption analysis and optimization of cold stores considering differential electricity price. Energy and Buildings,2024, DOI: 10.1016/j.enbuild.2024.114094.

[14] Rong Wang, **Peng Yang***, Yeming Gong, Cheng Chen.Operational Policies and Performance Analysis for Overhead Robotic Compact Warehousing Systems with Bin Reshuffling. International Journal of Production Research,2023,DOI: 10.1080/00207543.2023.2289643

[15] **Peng Yang***, Guang Jin and Guofang Duan, Modelling and analysis for multi-deep compact robotic mobile fulfilment system. International Journal of Production Research, 2022. 60(15): 4727-4742.

[16] **Peng Yang*,** Peiran Tao, Ping Xu, Yeming Gong. Bi-objective operation optimization in multi-shuttle automated storage and retrieval systems to reduce travel time and energy consumption. 2022, Engineering Optimization, 2022,DOI: 10.1080/0305215X.2022.2096881.

[17] **Peng Yang***, Guang Jin and Guofang Duan, Modelling and analysis for multi-deep compact robotic mobile fulfilment system. International Journal of Production Research, 2022. 60(15): 4727-4742.

[18] Xingwei Chen, **Peng Yang*** and Zixin Shao. Simulation-based time-efficient and energy-efficient performance analysis of an overhead robotic compact storage and retrieval system. Simulation Modelling Practice and Theory,2022.DOI: 10.1016/j.simpat.2022.102560.

[19] **Peng Yang**, Zhijie Zhao and Zuo-Jun Max Shen. A flow picking system for order fulfillment in e-commerce warehouses. IISE Transactions, 2021. 53(5): 541-551.

[20] Wenpeng Li, Lixin Miao and **Peng Yang***, SIMULATION ANALYSIS OF ROBOTIC MOBILE FULFILMENT SYSTEM BASED ON CELLULAR AUTOMATA. International Journal of Simulation Modelling, 2021. 20(2): 583-594.

[21] **Peng Yang***, Zhijie Zhao and Huijie Guo (2020) Order batch picking optimization under different storage scenarios for e-commerce warehouses. Transportation Research Part E: Logistics and Transportation Review, DOI:10.1016/j.tre.2020.101897

Selected Working Papers:

[1] Jie Shao, Yuexin Kang, Mingzhe Li, **Peng Yang*** and Rui Chen. Deep Reinforcement Learning for Order-Tote-Robot Coordination in Multi-Tote Storage and Retrieval Systems with Sequential Picking Stations. European Journal of Operational Research.2025. (Major revision)

[2] Zhou Gao, Jiaxin Liu, **Peng Yang***,Rui Chen. Multi-Period Electric Vehicle Charging Infrastructure Planning Considering Path Deviation and Service Capability. Journal of Transport Geography. 2025 (Accept).

[3] Jie Shao,Mingzhe Li, Mingyao Qi and **Peng Yang***.Reinforcement learning for pod retrieval scheduling and robot dispatching in the multi-deep compact robotic mobile fulfillment system. Expert Systems With Applications. 2025.(Major revision)

[4] Zichun Ji, Xinglu Liu, Kefan Lai, Yuexin Kang, Kaifeng Jia and **Peng Yang∗**. Cell-based dense parking optimization. Transportation Research Part C: Emerging Technologies. 2025. (Major revision)

Selected Research Projects:

[1]. National Natural Science Foundation of China: Data-driven modeling and optimization of human-robot collaborative order picking systems, 2024-2027, PI.

[2]. National Natural Science Foundation of China: Operation optimization in multi-shuttle automated storage and retrieval systems with the consideration of share storage and uncertainties, 2016-2019, PI. (Final assessment is "Excellent")

[3]. National Natural Science Foundation of China: Optimization and simulation on key operational strategies in multi-shuttle Automated Storage and Retrieval Systems, 2013-2015, PI. (Final assessment is "Excellent")

[4]. Shenzhen Science and Technology Program: Data-driven dynamic modeling and optimization techniques for tote-handling robotic warehousing systems,2024-2027,PI.

[5]. Shenzhen Science and Technology Program: Modelling and analysis on Overhead Compact Robotic Warehousing System based on Artificial Intelligent and Queuing Network,2023-2025,PI.

[6]. Shenzhen Municipal Science and Technology Innovation Committee: Research on dynamic order picking technology based on flow picking, 2020-2023, PI.

[7]. Shenzhen Municipal Science and Technology Innovation Committee: Key technologies of energy management and optimization in smart warehousing equipment, 2019-2021, PI.

[8]. Shenzhen Municipal Science and Technology Innovation Committee: Research on application technology of low-carbon and compact warehousing system, 2015-2017, PI.

[9]. National Key R&D Program of China , Research on optimization of charging infrastructure based on large-scale application of electric vehicles,2019-2021, Co-PI.

[10]. Longyan Municipal Bureau of Transportation: Longyan Downtown Area Traffic Organization Optimization and Enhancement, 2025-2029, PI.

[11]. Jushuitan (China’s leading e-commerce warehouse management solution provider): Research on Modeling for Jushuitan E-commerce Warehouse Optimization, 2020, PI.

[12]. State Grid Lianyungang Power Supply Company: Technical Consulting and Application of Inventory Control for Business Expansion and General Materials in the Materials Department of State Grid Lianyungang Power Supply Company, 2019, PI.

[13]. Vipshop: Optimization of Order-Picking Operations at Vipshop's South China Logistics Center,2016, PI.

[14]. Huawei HiSilicon: Huawei HiSilicon Chip Warehouse Planning and Simulation Optimization Project, 2011, Co-PI.

Selected Authorized Patents:

[1] Yang Peng, Xu Wenjun; Optimization Method and Device for Operation Scheduling of Automated Storage-and-Retrieval Systems, Patent No. ZL 2018 1 0034541.4.

[2] Yang Peng, Qin Zhizhen; Optimal Routing Method for Multi-Tote Robot Storage-and-Retrieval Operations, Patent No. ZL 2021 1 1476392.5.

[3] Yang Peng, Qu Zhiqiang; Online Order Batching Method and System Based on Order-Reservation Prediction Mechanism, Patent No. ZL 2022 1 0769394.1.

[4] Yang Peng, Wang Rong; Performance Analysis Method and Device for High-Density Overhead Robot Warehousing Systems, Patent No. ZL 2021 1 1348175.8.

[5] Yang Peng, Gao Zhou, Zhang Kai; A Method for Calculating Electric-Vehicle Over-Charging Time, Patent No. ZL 2021 1 0926801.0.

[6] Yang Peng, Gao Zhou, Li Zhiheng; Method for Improving Electric-Vehicle Charging-Infrastructure Layout and Computer-Readable Storage Medium, Patent No. ZL 2021 1 0359531.X.

[7] Yang Peng, Song Shanshan; Optimization Method and Device for a Human–Robot Collaborative Order Picking System, Patent No. ZL 2022 1 0800581.1.

[8] Yang Peng, Huang Li, Li Binjia; A Method for Assessing and Analyzing Operator Fatigue Intensity in Human–Robot Collaborative Work Systems, Patent No. ZL 2024 1 1232092.6.

Courses:

- Modeling and analysis on warehousing system (Excellent Course of Tsinghua University)
- Modeling and analysis on warehousing system (MOOC) (First cohort of China's National Demonstration Online Courses for engineering graduate students. This MOOC has attracted

over 28,000 learners, more than half of them international, and is now used by 17 universities worldwide.)

- Applied Statistics

Professional Services:

- **Area editor** for Computers & Industrial Engineering
- **Associate editor** for Operations Management Research
- **Standing Director of the China Society of Logistics**
- **Member of IFAC TC 5.2 Management and Control in Manufacturing and Logistics**
- **Program Co-Chairs**
  - 2025 7th International Conference on Management Science and Industrial Engineering
  - 2026 8th International Conference on Management Science and Industrial Engineering
- **Track chair:** 2022 INFORMS Conference on Service Science
- **Session chair:**
  - 2024 6th International Conference on Management Science and Industrial Engineering
  - 2022 IEEE International Conference on Industrial Engineering and Applications
  - 2021 IEEE International Conference on Industrial Engineering and Applications
  - 2020 IEEE International Conference on Industrial Engineering and Applications
- **Referee for Academic and Professional Organizations**
  - National Natural Science Foundation of China
  - Natural Science Foundations of Guangdong & Shaanxi Provinces
  - Natural Science Foundations of Shaanxi Province
  - Shenzhen Science, Technology & Innovation Commission
  - Shenzhen Development & Reform Commission
  - Shenzhen Bureau of Industry & Information Technology
  - Shenzhen Logistics and Supply Chain Management Association
- **Referee for Academic Journals and Peer-reviewed Conferences**
  - Applied Mathematical Modelling
  - Computers & Industrial Engineering
  - Computers & Operations Research
  - Energy

- Energies
- Energy & Buildings
- Energy Policy
- IEEE Transactions on Engineering Management
- IEEE Transactions on Intelligent Transportation Systems
- IEEE Transactions on Intelligent Vehicles
- IEEE International Conference on Industrial Engineering and Applications
- IISE Transactions
- International Journal of Production Economics
- International Journal of Production Research
- International Transactions in Operational Research
- International Journal of Sustainable Transportation
- International Conference on Management Science and Industrial Engineering
- Journal of Manufacturing Systems
- Naval Research Logistics
- Production and Manufacturing Research
- Robotics and Computer-Integrated Manufacturing
- Science China Information Sciences
- Simulation Modelling Practice and Theory
- Transportation Research Part E

Keynote/Invited Speech and Lectures:

- **Invited seminar for** Politecnico di Milano, Italy, 2025
- **Guest lecture for** Università di Padova, Italy, 2025
- **Keynote speaker for** 2025 International Symposium on Intelligent Technology for Future Transportation (ITFT 2025), London, United Kingdom
- **Invited speaker for**
  - Huawei (2024)
  - Zhejiang Logistics Engineering Symposium (2024)
  - Zhejiang University of Technology (2024)
  - China Storage & Distribution Association (2024)

- 2020 IEEE International Conference on Industrial Engineering and Applications

Selected Public Services:

- Assistant to the Director, Institute of Data and Information.
- Deputy Director, Embodied AI and Logistics & Transportation Research Institute.

Selected Awards & Honors

- 2025/Fifth Meituan Business Analytics Elite Competition-Elite Mentor Achievement Award (Only one team selected out of 1,206 entrants)
- 2025/Second Prize of Wu Wenjun Artificial Intelligence Science and Technology Progress Award
- 2024/Modeling and Analysis on Warehousing Systems MOOC/ First cohort of China's National Demonstration Online Courses for engineering graduate students / Only 18 courses university-wide/ National-level award
- 2024/China Federation of Logistics and Purchasing Science and Technology Innovation Youth Award (25 people nationwide)
- 2023/Second Prize of China Federation of Logistics and Purchasing Scientific and Technological Progress Award
- 2022 INFORMS Conference on Service Science-Best Student Paper Finalist
- 2021/Young Teacher Teaching Excellence Award of Tsinghua University/The highest teaching honor for Young Teacher at Tsinghua University
- 2021/Excellent Course of Tsinghua University: Modeling and analysis on warehousing system
- 2020/2021/2024/2025 Excellent Master's Thesis Supervisor of Tsinghua University
- 2020/2022/2024 Outstanding Individual Award, Tsinghua University Shenzhen International Graduate School