

Assistant Professor GAO, KAIZHOU

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Academic Qualification:

PhD., Nanyang Technological University, Singapore, 2016
Master degree, Yangzhou University, Yangzhou, China, 2008
B.A., Liaocheng University, Liaocheng, China, 2005

Teaching Area

Fundamentals of Artificial Intelligence
Introduction to Management

Research Area

Artificial Intelligence; Intelligent Optimization Theory, Method and Application; Reinforcement Learning
Complex Systems Modeling, Optimization and Scheduling; Intelligent Transportation; Intelligent Manufacturing; Smart City

Working Experience

Sep. 2018 – Till now, Assistant Professor, Macau University of Science and Technology.
Apr. 2015 - Apr. 2018, Research Fellow, Nanyang Technological University.
Feb. 2012 - Dec. 2012, Research associate, Nanyang Technological University.

Academic Publication (selected)

- [1] Zhongjie Lin, **K.Z. Gao***, Naiqi Wu, "Scheduling Eight-Phase Urban Traffic Light Problems via Ensemble Meta-Heuristics and Q-Learning Based Local Search," **IEEE Transactions on Intelligent Transportation Systems**, Aug 2023, doi:10.1109/TITS.2023.3296387.
- [2] Liang Wang, **K.Z. Gao***, Zhongjie Lin, Wuze Huang, "Problem feature based meta-heuristics with Q-learning for solving urban traffic light scheduling problems," **Applied Soft Computing**, Aug 2023, doi:10.1016/j.asoc.2023.110714.
- [3] Minglong Gao, **K.Z. Gao***, Zhenfang Ma, Weiyu Tang, "Ensemble meta-heuristics and Q-learning for solving unmanned surface vessels scheduling problems," **Swarm and Evolutionary Computation**. Jul 2023. doi: 10.1016/i.swevo.2023.101358.
- [4] Hui Yu, **K.Z. Gao***, Zhenfang Ma, Yu-xia Pan, "Improved Meta-heuristics with Q-learning for Solving Distributed Assembly Permutation Flowshop Scheduling Problems," **Swarm and Evolutionary Computation**. May 2023. doi: 10.1016/i.swevo.2023.101335.
- [5] Yaxian Ren, **K.Z. Gao***, Yaping Fu, Yu-xia Pan, Hongyan Sang, "A Novel Q-learning based Variable Neighborhood Iterative Search Algorithm for Solving Disassembly Line Scheduling Problems," **Swarm and Evolutionary Computation**, May 2023, doi:

- [6] Hanxiao Li, **K.Z. Gao***, Pei-Yong Duan, Jun-Qing Li, "An Improved Artificial Bee Colony Algorithm With Q-Learning for Solving Permutation Flow-Shop Scheduling Problems," **IEEE Transactions on Systems Man and Cybernetics**. Nov 2022. doi:
- [7] J. Mou, **K.Z. Gao***, P. Duan, J. Li*, A. Garg and R. Sharma, "A Machine Learning Approach for Energy-Efficient Intelligent Transportation Scheduling Problem in a Real-World Dynamic Circumstances," **IEEE Transactions on Intelligent Transportation Systems**. 2022. doi:
- [8] Y. Pan, **K. Gao***, Z. Li and N. Wu, "Solving Biobjective Distributed Flow-Shop Scheduling Problems With Lot-Streaming Using an Improved Jaya Algorithm," **IEEE Transactions on Cybernetics**. Apr 2022. doi: 10.1109/TCYB.2022.3164165.
- [9] Leilei Meng, **Kaizhou Gao***, Yaping Ren, Biao Zhang, Hongyan Sang, Zhang Chaoyong, "Novel MILP and CP models for distributed hybrid flowshop scheduling problem with sequence-dependent setup times," **Swarm and Evolutionary Computation**, 71: 101058, 2022.
- [10] Yaping Fu, Yushuang Hou, **Kaizhou Gao***, et al. Modelling and Scheduling Integration of Distributed Production and Distribution Problems via Black Widow Optimization. **Swarm and Evolutionary Computation**. 68: 101015. 2022.
- [11] Y. Pan, **K. Gao**, Z. Li and N. Wu, "Improved Meta-Heuristics for Solving Distributed Lot-Streaming Permutation Flow Shop Scheduling Problems," **IEEE Transactions on Automation Science and Engineering**, Feb 2022, doi: 10.1109/TASE.2022.3151648.
- [12] Y. An, X. Chen, **K. Gao**, Y. Li and L. Zhang, "Multiobjective Flexible Job-Shop Rescheduling With New Job Insertion and Machine Preventive Maintenance," **IEEE Transactions on Cybernetics**, Mar 2022, doi: 10.1109/TCYB.2022.3151855.
<https://ieeexplore.ieee.org/document/9733957>
- [13] Junqing Li, Yu Du, **Kaizhou Gao**, P.N. Suganthan. A Hybrid Iterated Greedy Algorithm for a Crane Transportation Flexible Job Shop Problem, **IEEE Transactions on Automation Science and Engineering**. Mar. 2021. DOI: 10.1109/TASE.2021.3062979.
- [14] Guoxing Wen, Wei Hao, Weiwei Feng, **Kaizhou Gao**, Optimized Backstepping Tracking Control Using Reinforcement Learning for Quadrotor Unmanned Aerial Vehicle System, **IEEE Transactions on Systems, Man, and Cybernetics: Systems**, September 2021. DOI: 10.1109/TSMC.2021.3112688.
- [15] PW Shaikh, M El-Abd, M Kanafer, **KZ Gao**, A Review on Swarm Intelligence and Evolutionary Algorithms for Solving the Traffic Signal Control Problem, **IEEE Transactions on Intelligent Transportation Systems**, 23(1): 48-63, Jan 2022.
- [16] **KZ Gao**, ZM He, Y Huang, PY Duan, PN Suganthan, A survey on meta-heuristics for solving disassembly line balancing, planning and scheduling problems in remanufacturing, **Swarm and Evolutionary Computation**, 57, Sep 2020.

Professional Certification and Awards

1. 2022 World's Top 2% Scientists
2. 2022 Norbert Wiener Review Award by IEEE/CAA Journal of Automatica Sinica
3. 2022 Excellent Paper Award by TSINGHUA Science and Technology
4. 2021 World's Top 2% Scientists
5. 2021 Shandong Science and Technology Award, Natural Science Award, Second Prize
6. 2020 Shandong Provincial Higher Education Science and Technology Award
7. Excellent Paper Award of the 5th Conference on Intelligent Optimization and Scheduling,
8. Excellent Paper Award of the 4th Conference on Intelligent Optimization and Scheduling, 2020

Professional Society Membership

- [1] Associate Editor: IEEE Transactions on Intelligent Transportation Systems, IEEE, since
- [2] Associate Editor: Expert Systems with Application, Elsevier, since 2022.
- [3] Associate Editor: Swarm and Evolutionary Computation, Elsevier, since 2019.
- [4] Special Issue Chair "Modelling and Optimization of Green Manufacturing and Supply Chain
- [5] Special session Chair: 2022 The 25th IEEE International Conference on Intelligent Transportation Svstems (IEEE ITSC). Macao. China. 8-12 Oct 2022.
- [6] Special session Chair: 2022 IEEE Congress on Evolutionary Computation, Padua, Italy, 18-23 June 2022.
- [7] Special session Chair: 2019 IEEE Congress on Evolutionary Computation, Wellington, New Zealand, 10-13 June 2019.
- [8] Special session Chair: 2021 IEEE Congress on Evolutionary Computation, Krakow, Poland, 28 June - 1 July. 2021.

Research Grants

1. Problem-specific knowledge and learning based distributed intelligent manufacturing schedulina. Natural Science Foundation of Guanadong Province. PI
2. Learning based collaborative intelligent scheduling and rescheduling for remanufacturing with uncertain. FDCT, PI
3. Problem specific knowledge based intelligent scheduling and rescheduling for uncertain remanufacturing. NSFC, PI
4. USV intelligent collaborative and autonomous task allocation: theories and applications,
5. Ensembles of discrete intelligent algorithms for re-manufacturing scheduling with complex constraints. NSFC. PI
6. Research funding from Macau University of Science and Technology, MUST, PI

Personal Website

<https://www.researchgate.net/profile/Kaizhou-Gao/research>