Fei Liu

Department of Computer Science, City University of Hong Kong

fliu36-c@my.cityu.edu.hk | Google Scholar | Github | Homepage |

■ Education

2020.09 – 2025.05   **Ph.D. in Computer Science**, City University of Hong Kong, Hong Kong SAR. (Advisor: Prof. Qingfu Zhang)

2017.09 – 2020.04   **M.Sc. in Fluid Mechanics**, Northwestern Polytechnical University, China. (Advisor: Prof. Zhonghua Han)

2013.09 – 2017.07   **B.Eng. in Aircraft Airworthiness Technology**, Northwestern Polytechnical University, China.

■ Working Experience

2025.06 - Present   **Postdoctoral Researcher**, Department of Computer Science, City University of Hong Kong, Hong Kong SAR.

■ Awards (selected)

2024 – Champion, IEEE HK CI Postgraduate Student Research Paper Competition

2024 – Second Price (Only One, Team Leader), IEEE FLAME Challenge

2021 – Gold Award, EMO 2021 Logistic Competition

■ Academic Activities (selected)

2025 – Conference Keynote: "Automated Algorithm Design with Large Language Model", IJCCI.

2025 – Webinar: "Large Language Model for Algorithm Design", IEEE CIS ESCO Webinar.

2025 – Tutorial: "Automated Algorithm Design with Large Language Model", CEC.

2025 – Tutorial, "Automated Algorithm Design with Large Language Model", EMO.

■ Academic Service (selected)

Reviewer for: TEVC, TMLR, TELO, ECJ, ICML, ICLR, NeurIPS, AAAI, KDD, GECCO.

Organizer for: Special Session for CEC 2025, Large Language Model-Enhanced Evolutionary Algorithms for Industrial Optimization.

■ Community Activities (selected)

LLM4AD Project and Community: Lead the LLM4AD open-source platform, a Python platform for LLM-powered Automated Algorithm Design, growing a research community (400+ GitHub stars as of August 2025). The project provides modular tools, extensive documentation, and applications spanning optimization, ML, scientific discovery, and engineering.

■ Publications

Highlight: 10+ (co-)first authored papers and 20+ co-authored papers on foundation models, machine learning, evolutionary algorithms and their applications. Google citation 900+ with an H-index of 15 (August, 2025).

1. **Fei Liu**, Xialiang Tong, Mingxuan Yuan, Xi Lin, Fu Luo, Zhenkun Wang, Zhichao Lu, and Qingfu Zhang. "Evolution of heuristics: towards efficient automatic algorithm design using large language model." *International Conference on Machine Learning (ICML)*, 2024 (Oral, Accept Rate Top 1.52%)

2. **Fei Liu**, Xi Lin, Weiduo Liao, Zhenkun Wang, Qingfu Zhang, Xialiang Tong, and Mingxuan Yuan. "Prompt learning for generalized vehicle routing." *33th International Joint Conference on Artificial Intelligence (IJCAI)*, 2024

3. **Fei Liu**, Xi Lin, Qingfu Zhang, Xialiang Tong, and Mingxuan Yuan. "Multi-task learning for routing problem with cross-problem zero-shot generalization." *ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (SIGKDD)*, 2024

4. **Fei Liu**, Qingfu Zhang, Qingling Zhu, Xialiang Tong, and Mingxuan Yuan. "Machine learning assisted multiobjective evolutionary algorithm for routing and packing." *IEEE Transactions on Evolutionary Computation*, 2024 (Q1, IF 11.7)

5. **Fei Liu**, Zhong-Hua Han, Yang Zhang, Ke Song, Wen-Ping Song, Feng Gui, and Ji-Bin Tang. "Surrogate-based aerodynamic shape optimization of hypersonic flows considering transonic performance." *Aerospace Science and Technology*, 93:105345, 2019 (Q1, IF 5.0)

6. Zhuoliang Xie*, **Fei Liu***, Genghui Li, Zhilin Mao, Yu Zhang, Zhenkun Wang, and Qingfu Zhang. "Multi-population optimization with LLM-driven knowledge discovery for large-scale HFVRP." *IEEE Transactions on Computational Social Systems*, 2025 (Q1, IF 4.5, Equal Contribution)

7. Han Li*, **Fei Liu***, Zhi Zheng, Yu Zhang, and Zhenkun Wang. "Cada: cross-problem routing solver with constraint-aware dual-attention." *International Conference on Machine Learning (ICML)*, 2025 (Equal Contribution)

8. Shunyu Yao*, **Fei Liu***, Xi Lin, Zhichao Lu, Zhenkun Wang, and Qingfu Zhang. "Multi-objective evolution of heuristic using large language model." *Proceedings of the AAAI Conference on Artificial Intelligence (AAAI)*, 2025 (Oral, Equal Contribution)

9. Yu Zhang, Kefeng Zheng, **Fei Liu**†, Qingfu Zhang, and Zhenkun Wang. "AutoTurb: using large language models for automatic algebraic model discovery of turbulence closure." *Physic of Fluids*, 2025 (Q1, IF 4.1, Only corresponding Author)

10. **Fei Liu**, Qingfu Zhang, and Zhonghua Han. "MOEA/D with gradient-enhanced kriging for expensive multiobjective optimization." *Natural Computing*, 22(2):329-339, 2023 (Q2, IF 1.7)

11. **Fei Liu**, Xi Lin, Zhenkun Wang, Shunyu Yao, Xialiang Tong, Mingxuan Yuan, and Qingfu Zhang. "Large language model for multi-objective evolutionary optimization." *International Conference on Evolutionary Multi-Criterion Optimization (EMO)*, 2025

12. **Fei Liu** and Qingfu Zhang. "A two-stage algorithm for integer multiobjective simulation optimization." In *International Conference on Evolutionary Multi-Criterion Optimization (EMO)*, pages 17-28. Springer, 2023

13. **Fei Liu**, Yiming Yao, Ping Guo, Zhiyuan Yang, Xi Lin, Xialiang Tong, Mingxuan Yuan, Zhichao Lu, Zhenkun Wang, and Qingfu Zhang. "A systematic survey on large language

models for algorithm design." *arXiv preprint arXiv:2410.14716*, 2024 (Under Review)

14. **Fei Liu***, Rui Zhang*, Zhuoliang Xie, Rui Sun, Kai Li, Xi Lin, Zhenkun Wang, Zhichao Lu, and Qingfu Zhang. "LLM4AD: a platform for algorithm design with large language model." *arXiv preprint arXiv:2412.17287*, 2024 (Under Review)

15. Kefeng Zheng, Yiheng WANG, **Fei Liu**, Qingfu ZHANG, and Wenping SONG. "CST-LLM: enhancing airfoil parameterization method with large language model." *Aerospace Science and Technology*, 2025

16. Zidong Wang, **Fei Liu**, Qi Feng, Qingfu Zhang, and Xiaoguang Gao. "Llm-enhanced score function evolution for causal structure learning." *34th International Joint Conference on Artificial Intelligence (IJCAI)*, 2025

17. Ping Guo, Cheng Gong, Xi Lin, **Fei Liu**, Zhichao Lu, Qingfu Zhang, and Zhenkun Wang. "MOS-Attack: a scalable multi-objective adversarial attack framework." *Conference on Computer Vision and Pattern Recognition (CVPR)*, 2025

18. Ke Li, **Fei Liu**, Zhenkun Wang, and Qingfu Zhang. "Destroy and repair using hyper-graphs for routing." In *Proceedings of the AAAI Conference on Artificial Intelligence (AAAI)*, volume 39, pages 18341-18349, 2025

19. Zhuoliang Xie, **Fei Liu**, Zhenkun Wang, and Qingfu Zhang. "LLM-driven neighborhood search for efficient heuristic design." In *2025 IEEE Congress on Evolutionary Computation (CEC)*, pages 1-8. IEEE, 2025

20. Yiming Yao, **Fei Liu**, Ji Cheng, and Qingfu Zhang. "Evolve cost-aware acquisition functions using large language models." *International Conference on Parallel Problem Solving from Nature (PPSN)*, 2024 (Best Paper Nomination)

21. Rui Zhang, **Fei Liu**, Xi Lin, Zhenkun Wang, Zhichao Lu, and Qingfu Zhang. "Understanding the importance of evolutionary search in automated heuristic design with large language models." In *International Conference on Parallel Problem Solving from Nature (PPSN)*, pages 185-202. Springer, 2024

22. Bo Xue, Ji Cheng, **Fei Liu**, Yimu Wang, and Qingfu Zhang. "Multiobjective lipschitz bandits under lexicographic ordering." In *Proceedings of the AAAI Conference on Artificial Intelligence (AAAI)*, 2024

23. Xi Lin, Xiaoyuan Zhang, Zhiyuan Yang, **Fei Liu**, Zhenkun Wang, and Qingfu Zhang. "Smooth tchebycheff scalarization for multi-objective optimization." *International Conference on Machine Learning (ICML)*, 2024

24. Yiming Yao, **Fei Liu**, and Qingfu Zhang. "High-throughput multi-objective bayesian optimization using gradients." In *2024 IEEE Congress on Evolutionary Computation (CEC)*, pages 1-8. IEEE, 2024

25. Fu Luo, Xi Lin, **Fei Liu**, Qingfu Zhang, and Zhenkun Wang. "Neural combinatorial optimization with heavy decoder: toward large scale generalization." *Advances in Neural Information Processing Systems (NeurIPS)*, 36, 2024

26. Ping Guo, **Fei Liu**, Xi Lin, Qingchuan Zhao, and Qingfu Zhang. "L-AutoDA: leveraging large language models for automated decision-based adversarial attacks." *The Genetic and Evolutionary Computation Conference (GECCO)*, 2024

27. Yiwen Wang, **Fei Liu**, and Qingfu Zhang. "A decomposition-based hybrid algorithm for multi-objective vehicle routing problem with time windows." *IEEE Congress on Evolutionary Computation (CEC)*, 2023

28. Zhonghua Han, **Fei Liu**, Chengzhou Xu, Keshi Zhang, and Qingfu Zhang. "Efficient multi-objective evolutionary algorithm for constrained global optimization of expensive functions." *IEEE Congress on Evolutionary Computation (CEC)*, 2019

29. Bei Liu, Hua Liang, Zhonghua Han, Yinghong Li, **Fei Liu**, Jiangbo Chi, and Zhiwen Ding. "Numerical research on airfoil transition delay by alternative current dielectric barrier discharge actuation." *Chinese Journal of Aeronautics*, 2019

30. **Fei Liu**, Xialiang Tong, Mingxuan Yuan, and Qingfu Zhang. "Algorithm evolution using large language model." *arXiv preprint arXiv:2311.15249*, 2023

31. **Fei Liu**, Chengyu Lu, Lin Gui, Qingfu Zhang, Xialiang Tong, and Mingxuan Yuan. "Heuristics for vehicle routing problem: a survey and recent advances." *arXiv preprint arXiv:2303.04147*, 2023