Hongzong LI

hongzli2-c@my.cityu.edu.hk | https://hongzongli-cs.github.io/ | Google Scholar

RESEARCH INTERESTS

Computational Intelligence, Optimization, Neural Networks, Machine learning, Clustering

EDUCATION BACKGROUND

City University of Hong Kong, Kowloon, Hong Kong — Jan. 2021 -

- **Ph.D.** candidate in Computer Science
- Advisor**:** Prof. WANG Jun
- Developing optimization algorithms for capacitated clustering, quadratic unconstrained binary optimization, binary matrix factorization, etc. (Published: 4 first-authored papers. Under review: 3 first-authored papers)
- Developing clustering algorithms and implementing clustering applications (Published: 5 papers, 4 first-authored papers)

Northeastern University, Shenyang, China — Sept. 2016 - July 2020

- **B.E**. in Automation, School of Information Science and Engineering
- Overall GPA: 3.9891/5 - ranking within the top 5%.
- Focusing on the applications of machine learning (published: 8 papers, 5 student first-authored papers, and 7 filed patents and software copyrights)

HONORS & AWARDS

Doctor of Philosophy (Ph.D.)

- Outstanding Academic Performance Award
- Postgraduate Studentship (18,270 HKD per month)
- Institutional Research Tuition Scholarship (3,508 HKD per month)
- Institutional Research Tuition Grant (3,508 HKD per month)

Bachelor of Engineering (B.E.)

- Outstanding Graduates of Liaoning Province in 2020
- The Special Prize of excellent students of Baosteel in 2019 (20,000 CNY)
- The Fourth most influential graduate of the College in 2020
- The First Prize of "TI" Cup Electronic Design Competition for undergraduate students in Liaoning Province
- The Special Prize of the 7th China TRIZ Cup Undergraduate Innovation Method Competition
- The First Prize of the fourth Liaoning "TRIZ Cup" college students innovation method competition
- Northeast University (2019) National Innovation Training Program for College Students - National Excellent
- Northeast University (2019) National Innovation Training Program for College Students - my favorite innovation program for College Students
- Northeast University (2018) National Innovation Training Program for College Students - Provincial Qualification
- The Second Prize of the 17th Undergraduate Electronic Design Competition of "Jianlong iron and steel" of Northeast University in 2018
- The Third Prize of the fourth Internet plus China Northeastern University Student Competition
- First-class scholarship for outstanding students at Northeast University (2018-2019, and 2019-2020)
- Third-class scholarship for outstanding students at Northeast University (2016-2017, and 2017-2018)

PUBLICATIONS

Developing optimization algorithms for capacitated clustering, quadratic unconstrained binary optimization, binary matrix factorization, machine-cell and part family formulation, traveling salesman problem, Sudoku puzzles:

[1] **H. Li** and J. Wang, "Capacitated Clustering via Majorization Minimization and Collaborative Neurodynamic Optimization," *IEEE Transactions on Neural Networks and Learning Systems*, 2022. (IF: 14.255)

[2] **H. Li** and J. Wang, "A Collaborative Neurodynamic Algorithm for Quadratic Unconstrained Binary Optimization," *IEEE Transactions on Emerging Topics in Computational Intelligence*, 2024. (under review)

[3] **H. Li**, N. Zhang, W. Zhang, and J. Wang, "Binary Matrix Factorization via Collaborative Neurodynamic Optimization," *Neural Networks*, 2024. (under review)

[4] **H. Li** and J. Wang, "Machine-Cell and Part-Family Formation via Neurodynamics-Driven Constrained Binary Matrix Factorization," *International Journal of Production Research*, 2024. (under review)

[5] **H. Li**, J.S. Wang, and J. Wang, "Solving the Travelling Salesman Problem Based on Collaborative Neurodynamic Optimization with Discrete Hopfield Networks," in *11th International Conference on Information Science and*

Technology (ICIST). IEEE, 2021, pp. 456–465.

[6] **H. Li** and J. Wang, "A Collaborative Neurodynamic Optimization Algorithm Based on Boltzmann Machines for Solving the Traveling Salesman Problem," in *11th International Conference on Intelligent Control and Information Processing (ICICIP)*. IEEE, 2021, pp. 325–333.

[7] **H. Li** and J. Wang, "Collaborative Neurodynamic Algorithms for Solving Sudoku Puzzles," in *12th International Conference on Information Science and Technology (ICIST)*. IEEE, 2022, pp. 8–17.

Developing clustering algorithms and applying clustering algorithms to fault diagnosis and index tracking:

[8] **H. Li** and J. Wang, "From Soft Clustering to Hard Clustering: A Collaborative Annealing Fuzzy c-means Algorithm," *IEEE Transactions on Fuzzy Systems*, vol. 32 pp. 1181-1194, 2024. (IF:12.253)

[9] **H. Li** and J. Wang, "CAPKM++ 2.0: An Upgraded Version of the Collaborative Annealing Power K-means++ Clustering Algorithm," *Knowledge-Based Systems*, p. 110241, 2023. (IF: 8.139)

[10] **H. Li** and J. Wang, "Collaborative Annealing Power K-means++ Clustering," *Knowledge-Based Systems*, vol. 255, p. 109593, 2022. (IF: 8.139)

[11] **H. Li**, X. Ye and J. Wang, "HVAC System Fault Diagnosis via Feature Selection and Classification," in *13th International Conference on Information Science and Technology (ICIST)*. IEEE, 2023, pp 432-440.

[12] R. Zhang, **H. Li**, and J. Wang, "Index Tracking Based on Dynamic Time Warping and Constrained K-medoids Clustering," in *11th International Conference on Intelligent Control and Information Processing (ICICIP)*. IEEE, 2021, pp. 352–359.

The following papers were published during my undergraduate study. The papers focus mainly on the applications of machine learning. Dong Xiao was my supervisor:

[13] D. Xiao, **H. Li**, and X. Sun, "Coal Classification Method Based on Improved Local Receptive Field-Based Extreme Learning Machine Algorithm and Visible–Infrared Spectroscopy," *ACS Omega*, vol. 5, no. 40, pp.25 772–25 783, 2020.

[14] D. Xiao, **H. Li**, C. Liu, and Q. He, "Large-Truck Safety Warning System Based on Lightweight SSD Model," *Computational Intelligence and Neuroscience*, vol. 2019, 2019.

[15] D. Xiao, **H. Li**, B. T. Le, S. Zhang, J. Wang, D. He, and X. Fu, "Research on a Method of Gross Error Elimination for Slope Monitoring Data Based on Machine Learning," *IEEE Access*, vol. 7, pp. 164 682–164 695, 2019.

[16] D. Xiao, **H. Li**, Z. Ji, E. Xu, B. Luo, and J. Chen, "An Anti-Collision Early Warning System for Mine Trucks Based on RBF Network and Wi-Fi," *Journal of Physics: Conference Series*, vol. 1631, p. 012157, 2020.

[17] D. Xiao, **H. Li**, and G. Jiang, "Spectral and BP Neural Network Research on Classification of Iron Ore," in *Proceedings of the 2019 International Conference on Artificial Intelligence and Computer Science*, 2019, pp.239–242.

[18] D. Xiao, Q. He, **H. Li**, and C. Liu, "Real-Time Monitoring of Mine Landslide Based on Gaussian Mixture Model," in *Proceedings of the 2019 International Conference on Artificial Intelligence and Computer Science*, 2019, pp. 468–471.

[19] D. Xiao, B. T. Le, Z. Yu, C. Liu, **H. Li**, Q. He, H. Xie, and J. Wang, "A Method of Fault Monitoring and Diagnosis for the Thickener in Hydrometallurgy," *IEEE Access*, vol. 7, pp. 142 317–142 324, 2019.

[20] D. Xiao, H. Xie, L. Jiang, B. T. Le, J. Wang, C. Liu, and **H. Li**, "Research on a Method for Predicting the Underflow Concentration of a Thickener Based on the Hybrid Model," *Engineering Applications of Computational Fluid Mechanics*, vol. 14, no. 1, pp. 13–26, 2020.

ACADEMIC SERVICE

Committee member and session chair: *The 13th International Conference on Information Science and Technology (ICIST)*, 2023.

Reviewer of the following eight journals and four conferences: *IEEE Transactions on Pattern Analysis and Machine Intelligence*, *IEEE Transactions on Consumer Electronics*, *IEEE Transactions on Computational Social Systems*, *Neural Networks*, *Mathematical Biosciences and Engineering*, *Signal Processing*, *Journal of Low Frequency Noise, Vibration & Active Control*, *Cloud Computing and Data Science*, *ICIST2022*, *ICIST2024*, *ICICIP2024*, *ISNN2024*.

MENTORING EXPERIENCE

- Ran Zhang, Master at City University of Hong Kong
  Topic: Portfolio and Index Tracking
- Xuntan Ye, Undergraduate at City University of Hong Kong
  Topic: Classification for HVAC System Fault Diagnosis

TEACHING EXPERIENCE

Teaching assistant in CS4386 AI Game Programming at CityU, Hong Kong — Spring 2024

Teaching assistant in CS5489 Machine Learning: Algorithms and Applications at CityU, — Fall 2023

Hong Kong

Teacher in CS5486 Intelligent Systems at CityU, Hong Kong — Fall 2022

Teaching assistant in CS4386 AI Game Programming at CityU, Hong Kong — Spring 2023

Teaching assistant in GE2313 Global IT Case Studies at CityU, Hong Kong — Spring 2022, Fall 2022

Teaching assistant in CS1302 Introduction to Computer Programming at CityU, Hong Kong — Spring 2021

TALKS

- HVAC System Fault Diagnosis via Feature Selection and Classification
  In ICIST, Cario, Egypt, Dec. 2023
- Collaborative Neurodynamic Algorithms for Solving Sudoku Puzzles
  In ICIST, Online, Oct. 2022
- Solving the Travelling Salesman Problem Based on Collaborative Neurodynamic Optimization with Discrete Hopfield Networks
  In ICIST, Online, May 2021
- A Collaborative Neurodynamic Optimization Algorithm Based on Boltzmann Machines for Solving the Traveling Salesman Problem
  In ICICIP, Online, Dec. 2021

PATENTS

Patents of Invention:

Anti-collision method and device for mine car, Dong Xiao, **Hongzong LI**, Qifei He, 201910637799.8

Mine truck anti-collision warning system and method based on radar and WIFI, Dong Xiao, **Hongzong LI**, Qifei He, 201910739099.X

Method and device for detecting iron content in iron ore, Dong Xiao, Guotai Jiang, **Hongzong Li**, Zeyuan Zhang, 201811033543.8

Software Copyrights:

Vehicle panoramic assisted driving system, Dong Xiao, **Hongzong LI**, Qifei He, 2019SR0716144

WIFI-based anti-collision warning system for mining trucks, Dong Xiao, **Hongzong LI**, Qifei He, 2019SR1029773

Patents of Utility Model:

Anti-collision device for mine car, Dong Xiao, **Hongzong LI**, Qifei He, 201921107903.4

Mine truck anti-collision warning system based on radar and WIFI, Dong Xiao, **Hongzong LI**, Qifei He, 201921297483.0

RELEVANT SKILLS

Programming: MATLAB, Python, C++, HTTP

Languages: Mandarin (Native), English (Fluent), Cantonese (Beginner)