Hongzong LI

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Research Interests

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

Education

City University of Hong Kong, Kowloon, Hong Kong Jan. 2021 – Dec. 2024 (Expected)

Ph.D. candidate in Computer Science

- Advisor: Prof. WANG Jun (Life FIEEE, FIAPR, Foreign MAE)
- Developing optimization algorithms for capacitated clustering, quadratic unconstrained binary optimization, binary matrix factorization, etc. (Published: 6 first-authored papers. Under review: 1 first-authored papers)
- Developing clustering algorithms and implementing clustering applications (Published: 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%.
- Advisor: Prof. Dong Xiao
- 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, 16 Aug. 2024
- Outstanding Academic Performance Award, 16 Aug. 2023
- 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
- Northeastern University (2019) National Innovation Training Program for College Students - National Excellent
- Northeastern University (2019) National Innovation Training Program for College Students - my favorite innovation program for College Students
- Northeastern 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 Northeastern University in 2018
- The Third Prize of the fourth Internet plus China Northeastern University Student Competition
- First-class scholarship for outstanding students at Northeastern University (2018-2019, and 2019-2020)
- Third-class scholarship for outstanding students at Northeastern University (2016-2017, and 2017-2018)

Selected Publications

Journal Papers:

[1] **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.

[2] **H. Li** and J. Wang, "Capacitated Clustering via Majorization Minimization and Collaborative Neurodynamic Optimization," *IEEE Transactions on Neural Networks and Learning Systems*, vol. 35 pp. 6679-6692, 2024.

[3] **H. Li** and J. Wang, "A Collaborative Neurodynamic Algorithm for Quadratic Unconstrained Binary Optimization," *IEEE Transactions on Emerging Topics in Computational Intelligence*, accepted & in press, 2024.

[4] **H. Li**, J. Wang, N. Zhang, and W. Zhang, "Binary Matrix Factorization via Collaborative Neurodynamic Optimization," *Neural Networks*, vol. 176 pp. 106348, 2024.

[5] **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.

[6] **H. Li** and J. Wang, "Collaborative Annealing Power K-means++ Clustering," *Knowledge-Based Systems*, vol. 255, p. 109593, 2022.

[7] **H. Li** and J. Wang, "Machine-Cell and Part-Family Formation via Neurodynamics-Driven Constrained Binary Matrix Factorization," *IEEE Transactions on Systems, Man, and Cybernetics: Systems*, 2024. (under review)

[8] **H. Li** and J. Wang, "Co-clustering for Binary Data via Neurodynamics-driven Binary Matrix Factorization," 2024. (in preparation)

[9] 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.

[10] 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.

Conference Papers:

[11] **H. Li**, J. Wang, and J. Wang, "Solving the Travelling Salesman Problem Based on Collaborative Neurodynamic Optimization with Discrete Hopfield Networks," in *11-th International Conference on Information Science and Technology (ICIST)*. IEEE, 2021, pp. 456–465.

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

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

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

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

Academic Service

Publication chair and committee member: The 17th International Conference on Advanced Computational Intelligence (ICACI2025), Bath, UK.

Session chair and committee member: The 13th International Conference on Information Science and Technology (ICIST2023), Cairo, Egypt.

Reviewer of the following nine journals and seven conferences: • IEEE Transactions on Pattern Analysis and Machine Intelligence, • IEEE Transactions on Neural Networks and Learning Systems, • IEEE Transactions on Industrial Electronics, • IEEE Transactions on Consumer Electronics, • IEEE Transactions on Computational Social Systems, •v Neural Networks, • Mathematical Biosciences and Engineering, • Signal Processing, • Journal of Low Frequency Noise, Vibration & Active Control, • Science China Technological Sciences, • Cloud Computing and Data Science, • ICIST2022, • ICIST2024, • ICICIP2024, • ISNN2024, • ICCA2024, • NeurIPS2024, • ICLR2025.

Mentoring Experience

Ran Zhang Jun. 2021 - Dec. 2021

Master at City University of Hong Kong

➢ Topic: Portfolio and Index Tracking

Xuntan Ye Jan. 2023 - Dec. 2023

Undergraduate at City University of Hong Kong

➢ Topic: Classification for HVAC System Fault Diagnosis

Teaching Experience

Teaching assistant in CS5487 Machine Learning: Principles and Practice at CityU, Hong Kong	Fall 2024
Teaching assistant in CS4386 AI Game Programming at CityU, Hong Kong	Spring 2024
Teaching assistant in CS5489 Machine Learning: Algorithms and Applications at CityU, Hong Kong	Fall 2023
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 & Presentations

- A Collaborative Neurodynamic Optimization Algorithm Based on Boltzmann Machines and 2-Opt Heuristic for Solving the Traveling Salesman Problem
  In ISNN, Weihai, Shandong, Jul. 2024
- 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

Technical Skills

Programming languages: MATLAB, Python, C++
ML/AI: Pytorch, Numpy, Pandas, Matplotlib
Web Technologies: HTML
Miscellaneous: Git, Shell, Latex, Unity