HAO DAI

Shenzhen Institutes of Advanced Technology
Chinese Academy of Sciences
1068 Xueyuan Blvd. Shenzhen, 518055 China.
F10, F-Building

Mobile: +86-13007181963
Email: daihaovigg@gmail.com
Homepage: https://daihao42.github.io

RESEARCH INTERESTS

Deep Reinforcement Learning
Edge Intelligence
Distributed Deep Learning
Distributed Computing and Storage

EDUCATION

Ph.D in Computer Science Sept. 2019 - Jan. 2024
University of Chinese Academy of Sciences, China

- Thesis: Theories and Methods of Edge-Cloud Collaboration for Edge Intelligence
- Advisor: Prof. Yang Wang

Master of Electronic Engineering Sept. 2015 - May 2017
Wuhan University of Technology, China

- Thesis: Real-time Congestion Analysis System for Urban Rail Transit Based on Big Data
- Advisor: Prof. Feng Lv

B.S. in Electronic Engineering Sept. 2011 - May 2015
Wuhan University of Technology, China

- Thesis: A Self-Organized Electronic Tag System based on the Wireless Ad-Hoc Network
- Advisor: Prof. Dejun Chen

REFERRED PUBLICATIONS

1. **Hao Dai**, Yang Wang, Jerome Yen, Yong Zhang, and Chengzhong Xu, "**Cost-Efficient Sharing Algorithms for DNN Model Serving in Mobile Edge Networks**", IEEE Transactions on Services Computing (IEEE TSC), 2023, vol. 16, no. 4, pp. 2517-2531. (IF=8.1, SCI Q1)
2. **Hao Dai**, Jiashu Wu, André Brinkmann, and Yang Wang, "**Neighborhood-oriented Decentralized Learning Communication in Multi-Agent System**", 32nd International Conference on Artificial Neural Networks (ICANN), 2023.
3. **Hao Dai**, Jiashu Wu, Yang Wang, and Chengzhong Xu, "**Towards Scalable and Efficient Deep-RL in Edge Computing : A Game-based Partition-based Approach**", Journal of Parallel and Distributed Computing (JPDC), 2022, vol. 168, pp. 108-119. (IF=3.8, SCI Q2)
4. **Hao Dai**, Yang Wang, Kenneth B. Kent, Lingfang Zeng, and Chengzhong Xu,"**On Metadata Managements in Large-Scale Distributed File Systems—Scalability, Performance and Availability**", IEEE Transactions on Parallel and Distributed Systems (IEEE TPDS), 2022, vol. 33, no. 12, pp. 3850-3869. (IF=5.3, SCI Q1)
5. **Hao Dai**, Yang Wang, and Chengzhong Xu, "**Osprey: A Heterogeneous Search Framework for Spatial-Temporal Similarity**", Springer Computing, 2022, vol. 104, pp. 1949–1975. (IF=3.7, SCI Q2)
6. Yang Wang, **Hao Dai**, Xinxin Han, Pengfei Wang, Yong Zhang, Chengzhong Xu, "**Cost-Driven Data Caching in Content Delivery Edges**", IEEE Transactions on Mobile Computing (IEEE TMC), 2023, vol. 22, no. 3, pp. 1384-1400. (IF=7.9, SCI Q1)
7. Jiashu Wu, **Hao Dai**, Kenneth B. Kent, Jerome Yen, Chengzhong Xu, Yang Wang, "**Open Set Dandelion Network for IoT Intrusion Detection**", ACM Transactions on Internet Technology (ACM TOIT), 2024. To appear. (IF=5.3, SCI Q1)

8. Jiashu Wu, **Hao Dai**, Yang Wang, Yong Zhang, Dong Huang, and Chengzhong Xu, "**PackCache: A Cost-driven Packable Model Caching Algorithm for Machine Learning in Distributed Clouds**", IEEE Transactions on Computers (IEEE TC), 2023, vol. 72, no. 4, pp. 1208-1214. (IF=3.7, SCI Q2)
9. Jiashu Wu, **Hao Dai**, Yang Wang, Kejiang Ye, Chengzhong Xu, "**Heterogeneous Domain Adaptation for IoT Intrusion Detection: A Geometric Graph Alignment Approach**", IEEE Internet of Things Journal (IOTJ), 2023, vol. 10, no. 12, pp. 10764-10777. (IF=10.6, SCI Q1)
10. Yang Wang, Min Li, **Hao Dai**, Kenneth B. Kent, Kejiang Ye, and Chengzhong Xu, "**Deadlock Avoidance Algorithms for Recursion-Tree Modeled Requests in Parallel Executions**", IEEE Transactions on Computers (IEEE TC), 2022, vol. 71, no. 9, pp. 2073-2087. (IF=3.7, SCI Q2)
11. **Hao Dai**, Ming Jin, Xing Chen, Nan Li, Zhiying Tu, and Yang Wang, "**A Survey of Data-Driven Application Self-Adaptive Technology**", Journal of Computer Research and Development, 2021.
12. Mengze Wei, Wenyi Zhao, Quan Chen, **Hao Dai**, and Mingyi Guo, "**Predicting and reining in application-level slowdown on spatial multitasking GPUs**", Journal of Parallel and Distributed Computing (JPDC), 2020, vol. 141, pp. 99-114. (IF=3.8, SCI Q2)

PAPERS UNDER REVIEW

1. **Hao Dai**, Jiashu Wu, Jerome Yen, Yang Wang, and Chengzhong Xu, "An Overlapping Parallel Training Method for On-Policy Deep Reinforcement Learning", under review.

RESEARCH EXPERIENCE

Shenzhen Institutes of Advanced Tech. Research Assistant Sept. 2019 - Present
Chinese Academy of Sciences

Research Projects:

- *Theory and Method of Hardware and Software Cooperative Optimization for Federated Learning*, Chinese General Program, 2023-2026, Research Assistant.
- *Edge Cloud Collaborative Computing Methods and Applications in C-V2X*, Shenzhen-Hong Kong-Macau S&T Program (Category C), SGDX20220530111001003, 2023-2025, Research Assistant.
- *Key Technology of Network Architecture Optimization in AI Computing Cluster*, Key-Area Research and Development Program of Guangdong Province (No. 2021B0101400005), 2021-2022, Research Assistant.
- *Software-defined Theory and Method for Human-Computer Integration–Scenario-driven Intelligent Cloud-Edge Management and Performance Optimization*, Key-Area Research and Development Program of Guangdong Province (No. 2020B010164002), 2020-2022, Research Assistant.
- *Cloud Computing Architecture and Platform for Human-Computer Integration–Data Driven Technology for Self-Adaptive and Evolutionary Applications*, National Key R&D Program of China (No. 2018YFB1004804), 2018-2021, Research Assistant.

WORK EXPERIENCE

Shenzhen Institute of Beidou Applied Tech. Data Mining Engineer May 2016 - Aug. 2019

- Technical Head of the team to build Big Data Analysis Platform for Shenzhen public transportation, responsible for the construction of the Traffic Big Data Mining Platform and Management System.
- In charge of real-time computation and storage of PB-level traffic big data, constructing real-time travel knowledge graphs, event modeling, and analytical mining.
- Construction of the real-time passenger flow analysis platform for Shenzhen Metro Company. Responsible for modeling passenger travel, real-time analysis of passenger travel destinations, and real-time metro passenger flow. Utilizes GCN model for passenger flow prediction.

COMPUTER SKILLS

Operating Systems:	Linux	2012-Present
Programming Languages:	Java	2011-Present
	C/C++	2011-Present
	Python	2013-Present
	Scala	2014-Present
Databases:	Redis	2013-Present
	HBase	2014-Present
Distributed Programming:	Spark	2016-Present
	Pytorch	2017-Present
	Ray	2021-Present
	CUDA	2022-Present
	Jax	2022-Present
Development Tools:	Git	2016-Present
	Docker	2019-Present

TEACHING EXPERIENCE

Teaching Assistant

• Distributed Storage	Dept. of Computing Science Shenzhen Institutes of Advanced Tech.	Spring 2022
• Operating System	Dept. of Computing Science Shenzhen Institutes of Advanced Tech.	Fall 2021

AWARD AND HONORS

President Scholarship of Shenzhen Institute of Advanced Technology	2022-2023
Outstanding Student of University of Chinese Academy of Sciences	2022-2023
Outstanding Student of University of Chinese Academy of Sciences	2021-2022
University of Chinese Academy of Sciences Ph.D Scholarship	2019-2022

PROFESSIONAL ACTIVITY

Technical Program Committee Member

- The 30th International European Conference on Parallel and Distributed Computing (Euro-Par 2024, Spain)

Paper Reviewer

- IEEE Transactions on Parallel and Distributed Systems (2022)
- IEEE Transactions on Services Computing (2021)
- Journal of Parallel and Distributed Computing (2021)
- Journal of Cloud Computing (2021)
- Wireless Communications and Mobile Computing (2021)