1 Curriculum Vitae

Dr. Haodi Zhang, Associate Professor,
Deputy Head of Software Engineering Department,
College of Computer Science and Software Engineering,
Shenzhen University

Rm 941, Computer Science, Shenzhen University
Shenzhen, China
E-Mail: hdzhang@szu.edu.cn
Homepage: https://hdzhangust.github.io

1.1 Education

09/2009-02/2016	PhD	Computer Science	Hong Kong University of Science and Technology
09/2005-07/2009	Bachelor	Computer Science	University of Science and Technology of China

1.2 Work experience

07/2023 - presently	Associate Professor College of Computer Science and Software Engineering, Shenzhen University
11/2023 - presently	Adjunct Assistant Professor Thrust of Data Science and Analytics, Hong Kong University of Science and Technology (Guangzhou)
11/2017 - 06/2023	Assistant Professor College of Computer Science and Software Engineering, Shenzhen University
02/2020 - 06/2020	Guest Lecturer Department of CSE, Hong Kong University of Science and Technology
03/2016 - 10/2017	Post-doctoral Research Fellow Department of IELM, Hong Kong University of Science and Technology

1.3 Research Interests

Knowledge Representation and Reasoning in Deep Learning, and its application in interdisciplinary topics.

1. Knowledge Extraction and Reasoning in Deep Reinforcement Learning
   - Nonmonotonic logic for deep reinforcement learning in game playing
   - Dialog policy learning with knowledge-enhanced deep reinforcement learning
2. Language Models for Data Science
   - End-to-end text-to-visualization/speech-to-visualization models
   - AI-aided data crowdsourcing
3. Interpretable AI for Medication and Healthcare (in collaboration with Guangdong Second Provincial General Hospital)

- LLMs for medical knowledge extraction and summarization
- Explainable diagnosis with Markov Logic Network
- End-to-end medication recommendation

4. Knowledge-enhanced AI for Environmental Science (in collaboration with Prof. Lin Ma from School of Environment at Nanjing University)
   - Spacial planning for livestock with deep reinforcement learning
   - Global food consumption prediction with AI models
   - Fertilizer management for global ammonia emission reduction with explainable AI method
5. Explainable AI for Neural Science (in collaboration with Prof. Qi Chen from School of Psychology at Shenzhen University)
   - Deep reinforcement learning for understanding human's behavior in cognition tasks

1.4 Honor and award

1.4.1 Research awards

- First Prize of Science and Technology Award of Guangdong Artificial Intelligence Industry Association, 2024
- Winner of Verbal Track, Machine Automated IQ Test Competition (MAIQ) on IJCAI 2020
- Winner of Diagram Track, Machine Automated IQ Test Competition (MAIQ) on IJCAI 2020
- Tencent "Rhino-bird" Open-Funded Young Researcher Award, 2019
- Shenzhen Overseas High-Caliber Personnel (Category C), 2018
- Best New Faculty Award, Computer Science and Software Engineering of Shenzhen University 2019
- Excellency Award, Shenzhen University, 2020
- Second Prize in the National College CS Design Competition, 2022 (Advised students: Peirou Liang, Xiaofeng Tan and Minhan Chen)
- Finalist Mention Award in the 2022 Mathematical Contest in Modeling, 2022 (Advised students: Peirou Liang, Chengwei He and Liangqiu Xiao)
- Second Prize in the Guangdong College CS Design Competition, 2022 (Advised students: Peirou Liang, Chengwei He and Liangqiu Xiao)
- Third Prize of 4th Blossom Cup 5G Application Competition, 2021 (Advised students: Zisen Lin, Ke Duan, Jiahao Lin)

1.4.2 Teaching awards

- 2024 First Prize for the Outstanding Speaker of the "Master Lecture Series" at Shenzhen University
- 2023 Tencent Outstanding Teacher Award
- 2023 Second Prize for the Outstanding Speaker of the "Famous Scholars Visiting Middle Schools" Program
- 2022 Outstanding Teacher Award of Shenzhen University
- 2022 The Second Prize of Shenzhen University in Guangdong Teaching Innovation Contest
- 2021 Outstanding Undergraduate Course Award, Shenzhen University
- 2021 The second prize of the College of CSSE in the 10th Teaching Competition, Shenzhen University
- 2021 Outstanding Class (Tencent Cloud AI Class), Shenzhen University
- 2020 Annual Excellency Award, Shenzhen University
- 2019 Best Course Award for *Discrete Mathematics*, CSSE, Shenzhen University
- 2019 Best New Teacher Award, CSSE, Shenzhen University
- 2019 The second prize of the College of CSSE in the 9th Teaching Competition, Shenzhen University

1.5 Funded research projects

- PI, Haodi Zhang, Theory and Application of Non-monotonic Reasoning in Characterizing Action Languages (NSFA-61806132), total fund: 250,000 (CNY), NSFC Young Scientists Program, National Natural Science Foundation of China, 2019.01-2021.12.
- PI, Haodi Zhang, Embedding and Integration of Knowledge Representation and Reasoning into Deep Reinforcement Learning (2022A1515010675), total fund: 100,000 (CNY), Guangdong-NSF Program, Natural Science Foundation of Guangdong Province, 2022.01-2024.12.
- PI, Haodi Zhang, Knowledge Representation and Reasoning Oriented to Fintech AI system, total fund: 100,000 (CNY), Swift Fund Fintech Funding, 2022.03-2022.12.
- PI, Haodi Zhang, Theory and Applications of Non-monotonic Reasoning in Action Languages, total fund: 2,700,000 (CNY), Research funding for high-level talents in Shenzhen (Peacock Project), 2019.01-2021.12.
- PI, Haodi Zhang, Logic Based Artificial Intelligence in Game Playing (201902), total fund: 50,000 (CNY), Tencent Open Fund, 2019.01-2020.12.

- PI, Haodi Zhang, Embedding and Integration of Knowledge Representation and Reasoning into Deep Reinforcement Learning (860/000002110326), total fund: 140,000 (CNY), Research Startup Project for Young Teachers of Shenzhen University-Phase II, 2019.01-2022.12.
- PI, Haodi Zhang, Embedding and Integration of Knowledge Representation and Reasoning into Deep Reinforcement Learning (85304/00000165), total fund: 60,000 (CNY), Research Startup Project for Young Teachers of Shenzhen University-Phase I, 2018.01-2019.12.
- Co-I, Kaishun Wu, Liang Wang, Ning Fu, Haodi Zhang, Yongpan Zou, Zhidan Liu, Xuliang Li, Siyuan Ren, Yiming Liu, Community Context Computation based on Multidimensional Deep Perceived Information, total fund: 2,550,000 (CNY), Joint Funds of National Natural Science Foundation of China (NSFC), Key Program, 2021.01-2024.12.
- Co-I, Kaishun Wu, Lu Wang, Xueliang Li, Haodi Zhang, Theory and Application of Non-Contact Intelligent Sensing Based on Vibration, total fund: 200,000 (CNY), Department of Education of Guangdong Province Research Foundation - Key Project, 2021.01-2024.12.

1.6 Professional service

- Area Chair for
  - International Joint Conference on Artificial Intelligence (IJCAI) 2025
- Session Chair for
  - IEEE International conference on Data Engineering (ICDE) 2024
  - IEEE International conference on Bioinformatics and Biomedicine (BIBM 2024)
  - AAAI conference on Artificial Intelligence (AAAI) 2023
  - IEEE International conference on Data Engineering (ICDE) 2023
- Local Chair for
  - International conference on Edge Computing and IoT (EAI ICECI) 2021
- Senior member/member of Program Committee for
  - AAAI conference on Artificial Intelligence (AAAI) 2023, 2022, 2021, 2020, 2019, 2018, 2015
  - International Joint conference on Artificial Intelligence (IJCAI) 2023, 2022, 2021, 2020, 2019, 2018
  - The Joint conference of the 59th Annual Meeting of the Association for Computational Linguistics and the 11th International Joint conference on Natural Language Processing (ACL-IJCNLP) 2022, 2021
  - The conference on Neural Information Processing Systems (NeurIPS) 2022, 2021
  - The conference on Empirical Methods in Natural Language Processing (EMNLP) 2021, 2020

  - International conference on Principles of Knowledge Representation and Reasoning (KR) 2014, 2012

- Invited Reviewer for
  - IEEE Transactions on Knowledge and Data Engineering
  - Artificial Intelligence
  - Machine Learning
  - Data Intelligence
  - AAAI conference on Artificial Intelligence (AAAI) 2023, 2022, 2021, 2020, 2019, 2018, 2015
  - International Joint conference on Artificial Intelligence (IJCAI) 2023, 2022, 2021, 2020, 2019, 2018
  - The Joint conference of the 59th Annual Meeting of the Association for Computational Linguistics and the 11th International Joint conference on Natural Language Processing (ACL-IJCNLP) 2022, 2021
  - The conference on Neural Information Processing Systems (NeurIPS) 2022, 2021
  - The conference on Empirical Methods in Natural Language Processing (EMNLP) 2021, 2020
  - International conference on Principles of Knowledge Representation and Reasoning (KR) 2014, 2012
  - Conference of the European Chapter of the Association for Computational Linguistics (EACL) 2023

1.7 Invited talk

- Knowledge Representation and Integration for Avatar, on *the Bay Area Fintech University Forum*, Shenzhen, Feb. 4th, 2023
- Leveraging Human Intelligence in Machine Learning for NLP, on *The 2nd Macau Symposium on Linguistics*, Macau University, Dec. 4th, 2021
- Natural language processing: tasks, models and applications, on *The 2nd Interdisciplinary frontier Forum*, BNU Zhuhai, Nov. 24, 2021
- Leveraging Human Intelligence in Machine Learning for NLP, on *The 1st Macau Symposium on Linguistics*, Macau University, Dec. 4th, 2020

1.8 Teaching experience

	University	Students	Course	Evaluation
2021 Spring	SZU	Undergraduate	Discrete Mathematics	98.1/100 (Top 7.1%)
2020 Fall	SZU	Undergraduate	Discrete Mathematics	93.8/100
2020 Fall	SZU	Undergraduate	Natural Language Processing	85.2/100
2020 Spring	HKUST	Master	Natural Language Processing	-
2020 Spring	SZU	Undergraduate	Compilers	85.7/100
2019 Fall	SZU	Undergraduate	Discrete Mathematics	94.6/100
2019 Spring	SZU	Undergraduate	Compilers	100/100 (Top 0.7%)
2018 Fall	SZU	Undergraduate	Discrete Mathematics	93.6/100 (Top 9.8%)
2018 Spring	SZU	Undergraduate	Programming Languages	82.7/100

2 Publication List

Co-first author[#], Corresponding author[*]

2.1 Published journal and conference papers

[1] **Haodi Zhang**, Xinhe Zhang, Jihua Zhou, Kaishun Wu, Yuanfeng Song, Raymond Chi-Wing Wong. Speech-to-Visualization: Toward End-to-End Speech-Driven Data Visualization Generation from Natural Language Questions, in Proceedings of European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (**ECML-PKDD 2025**)

[2] **Haodi Zhang**, Xiangyu Zeng, Junyang Chen, Yuanfeng Song, Rui Mao, Fangzhen Lin. Deduction with Induction: Combining Knowledge Discovery and Reasoning for Interpretable Deep Reinforcement Learning, in Proceedings of 34th International Joint Conference on Artificial Intelligence (**IJCAI 2025**)

[3] Yichi Wang, Tian Huang, DanDan Huang, ZhaoHai Bai, Xuan Wang, Lin Ma, **Haodi Zhang***. Learning Dynamical Coupled Operator For High-dimensional Black-box Partial Differential Equations, in Proceedings of 34th International Joint Conference on Artificial Intelligence (**IJCAI 2025**)

[4] **Haodi Zhang**, Jiawei Wen, Jiahong Li, Yuanfeng Song, Liangjie Zhang, Lin Ma. SSPNet: Leveraging Robust Medication Recommendation with History and Knowledge, in Proceedings of 34th International Joint Conference on Artificial Intelligence (**IJCAI 2025**)

[5] **Haodi Zhang**, Siqi Ning, Qiyong Zheng, Yuanfeng Song, Liang-Jie Zhang. HealthLens: A Natural Language Querying System for Interactive Visualization of Electronic Health Records, in Proceedings of 34th International Joint Conference on Artificial Intelligence (**IJCAI 2025 Demo**)

[6] Yuanfeng Song, Jinwei Lu*, Yuanwei Song, Caleb Chen Cao, Raymond Chi-Wing Wong, **Haodi Zhang***. FeVisQA: Free-form Question Answering over Data Visualizations, in Proceedings of IEEE International Conference on Data Engineering, accepted (**ICDE 2025**)

[7] Jinwei Lu, Yuanfeng Song*, **Haodi Zhang***, Chen Zhang, Kaishun Wu, Raymond Chi-Wing Wong. Towards Robustness of Text-to-Visualization Translation against Lexical and Phrasal Variability, in Proceedings of IEEE International Conference on Data Engineering, accepted (**ICDE 2025**)

[8] **Haodi Zhang**, Xiangyu Zeng, Chen Zhang, Yuanfeng Song, Kaishun WU. HRLMS: A Data-driven Hierarchical Reinforcement Learning System for Interactive Rule Intervention and Visualization, in Proceedings of IEEE International Conference on Data Engineering, accepted (**ICDE 2025 Demo**)

[9] Zhidan Liu, Yingqian Zhou, Xiaosi Liu, **Haodi Zhang**, Yabo Dong, Dongming Lu, Kaishun Wu. Learning Road Network Index Structure for Efficient Map Matching, in IEEE Transactions on Knowledge and Data Engineering 37(1): 423-437, 2025 (**TKDE**)

[10] **Haodi Zhang**, Yichi Wang, Yifan Jian, Jiahui Jiang, Zhaohai Bai, Lin Ma. Climate Downscaling Using Neural Operator: Spatiotemporal Multimodal Fusion Operator with State-Query Coupled Kernel, in Proceedings of IEEE International Conference on Acoustics, Speech and Signal Processing, accepted (**ICASSP 2025**)

[11] **Haodi Zhang**, Junyu Yang, Jinyin Nie, Peirou Liang, Kaishun Wu, Defu Lian, Rui Mao and Yuanfeng Song. Efficient Data Labeling by Hierarchical Crowdsourcing with Large Language Models, in Proceedings of International Conference on Computational Linguistics, accepted (**COLING 2025**)

[12] **Haodi Zhang**, Xinhe Zhang, Min Cai, Weicheng Wang, Yuanfeng Song. Prompt-Based Relation Extraction By Reasoning with Contextual Knowledge, in Proceedings of 29th Pacific-Asia Conference on Knowledge Discovery and Data Mining (**PAKDD 2025**)

[13] **Haodi Zhang**, Yong Ding, Liang-Jie Zhang, Weicheng Wang, Yuanfeng Song, Di Jiang. Dual Learning between Molecules and Natural Language, in Proceedings of 29th Pacific-Asia Conference on Knowledge Discovery and Data Mining (**PAKDD 2025**)

[14] **Haodi Zhang**, Xinrui Zhu, Xuan Wang, Hanlin Gu, Yuanfeng Song, Lin Ma. Natural Language to Overpass Query: A Multi-Step Approach Using Task Decomposition and Key-Value Correction, in Proceedings of 26th IEEE International Conference on Mobile Data Management (**MDM 2025**)

[15] Gang Wang, Jing Yang, Xia Liu, **Haodi Zhang**, Xiangbo Xu, Jiafa Luo, Zhaohai Bai, Lin Ma. Enhancing crop production in the Haihe Basin while addressing challenges related to water quantity and quality, in Science of The Total Environment, Volume 955: 176800 (2024)

[16] Yuanfeng Song, Jinwei Lu, Xuefang Zhao, Raymond Chi-Wing Wong, **Haodi Zhang***. Demonstration of FeVisQA: Free-Form Question Answering over Data Visualization, in Proceedings of IEEE International Conference on Data Engineering (**ICDE 2024 Demo**)

[17] **Haodi Zhang**, Jinyin Nie, Zeming Liu, Dong Lei, and Yuanfeng Song. Automatic SQL Query Generation from Code Switched Natural Language Questions on Electronic Medical Records, in Proceedings of IEEE International Conference on Bioinformatics and Biomedicine (**BIBM 2024**)

[18] **Haodi Zhang**, Junyu Yang, Wenxi Huang, Min Cai, Jiahong Li, Chen Zhang and Kaisu Wu. Recognizing Textual Entailment by Hierarchical Crowdsourcing with Diverse Labor Costs, in Proceedings of 27th International Conference on Computer Supported Cooperative Work in Design (**CSCWD 2024**)

[19] Liang-Jie Zhang, Huan Chen, Sheng He, Changhu Li, Junyang Chen, **Haodi Zhang**, Wenfeng Du. COSIS: An AI-Enabled Digital Transformation Framework Integrating Large Language Models and Key Performance Indicators, in Proceedings of 21st Services Computing - International Conference (**SCC 2024**)

[20] **Haodi Zhang**, Wenxi Huang, Zhenhan Su, Junyang Chen, Di Jiang, Lixin Fan, Chen Zhang, Defu Lian and Kaishun Wu. Hierarchical Crowdsourcing for Data Labeling with Heterogeneous Crowd. *Proceedings of IEEE International conference on Data Engineering* (**ICDE 2023**)

[21] Jin Zhang, Defu Lian, **Haodi Zhang**, Baoyun Wang, Enhong Chen. Query-aware Quantization for Maximum Inner Product Search. *Proceedings of the Thirty-Seventh AAAI Conference on Artificial Intelligence* (**AAAI 2023**)

[22] Chen Zhang#, **Haodi Zhang#***, Weiteng Xie, Nan Liu, Kaishun Wu and Lei Chen. Where To: Crowd-Aided Path Selection by Selective Bayesian Network. *IEEE Transactions on Knowledge and Data Engineering* (**TKDE**), 35(1):1072-1087 (2023).

[23] **Haodi Zhang**, Zhichao Zeng, Keting Lu, Kaishun Wu, Shiqi Zhang. Efficient Dialog Policy Learning by Reasoning with Contextual Knowledge. *Proceedings of the Thirty-Sixth AAAI conference on Artificial Intelligence* (**AAAI 2022**), 2022:11667-11675

[24] Chen Zhang#, **Haodi Zhang#***, Weiteng Xie, Nan Liu, Qifan Li, Kaishun Wu, Di Jiang, Peiguang Lin and Lei Chen. Cleaning Uncertain Data with Crowdsourcing - a General Model with Diverse Accuracy Rates. *IEEE Transactions on Knowledge and Data Engineering* (**TKDE**), 34(8): 3629-3642, 2022

[25] **Haodi Zhang**, Chenyu Xu, Jiahong Li, Peirou Liang, Xiangyu Zeng, Hao Ren, Weibin Cheng, and Kaishun Wu. Explainable Pulmonary Disease Diagnosis with Prompt-Based Knowledge Extraction. *Proceedings of the IEEE International conference on Bioinformatics and Biomedicine* (**BIBM 2022**)

[26] Junyang Chen, Mengzhu Wang, **Haodi Zhang**, Zhiguo Gong, Zhidan Liu, Kaishun Wu, Victor Leung, From Where and Where To Go: Deep User Interest Exploration for Sequential Location Recommendation. *IEEE Transactions on on Computational Social Systems* (**IEEE TCSS**), 2022

[27] **Haodi Zhang**, Zhenhao Chen, Junyang Chen, Yi Zhou, Defu Lian, Kaishun Wu and Fangzhen Lin. Dynamic Decision Making Framework Based on Explicit Knowledge Reasoning and Deep Reinforcement Learning (In Chinese). *Journal of Software*, 2022

[28] **Haodi Zhang**, Chenyu Xu, Peirou Liang, Ke Duan, Hao Ren, Weibin Cheng, and Kaishun Wu. MMLN: Leveraging Domain Knowledge for Multimodal Diagnosis. *Proceedings of the Eighteenth International Symposium on Bioinformatics Research and Applications* (**ISBRA 2022**)

[29] Sheng Luo, **Haodi Zhang**, Qifan Li and Kaishun Wu. Knowledge-Assisted DRL for Energy Harvesting Based Multi-Access Wireless Communications, *Proceedings of IEEE International conferences on High Performance Computing and Communications* (**IEEE HPCC 2022**), 2022:869-876

[30] **Haodi Zhang**, Zhao Chen, Jinyin Nie, Di Jiang, Lixin Fan and Kaishun Wu. Knowledge-Enhanced Learning for KG Embedding. *Proceedings of the Twenty-Eighth IEEE International conference on Parallel and Distributed Systems* (**ICPADS 2022**)

[31] **Haodi Zhang**, Wenxi Huang, Chenyu Xu, Zhengbang Yang, Hongxin Zhou, Fengtian Qi, Kaishun Wu and Chen Zhang. Improving Confidence of Uncertain Knowledge Graphs by Crowdsourcing with Limited Budget. *Proceedings of the Twenty-Eighth IEEE International conference on Parallel and Distributed Systems* (**ICPADS 2022**)

[32] Chen Zhang#, **Haodi Zhang#***, Qifa n Li, Kaishun Wu, Di Jiang, Yuanfeng Song, Peiguang Lin, and Lei Chen. Burstiness-Aware Web Search Analysis on Different Levels of Evidences. *IEEE Transactions on Knowledge and Data Engineering* (**TKDE**), 2023.

[33] Zhidan Liu, Junhong Zheng, Zengyang Gong, **Haodi Zhang** and Kaishun Wu. Exploiting Multi-source Data for Adversarial Driving Style Representation Learning. *Proceedings of 26th International conference of DASFAA* (**DASFAA 2021**), 2021:491-508.

[34] Shan Wang*, Zhao Chen, **Haodi Zhang***, Macau's Vocabulary Growth in the Recent Ten Year (In Chinese). *Proceedings of the 20th Chinese National conference on Computational Linguistics* (**CCL 2021**), 2021:350-360.

[35] Hao Ren, Aslan B. Wong, Wanmin Lian, Weibin Cheng, Ying Zhang, Jianwei He, Qingfeng Liu, Jiasheng Yang, Chen Jason Zhang, Kaishun Wu, **Haodi Zhang***. Interpretable Pneumonia Detection by Combining Deep Learning and Explainable Models with Multisource Data. *IEEE Access* 9:95872-95883, 2021.

[36] Zihang Gao, Fangzhen Lin, Yi Zhou, Hao Zhang, Kaishun Wu, **Haodi Zhang***. Embedding High-Level Knowledge into DQNs to Learn Faster and More Safely. *Proceedings of the AAAI conference on Artificial Intelligence* (**AAAI 2020**)

[37] **Haodi Zhang**, Di Zhan, Chen Jason Zhang, Kaishun Wu, Ye Liu, Sheng Luo. Deep Reinforcement Learning-Based Access Control for Buffer-Aided Relaying Systems With Energy Harvesting. *IEEE Access* 8:145006-145017, 2020.

[38] Yusen Liu, Fangyuan He, **Haodi Zhang**, Guozheng Rao, Zhiyong Feng and Yi Zhou. How Well Do Machines Perform on IQ tests: a Comparison Study on a Large-Scale Dataset. *Proceedings of International Joint conference on Artificial Intelligence* (**IJCAI 2019**), 2019:6110-6116.

[39] Fangyuan He, Yi Zhou, **Haodi Zhang**, Zhiyong Feng. Dual-enhanced Word Representations Based on Knowledge Base. *International Semantic Web conference* (**ISWC 2018**), 2018.

[40] **Haodi Zhang**, Fangzhen Lin. Characterizing causal action theories and their implementations in answer set programming. *Artificial Intelligence* (**AIJ**) 248:1-8, 2017.

[41] **Haodi Zhang**, Yu Wang, Xiangtong Qi, Weiping Xu, Tao Peng, Shucheng Liu. Demo: An intent solver for enabling intent-based SDN. **IEEE INFOCOM** (short paper) 2017:13608-13609.

[42] **Haodi Zhang**, Fangzhen Lin. Mapping Action Language BC to Logic Programs: A Characterization by Postulates. *Proceedings of the AAAI conference on Artificial Intelligence* (**AAAI 2016**), 2016:1116-1123.

[43] **Haodi Zhang**, Fangzhen Lin. Characterizing Causal Action Theories and Their Implementations in Answer Set Programming: Action Languages B, C, and Beyond. *Proceedings of International Joint conference on Artificial Intelligence* (**IJCAI 2015**), 2015:3285-3291.