

Qi Song

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Work Experience

- 2022.11-now **(Pre-tenure) Professor**, *University of Science and Technology of China*, Hefei, China.
2022.01-2022.10 **Associate Professor**, *University of Science and Technology of China*, Hefei, China.
2020.04-2022.01 **Applied Scientist**, *Amazon.com*, Seattle.

Education

- 2015.05-2020.04 **Phd**, *School of Electrical Engineering and Computer Science, Washington State University*, Major: *Computer science*, Mentor: Prof. Yinghui Wu.
2012.09-2015.02 **Master**, *School of Computer Science and Engineering, Beihang University*, Major: *Computer science*, Mentor: Prof. Jinpeng Huai.
2008.09-2012.07 **Bachelor**, *School of Computer Science and Engineering, Beihang University*, Major: *Computer science*.

Research Interests

- Knowledge construction, knowledge enhanced LLM/time-series models/multimodal models.
- Deep learning (e.g., deep neural network models like CNN and RNN) for graph analysis (e.g., ranking, anomaly detection).
- (Distributed) graph data mining, (temporal) graph query models and languages.

Research Experience

- 2015 - 2020 Research Assistant, Washington State University, Supervisor: Prof. Yinghui Wu.
Research topic: Towards User-friendly Graph Exploration.
- 2019 summer Applied scientist intern, Amazon.com
Research topic: Time fixed effects for long-running experiments.
- 2018 summer Intern research assistant, JD AI Research, Silicon Valley, Mentor: Dr. Wei Li, Jin Guo and (Martin) Congmin Min.
Research topic: user prompt generation for online e-commerce dialogue system.
- 2017 summer Intern research assistant, NEC labs America, Mentor: Dr. Bo Zong.
Research topic: unsupervised anomaly detection model for network attack detection.
- 2016 summer Intern research assistant, NEC labs America, Mentor: Dr. Bo Zong.
Research topic: temporal graph ranking for system log analysis.

Publications

- (39) 2025 Xiang-Yang Li, Yihang Wang, Junli Liang, Xinyu Wang, Pengfei Zhou, Qi Zhao, Yuhang Zhang, Qi Song, "Knowledge-enhanced AI models for domain-specific application: a survey.", SCIENCE CHINA Information Sciences (SCIS), 2025.
- (38) 2025 Yuhang Zhang, Yiming Xu, Peilin Chen, Shiqi Wang, Qi Song, Lei Yu, Wei Cai, "Knowledge-Enhanced Medical Image Classification via Descriptive Priors from Large Language Models.", Health Information Science and Systems (HISC), 2025.
- (37) 2025 Yuhang Zhang, Peilin Chen, Keyan Ding, Han Liu, Shiqi Wang, Qi Song, "MPSol: A Multimodal Prompt Learning Framework for Protein Solubility Prediction.", IEEE Journal of Biomedical and Health Informatics (JBHI), 2025.
- (36) 2025 Can Lin, Zhengwang Jiang, Ling Zheng, Qi Zhao, Yuhang Zhang, Qi Song, Wangqiu Zhou, "RJE: A Retrieval-Judgment-Exploration Framework for Efficient Knowledge Graph Question Answering with LLMs.", The Conference on Empirical Methods in Natural Language Processing (EMNLP), 2025.
- (35) 2025 Yiming Xu, Qi Song, Yihan Wang, Wangqiu Zhou and Junli Liang, "LGC-CR: Few-shot Knowledge Graph Completion via Local Global Contrastive Learning and LLM-Guided Refinement.", The Conference on Information and Knowledge Management (CIKM), 2025.
- (34) 2025 Ling Zheng, Qi Song, Yihan Wang, Zhitao Wang, Xiang-Yang Li, "HE-GAD: A Behavior-Enhanced Contrastive Learning Framework for Graph Anomaly Detection.", Machine Learning (ECML-PKDD Journal Track), 2025.
- (33) 2025 Yihan Wang, Qi Song, Ling Zheng, Xiang-Yang Li, "Efficient and Tractable Conflict Detection in Knowledge Graphs via Path Analysis.", IEEE Transactions on Big Data (TBD), 2025.
- (32) 2025 Xin-Wei Yao, Junfeng Bai, Chuan He, Qiang Li, Qi Song, "Leveraging Contrastive Learning to Bridge Semantic Gaps in Multimodal Recommendation.", International Conference on Intelligent Computing (ICIC), 2025.
- (31) 2025 Pengfei Zhou, Yunlong Liu, Junli Liang, Qi Song, Xiangyang Li, "CrossLinear: Plug-and-Play Cross-Correlation Embedding for Time Series Forecasting with Exogenous Variables.", Proceedings of the 31th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD), 2025.
- (30) 2025 Xinyu Wang, Shenyao Jiang, Wangqiu Zhou, Hao Zhou, Zhi Liu, Qi Song, Yusheng Ji, "In-Band Parallel Feedback Communication for Magnetic MIMO Wireless Power Transfer System.", IEEE Wireless Communications Magazine, 2025.
- (29) 2025 Xinyu Wang, Wangqiu Zhou, Hao Zhou, Shenyao Jiang, Zhi Liu, Xiaoyan Wang, Yusheng Ji, Qi Song, "Relip: Reliable In-Band Parallel Communication for Magnetic MIMO Wireless Power Transfer System.", IEEE Transactions on Mobile Computing (TMC), 2025.
- (28) 2025 Qi Zhao, Qi Song, Tian Xie, Haiyue Zhang, Hongyu Yang, Xiangyang Li, "Improving Pre-trained Language Models with Knowledge Enhancement and Filtering Framework.", Annual Conference of the Nations of the Americas Chapter of the Association for Computational Linguistics (NAACL), 2025.
- (27) 2025 Pengfei Zhou, Junli Liang, Yunlong Liu, Ji Wu, Qi Song, Xiangyang Li, "Capacity estimation of retired lithium-ion batteries using random charging segments from massive real-world data.", Cell Reports Physical Science (CRPS), 2025.

- (26) 2025 Xinyu Wang, Wangqiu Zhou and Hao Zhou, Tianjian Yang, Shenyao Jiang, Zhi Liu, Yusheng Ji, Qi Song, "*Fast and Anti-starvation Charging Device Grouping for Magnetic Wireless Power Transfer.*", IEEE International Conference on Computer Communications (**INFOCOM**), 2025.
- (25) 2024 Xin-Wei Yao, Wei-Wei Xing, Ke-Chen Zheng, Chu-Feng Qi, Xiang-Yang Li, Qi Song, "*GTDIM: Grid-based Two-stage Dynamic Incentive Mechanism for Mobile Crowd Sensing.*", Pervasive and Mobile Computing (**PMC**), 2024.
- (24) 2024 Tian Xie, Qi Song, Qi Zhao, Hao Jiang, Yijie Li, Tongjing Zhu, "*Query Exploration based on Knowledge Reasoning.*", International Conference on Advanced Data Mining and Applications (**ADMA**), 2024.
- (23) 2024 Lingchang Kong, Xinyu Wang, Hao Zhou, Fengyu Zhou, Shenyao Jiang, Peide Zhu, Qi Song, Zhi Liu, "*LAORA: Location-Aware Orientation Adjustment for MIMO Magnetic Wireless Charging System*", IEEE International Conference on Sensing, Communication, and Networking (**SECON**), 2024.
- (22) 2023 Miao-Hui Song, Lan Zhang, Mu Yuan, Zichong Li, Qi Song, Yijun Liu and Guidong Zheng, "*CoTel: Ontology-Neural Co-Enhanced Text Labeling*", ACM The Web Conference (**WWW**), 2023.
- (21) 2023 Hanchao Ma, Sheng Guan, Mengying Wang, Qi Song, Yinghui Wu, "*Fair Group Summarization with Graph Patterns*", IEEE International Conference on Data Engineering (**ICDE**), 2023.
- (20) 2023 Zichong Li, Lan Zhang, Mu Yuan, Miao-Hui Song, **Qi Song**, "*Efficient Deep Ensemble Inference via Query Difficulty-dependent Task Scheduling*", IEEE International Conference on Data Engineering (**ICDE**), 2023.
- (19) 2022 **Qi Song**, Mohammad Hossein Namaki, Peng Lin, Yinghui Wu, "*Answering Why-Questions for Subgraph Queries*", Accepted by IEEE Transactions on Knowledge and Data Engineering (**TKDE**), 34(10), 4636-4649, (2022).
- (18) 2021 **Qi Song**, Peng Lin, Hanchao Ma, Yinghui Wu, "*Explaining Missing Data in Graphs: A Constraint-based Approach*", IEEE International Conference on Data Engineering (**ICDE**), 2021.
- (17) 2021 **Qi Song**, Hanchao Ma, Peng Lin, Yinghui Wu, "*GRIP: Constraint-based Explanation of Missing Entities in Graph Search*", ACM SIGMOD Conference on Management of Data (**SIGMOD(demo)**), 2021.
- (16) 2020 Peng Lin, **Qi Song**, Yinghui Wu, "*Repairing Entities using Star Constraints in Multirelational Graphs*", IEEE International Conference on Data Engineering (**ICDE**), 2020.
- (15) 2019 Mohammad Hossein Namaki, **Qi Song**, Yinghui Wu, Shengqi Yang, "*Answering Why-questions by Exemplars in Attributed Graphs*", ACM SIGMOD Conference on Management of Data (**SIGMOD**), 2019.
- (14) 2019 Mohammad Hossein Namaki, **Qi Song**, Yinghui Wu, Jiaying Pi, "*NAVIGATE: Explainable Visual Graph Exploration by Examples*", ACM SIGMOD Conference on Management of Data (**SIGMOD (demo)**), 2019.
- (13) 2019 **Qi Song**, Mohammad Hossein Namaki, Yinghui Wu, "*Answering Why-Questions for Subgraph Queries in Multi-Attributed Graphs*", IEEE International Conference on Data Engineering (**ICDE**), 2019.
- (12) 2018 **Qi Song**, Bo Zong, Yinghui Wu, Lu-An Tang, Hui Zhang, Guofei Jiang and Haifeng Chen, "*TGNet: Learning to Rank Nodes in Temporal Graphs*", ACM International Conference on Information and Knowledge Management (**CIKM**), 2018.

- (11) 2018 Peng Lin, **Qi Song**, Jialiang Shen, Yinghui Wu, "*Discovering Graph Patterns for Fact Checking in Knowledge Graphs*", International Conference On Database Systems for Advanced Applications(**DASFAA**), 2018.
- (10) 2018 Bo Zong, **Qi Song**, Martin Renqiang Min, Wei Cheng, Cristian Lumezanu, Daeki Cho, Haifeng Chen, "*Deep Autoencoding Gaussian Mixture Model for Unsupervised Anomaly Detection*", International Conference on Learning Representations(**ICLR**), 2018.
- (9) 2018 **Qi Song**, Yinghui Wu, Peng Lin, Xin Luna Dong, Hui Sun, "*Mining Summaries for Knowledge Graph Search*", IEEE Transactions on Knowledge and Data Engineering (**TKDE**), 30(10), 1887-1900, (2018).
- (8) 2018 Peng Lin, **Qi Song**, Yinghui Wu, "*Discovering Patterns for Fact Checking in Knowledge Graphs*", Journal of Data and Information Quality(**JDIQ**), 2018.
- (7) 2018 Peng Lin, **Qi Song**, Yinghui Wu, "*Fact Checking in Knowledge Graphs with Ontological Subgraph Patterns*", Data Science and Engineering(**DSE**), 2018.
- (6) 2018 Wei Cai, Baochun He, Min Hu, Wenyu Zhang, Deqiang Xiao, Hao Yu, Nan Xiang, Jian Yang, **Qi Song**, Songsheng He, Yaohuan Huang, Wenjie Huang, Fucang Jia, Chi-hua Fang, "*A radiomics-based Nomogram for the Preoperative Prediction of Posthepatectomy Liver Failure in Patients with Hepatocellular Carcinoma*", Surgical Oncology(**SO**), 2018.
- (5) 2017 Mohammad Hossein Namaki, Yinghui Wu, **Qi Song**, Peng Lin, Tingjian Ge, "*Discovering Temporal Graph Association Rules*", ACM International Conference on Information and Knowledge Management (**CIKM**), 2017.
- (4) 2017 **Qi Song**, Mohammad Hossein Namaki, Peng Lin, Yinghui Wu, "*Parallel Graph Summarization for Knowledge Search*", 13th International Workshop on Mining and Learning with Graphs (**MLG**), 2017.
- (3) 2016 **Qi Song**, Yinghui Wu, Xin Luna Dong, "*Mining Summaries for Knowledge Graph Search*", IEEE International Conference on Data Mining (**ICDM**), 2016.
- (2) 2014 **Qi Song**, Bo Li, Weiren Yu, Jianxin Li, Bin Shi, "*NSLPA: A node similarity based label propagation algorithm for real-time community detection*", IEEE International Conference on Utility and Cloud Computing (**UCC**), 2014.
- (1) 2013 Jianxin Li, **Qi Song**, Weiren Yu, Chunming Hu, Jian Kang, "*iScreen: A Merged Screen of Local System with Remote Applications in a Mobile Cloud Environment*", IEEE International Symposium on Service Oriented System Engineering (**SOSE**), 2013.

Patents - before 2020

- (6) **Qi Song**, Congmin Min, Jin Guo, Wei Li, "*System and method for intelligent guided shopping*", US Patent 16,296,169, Status: **Granted**.
- (5) Bo Zong, Daeki Cho, Cristian Lumezanu, Haifeng Chen, **Qi Song**, "*Density estimation network for unsupervised anomaly detection*", US Patent 10,999,247, Status: **Granted**.
- (4) Bo Zong, LuAn Tang, **Qi Song**, Biplob Debnath, Hui Zhang, Guofei Jiang, "*Discovering critical alerts through learning over heterogeneous temporal graphs*", US Patent 10,409,669, Status: **Granted**.
- (3) Bo Li, **Qi Song**, Jianxin Li, Weiren Yu, "*Data segmenting method and system of distributed graph calculating system*", Publication No. : CN104281664B, Status: **Granted**.
- (2) Jianxin Li, Weiren Yu, **Qi Song**, Chenggen Sun, Bo Wu, "*Desktop presenting method based on cloud*", Publication No. : CN103595759B, Status: **Granted**.
- (1) Chunming Hu, Weiren Yu, **Qi Song**, Chenggen Sun, Bo Wu, "*File picture sharing method based on cloud*", Publication No. : CN103595760B, Status: **Granted**.

Awards

- 2024.06 **2023 ACM China Council Hefei Chapter Rising Star.**
- 2022.12 **Mozi distinguished youth from USTC.**
- 2019.04 **NSF Student Travel Award for SIGMOD 2019.**
- 2019.04 **NSF Student Travel Award for ICDE 2019.**
- 2017.11 **SIGIR Student Travel Award for CIKM 2017.**
- 2016.11 **NSF Student Travel Award for ICDM 2016.**
- 2015 & 2016 **NSF Travel support for NSF Graduate Data Science Workshop 2015, 2016.**
- 2014.11 **MediaTek Inc. - Beihang Univ. Science and Technology Award.**

Services

- SPC **CIKM'23.**
- PC **DASFAA'24,AAAI'23/24,ECAI'23.**
- Journal Reviewer **TPAMI, TDSC, TKDE, VLDBJ, JAIR, TNNLS, JDIQ, TBD, JCST, PR, ML, JAIR.**
- Conference Reviewer **VLDB, SIGMOD, ICDE, KDD, Big Data.**