Yumeng Song

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EDUCATION & WORK EXPERIENCE

Aalborg University, Denmark | ***Postdoc*** Nov. 2024 –
Major: Computer Science Aalborg, Denmark
- *Research Topic:* Machine learning for spatio-temporal management and analytics

Aalborg University, Denmark | ***Guest PhD*** Nov. 2022 – Oct. 2024
Major: Computer Science Aalborg, Denmark
- *Host Supervisor:* Assistant Professor Tianyi Li
- *Research Topic:* Machine learning for spatio-temporal management and analytics

Northeastern University, China | ***PhD*** Sep. 2019 – Oct. 2024
Major: Computer Science and Technology Shenyang, China
- *Main Supervisor:* Prof. Ge Yu
- *Co-supervisor:* Prof. Yu Gu
- *Research Topic:* Graph neural networks

Northeastern University, China | ***Master*** Sep. 2017 – Jul. 2019
Major: Computer Software and Theory Shenyang, China
- *Supervisor:* Prof. Ge Yu
- *Research Topic:* Location-based social networks

Northeastern University, China | ***Bachelor*** Sep. 2013 – Jun. 2017
Major: Computer Science and Technology Shenyang, China
- *Rank:* 11/258

PUBLICATIONS

Accepted papers:

* **Yumeng Song**, Yu Gu, Tianyi Li, Yushuai Li, Christian S. Jensen, and Ge Yu. Quantifying Trajectory Point Contributions: A Lightweight Framework for Efficient and Effective Query-Driven Trajectory Simplification. VLDB, 2025.

* Tianyi Li, Yushuai Li, **Yumeng Song**, Zhongming Yao, Wei Gao, and David Wenzhong Gao. Networked Digital Twins for Autonomous Vehicles: A New Perspective. IEEE Transactions on Intelligent Vehicles.

* **Yumeng Song**, Yu Gu, Tianyi Li, Jianzhong Qi, Zhenghao Liu, Christian S. Jensen, and Ge Yu. CHGNN: A Contrastive Network for Semi-Supervised Hypergraph Learning. TKDE, 2024.

* Qi Dai, **Yumeng Song**, Yu Gu, Fangfang Li, and Xiaohua Li. Diffusion Model-Enhanced Contrastive Learning for Graph Representation. DASFAA, 2024.

* **Yumeng Song**, Xiaohua Li, Fangfang Li, and Ge Yu. Learning from Feature and Global Topologies: Adaptive Multi-View Parallel Graph Contrastive Learning. Mathematics, 2024.

* Jingbo Wang, **Yumeng Song**, Yu Gu, Xiaohua Li and Fangfang Li. CLNIE: A Contrastive Learning Based Node Importance Evaluation Method for Knowledge Graphs with Few Labels. DASFAA, 2023.

* **Yumeng Song**, Yu Gu, Xiaohua Li, Chuanwen Li, and Ge Yu. CSGNN: Improving Graph Neural Networks with Contrastive Semi-supervised Learning. DASFAA, 2022.
* Di Wei, Yu Gu, **Yumeng Song**, Zhen Song, Fangfang Li, and Ge Yu. IncreGNN: Incremental Graph Neural Network Learning by Considering Node and Parameter Importance. DASFAA, 2022.
* **Yumeng Song**, Yu Gu, Fangfang Li, and Ge Yu. Survey on AI-powered new techniques for query processing and optimization. Journal of Frontiers of Computer Science and Technology, 2020.
* **Yumeng Song**, Mo Chen, Ge Yu. Dynamic preference-based group query in temporal geo-social networks. Journal of Frontiers of Computer Science and Technology, 2019.

Ongoing papers:

* Xinru Ye, Yu Gu, **Yumeng Song**, Zhenghao Liu, Xiaohua Li, and Fangfang Li DS-GAT: Dynamic Spike Graph Neural Networks with Biological Attention Restoration. AAAI, 2025. (Under review)
* Tianyi Li, Yifei Chen, **Yumeng Song**, Lu Chen, Yushuai Li, Yunjun Gao, Kristian Torp, Torben Bach Pedersen, and Christian S. Jensen. Movement Pattern-Enhanced Evolutionary and Incremental Clustering of Moving Objects. TKDE. (To be submitted in November)
* Zhongming Yao, **Yumeng Song**, Junchang Xin, Tianyi Li, Yushuai Li, Zhiqiong Wang, Chenxu Wang, and Christian S. Jensen. VGQ: Enabling Verifiable Graph Queries on Blockchain Systems. ICDE, 2025. (To be submitted in November)

PATENTS

* A Cryptographic Multi-Copy Reliability Verification based on Blockchain, 2020.
* A Dynamic Data Reliability Verification based on Blockchain, 2019.
* An On-Chain-Off-Chain Collaborative Data Interaction based on Blockchain, 2019.

RESEARCH EXPERIENCE

* **Research on Trajectory Simplification based on Deep Learning.** The research provides sampling-based and generative-based efficient trajectory simplification models by deep learning. The query results on a simplified database aim to be similar to those of the source database.
* **Research on Contrastive Graph Neural Network (GNN).** The research focuses on contrastive learning-based GNNs and hypergraph GNNs.The research aims to improve GNN and hypergraph GNN performance in semi-supervised learning by mining hidden information of unlabeled nodes.

PROJECT EXPERIENCE

* **Research on the Construction of Interactive Personalized Teaching Environment based on Big Data.** The research focuses on the intelligent management of multi-source heterogeneous teaching space, diversified teaching interaction design and adaptive optimization, personalized and precise guidance under multiple subjects, etc. The research aims to build an intelligent environments for teaching, where both physical space and virtual space are fused.
* **Research on Distributed Data Storage and Management based on Heterogeneous Architecture.** The research aims at: (a) developing a distributed data storage model and designing a dynamic partitioning strategy for the model, in order to enhance the efficiency of accessing diversified types of data; (b) enabling high-throughput and flexible access of streaming data, under multiple patterns of data processing; (c) presenting a multi-level management of data cache, in order to efficiently access fault-tolerance when processing streaming data.

* **Research on High-Performance Storage and Management Methods for Big Data.** The research includes three steps: (a) developing high-performance storage and management system with high scalability, high reliability, and high concurrency; (b) enabling the system to achieve dynamic dispatch of storage resources and to evaluate the effectiveness of itself; and (c) applying the system to manage satellite data and ocean environment monitoring data.

HONORS AND AWARDS

Outstanding Graduate Award 2018
Northeastern University, China

Principal scholarship of Northeastern University 2017
Northeastern University, China

Outstanding Undergraduate Award 2014, 2015, 2016, 2017
Northeastern University, China