Yongkang Li

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Research Interests: Information Retrieval, NLP, Graph Neural Network, Data Mining

Education Backgrounds

- **University of Amsterdam, Informatics Institute**
  Lab: *Information Retrieval Lab* **PhD**, 2023–Now, Amsterdam, The Netherlands
  Supervisors: Prof. dr. Evangelos Kanoulas and dr. Panagiotis Eustratiadis
- **Southern University of Science and Technology, Department of Computer Science and Engineering**
  Lab: *SUSTech-UTokyo Joint Research Center on Super Smart City* **Master**, 2020–2023, Shenzhen, China
  GPA & Achievements: 3.41/4.0 ≈ 87.8/100, 3 papers, 3 Chinese invention patents, 2 AI internships
  Supervisors: Prof. Xuan Song and Prof. Zipei Fan at the University of Tokyo
- **Beijing University of Posts and Telecommunications, School of Information and Communication Engineering**
  Lab: *Pattern Recognition and Intelligent Systems (PRIS) Laboratory* **Bachelor**, 2016–2020, Beijing, China
  GPA & Supervisor: 3.17/4.0 ≈ 80.8/100, Prof. Kaili Zhao

Publications

Papers

- **Yongkang Li**, Zipei Fan, Xuan Song, *Heterogeneous Hyperbolic Hypergraph Neural Network for Friend Recommendation in Location-based Social Network*. [J]// Under Review in **TKDD**: ACM Transactions on Knowledge Discovery from Data, Date Submitted: 08-Dec-2023.
- Jixiao Zhang, **Yongkang Li**, Ruotong Zou, Jingyuan Zhang, Renhe Jiang, Zipei Fan, Xuan Song, *Hyper-relational knowledge graph neural network for next POI recommendation*. [J]// Published by **World Wide Web Journal** , 2024 (JCR Q2, CCF Rank:B, IF=3.0) [Paper Link] [GitHub]
- **Yongkang Li**, Zipei Fan, Jixiao Zhang, Dengheng Shi, Tianqi Xu, Du Yin, Jinliang Deng, Xuan Song, *Heterogeneous Hypergraph Neural Network for Friend Recommendation with Human Mobility*. [C]// Published by **CIKM'2022**: Proceedings of the 31st ACM International Conference on Information and Knowledge Management, 2022: 4209-4213, (Core Rank:A, CCF Rank:B, Acceptance rate: 27.51%) [Paper Link] [GitHub]
- **Yongkang Li**, Zipei Fan, Du Yin, Renhe Jiang, Jinliang Deng, Xuan Song, *HMGCL: Heterogeneous Multigraph Contrastive Learning for LBSN Friend Recommendation*. [J]// Published by **World Wide Web Journal** , 2022 (JCR Q2, CCF Rank:B, IF=3.0) [Paper Link] [GitHub]
- Du Yin, Renhe Jiang, Jiewen Deng, **Yongkang Li**, Yi Xie, Zhongyi Wang, Yifan Zhou, Xuan Song, Jedi S Shang. *MTMGNN: Multi-time multi-graph neural network for metro passenger flow prediction*. [J]// Published by **Geoinformatica Journal**, 2022: 1573-7624. (JCR Q3, CCF Rank:B, IF=2.7) [Paper Link] [GitHub]

Chinese invention patents

- Xuan Song, **Yongkang Li**, Zipei Fan, Du Yin, Defan Feng, Jinliang Deng, Hongjun Wang, *Local Event Detection Methods, Devices, Equipment and Storage Media.*// CN Patent ZL202111381988.7 [Link]
- Xuan Song, **Yongkang Li**, Zipei Fan, Du Yin, Jinliang Deng, *Friend Recommendation Methods, Devices, Equipment and Storage Media.*//CN Patent ZL202210490518.2 [Link]
- Xuan Song, **Yongkang Li**, Tianqi Xu, Jixiao Zhang, Dengheng Shi, Zipei Fan, *Method and terminal for friend recommendation and points of interest recommendation.*//CN Patent ZL202211068518.X [Link]

Research Projects

- **Heterogeneous Multigraph Contrastive Learning for LBSN Friend Recommendation**
  Friend recommendation from user trajectory is a vital real-world application of location-based social networks (LBSN) services. Previous statistical analysis indicated that social network relationships could explain 10% to 30% of human movement, especially long-distance travel. Therefore, it is necessary to recognize patterns from human mobility to assist the friend recommendation. However, previous works either modelled friendships and check-in records by simple graphs with only one connection between any two nodes or ignored a large amount of vital spatio-temporal information and semantic information in raw LBSN data. To overcome

the limitation of the simple graph commonly seen in previous works, we leverage heterogeneous multigraph to model LBSN data and define various semantic connections between nodes. Against this background, we propose a Heterogeneous Multigraph Contrastive Learning (HMGCL) model to capture spatio-temporal characteristics of human trajectories for user node embedding learning.

This paper has been published by ***World Wide Web Journal*** as **the first author**. The corresponding "*Friend Recommendation Methods, Devices, Apparatus and Storage Media*" has been issued as a Chinese invention patent.

- **Heterogeneous Hypergraph Neural Network for Friend Recommendation with Human Mobility**
  This project still focuses on the friend recommendation task in location-based social network data. For human mobilities, point-of-interest (POI), time and POI type are often involved in a user check-in record. Previous works prefer classical simple graph-based methods with an edge linking two nodes that cannot fully model the complex data structure of LBSN. We model location-based social network data as hyperedges in a heterogeneous LBSN hypergraph and design an end-to-end trainable heterogeneous hypergraph neural network, which can learn hypergraph node embedding for the next friend recommendation task.

  This paper has been published by ***CIKM'2022*** (The 31st ACM International Conference on Information and Knowledge Management) as **the first author**. Moreover, the corresponding "*Method and terminal for friend recommendation and points of interest recommendation*" has been issued as a Chinese invention patent.

Intern Experiences

Pinduoduo Inc. - Research and Development Department(R&D) Shanghai, China
Machine Learning Internship Jul 2022–Sep 2022

- **Knowledge Graph Embedding**
  Investigate the development history and typical technologies of knowledge graph embedding models (such as TransE, TransR, DisMult, ComplEx, KG-Bert, RotatE and PairRE), implement the corresponding codes and do academic talk with colleagues across the department.
- **Aspect-based Sentiment Analysis**
  Based on the e-commerce review data, I implemented the aspect-based sentiment analysis module via PaddleNLP, which extracts a quadruple like (attribute, opinion, sentiment, attribute category) from consumer review data. And this module has been applied to the company business.

Awards & Skills

English:
- TOEFL-107, Reading 29, Listening 29, Speaking 23, Writing 26

Scholarship:
- CIKM 2022 National Science Foundation Travel Award, 2022
- University-level Scholarship in Beijing University of Posts and Telecommunications, 2017

Professional Coding:
- Python, C++, Linux, Git and good coding skills.
- Familiar with PyTorch, DGL, PyG, Pandas, NumPy, Scikit-learn, TensorFlow, etc.

Self-evaluation

I have strong curiosity for new things and good at taking challenges under pressure. I also love teamwork and take great responsibility for each project.