NIAN (OAKLEY) LIU

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EDUCATION

Beijing University of Posts and Telecommunications   Beijing, China

M.S. in Computer Science   Sep. 2020 – Jun. 2023

- GPA: 3.64/4.0; Score: 86.75/100;
- I achieved Master of Science majored in computer science in BUPT advised by Prof. Chuan Shi and Xiao Wang working on graph neural network, graph self-supervised learning, from theory, model to application.

Beijing University of Posts and Telecommunications   Beijing, China

B.S. in Electronics Science and Technology   Sep. 2016 – Jun. 2020

- GPA: 3.69/4.0; Score: 88.59/100; Rank: 7/140;
- I achieved Bachelor of Science majored in Electronics Science and Technology.

PUBLICATIONS

PUBLISHED PAPERS

- **Nian Liu,** Xiao Wang, Deyu Bo, Chuan Shi, Jian Pei, "Revisiting Graph Contrastive Learning from the Perspective of Graph Spectrum," in Advances in neural information processing systems (**NeurIPS**), 2022.

    Overview: This is the first attempt to fundamentally explore the augmentation strategies for GCL from spectral domain. We not only reveal the general graph augmentation rule behind different augmentation, but also explain why GCL works by proposing the contrastive invariance theorem. Our work provides deeper understanding on the nature of GCL.

- **Nian Liu**, Xiao Wang, Lingfei Wu, Yu Chen, Xiaojie Guo, Chuan Shi, "Compact Graph Structure Learning via Mutual Information Compression," in International World Wide Web Conference (**TheWebConf**), 2022.

    Overview: In this paper, we are the first to define the "optimal graph structure" in principle by Information theory, which can achieve effectiveness and robustness simultaneously.

- Xiao Wang, **Nian Liu (First student author),** Hui Han, Chuan Shi, "Self-supervised Heterogeneous Graph Neural Network with Co-contrastive Learning, " in Proceedings of the 27th ACM SIGKDD Conference on Knowledge Discovery & Data Mining (**KDD**). 2021: 1726-1736.

    Overview: HeCo is the first to conduct cross-view contrastive learning in heterogeneous graph. According to PaperDigest, this paper is one of the most influential paper in KDD 2021 as for 2022/05.

- Yiding Zhang, Xiao Wang, **Nian Liu**, Chuan Shi, "Embedding Heterogeneous Information Network in Hyperbolic Spaces, " in ACM Transactions on Knowledge Discovery from Data (**ACM TKDD**), 2021.

    Overview: We are the first to explore HIN embedding in hyperbolic spaces, naturally capture the hierarchical and power-law structure in complex network.

- Yiding Zhang, Xiao Wang, Chuan Shi, **Nian Liu**, Guojie Song., "Lorentzian graph convolutional networks, " in International World Wide Web Conference (**TheWebConf**), 2021.

    Overview: We study on the hyperbolic GCN, rebuild graph operations with Lorentzian version and design a neighborhood aggregation method based on the centroid of Lorentzian distance.

- Shaohua Fan, Xiao Wang, Chuan Shi, Kun Kuang, **Nian Liu**, Bai Wang., " Debiased graph neural networks with agnostic label selection bias, " in IEEE Transactions on Neural Networks and Learning Systems (**IEEE TNNLS**), 2022.

    Overview: We focus on the label selection bias in GNN, and propose Debiased GNN to eliminate spurious correlation by reweighting samples and improve stability of prediction.

PREPRINT PAPER

- **Nian Liu,** Xiao Wang, Hui Han, Chuan Shi, " Hierarchical Contrastive Learning Enhanced Heterogeneous Graph Neural Network," IEEE Transactions on Knowledge and Data Engineering (**IEEE TKDE**).

    Overview: This work argues that besides cross-view contrast to capture commonality in HeCo, view-specific information also should be explored by intra-view contrast.

INTERNSHIP

Alibaba Group, Data Technology Business Group   Sep. 2022 – Present

- Alibaba owns a very large-scale e-commerce network, which contains about 1 billion users and 100 billion various interactions between users.
- My research subject is to explore efficient graph structure learning algorithm to refine the e-commerce network, so that the learnt structure can boost different downstream tasks, i.e., predict the relation between two users.

ACADEMIC ACTIVITIES

- Talks: Oral presentation in WWW 2022, KDD 2021, KDD2021 Pre-Conference; Poster in NeurIPS 2022, ACM TURC 2021; Spotlight in MLA 2022.
- Books:
  - *Heterogeneous Graph Representation Learning and Applications* (Chuan Shi, Xiao Wang, Philip S. Yu);
  - Translate *Neural Network and Deep Learning: A Textbook* (Charu C. Aggarwal).

SELECTED AWARDS AND HONORS

Postgraduate
- The University's First-Class Scholarship   2020-21

Undergraduate
- Outstanding Graduate Student Award of BUPT   07/2020
- Postgraduate recommendation award from Beijing University of Posts and Telecommunications   07/2020
- The University's First-Class Scholarship   10/2018
- The University's Second-Class Scholarship (twice)   10/2019; 10/2017

ADDITIONAL INFORMATION

Language Certificate
- IELTS: overall 7.0 (Listening 7.5, Reading 8.0, Writing 6.5, Speaking 6.0).

Referrers
- Jian Pei, Fellow of the Royal Society of Canada, the Canadian Academy of Engineering, ACM and IEEE, Professor at Duke University (j.pei@duke.edu).
- Chuan Shi, Professor at Beijing University of Posts and Telecommunications (shichuan@bupt.edu.cn).