Jiaang Li | 李家昂

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Education

Ph.D. Student *2021.9 – Now*
University of Science and Technology of China (USTC)
- Co-advised by Prof. Zhendong Mao and Prof. Yongdong Zhang
- Information and Communication Engineering, School of Information Science and Technology

Bachelor of Engineering *2017.9 – 2021.6*
University of Science and Technology of China (USTC)
- Major in Automation, School of Information Science and Technology
- Member of Artificial Intelligence Elite Class
- Overall Ranking: 19/105

Research Experience

Random Entity Quantization for Parameter-Efficient Compositional Knowledge Graph Representation
- Supervised by Prof. Zhendong Mao
- Representation Learning on Knowledge Graphs (KGs) is essential for downstream tasks. The dominant approach, KG Embedding (KGE), represents entities with independent vectors and faces the scalability challenge. Recent studies propose an alternative way for parameter efficiency, which represents entities by composing entity-corresponding codewords matched from predefined small-scale codebooks. We refer to the process of obtaining corresponding codewords of each entity as entity quantization, for which previous works have designed complicated strategies. Surprisingly, this paper shows that simple random entity quantization can achieve similar results to current strategies. We analyze this phenomenon and reveal that entity codes, the quantization outcomes for expressing entities, have higher entropy at the code level and Jaccard distance at the codeword level under random entity quantization. Therefore, different entities become more easily distinguished, facilitating effective KG representation. The above results show that current quantization strategies are not critical for KG representation, and there is still room for improvement in entity distinguishability beyond current strategies.
- Accepted by EMNLP 2023 as an oral paper (~3%).
- Resource: Code and Paper

Inductive Relation Prediction from Relational Paths and Context with Hierarchical Transformers
- Supervised by Prof. Zhendong Mao
- Propose a method that only uses the relational semantics in the knowledge graph to perform inductive relational reasoning, which can be generalized to new entities that have not appeared in training and achieved the best performance.
- Based on the original work using paths for reasoning, the relationship neighborhood of entities is introduced to assist relationship reasoning. Aggregate neighborhood information and path information, and use the aggregated upper-level semantics for reasoning to improve model prediction performance.
- Design a Hierarchical Transformer form for path-neighborhood encoding and information aggregation, and used attention weights to analyze the interpretability of the inference results.
- Accepted by ICASSP 2023 as an oral paper (~4%).
- Resource: Code, Paper and Slides

Other Experience

Research Intern at State Key Laboratory of Communication Content Cognition *2022.9 -2022.12*
- Hosted by Prof. Yongdong Zhang
- Use the method of open-domain question answering to solve a reading comprehension project.
- A data augmentation method is designed with Named Entity Recognition.

Teaching Assistant *2023 Spring*
- Machine Learning and its Applications, by Prof. Zhendong Mao

Summer Exchange *2019 Summer*

- Robotics and Artificial Intelligence Summer School at Imperial College London, UK.
- Won the *Best Overall Project*.

Honors and Awards

GDC Tech Scholarship	2023
Institute of Microsystems, CAS Scholarship	2019
USTC Outstanding Student Scholarship	2017 & 2018 & 2021

Skills

Language – Chinese/English

- TOEFL iBT: 101 *2019.3*

Programming Language

- Python/Matlab/C