

# Jiaang Li | 李家昂

Phone: (+86)159-0399-2489 | Email: [jali@mail.ustc.edu.cn](mailto:jali@mail.ustc.edu.cn)

Homepage: <https://jiaangl.github.io/>

## 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*

- The dominant Knowledge Graph (KG) representation 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 define the process of obtaining corresponding codewords of each entity as entity quantization, for which previous works have designed complicated strategies.
- Surprisingly, we find out 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.
- We prove that random quantization strategy is already good enough for KG representation. Future work could focusing on improving entity distinguishability for further benefits.
- Accepted by EMNLP 2023 as an oral paper (~3%).
- Resource: [Code](#) and [Paper](#)

### *Enhance Lifelong Model Editing with Continuous Data-Adapter Association*

- Current Lifelong Model Editing approaches manage sequential edits through discrete data-adapter mappings. They assign a unique adapter per new edit via key-value mapping. They are sensitive to minor data changes, as such changes can map an edit to a wrong adapter, causing inconsistent outputs and poor generalization.
- In contrast, our method maps each edit to a combination of preset adapters, ensuring minor data changes don't entirely alter the adapter params, enhancing generalization.
- Our method also addresses the scalability challenge by sharing preset adapters across edits, while previous discrete methods require as many adapters as edits.
- Under Review. arXiv version available at: [Paper](#)

### *Inductive Relation Prediction from Relational Paths and Context with Hierarchical Transformers*

- 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

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**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

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GDC Tech Scholarship 2023

Institute of Microsystems, CAS Scholarship 2019

USTC Outstanding Student Scholarship 2017 & 2018 & 2021

## Skills

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**Language – Chinese/English**

- TOEFL: 101

**Programming Language**

- Python/Matlab/C