

Personal Statements

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1 Introduction

My academic journey in computer science has been a profound exploration of my passion for natural language processing (NLP). As a Master's student at Nanjing University and a research intern at Microsoft's DKI (Data, Knowledge, Intelligence) Group, I am fervently dedicated to advancing how language models (LMs) can effectively reason over complex environments. This dedication is also mirrored in my personal discipline as a power-lifter and basketball aficionado, where regular workouts and meticulous diet control are a testament to my commitment and perseverance.

Driven by an insatiable curiosity, I am eager to delve deeper into the reasoning capabilities of LMs in complex environments. My research interests are focused on:

- Enhancing LLM interactions with structured environments for more practical multi-hop reasoning.
- Advancing efficient and accurate retrieval for Retrieval Augmented Generation.
- Improving semantic parsing methods to enable precise reasoning over complex environments.

As I seek to embark on a Ph.D. journey, I bring with me not only a solid foundation in NLP research but also the tenacity and dedication that permeate every facet of my life.

2 Research Experience

Advised by Prof. Yuzhong Qu at Websoft Lab, my academic journey has been distinctly shaped by my focus on reasoning over knowledge bases, which has laid a robust foundation for my research pursuits. My internship at Microsoft and Ant Group have been instrumental, providing me with invaluable research and engineering insights and enabling me to apply my research in practical scenarios while collaborating with leading experts in the field of NLP. My contributions to the field are highlighted by several innovative projects:

My initiation into research began through collaboration with a senior colleague at Websoft Lab, where I cultivate my perspective on the research process. Through frequent discussions, we refined our question decomposition method and the structure of our paper, dubbed [QDT](#), which, despite three initial setbacks, was accepted at AAAI23. This experience spurred me to take on a more pivot role, dedicating increased effort from investigation, brainstorm to method implementation and experimentation. Our dedication led to a new project focusing on the structural complexity of reasoning tasks on knowledge base. With heightened engagement and a deepened passion for research, our commitment culminated a benchmark that necessitates both numerical and multi-hop reasoning, namely [MarkQA](#), which garnered recognition at EMNLP23.

My internship at Ant Group was a pivotal moment where I discovered a profound inclination towards further research. This realization led me to pursue a research internship at Microsoft, where I had the opportunity to embark on an independent research project. Here, I encountered numerous seasoned researchers who generously offered their support. The collaborative atmosphere was truly inspiring, as each discussion with colleagues and researchers provided a wealth of informative and innovative suggestions, expanding my horizons and furthering my research on leveraging the strong capabilities of large language models (LLMs) for efficient and reliable reasoning over structured environments, namely [Readi framework](#). In parallel, I continued my collaboration with my senior colleague at Websoft, where we explored a different paradigm, asking LLMs to step-by-step build a query with a novel correction method to mitigate hallucination ([QueryAgent](#)). Both works have been submitted to ACL24 and are currently under review.

3 Conclusion

The prospect of joining a Ph.D. program that aligns with my research aspirations excites me. With a robust foundation in both theoretical and practical aspects of NLP, I am eager to contribute to this field and explore the untapped potential of language models in reasoning. That's why I apply this project.