Statement of Purpose

Yao Xiao *Apply for PhD in Natural Language processing*

Career Goal

After I got my bachelor degree, I worked as a java engineer for almost two years. When I was working, I spent a lot of time thinking about what I am going to pursue for a career goal. Eventually, I got my answer.

Nothing could grant me more honor than to make a contribution to the most influential advances in the modern world. Taking part in research in Natural Language Processing is one way to win this ultimate honor. I have a deep interest in the area of Natural Language Processing. I was fascinated by complexity of language as well as the practical application of Natural Language Processing in our society. This technology really benefits the whole world. I also want to donate something to this area.

My interest in Natural Language Processing was enhanced by access to research when I was studying for master degree in Shanghai Jiao Tong university. In addition, the experience of being remote intern in SUTDNLP singapore for about a year helps me broaden my knowledge about Natural Language Processing. These experiences urged me to set my career goal, very board but clear, to be a researcher who can not only work independently to explore the beauty of language but also design better language model for practical use.

Preparation for the Goal

Deep learning for natural language processing

Deep learning has been the most predominant approach for natural language processing in these years. It releases us from the feature engineering burden which needs expert knowledge. Furthermore, neural network is capable of extracting the salient features and capturing the interactions between features, which are essential for the high performance of deep neural model. The word2vec can be considered the start of the new era in natural language processing history. After that, there is a boom of work about embedding. Bert based on attention mechanism now achieves dominant performance in various natural language tasks. Some work have even suggests that Transformers pretrained on a language modeling objective can capture syntactic information. There are significant advances in this area every year. To better apply neural network for natural language processing, I have to equip myself with a broader and deeper knowledge of this field.

I have been involved in work of natural language processing for some time. My master experience lays a solid foundation for me. It takes most of my time to follow the latest progress in this area. During my remote intern at SUTDNLP in Singapore, I also gained some experience about structure prediction and induced latent structure which further reinforces my interest in this area.

Academic Plan

Natural language processing has been a very active area in computer science and wildly used in our society. Different from many others fields, related technologies like neural machine translation in this area are really changing the world. So far, neural network has been the dominant approach for natural language processing and has achieved remarkable accomplishments.

On one hand, I want to design more robust and powerful model to handle various natural language tasks, so that it can better serve our community. In my opinion, the future of deep learning for natural language processing is that more inductive bias or prior knowledge should be incorporated into model(personal opinion). I will continue my work on information extraction. Meanwhile, to handle more practical issues, we have to develop better methods for better zero-shot and few-shot performance. Because in reality, it is sometimes impossible to annotate sufficient samples to train a supervised learning model. Currently, it seems that a unified framework(by converting the original task format to another like prompt) is likely to emerge for various NLP tasks, which is a promising direction.

On the other hand, one of the drawbacks of neural models for natural language task is that they are sort of uninterpretable. This may hinder the practicality of our approaches when we install it for practical use, i.e. in medical field. It is definitely necessary that we have to develop more reliable methods to understand the decision of our model. In a word, a PhD degree on natural language processing is a journey for me to explore the intricacy and complexity of language with computational methods. I wish that my efforts could make a difference to this world in this process.