Preface

Language is the fundamental mark that distinguishes humans from animals. It has infinite semantic composition, high ambiguity and continuous evolution. Natural language processing (NLP) mainly studies the theories and methods of using computers to understand and generate human language (also known as natural language), which is a very important and even core task in the field of artificial intelligence (AI), and has become one of the main bottlenecks restricting AI to achieve greater breakthroughs. Therefore, NLP is also known as "the jewel in the crown of AI".

NLP has undergone the evolution of two major research paradigms: the early rationalism was based on small-scale expert rules, and the empiricism switched to the statistical method in the 1990s. From 2010, using Deep Learning as the basic framework, direct end-to-end learning of various NLP tasks has become the mainstream method of NLP, and significant progress has been made, even reaching or surpassing human intelligente level on several public datasets with the help of big data, large scale models and super computing. So, what progress has NLP technology made, and how did it do it?

In this special topic, we invited a number of well-known young researchers from Tsinghua University, Peking University, Fudan University, Chinese Academy of Sciences, Harbin Institute of Technology, etc. They provide detail surveys on the advanced scientific and technological progress and achievements in some classical NLP tasks, including pre-training models, syntactic and semantic analysis, discourse parsing, sentiment analysis, relation extraction, natural language generation, task-oriented dialogue systems, and machine translation. We hope that relevant researchers can have a deeper understanding of NLP technology. We really appreciate all the authors for contributing their efforts and valuable time to this special topic.

LIU Ting & CHE WanXiang
School of Computer Science and Technology, Harbin Institute of Technology, Harbin 150080, China