Al Etaiwi, Awajan A. 2020. Graph-based Arabic text semantic representation. Information Processing & Management. Volume 57, Issue 3, May 2020, doi.org /10.1016/j.ipm. 2019. 102183. Elsevier Journal. (ISI, Scopus).

Abstract

Semantic representation reflects the meaning of the text as it may be understood by humans. Thus, it contributes to facilitating various automated language processing applications. Although semantic representation is very useful for several applications, a few models were proposed for the Arabic language. In that context, this paper proposes a graph-based semantic representation model for Arabic text. The proposed model aims to extract the semantic relations between Arabic words. Several tools and concepts have been employed such as dependency relations, part-of-speech tags, name entities, patterns, and Arabic language predefined linguistic rules. The core idea of the proposed model is to represent the meaning of Arabic sentences as a rooted acyclic graph. Textual entailment recognition challenge is considered in order to evaluate the ability of the proposed model to enhance other Arabic NLP applications. The experiments have been conducted using a benchmark Arabic textual entailment dataset, namely, ArbTED. The results proved that the proposed graph-based model is able to enhance the performance of the textual entailment recognition task in comparison to other baseline models. On average, the proposed model achieved 8.6%, 30.2%, 5.3% and 16.2% improvement in terms of accuracy, recall, precision, and F-score results, respectively.