Abstract

Nashwa M Mohamed Elbendary

Sentence-level Aspect-based Sentiment Analysis for Classifying Adverse Drug Reactions (ADRs) using Hybrid Ontology-XLNet Transfer Learning

This paper presents a hybrid ontology-XLNet sentiment analysis classification approach for sentence-level aspects. The main objective of the proposed approach allows discovering user social data considering the extracted in-depth inference about sentiment depending on the context. Thus, in this paper, we investigate the contribution of utilizing the lexicalized ontology to improve the aspect-based sentiment analysis performance through extracting the indirect relationships in user social data. The XLNet model is utilized for extracting the neighboring contextual meaning and concatenating it with each embeddings word to produce a more comprehensive context and enhance feature extraction. In the proposed approach, Bidirectional Long Short Term Memory (Bi-LSTM) networks are used for classifying the aspects in online user reviews. Various experiments considering Adverse Drug Reactions (ADRs) discovery are conducted on six drug-related social data real-world datasets to evaluate the performance of the proposed approach using several measures. Obtained experimental results show that the proposed approach outperformed other tested state-of-the-art related approaches through improving feature extraction of unstructured social media text and accordingly improving the overall accuracy of sentiment classification. A significant accuracy of 98% and F-measure of 96.4% are achieved by the proposed ADRs aspect-based sentiment analysis approach.