Improving adverse drug reaction detection with models combination

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Abstract

Adverse drug reactions (ADRs) refer to accidental injuries resulting from correct medical drug use. In this paper we focus on automatic binary classification of ADRs. Although the issue of classification of adverse events has been previously concerned, in this work we provide the novel approach based on mixture of various techniques well-known models. We achieve satisfactory results on publicly available ADE corpus (Gurulingappa et al., 2012).

Table 1: Results for single models.

Model	Accuracy
LSA (Deerwester et al., 1990)	0.84
word2vec (Le and Mikolov, 2014)	0.86
RNNLM (Mikolov et al., 2010)	**0.88**
NBSVM (Wang and Manning, 2012)	**0.88**
N-gram	0.83

Our model assumes the combination of generative and discriminative approaches to predict the adverse events. It is the modification of the method presented in (Mesnil et al., 2014).

Table 2: Comparison of different model combinations.

Model	Accuracy
LSA, word2vec	0.9
RNNLM, word2vec	0.92
RNNLM, LSA	0.91
RNNLM, NBSVM (Bigrams)	0.93
word2vec, NBSVM (Bigrams)	**0.95**
LSA, NBSVM (Bigrams)	0.89

The results are demonstrated in Table 1 and 2. Table 1 shows how the single representations affect the classification. On the other hand, Table 2 reports the scores for combined approaches. One may notice that the mixture of models has a strong influence on the final scores and improves the performance of classification. In the future we plan to extend the research connected with the word embeddings and their impact on machine learning techniques connected with adverse events.

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1. References

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