

Classification of medical text using neural networks

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Abstract

Neural networks methods have recently influenced many areas, including natural language processing. The algorithms are constantly improved with increased performance compared to what exists in each domain. Learning effective representations for concepts has proven to be an important basis for many applications, such as machine translation or document classification. The correct representation of medical concepts, such as diagnosis, medication, procedure codes and visits, have wide applications in medical analyzes. Categorizing the text has the advantage to classify certain texts into certain categories that are easier to access. Each text can be classified into one or more categories. We will present a state of the art of the domain for the recent years and integrate our research results for text classification. We use neural networks to learn the classifiers in the examples and to automatically categorize other documents into the same categories. For structuring the prospectuses, we used three models of neural networks: Support Vector Machine Classifier, Naïve Bayes Classifier and 1D Convolutional Networks with sequential model. To learn these three types of neural network models, we used structured data from three medical prospect websites. We used three neural network algorithms that learn the names of certain texts in sections and predict in other texts the names of sections, after we extract from medical sections terms of interest. We created combinations between the specified sources and calculated the accuracy of the algorithms in each case and concluded which are the suitable sources for certain particular situations. Once the information from the medical brochures is structured, it can be used to create assisted decision applications that help the doctors in prescribing the correct medication. Neural networks can be a real help in categorizing medical texts so they can be used more easily in medical databases that can help physicians make certain decisions.

Keywords:

Neural Networks (NN); Medical Text; Classification; Prospects