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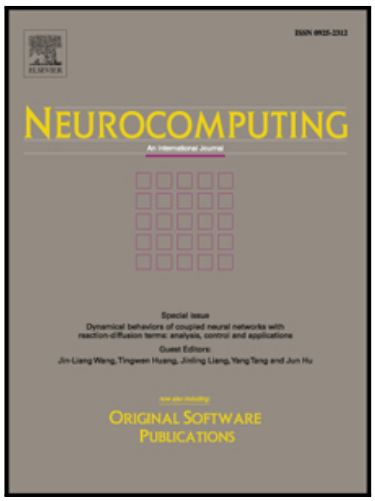

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Discriminant document embeddings with an extreme learning machine for classifying clinical narratives

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Abstract

The unstructured nature of clinical narratives makes them complex for automatically extracting information. Feature learning is an important precursor to document classification, a sub-discipline of natural language processing (NLP). In NLP, word and document embeddings are an effective approach for generating word and document representations (vectors) in a low-dimensional space. This paper uses skip-gram and paragraph vectors-distributed bag of words (PV-DBOW) with multiple discriminant analysis (MDA) to arrive at discriminant document embeddings. A kernel-based extreme learning machine (ELM) is used to map the clinical texts to the medical code. Experimental results on clinical texts indicate overall improvement especially for the minority classes.

Keywords: Document classification, Feature learning, Word embeddings, Document embeddings, Skip-gram, PV-DBOW, Multiple discriminant analysis, Extreme learning machines, Clinical narratives

1. Introduction

Clinical narratives contain the clinical encounter as observed by the healthcare professional with a patient. The data from clinical narratives enable qual-

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