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Text Similarity in Vector Space Models: A Comparative Study

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Abstract : Automatic measurement of semantic text similarity is an important task in natural language processing. In this paper, we evaluate the performance of different vector space models to perform this task. We address the real-world problem of modeling patent-to-patent similarity and compare TFIDF (and related extensions), topic models (e.g., latent semantic indexing), and neural models (e.g., paragraph vectors). Contrary to expectations, the added computational cost of text embedding methods is justified only when: 1) the target text is condensed; and 2) the similarity comparison is trivial. Otherwise, TFIDF performs surprisingly well in other cases: in particular for longer and more technical texts or for making finer-grained distinctions between nearest neighbors. Unexpectedly, extensions to the TFIDF method, such as adding noun phrases or calculating term weights incrementally, were not helpful in our context.

Keywords: big data, patent, text embedding, text similarity, vector space model

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