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Similarity of Semantic Relations

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Abstract Authors

There are at least two kinds of similarity. Relational similarity is correspondence between relations, in contrast with attributional similarity, which is correspondence between attributes. When two words have a high degree of attributional similarity, we call them synonyms. When two pairs of words have a high degree of relational similarity, we say that their relations are analogous. For example, the word pair mason:stone is analogous to the pair carpenter:wood. This article introduces Latent Relational Analysis (LRA), a method for measuring relational similarity. LRA has potential applications in many areas, including information extraction, word sense disambiguation, and information retrieval. Recently the Vector Space Model (VSM) of information retrieval has been adapted to measuring relational similarity,

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achieving a score of 47% on a collection of 374 college-level multiple-choice word analogy questions. In the VSM approach, the relation between a pair of words is characterized by a vector of frequencies of predefined patterns in a large corpus. LRA extends the VSM approach in three ways: (1) The patterns are derived automatically from the corpus, (2) the Singular Value Decomposition (SVD) is used to smooth the frequency data, and (3) automatically generated synonyms are used to explore variations of the word pairs. LRA achieves 56% on the 374 analogy questions, statistically equivalent to the average human score of 57%. On the related problem of classifying semantic relations, LRA achieves similar gains over the VSM.

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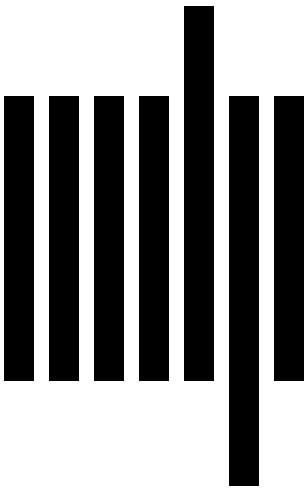

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