Adaptively entropy-based weighting classifiers in combination using Dempster-Shafer theory for word sense disambiguation

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Abstract: In this paper we introduce an evidential reasoning based framework for weighted combination of classifiers for word sense disambiguation (WSD). Within this framework, we propose a new way of defining adaptively weights of individual classifiers based on ambiguity measures associated with their decisions with respect to each particular pattern under classification, where the ambiguity measure is defined by Shannon's entropy. We then apply the discounting-and-combination scheme in Dempster-Shafer theory of evidence to derive a consensus decision for the classification task at hand. Experimentally, we conduct two scenarios of combining classifiers with the discussed method of weighting. In the first scenario, each individual classifier corresponds to a well-known learning algorithm and all of them use the same representation of context regarding the target word to be disambiguated, while in the second scenario the same learning algorithm applied to individual classifiers but each of them uses a distinct representation of the target word. These experimental scenarios are tested on English lexical samples of Senseval-2 and Senseval-3 resulting in an improvement in overall accuracy. © 2009 Elsevier Ltd. All rights reserved.

Author Keywords: Classifier combination; Computational linguistics; Dempster's rule of combination; Entropy; Word sense disambiguation

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