Semantic Information and Derivation Rules for Robust Dialogue Act Detection in a Spoken Dialogue System

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Abstract

In this study, a novel approach to robust dialogue act detection for error-prone speech recognition in a spoken dialogue system is proposed. First, partial sentence trees are proposed to represent a speech recognition output sentence. Semantic information and the derivation rules of the partial sentence trees are extracted and used to model the relationship between the dialogue acts and the derivation rules. The constructed model is then used to generate a semantic score for dialogue act detection given an input speech utterance. The proposed approach is implemented and evaluated in a Mandarin spoken dialogue system for tour-guiding service. Combined with scores derived from the ASR recognition probability and the dialogue history, the proposed approach achieves 84.3% detection accuracy, an absolute improvement of 34.7% over the baseline of the semantic slot-based method with 49.6% detection accuracy.