MINDS-II Feedback Architecture: Detection and Correction of Speech Misrecognitions

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Abstract

In this paper we describe the architecture and operation of the MINDS-II system. The system analyzes parsed, recognized speech and tries to detect and correct regions containing misrecognitions. The system uses syntactic, semantic, pragmatic and discourse level analyses to both delimit misrecognized input and hypothesize actual spoken content. The heuristics for deriving content hypotheses primarily rely on constraint satisfaction techniques. Hypotheses are expanded into a recursive transition network grammar and are processed with a finite state recognizer. Finally, when multiple phrases are produced in the re-recognition process, each is folded into the entire utterance in order to find which produces the best overall utterance score. Results show this technique reduces speech recognition errors by 50 to 80 percent across multiple test sets.

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