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Modeling acoustic cues to distinctive features in a lexical speech analysis system

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ABSTRACT

Acoustic cues are robust elements that can be used to infer information contained in the speech signal, such as underlying linguistic distinctive features and the words intended by the speaker (Stevens *JASA* 2002). Yet, most current automatic speech recognition systems do not take advantage of a feature-cue-based framework for signal analysis. In this project, a set of common acoustic cues has been explicitly modeled by Gaussian mixture models. This set of acoustic cues can provide evidence for the overall phoneme and word sequences of an utterance. The extracted cues and their values can also determine a speaker's linguistic production pattern, i.e., the systematic context-governed modifications in surface-phonetic form that occur pervasively in conversational speech. The simple Gaussian mixture model representation structure reduces the need for extensive amounts of training data, in contrast to conventional schemes based on large neural networks.

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