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Alignment of canonical and realized acoustic cue labels for modification patterns in speech analysis

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ABSTRACT

Acoustic cues are properties of the speech signal that provide information about the distinctive features of the speaker's intended words and phonemes. Analysis of acoustic cues can indicate reductions and modifications in speech, in which landmarks and other feature cues are deleted, inserted, or substituted for others, and can be informative in distinguishing underlying causes of speech impairments. To extract this information about modifications, we need to determine which predicted canonical labels the realized labels correspond to. We propose an algorithm that uses a time-based alignment method for the landmarks as well as a modified labeling scheme to more accurately find correspondences between realized landmarks and distinctive features to the canonical labels. The results show improved alignment not only for the realized landmark labels but also for the labels of other feature cues, enabling accurate and holistic analysis of modifications in speech, at the

more detailed level of cues to distinctive features rather than the phoneme or phone level. Using this algorithm, we analyze a database of CN-REP (Children's Nonword Repetition Task) recordings from children diagnosed with speech impairments and find several potential modification markers that may distinguish among different diagnoses.

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