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How time-based alignment of realized acoustic landmarks and predicted landmarks improves analysis of feature cue modification patterns in speech

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ABSTRACT

Acoustic landmarks are abrupt spectral changes that signal the underlying manner features of phonemes (Stevens 2002). Our goal in developing an automatic method to detect these landmarks is to create a robust, knowledge-based approach to phoneme extraction in automatic speech signal processing. One challenge in such an approach is posed by massive reductions, in which many landmarks and other feature cues are missing. Thus, there is a need to hand-label the acoustic landmarks that actually occur in the speech signal and align them with predicted landmarks. However, this often results in a discrepancy between the locations of labels for the automatically generated and hand-labeled landmarks, which leads to an inaccurate analysis of where realized landmarks occur with respect to word and phoneme interval boundaries. We attempted to solve this issue with a time-based alignment method derived from the minimum edit distance algorithm. The result improved alignment of the realized landmark labels with the predicted landmark labels, enabling a more accurate analysis of modifications in the hand-labeled (realized) landmark tiers.

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