Computer Aided Pronunciation Learning System Using Statistical Based Automatic Speech Recognition Techniques

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Abstract

This thesis describes building a system to teach correct recitation of The Holy Qur'an (Tajweed) by accepting user's recitation of Qur'an and then assessing recitation quality and produce a feedback message to help them locate their mispronounced letters. To achieve this goal, a speech recognizer was implemented to detect recitation errors affecting phonetic transcription. A phoneme duration classification algorithm was implemented to detect recitation errors related to phoneme durations. Also an algorithm for Recitation Rate Normalization (RRN) is introduced. The decision reached by the recognizer is accompanied by a confidence score. A module for the automatic generation of pronunciation hypotheses was built as a component of the system. A speaker adaptation algorithm suitable for the pronunciation assessment problem was developed. Also an algorithm was developed to evaluate system performance by measuring the degree of usefulness of its feedback to learners. An evaluation database was recorded and annotated to be used by the evaluation algorithm.

Keywords

Speech recognition , Pronunciation learning , Pronunciation hypotheses generation ,