Using Maximization Entropy in Developing a Filipino Phonetically Balanced Wordlist for a Phoneme-Level Speech Recognition System

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Abstract : In this paper, a set of Filipino Phonetically Balanced Word list consisting of 250 words (PBW250) were constructed for a phoneme-level ASR system for the Filipino language. The Entropy Maximization is used to obtain phonological balance in the list. Entropy of phonemes in a word is maximized, providing an optimal balance in each word's phonological distribution using the Add-Delete Method (PBW algorithm) and is compared to the modified PBW algorithm implemented in a dynamic algorithm approach to obtain optimization. The gained entropy score of 4.2791 and 4.2902 for the PBW and modified algorithm respectively. The PBW250 was recorded by 40 respondents, each with 2 sets data. Recordings from 30 respondents were trained to produce an acoustic model that were tested using recordings from 10 respondents using the HMM Toolkit (HTK). The results of test gave the maximum accuracy rate of 97.77% for a speaker dependent test and 89.36% for a speaker independent test.

Keywords : entropy maximization, Filipino language, Hidden Markov Model, phonetically balanced words, speech recognition
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