Optimizing Performance of a Speech Analysis System for Orofacial Muscle Activity Data

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Abstract

In this paper an investigation of a speech analysis system for orofacial muscle activity data is presented. Specifically, studies are conducted on compatibility, optimization and performance of the system. The speech analysis system determines the variability index of kinematic and electromyographic (EMG) data collected from nonpathological subjects. Previous studies showed that lip aperture variability index, which represents the difference in upper lip displacement and lower lip displacement, can be used as a reliable variability measure for EMG data to determine the effects of multiple repetitions of the same utterance on speech motor production. This study is an extension of previous work and examines the orofacial muscle activity patterns (i.e. EMG data) during speech production in efforts to quantify EMG variability. During system portability, however, there were several technical issues that minimized system performance. These challenges manifested primarily in compatibility issues, optimization issues and performance issues. This paper presents the main issues that impeded system performance and discusses optimal solutions. Once optimized the system can be used to obtain insight into how well the speech motor system is functioning in different groups of speakers (e.g., healthy young adults vs. healthy older adults). The analysis provides the platform for studying the quantification of variability in EMG data.

Biographies

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