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Acquiring Knowledge for Mimicking Dysarthric Speech by Incorporating Its Features Into Synthetic Speech

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The purpose of this study is two-fold. First of all, it is to conduct in-depth analyses, allowing the extraction of features associated with dysfunctional speech, and in particular, dysarthria. The methods of speech signal analysis, such as temporal, spectral, time-frequency, cepstral, as well as linear predictive coding (LPC), are used. In addition, linear predictive cepstral coefficients (LPCC) and perceptual linear predictive coefficients (PLP) are also investigated. Resulting from this analytical approach is a set of features that corresponds best to dysarthria. Hence, the second purpose of this study is to propose techniques that may be employed to synthesise normal speech patterns with the most relevant dysarthria features to create dysfunctional speech. Several speech synthesis techniques are applied to that end, and their outcome is examined both by objective measures and subjective tests. The results are shown in the form of stationary analyses and regarding a sequence of dysarthric utterances to highlight changes detected changes. The summary of the experiments includes conclusions and plans for future research studies related to automatic recognition of dysarthric speech.