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Multistyle classification of speech under stress using wavelet packet energy and entropy features

Abstract

Physco-physiological conditions like stress and emotional state may affect human's speech production. Different techniques have been proposed such as facial expressions, speech production variation, and physiological signals to detect the emotional/stressed states of a person. For past 2 decades, the determination of an emotional/stressed state through speech has been undergone substantial research and development. Various techniques are used in the literature to classify emotional/stressed states on the basis of speech. In this paper, a feature extraction method using two different wavelet packet filterbank structures which are based on barkscale and equivalent rectangular bandwidth (ERB) scale for identifying the emotional/stressed states of a person. In this study speech samples are taken from Speech Under Simulated and Actual Stress (SUSAS) database. Linear Discriminant analysis (LDA) based classifier is used to test usefulness of suggested features. Experimental result shows that the suggested methods can be used to identify the emotional/stressed states of a person.

Keywords — Emotional/stressed states, linear discriminant analysis, speech signal, stress classification, wavelet packet transform