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(Research Article)
Classification of noise-robust speech features in the speaker authentication system

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Abstract

Automatic speaker recognition has a wide range of applications in industrial and security systems and requires the extraction of speech signal features. The use of the feature matrix is very important in real-time recognition of the speaker, and the presence of environmental and processing noise leads to a violation in the characteristics of the features and the production of recognition errors. Increasing the accuracy of recognition detection requires the noise removal process to correctly determine the energy characteristics, energy entropy, zero- crossing rate, spectral centroid, spectral spread, spectral entropy, spectral flux, and spectral roll off the signal. In designing real-time and reliable algorithms, there are critical processes of correct speech extraction, sensitivity detection, and measuring the robustness of signal parameters to eliminate noise and improve speech quality, which play a key role in improving the signal-to-noise ratio. In this paper, the classification of speech signal features for designing real-time and noise-robust speaker recognition algorithms in measuring its robustness are investigated. The proposed method of noise removal uses a binary mask with a robust feature and the experimental results of the experiments on the standard data show the rate of signal improvement to the noise of approximately 2 to 3 db. The feature matrix evaluation for the authentication system consists of mel frequency coefficient, linear prediction coefficient and, cepstrum coefficient, which has been evaluated by the Euclidean distance method in another experimental standard data set. Our proposed method achieves on overall 80% real-time recognition accuracy in noisy data set.

Keywords: Classification of speech features, Speaker authentication, Noise-robust, Speech signal, Noise.

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