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## EXTRACTING MFCC AND GTCC FEATURES FOR EMOTION RECOGNITION FROM AUDIO SPEECH SIGNALS

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### Abstract

Emotion recognition from speech has an increasing interest in recent years given the broad field of applications. The recognition system developed here uses Mel Frequency Cepstrum Coefficient (MFCC) and Gammatone Cepstrum Coefficient (GTCC) as the feature vectors for recognizing emotions in a speech signal. MFCC is the most commonly used feature vector for classification. But, MFCC systems usually do not perform well under noisy conditions because extracted features are distorted by noise, causing mismatched likelihood calculation. By introducing a novel speaker feature, gammatone cepstral coefficient (GTCC), based on an auditory periphery model, and show that this feature captures speaker characteristics and performs substantially better than conventional speaker features under noisy conditions. An important finding in the study is that GTCC features outperform conventional MFCC features under noisy conditions. These features are then used to train the classifier. The classifier used for the system is a cascade feed forward back propagation neural network. The database consists of 240 speech samples. Among them, 180 samples are used for training the system and the remaining 60 samples are used for testing the system. This study compares the differences between MFCC and GTCC for recognizing emotion from speech. The error rate of the system corresponds to MFCC and GTCC is 0.009703 and 0.0090822 respectively.

**Keywords:** Automatic speech recognition, Pre-processing, Feature extraction, Classification, Mel-frequency cepstral coefficient, Gammatone cepstral coefficient.

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### 1. Introduction

Speech is a complex signal which contains information about the message, speaker, language and emotions. Speech is one of the most natural communication forms between human beings. Emotion on other side is an individual mental state that arises spontaneously rather than through conscious effort. Humans also express

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