

Abstract

In this paper we provide a brief overview of the area of speaker recognition, defining terminology, discussing applications, describing underlying techniques and providing some indications of performance. Speaker Identification system is a system that identifies the individuality of a speaker based on their voice utterance.

Speech processing is emerged as one of the important application area of digital signal processing. Various fields for research in speech processing are accent recognition, language recognition, speech recognition, emotion recognition, gender recognition, speaker recognition etc. The objective of this paper is to extract, characterize and recognize the information about speaker identity. Feature extraction is the first step for speaker recognition. Many algorithms are suggested/developed by the researchers for feature extraction. In our work, the Mel Frequency Cepstrum Coefficient (MFCC) feature has been used for designing a text independent speaker identification system.

Although the rapid development of speaker identification technology is happening, there are still many problems to be solved. One problem is to understand what characteristics in the speech signal convey the representation of a speaker. This relates to understanding how humans listen to the speech signal and recognize the speaker. The other problem is to make Speaker Identification systems robust under different conditions.

A Speaker Identification algorithm consists of two phases Feature Extraction and Feature Mapping. In Feature Extraction each speaker has to provide samples of their voice so that the reference template model can be build. In Feature Mapping the input test voice is matched with stored reference template model and recognition decision are made. Mel frequency Cepstral Coefficients MFCCs have been used for feature extraction. Vector Quantization is used for feature mapping.

In our work we have studied an existing Speaker Identification system. The Feature Extraction part is implemented. The algorithm takes as input the voice of a speaker through a microphone and produces as output a sequence of acoustic vectors. The Feature Mapping part is also implemented by using the Vector Quantization algorithm. In Feature Mapping the acoustic vectors are used to represent and recognize the identity of the speaker. Finally we propose the parameters that needs to be set for getting an identification rate of more than 80% which is considered to be quite decent in the field of speaker recognition.

Keywords: Speech Processing, Speaker Identification System, Feature Extraction, MFCC algorithm, VQ algorithm, K means algorithm.