ABSTRACT

Speech is one of the natural forms of communication. Speaker identification is mainly divided into two classifications: speaker recognition, and speaker verification. Speaker recognition consists of comparing a speech signal from an unknown speaker to a database of known speakers and then determining the identity of the speaker. In speaker verification, the task is to use a speech sample to test whether a person who claims to have produced the speech has in fact done so. This technique for example makes it possible to use a speaker's voice to verify his or her identity, and to provide controlled access to remote services such as entering the password by telephone, remote access to computers, voice mail, and so on.

The aim of this thesis is the development of a MATLAB based speaker recognition system. The Mel Frequency Cepstral Coefficients are used for the speech feature extraction, and a vector quantization algorithm is used for the speech feature matching. The developed system is Graphical User Interface (MENU type), where a user can load new speech signals to the database, select and play a speech signal, display the time domain graphics of each speech signal, display the power spectrums of the signals, or recognize a given speech signal by finding a match in the database.

The developed system is tested using a database of pre-recorded sample speech signals and the unknown speakers have been recognized successfully. In addition, noise is added to the database speech signals and the developed speaker recognition system has been tested in the presence of this noise. It is shown that the developed system can recognize speakers even in the presence of small amounts of noise. Recommendations have been made on how a speaker can be recognized when large amount of noise is present in a speech signal.

Keywords: MATLAB, audio processing, speech processing, speaker recognition system