Speaker Authentication Using Wavelet Coefficients and KNN algorithm.

Abstract:

Speaker verification is a technique used to determine whether the identity claimed by an individual matches their actual voice. It is a biometric authentication method that uses the unique characteristics of a person's voice to verify their identity. The goal of speaker verification is to authenticate the speaker's identity using audio recordings and direct enrolment, making it an important aspect of biometric authentication. The speaker verification system consists of three main stages: The Analyzing stage, the identification stage, and the verification stage: In the beginning audio files are recorded for two persons (male and female), five acoustic files for each. Then the audio signal is analyzed by low pass filter for three levels using the wavelet method, then cut it into 41 frames, each frame contains 1024 values, then extracted the average number of frames. The db1 family type is specified. To determine the identity of the person the KNN algorithm is used (k=5). Next the identification stage is used to determine the speaker's identity using KNN algorithm takes the nearest 5 neighbors for each sample. Subsequently, the verification stage to approve the speaker's identity, we take the five files of the identified person, then repeat the previous steps to process the sound and calculate the Euclidean distance for the recorded voice, and the five files stored for the owner of the voice. After 9 that, the average is calculated for the distances and impose a threshold value of 225 on which we rely in the verification decision if the average is greater than the threshold value (False detection), and if the rate is less than the threshold value (correct detection). Additionally, this work supports the direct enrollment of speaker. Thus, during the enrollment stage, the system records the speaker's voice and extracts the wavelet coefficients. The coefficients are then used to train the system's classifier, which learns to distinguish the speaker's unique features. While during the verification stage, the system records the speaker's voice again and extracts the wavelet coefficients. The coefficients are then compared with the coefficients stored in the system's. If the coefficients match within a certain threshold, the speaker is authenticated, and access is granted