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Signals and systemsECE1004

J-Component Report

Topic: Speech recognition using MATLAB

Submitted to: Dr.

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ABSTRACT:

The algorithm utilizes the correlation in order to compare the frequency spectra of two voices. User needs to enter the audio filename in the input section. This section reads the audio file with thegiven name in the MATLAB project directory using ‘audioread’ function .

INTRODUCTION:

The Development in Wireless and communication and mobile deviceshas bolstered the improvement of speech recognition system. When we say speech recognition system two main significant terms that comes are the pattern matching and the feature extraction. This paper denotes and computes a simple algorithm using MATLAB to match the patterns to recognize speech using cross correlation technique.
Correlation is a statistical measure where you have to contrast two or more signals to discover the similarity between them. Speech recognition which is a part of biometrics has become one of the majoraspects to provide security to the devices and applications. Speech recognition is a concept where we extract the spoken words and match it with the sample.

WORKING:

The basic idea behind speech recognition is that the system compares the received signal with the pre existing models, find the extend of similarity between them and recognizes the signal. For this we use theidea of correlation. It is also know as the dot product of those two signals. Correlation is also used for pattern recognition like you want to find some pattern in the signal then you can use Correlation. The file containing the speech can be of .wav or mp3 format, read in matlab via audioread function.

Here in MATLAB corr(x,y) function is used to compare signals. The signals are samples in the process of speech recognition. The more thesampling rate , more the accuracy.

CODE:

```
function speechrecognition(filename)
%Speech Recognition Using Correlation Method
%Write Following Command On Command Window
%speechrecognition('test.wav')
voice=audioread(filename); x=voice;
x=x';
x=x(1,:);
x=x'; y1=audioread('one.wav');y1=y1';
y1=y1(1,:);
y1=y1';
z1=xcorr(x,y1);
m1=max(z1);
l1=length(z1);
t1=-((l1-1)/2):1:((l1-1)/2);t1=t1';
%subplot(3,2,1);
plot(t1,z1); y2=audioread('two.wav');
y2=y2';
y2=y2(1,:);
z2=xcorr(x,y2);
m2=max(z2);
l2=length(z2);
t2=-((l2-1)/2):1:((l2-1)/2);t2=t2';
%subplot(3,2,2);figure
plot(t2,z2);
y3=audioread('three.wav');y3=y3';
y3=y3(1,:);
y3=y3';
z3=xcorr(x,y3);
m3=max(z3);
l3=length(z3);
t3=-((l3-1)/2):1:((l3-1)/2);t3=t3';
%subplot(3,2,3);figure
plot(t3,z3);
```

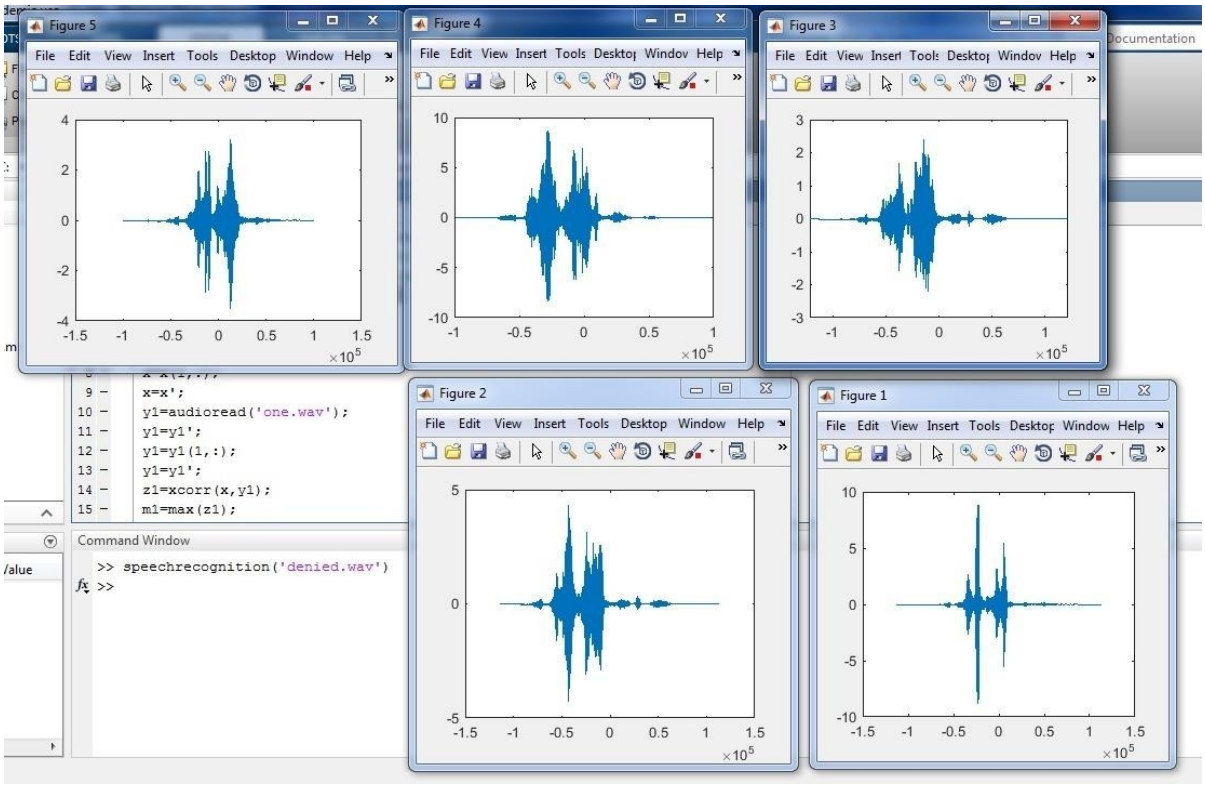
```
y4=audioread('four.wav');y4=y4';
y4=y4(1,:);
y4=y4';
z4=xcorr(x,y4);
m4=max(z4);
l4=length(z4);
t4=-((l4-1)/2):1:((l4-1)/2);t4=t4';
%subplot(3,2,4);figure
plot(t4,z4);
y5=audioread('five.wav');y5=y5';
y5=y5(1,:);
y5=y5';
z5=xcorr(x,y5);
m5=max(z5);
l5=length(z5);
t5=-((l5-1)/2):1:((l5-1)/2);t5=t5';
%subplot(3,2,5);figure
plot(t5,z5); m6=300;
a=[m1 m2 m3 m4 m5 m6];m=max(a);
h=audioread('allow.wav'); if m<=m1
soundsc(audioread('one.wav'),50000)soundsc(h,50000)

elseif m<=m2 soundsc(audioread('two.wav'),50000)
        soundsc(h,50000)elseif
m<=m3
    soundsc(audioread('three.wav'),50000)soundsc(h,50000)
elseif m<=m4 soundsc(audioread('four.wav'),50000)
        soundsc(h,50000)elseif
m<m5
    soundsc(audioread('five.wav'),50000)soundsc(h,50000)
else
   soundsc(audioread('denied.wav'),50000)

end
```

```
function speechrecognition(filename)
%Speech Recognition Using Correlation Method
%Write Following Command On Command Window
%speechrecognition('test.wav')
voice=audioread(filename);
x=voice;
x=x';
x=x(1,:);
x=x';
y1=audioread('one.wav');
y1=y1';
y1=y1(1,:);
y1=y1';
z1=xcorr(x,y1);
m1=max(z1);
l1=length(z1);
t1=-((l1-1)/2):1:((l1-1)/2);
t1=t1';
%subplot(3,2,1);
plot(t1,z1);
y2=audioread('two.wav');
y2=y2';
y2=y2(1,:);
y2=y2';
z2=xcorr(x,y2);
m2=max(z2);
```

OUTPUT:



APPLICATION:

Speech recognition is used in almost every security project where youneed to speak and tell your password to computer and is also used forautomation. In the current world, there is a continually expanding need to confirm and recognize the voice of individuals automatically.For every individual securing the personal details from the theft is thenational priority. This paper tells about the concept Mel frequency cepstral coefficients (MFCCs) as the feature for the recorded speech.

Speech recognition is basically and widely used concept for providingthe security to the applications. Security has become a major part for any user using any smart devices. Speech Recognition is one of part of Biometrics. Biometrics, the physical qualities and behavioural attributes that make each of us exceptional, are a characteristic decision for personality confirmation. It is a developing innovation that guarantees a viable answer for our security needs. We can utilize a biometric to get to our home, our record, or to conjure an altered setting for any safe range or application.

LINK FOR WORKING OF THE PROJECT

https://youtu.be/ELZd60Oe3dM