Labsheet 5

figure(1);

[Y,fs]=audioread('speech.wav');

y=length(Y);

ns=0.030\*2\*fs;%no of samples in 30ms

off=floor(0.01\*fs); %offset for each sample= 50%

cnt=1;

t=floor(y/(ns-off));

%to segment the speech

for i=1:t

for j=1:ns

if(cnt<=y)

X(i,j)=Y(cnt);

cnt=cnt+1;

else

X(i,j)=0;

end

end

cnt=cnt-off;

end

subplot(2,2,1);

plot(X(1,2100:ns));

title('sample');

h=hamming(ns); %to create window function

%windowing on segments

for i=1:t

for j=1:ns

A(i,j)=X(i,j)\*h(j);

end

end

subplot(2,2,2);

plot(A(1,2100:ns));

title('sample after windowing');

N=1024;

k=1:512;

fx=fft(A(1,2100:ns),N);

f=k\*(fs/N);

subplot(2,2,3);

plot(f(1:512),abs(fx(1:512)));

title('FFT of windowed sample');

C=log(fx);

subplot(2,2,4);

plot(f(1:512),abs(C(1:512)));

title('logarithmic sample');

%getting cepstrum

c=ifft((C),N);

sm=smooth(c);

% subplot(3,2,5);

figure(2);

plot(1:length(c),c);

title('cepstrum by IDFT');

%Liftering

figure(3);

%window

w=ones(1,30);

ce=c(1:30);

cx=fft(ce(1:30),N);

f=k\*(fs/N);

subplot(2,1,1);

plot(f,abs(cx(1:512)));

title('fft of cspectrum');

cL=log(abs(cx(1:512)));

subplot(2,1,2);

plot(f,cL);

title('Log of cspectrum');

[pks,locs]=findpeaks(cL,'MinPeakDistance',50);

hold on;

stem(f(locs),pks,'\*');

[pk1,mloc]=max(pks)

loc1=locs(mloc)

pks(mloc)=0;

[pk2,mloc]=max(pks)

loc2=locs(mloc)

pks(mloc)=0;

[pk3,mloc]=max(pks)

loc3=locs(mloc)

% high time lifting

figure(4);

lc=length(c);

for i=1:lc

if i>=30 && i<=lc/2

wh(i)=1;

else

wh(i)=0;

end

end

ch=wh.\*c;

%ch=smooth(ch);

plot(1:300,ch(1:300));

[cpks,clocs]=max(ch(1:300));

pith=(1/clocs)\*fs

Answers & Diagrams:

pk1 =1.8657

mloc = 7

loc1 = 509

pk2 = 1.8549

mloc = 5

loc2 = 372

pk3 = 1.8368

mloc = 6

loc3 = 440



  