[s1,f1]=audioread('1.wav');

k1=size(s1)

t1=k1(1)/f1;

[s2,f2]=audioread('2.wav');

k2=size(s2)

t2=k2(1)/f2;

[s3,f3]=audioread('3.wav');

k3=size(s3)

t3=k3(1)/f3;

[s4,f4]=audioread('4.wav');

k4=size(s4)

t4=k4(1)/f4;

[s5,f5]=audioread('5.wav');

k5=size(s5)

t5=k5(1)/f5;

[s6,f6]=audioread('6.wav');

k6=size(s6)

t6=k6(1)/f6;

[s7,f7]=audioread('7.wav');

k7=size(s7)

t7=k7(1)/f7;

[s8,f8]=audioread('8.wav');

k8=size(s8)

t8=k8(1)/f8;

[s9,f9]=audioread('9.wav');

k9=size(s9)

t9=k9(1)/f9;

[s10,f10]=audioread('10.wav');

k10=size(s10)

t10=k10(1)/f10;

[s11,f11]=audioread('11.wav');

k11=size(s11)

t11=k11(1)/f11;

[s12,f12]=audioread('12.wav');

k12=size(s12)

t12=k12(1)/f12;

[s13,f13]=audioread('13.wav');

k13=size(s13)

t13=k13(1)/f13;

[s14,f14]=audioread('14.wav');

k14=size(s14)

t14=k14(1)/f14;

[s15,f15]=audioread('15.wav');

k15=size(s15)

t15=k15(1)/f15;

[s16,f16]=audioread('16.wav');

k16=size(s16)

t16=k16(1)/f16;

% display(audioinfo('1.wav'));

% display(audioinfo('2.wav'));

% display(audioinfo('3.wav'));

% display(audioinfo('4.wav'));

% display(audioinfo('5.wav'));

% display(audioinfo('6.wav'));

% display(audioinfo('7.wav'));

% display(audioinfo('8.wav'));

% display(audioinfo('9.wav'));

% display(audioinfo('10.wav'));

% display(audioinfo('11.wav'));

% display(audioinfo('12.wav'));

% display(audioinfo('13.wav'));

% display(audioinfo('14.wav'));

% display(audioinfo('15.wav'));

% display(audioinfo('16.wav'));

A= RandOrthMat(16) ;

display(A)

s2(numel(s1)) = 0;

s3(numel(s1)) = 0;

s4(numel(s1)) = 0;

s5(numel(s1)) = 0;

s6(numel(s1)) = 0;

s7(numel(s1)) = 0;

s8(numel(s1)) = 0;

s9(numel(s1)) = 0;

s10(numel(s1)) = 0;

s11(numel(s1)) = 0;

s12(numel(s1)) = 0;

s13(numel(s1)) = 0;

s14(numel(s1)) = 0;

s15(numel(s1)) = 0;

s16(numel(s1)) = 0;

s=[s1, s2 ,s3 ,s4 ,s5 ,s6 ,s7 ,s8 ,s9 ,s10 ,s11 ,s12 ,s13 ,s14 ,s15 ,s16];

s=transpose(s);

display(size(s));

display(size(A));

x=A\*s;

% display(size(x(1,:)));

% display(size(x(2,:)));

% display(size(x(3,:)));

% display(size(x(4,:)));

% display(size(x(5,:)));

% display(size(x(6,:)));

% display(size(x(7,:)));

% display(size(x(8,:)));

% display(size(x(9,:)));

% display(size(x(10,:)));

% display(size(x(11,:)));

% display(size(x(12,:)));

% display(size(x(13,:)));

% display(size(x(14,:)));

% display(size(x(15,:)));

% display(size(x(16,:)));

c=[];

for i = 1:16

c{i}= x(i,:);

end

display(c)

L=240; %Frame Length

M=round(f1/L);

%for m=1:Nof

% y=x(m:m+L-1)\*transpose(x(m:m+L-1));

%end

%display(size(y))

% display(M)

% display(size(x))

% display(audioinfo('1.wav'));

% display(audioinfo('12.wav'));

% display(t1)

% display(f1)

% display(t2)

% display(f2)

% display(t3)

% display(f3)

% display(t4)

% display(f4)

% display(t5)

% display(f5)

% display(t6)

% display(f6)

% display(t7)

% display(f7)

% display(t8)

% display(f8)

%display(t9)

%display(f9)

%display(t10)

%display(f10)

%display(t11)

%display(f11)

%display(t12)

%display(f12)

%display(t13)

%display(f13)

%display(t14)

%display(f14)

%display(t15)

%display(f15)

%display(t16)

%display(f16)

tmax=max(t1,max(t2,max(t3,max(t4,max(t5,max(t6,max(t7,max(t8,max(t9,max(t10,max(t11,max(t12,max(t13,max(t14,max(t15,t16)))))))))))))));

%This calculates the autocorrelation values

R=zeros(M,16,16);

for m=1:M

for t=(0.5\*(m-1)\*L)+1:(0.5\*(m-1)\*L)+L

R(m,:,:)=reshape(R(m,:,:),16,16)+x(:,t)\*transpose(x(:,t));

end

R(m)=R(m)/L;

end

display(size(R));

y=zeros(M,16\*16,1);

for m=1:M

y(m,:,:)=reshape(R(m,:,:),16\*16,1)

end

for m=1:M

z(m)=trace(reshape(R(m,:,:),16,16))

end

ty=zeros(M,1);

tyc=zeros(M,1);

f=0;

ck=zeros(M)

t23=norm(y(1,:,:))

for m=1:M

ty(m)=norm(y(m,:,:),'fro')

tyc(m)=ty(m)/z(m)

end

[argvalue,argmax]=max(tyc)

h1cap=y(argmax);

for m=1:M

if h1cap==y(m)

a1cap=eig(reshape(R(m,:,:),16,16))

end

end

% var1=zeros(M,M,1)

% var2=zeros(M,M,1)

% for m=1:M

% var1=

ty1=zeros(M,1);

tyc1=zeros(M,1);

H=[a1cap]

K=16

for k=2:K

P=eye(length(H))-H\*ctranspose(transpose(H)\*H)\*transpose(H)

display(size(P))

for m=1:M

display(size(reshape(y(m,:,:),16,16)))

ty1(m)=norm(P\*reshape(y(m,:,:),16,16),'fro')

tyc1(m)=ty1(m)/z(m)

end

[argvalue,argmax]=max(tyc1)

h1cap1=y(argmax)

for m=1:M

if h1cap1==y(m)

H=[H eig(reshape(R(m,:,:),16,16))]

end

end

end

D = abs(A-H).^2;

MSE = sum(D(:))/numel(A);