EE5351\_DIGITAL VIDEO CODING

16 x 16 INTRA PREDICTION ASSIGNMENT

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PROGRAM:

clc

close all;

clear all;

Image=double(imread('cameraman.bmp'));

[row col]=size(Image);

Pre=zeros(row, col);

DC=zeros(16,16);

mV=zeros(16,16);

l=zeros(16,16);

Pl=zeros(16,16);

DC=0;

V\_ct=0;

H\_c=0;

Pla=0;

for R=1:16:row

for C=1:16:col

if R-1==0 && C-1 ==0

DC(1:16,1:16)=128;

Pre(R:R+15,C:C+15)=DC;

elseif R-1==0 && C-1~=0

DC(1:16,1:16)=(sum(Pre(R:R+15,C-1))+8)/16;

Pre(R:R+15,C:C+15)=DC;

elseif R-1~=0 && C-1==0

DC(1:16,1:16)=(sum(Pre(R-1,C:C+15))+8)/16;

Pre(R:R+15,C:C+15)=DC;

elseif R-1~=0 && C-1~=0

a=(sum(Pre(R-1,C:C+15)));

b=(sum(Pre(R:R+15,C-1)))+16;

DC(1:16,1:16)=(a+b)/32;

a=1;b=0;

for k=1:16

l(a,1:16)=Pre(R+b,C-1);

mV(1:16,a)=Pre(R-1,C+b);

a=a+1; b=b+1;

end

H1=0;

a=8;

b=6;

V1=0;

for i=1:8

H1=H1+(i\*(Pre(R-1,C+a)-Pre(R-1,C+b)));

V1=V1+(i\*(Pre(R+a,C-1)-Pre(R+b,C-1)));

a=a+1; b=b-1;

end

H\_Plane=(5\*H1 + 32) / 64;

V\_Plane = (5\*V1 + 32) / 64;

a =( 16 \* (Pre(R-1,C+15) + Pre(R+15,C-1) + 1)) - (7\*(V\_Plane+H\_Plane));

for i=1:16

for j=1:16

b = a + (V\_Plane \* j) + (H\_Plane \* i);

Pl(i,j)= uint8(b/32);

end

end

DC\_SAE=sum(sum(abs(Image(R:R+15,C:C+15)- DC(1:16,1:16))));

V\_SAE=sum(sum(abs(Image(R:R+15,C:C+15)- mV(1:16,1:16))));

H\_SAE=sum(sum(abs(Image(R:R+15,C:C+15)-l(1:16,1:16))));

P\_SAE=sum(sum(abs(Image(R:R+15,C:C+15)- Pl(1:16,1:16))));

Block=[DC\_SAE,V\_SAE,H\_SAE,P\_SAE];

if min(Block)==DC\_SAE

Pre(R:R+15,C:C+15)=DC;

DC=DC+1;

elseif min(Block)==V\_SAE

Pre(R:R+15,C:C+15)=mV;

V\_ct=V\_ct+1;

else if min(Block)==H\_SAE

Pre(R:R+15,C:C+15)=l;

H\_c=H\_c+1;

elseif min(Block)==P\_SAE

Pre(R:R+15,C:C+15)=Pl;

Pla=Pla+1;

end

end

end

end

figure;

imshow(uint8(Image),[]);

figure;

imshow(uint8(Pre),[]);

Resid=Image-Pre;

figure;

imshow(uint8(Resid),[]);

OUTPUT:

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By applying the code to lena,goldhill and photographer images, the output is obtained as shown above.