Mohamed Ashraf Mohamed 18104764

**1-Function Compress**

* 4x4

function cframe = compress(iframe)

c = iframe;

imgycbcr = rgb2ycbcr(iframe);

Y = imgycbcr(:,:,1);

Cb = imgycbcr(:,:,2);

Cr = imgycbcr(:,:,3);

D = 4;

T = dctmtx(D);

Y = im2double(Y);

Cb = im2double(Cb);

Cr = im2double(Cr);

BY = blkproc(Y,[D D],'P1\*x\*P2',T,T');

BCb = blkproc(Cb,[D D],'P1\*x\*P2',T,T');

BCr = blkproc(Cr,[D D],'P1\*x\*P2',T,T');

mask = [1 1 0 0

1 0 0 0

0 0 0 0

0 0 0 0

];

B2Y = blkproc(BY,[D D],'P1.\*x',mask);

B2Cb = blkproc(BCb,[D D],'P1.\*x',mask);

B2Cr = blkproc(BCr,[D D],'P1.\*x',mask);

I2Y = blkproc(B2Y,[D D],'P1\*x\*P2',T',T);

I2Cb = blkproc(B2Cb,[D D],'P1\*x\*P2',T',T);

I2Cr = blkproc(B2Cr,[D D],'P1\*x\*P2',T',T);

imgycbcr(:,:,1) = im2uint8(I2Y);

imgycbcr(:,:,2) = im2uint8(I2Cb);

imgycbcr(:,:,3) = im2uint8(I2Cr);

cframe = ycbcr2rgb(imgycbcr);

end

* 8x8

function cframe = compress(iframe)

c = iframe;

imgycbcr = rgb2ycbcr(iframe);

Y = imgycbcr(:,:,1);

Cb = imgycbcr(:,:,2);

Cr = imgycbcr(:,:,3);

D = 8;

T = dctmtx(D);

Y = im2double(Y);

Cb = im2double(Cb);

Cr = im2double(Cr);

BY = blkproc(Y,[D D],'P1\*x\*P2',T,T');

BCb = blkproc(Cb,[D D],'P1\*x\*P2',T,T');

BCr = blkproc(Cr,[D D],'P1\*x\*P2',T,T');

mask = [1 1 1 1 0 0 0 0

1 1 1 0 0 0 0 0

1 1 0 0 0 0 0 0

1 0 0 0 0 0 0 0

0 0 0 0 0 0 0 0

0 0 0 0 0 0 0 0

0 0 0 0 0 0 0 0

0 0 0 0 0 0 0 0

];

B2Y = blkproc(BY,[D D],'P1.\*x',mask);

B2Cb = blkproc(BCb,[D D],'P1.\*x',mask);

B2Cr = blkproc(BCr,[D D],'P1.\*x',mask);

I2Y = blkproc(B2Y,[D D],'P1\*x\*P2',T',T);

I2Cb = blkproc(B2Cb,[D D],'P1\*x\*P2',T',T);

I2Cr = blkproc(B2Cr,[D D],'P1\*x\*P2',T',T);

imgycbcr(:,:,1) = im2uint8(I2Y);

imgycbcr(:,:,2) = im2uint8(I2Cb);

imgycbcr(:,:,3) = im2uint8(I2Cr);

cframe = ycbcr2rgb(imgycbcr);

end

* 16x16

function cframe = compress(iframe)

c = iframe;

imgycbcr = rgb2ycbcr(iframe);

Y = imgycbcr(:,:,1);

Cb = imgycbcr(:,:,2);

Cr = imgycbcr(:,:,3);

D = 16;

T = dctmtx(D);

Y = im2double(Y);

Cb = im2double(Cb);

Cr = im2double(Cr);

BY = blkproc(Y,[D D],'P1\*x\*P2',T,T');

BCb = blkproc(Cb,[D D],'P1\*x\*P2',T,T');

BCr = blkproc(Cr,[D D],'P1\*x\*P2',T,T');

mask = [1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0

1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0

1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0

1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0

1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0

1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0

1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0

1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

];

B2Y = blkproc(BY,[D D],'P1.\*x',mask);

B2Cb = blkproc(BCb,[D D],'P1.\*x',mask);

B2Cr = blkproc(BCr,[D D],'P1.\*x',mask);

I2Y = blkproc(B2Y,[D D],'P1\*x\*P2',T',T);

I2Cb = blkproc(B2Cb,[D D],'P1\*x\*P2',T',T);

I2Cr = blkproc(B2Cr,[D D],'P1\*x\*P2',T',T);

imgycbcr(:,:,1) = im2uint8(I2Y);

imgycbcr(:,:,2) = im2uint8(I2Cb);

imgycbcr(:,:,3) = im2uint8(I2Cr);

cframe = ycbcr2rgb(imgycbcr);

end

**2**- VideoCompression

video = VideoReader('tiger.mp4');

wcVideo = VideoWriter("tiger16x16.avi");

wcVideo.FrameRate =1;

open(wcVideo);

v = read(video,[1 10]);

for i = 1:10

frame = v(:,:,:,i);

for a = 1:size(frame,1)

for b = 1:size(frame,2)

if(frame(a,b,1) <= 120 &&frame(a,b,2) >= 150 && frame(a,b,3)<=120)

frame(a,b,1);

frame(a,b,2);

frame(a,b,3);

end

end

end

cframe = compress(frame);

imwrite(cframe,strcat('images\c16\\img',int2str(i),'.png'));

writeVideo(wcVideo,cframe);

end

close(wcVideo);

Results

