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clc
clear all
close all

%No channel coding
p=0.1;
obj = VideoReader('highway.avi');
a= read(obj);
frames=get(obj,'NumberOfFrames');

%extracting Frames

for i=1:frames
    I(i).cdata=a(:,:,i);
end

s=size(I(1).cdata);
mov(1:frames) =struct('cdata', zeros(s(1),s(2), 3, 'uint8'),'colormap', []);

for Frame=1:frames
    errorBitsWithoutRedun=0;
    errorBitsWithRedun=0;
    numOfSentBits=0;

%Red Components of the Frame
R=I(Frame).cdata(:,:,1);
%Green Components of the Frame
G=I(Frame).cdata(:,:,2);
%Blue Components of the Frame
B=I(Frame).cdata(:,:,3);

%reshaping and converting to binary as in the project guidelines
sequenceRed=[1:25344];
sequenceRed=reshape(R,1,[]);

sequenceGreen=[1:25344];
sequenceGreen=reshape(G,1,[]);

sequenceBlue=[1:25344];
sequenceBlue=reshape(B,1,[]);

sequenceRed=double(sequenceRed);
sequenceRed=de2bi(sequenceRed);
sequenceRed=reshape(sequenceRed,1,[]);

sequenceGreen=double(sequenceGreen);
sequenceGreen=de2bi(sequenceGreen);
sequenceGreen=reshape(sequenceGreen,1,[]);

sequenceBlue=double(sequenceBlue);
sequenceBlue=de2bi(sequenceBlue);
sequenceBlue=reshape(sequenceBlue,1,[]);

sequence=horzcat(sequenceRed,sequenceGreen,sequenceBlue);

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%dividing the sequence into frames
divided=[1:594,1:1024];
divided=reshape(sequence,[],1024);
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%transmitting the data over the channel
recieved = bsc(divided,p);
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%collect the divided frames to one sequence again
sequenceDone=reshape(recieved,1,[]);
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%reshaping and converting to uint8 as in the project guidelines
sequenceRedDone=sequenceDone(1,1:202752);
sequenceGreenDone=sequenceDone(1,202753:405504);
sequenceBlueDone=sequenceDone(1,405505:608256);
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sequenceRedDone=reshape(sequenceRedDone,25344,8);
sequenceRedDone=bi2de(sequenceRedDone);
sequenceRedDone=uint8(sequenceRedDone);
sequenceRedDone=reshape(sequenceRedDone,144,176);
```

```
sequenceGreenDone=reshape(sequenceGreenDone,25344,8);
sequenceGreenDone=bi2de(sequenceGreenDone);
sequenceGreenDone=uint8(sequenceGreenDone);
sequenceGreenDone=reshape(sequenceGreenDone,144,176);
```

```
sequenceBlueDone=reshape(sequenceBlueDone,25344,8);
sequenceBlueDone=bi2de(sequenceBlueDone);
sequenceBlueDone=uint8(sequenceBlueDone);
sequenceBlueDone=reshape(sequenceBlueDone,144,176);
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%Converting back to Video
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%constracting frame back
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mov(1,Frame).cdata(:,:,1) = sequenceRedDone;
mov(1,Frame).cdata(:,:,2) = sequenceGreenDone;
mov(1,Frame).cdata(:,:,3) = sequenceBlueDone;
end
```

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%saving the new Movie
movie2avi(mov,'p=0.1 using no channel coding.avi')
%play the movie
implay('p=0.1 using no channel coding.avi')
```