
Image Processing | Lab 12

Encode and Decode the Image Segment

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Function Used in this lab:

prob.m

```
function out = prob(img)
    format long
    out = zeros(255,1);
    for i=0:255
        out(i+1) = sum(sum(img==i))/prod(size(img));
    endfor
endfunction
```

Encode.m

```
function code = Encode(p,mes)
    m=length(mes);
    k=length(p);
    start=0;
    range=zeros(k+1,1);
    span=1;
    for i=1:m
        for j=1:k
            range(j+1)=start+p(j)*span;
            start=range(j+1);
        endfor
        start=range(mes(i));
        span=range(mes(i)+1)-start;
        range(1)=start;
    endfor
    code = (2*start+span)/2;
endfunction
```

Decode.m

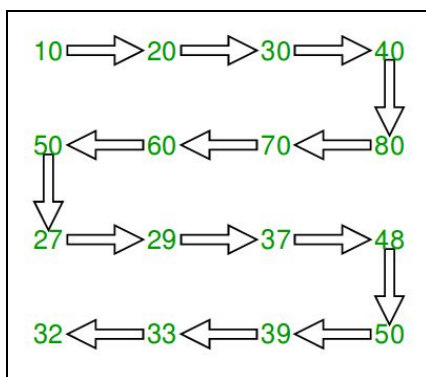
```

function mes = Decode(p,code,m)
    k=length(p);
    start=0;
    range=zeros(k+1,1);
    span=1;
    mes=zeros(m,1);
    for i=1:m
        for j=1:k
            range(j+1)=start+p(j)*span;
            if(start<=code && range(j+1)>=code)
                mes(i)=j;
                span=range(j+1)-start;
                break;
            endif
            start=range(j+1);
        endfor
    endfor
endfunction

```

Task 1 : Write an octave code to encode a 3x3 segment of your grayscale photo. Consider the 3x3 segment element as a vector of length 9 by considering image elements in the pattern shown below.

Task 2 : Write an octave code to decode the image.



Code :

```

pkg load image;
r = imread("gray_scale_img.jpg");
r = imresize(r,[256,256]);
p = prob(r);
num_ele = 3;
seg_img = round(rand(1)*(min(size(r))-num_ele-1)+1);
segment = r(seg_img:seg_img+num_ele-1,seg_img:seg_img+num_ele-1);
segment
fg = true;
s_index = 1;
for i=1:num_ele
    if fg == true
        msg(s_index:s_index+num_ele-1) = segment(i,:);
    else
        msg(s_index:s_index+num_ele-1) = flip(segment(i,:));
    endif
    s_index = s_index + num_ele;
    fg = not(fg);
endfor
msg
encode_code = Encode(p,msg)
decode = Decode(p,encode_code,length(msg))

```

Output :

```

>> Task1
segment =

     7     9    11
    10    16    18
    15    16     8

msg =

     7     9    11    18    16    10    15    16     8

encode_code =      2.669057251424622e-02
decode =

     7
     9
    11
    18
    16
    10
    15
    15
     0

```