Lab #10

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EE146 Section (022)

```
clc
clear all
close all
```

parameters

```
thres = 5;
minArea = 10;
```

part 1

```
f1 = imread( 'car_frame1.jpg' );
f2 = imread( 'car_frame2.jpg' );
% convert f1 and f2 to grayscale and double precision
g1=cast(rgb2gray(f1),'double');
g2=cast(rgb2gray(f2),'double');
% code here

% get the difference between g1 and g2, then find the location where the
difference=abs(g1-g2);
cc=zeros(height(f1),width(f1));
% difference is larger than the threshold (thres)
for x=1:height(g1)
for y=1:width(g1)
if(difference(x,y)>thres)
cc(x,y)=difference(x,y);
else
end
end
end
% code here

% use morphlogical ops to the difference image
cc = bwareaopen( cc, minArea );
cc = imclose( cc, strel( 'disk', 5 ));

figure; imshow( cc );
```

```
% get bounding box (bb) from regionprops
bb=regionprops(cc,"BoundingBox");
% code here

% use insertShape to put bb on image I
I1=insertShape(f1,'Rectangle',bb.BoundingBox);
I=insertShape(f2,'Rectangle',bb.BoundingBox);
figure;imshow(I);figure;imshow(I1);
```

part 2

```
w = 1;  % this is our window size
% detect the corner points
ip =  detectCornerPoints( g1, 1000, 1 );

nIp = length( ip( :, 1 ));
feat1 = zeros( nIp, (2*w+1)^2);
for i = 1 : nIp
    % get the sub pixel values of g1 from 3x3 window based on the corner points,
    % code here
```

```
    g1_corner=detectCornerPoints(g1,thres,w);
    for x=1:height(g1_corner)
    feature_g1(x)=interestOperator(g1,g1_corner(x,1),g1_corner(x,2),w);
    end
    % reshape() the feature to 1x9, numel() can be used for counting

    % the number of elements in a matrix
    % code here


end

% init the variables for computing the motion vectors
[r,c] = size( g2 );
feat2 = zeros( (r-2*w)*(c-2*w), (2*w+1)^2);
p2 = zeros( (r-2*w)*(c-2*w), 2 );
count = 1;
for i = 1+w:r-w
    for j= 1+w:c-w
        % get the sub pixel values of g2 from 3x3 window,
        % code here

        % reshape() the feature to 1x9
        % code here

        % record the location of i, j in p2
        % code here

        % increase the counter
        count = count + 1;
    end
end



idxP = matchFeatures(feat1,feat2);
mp1 = ip( idxP( :, 1 ), : );
mp2 = p2( idxP( :, 2 ), : );
figure; showMatchedFeatures(g1,g2,fliplr(mp1),fliplr(mp2),'montage');
```