

## Lab4 - Moving Object Tracking

In this lab you will learn how to separate foreground object from background scene to track the object by subtracting two video frames.

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### Step 1: Reading Video

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Let's read movie and show the 1st and 75th frame.

```
f = VideoReader('bike.avi');  
mov = read(f);  
I = mov(:,:,1);  
imshow(I);
```



```
J = mov(:,:,75);  
imshow(J);
```



## Step 2: Finding Difference

Let's find the three possible differences and convert them to binary image in which foreground will be white and background black.

```
% I - J  
close all  
D1 = I - J;  
B1 = im2bw(D1,.1);  
figure, imshow(D1);  
figure, imshow(B1);
```



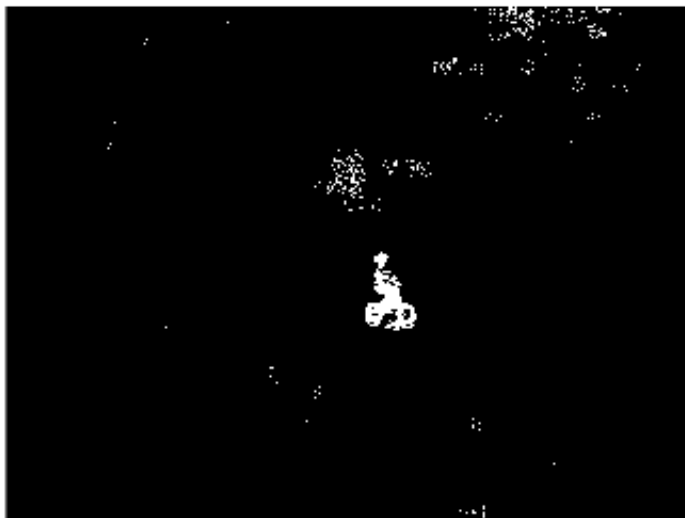


```
% J - I  
close all  
D2 = J-I;  
B2 = im2bw(D2,.1);  
figure, imshow(D2);  
figure, imshow(B2);
```





```
% |I - J|  
close all  
D3 = imabsdiff(I,J);  
B3 = im2bw(D3,.1);  
figure, imshow(D3);  
figure, imshow(B3);
```





### Step 3: Finding Interesting Properties of Blobs

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Blobs are the foreground objects which are white in color in binary images. We can extract various properties of those objects using library function **regionprops** (type **doc regionprops** for more information)

We will use the absolute difference ( **why?** ) to extract BoundingBox property for each blob.

```
P = regionprops(B3, 'BoundingBox');
len = size(P)
P(1).BoundingBox
P(2).BoundingBox
P(5:7).BoundingBox
P(len).BoundingBox
```

```
len =
    155      1
ans =
    47.5000    66.5000    1.0000    1.0000
ans =
    48.5000    64.5000    1.0000    1.0000
ans =
    65.5000    15.5000    1.0000    1.0000
ans =
    74.5000   149.5000    1.0000    1.0000
ans =
   103.5000     7.5000    1.0000    1.0000
ans =
   295.5000    27.5000    1.0000    1.0000
ans =
    47.5000    66.5000    1.0000    1.0000
```

### Step 4: Drawing Bounding Boxes

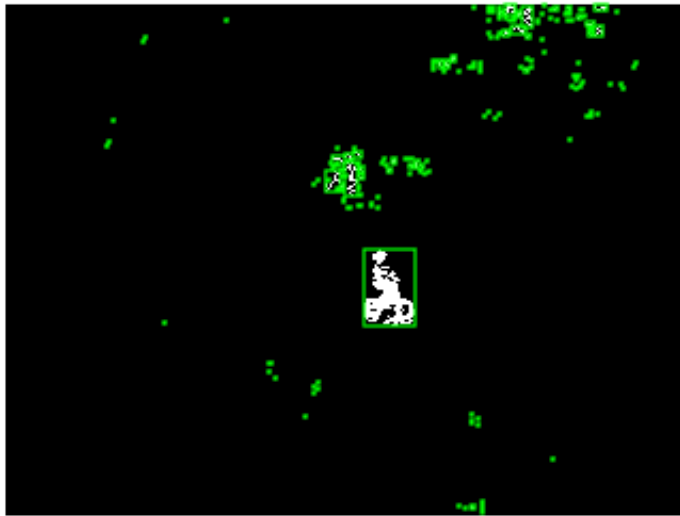
---

Let's draw a rectangle (i.e. BoundingBox) around each blob in a figure. Note that all pixel of a blob are connected.

```

imshow(B3);
for i=1:len
    rectangle('Position',P(i).BoundingBox, 'EdgeColor','green','LineWidth',1);
end

```



## Step 5: Visualizing Many Figures

Here we learn how to snap figure in loop to publish nicely. We snap the figure each time we draw a new BoundingBox. We draw BoundingBox only if the product of height and width is greater than 30 to filter out small blobs.

```

close all
imshow(J);
for i=1:len
    if P(i).BoundingBox(3)*P(i).BoundingBox(4)>30
        rectangle('Position',P(i).BoundingBox, 'EdgeColor','green','LineWidth',1);
        snapnow;
    end
end

```







## Assignment

Find two similar images and draw a BoundingBox around the objects that are present in one image and absent in another.

Similar to these images:













Lab4stub.m

```
%% Lab4 Assignment :)
% Student: *Bob The Builder @ EN3-A-04*
%%
% Play here...
```