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Edge base Segmentation

Detecting a Object Using edge base Image Segmentation

Read image from the link

```
I = imread('F:\Matlab\Matlab Works\Edge Base Segmentation\tiger.jpg');
J = I;
figure, imshow(I), title('original image');
I = rgb2gray(I); %convert rgb to gray

Warning: Image is too big to fit on screen; displaying at 67%
```
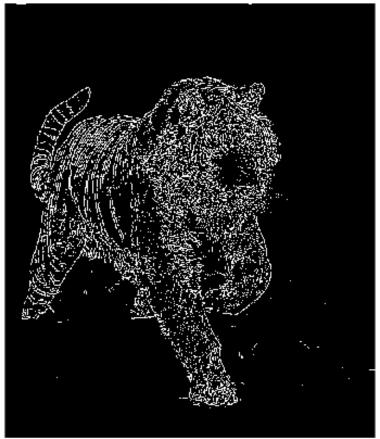
original image

Here we use 'Roberts' operator to calculate the threshold value. We then tune the threshold value and use again to obtain a binary mask that contains the segmented object.

```
[~, threshold] = edge(I, 'Roberts');
fudgeFactor = .4;
BWs = edge(I,'Roberts', threshold*fudgeFactor);
figure, imshow(BWs), title('binary gradient mask');

Warning: Image is too big to fit on screen; displaying at 67%
```

binary gradient mask

Compared to the orginal image, in binary gradient mask has gaps in lines surrounding the object in the gradient mask. These linear gaps will disapper if the sobel image is dilated using liner stucturing elements. This linear structuring elements can create with the strel function.

```
se90 = strel('line', 3, 90);
se0 = strel('line', 3, 0);

% Here we use imdilate function for dilating the binary gradient mask.
BWsdil = imdilate(BWs, [se90 se0]);
figure, imshow(BWsdil), title('dilated gradient mask');

Warning: Image is too big to fit on screen; displaying at 67%
```
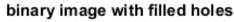
dilated gradient mask

Fill Interior Gaps

We use imfill to fill interior gaps

```
BWdfill = imfill(BWsdil, 'holes');
figure, imshow(BWdfill);
title('binary image with filled holes');
```

Warning: Image is too big to fit on screen; displaying at 67%

binary image with filled holes

Remove Connected Objects on Border

If there is object that connected to the border and that is not our object then we can remove it by using imclearborder function. The connectivity in the imclearborder function was set to 4 to remove diagonal connections.

```
BWnobord = imclearborder(BWdfill, 4);
figure, imshow(BWnobord), title('cleared border image');

Warning: Image is too big to fit on screen; displaying at 67%
```

cleared border image

imerode function is use to make the segmented object look natural. the image is eroding twice with a diamond structuring element and that is created by strel function.

```
seD = strel('diamond',2);
BWfinal = imerode(BWnobord,seD);
BWfinal = imerode(BWfinal,seD);
figure, imshow(BWfinal), title('segmented image');

Warning: Image is too big to fit on screen; displaying at 67%
```

segmented image

Here i display a yellow line in the original image for mark the object that we detected.

```
BWoutline = bwperim(BWfinal);
SegoutR = J(:,:,1);
SegoutG = J(:,:,2);
SegoutB = J(:,:,3);

%now set yellow, [255 255 0]
SegoutR(BWoutline) = 255;
SegoutG(BWoutline) = 255;
SegoutB(BWoutline) = 0;
SegoutRGB = cat(3, SegoutR, SegoutG, SegoutB);
figure, imshow(SegoutRGB), title('outlined original image');

Warning: Image is too big to fit on screen; displaying at 67%
```

outlined original image

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