Computer Vision

Assignment 1

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U19ME191

MATALB code:

```matlab
img = imread("C:\Users\avdhe\Downloads\img_51.jpg"); % Input the image file

theta = 51; % angle by which image is to be rotated
rmat = [ cos(theta) sin(theta) 0
-        sin(theta) cos(theta) 0
         0 0 1]; % defining rotation matrix

mx = size(img,2); % number of rows
my = size(img,1); % number of columns

corners = [ 0 0 1
            mx 0 1
            0 my 1
            mx my 1]; % defining corner matrix

new_c = corners*rmat; % rotating the image

T = maketform('affine', rmat);   % translation line

img2 = imtransform(img, T, ...
   'XData',[min(new_c(:,1)) max(new_c(:,1))],...
   'YData',[min(new_c(:,2)) max(new_c(:,2))]); % final rotated image

figure;
imshow(img);
title('Original Image U19ME191');

figure;
imshow(img2);
title('Rotated image by 51   degrees U19ME191');
```

MATLAB R2021a

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```
1  -   img = imread("C:\Users\avdhe\Downloads\img_51.jpg"); % Input the image file
2
3  -   theta = 51; % angle by which image is to be rotated
4  -   rmat = [ cos(theta)  sin(theta) 0
                sin(theta)  cos(theta) 0
                0 0 1]; % defining rotation matrix
5
6  -   mx = size(img,2); % number of rows
7  -   my = size(img,1); % number of columns
8
9
10
11 -   corners = [0 0 1
                  mx 0 1
                  0 my 1
                  mx my 1]; % defining corner matrix
12
13
14
15 -   new_c = corners*rmat; % rotating the image
16
17 -   T = maketform('affine', rmat); % translation line
18
19
20 -   img2 = imtransform(img, T, ...
21         'XData',[min(new_c(:,1)) max(new_c(:,1))],...
22         'YData',[min(new_c(:,2)) max(new_c(:,2))]);% final rotated image
23
24 -   figure;
25 -   imshow(img);
26 -   title('Original Image U19ME191');
27
28 -   figure;
29 -   imshow(img2);
30 -   title('Rotated image by 51 degrees U19ME191');
```

Command Window

fx >>

Figure 2
File Edit View Insert Tools Desktop Window Help

Rotated image by 51 degrees U19ME191

Figure 1
File Edit View Insert Tools Desktop Window Help

Original Image U19ME191

Workspace

Name ▲	Value
corners	4x3 double
img	628x1200x3 uint8
img2	1272x1313x3 uint8
mx	1200
my	628
new_c	4x3 double
rmat	[0.7422,0.6702,0;-0.6702,0.7422...
T	1x1 struct
theta	51

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