

Department of Electronics Engineering

Faculty of Engineering & Technology BS(Electronics)

Name: MARIA MAJEED / Bisma Noor

Roll No: 2K18/ELE/51 / 2K18/ELE/22

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clc;
clear;
% close all;
tic
%% Input Image
[file,path] = uigetfile('*.');
f1 = fullfile(path,file);
if prod(double(file) == 0) && prod(double(path) == 0)
    return
end
a = imread(f1);
%% Input Formating
in = input('Press 1 for Rotate and 2 for Transform : ');
if in==1
    angle = input('Enter angle in Degrees : ');
    in1 = input('Press 1 for further transform else 2 : ');
    if in1 == 1
        homo = input('3D rotation as row vector (1x3) : ');
        anglerad = pi*angle/180;
        A1 = [cos(anglerad), sin(anglerad);-sin(anglerad),cos(anglerad)];
        A = [A1,[0;0];homo];
    else
        anglerad = pi*angle/180;
        A = [cos(anglerad), sin(anglerad),0;-sin(anglerad),cos(anglerad),0;0,0,1];
    end
else
    A = input('Enter transform Matrix : ');
end
a1=0;
% Is it color or grayscale
b = size(a);
if size(b,2)==3
    a1 = 1;
end
%Convert to double
a= double(a);
%% Transform
% Bring the origin to the center by this Matrix
trans = [1,0,-b(2)/2;0,1,-b(1)/2;0,0,1];
%Transform Happens Here
outx = zeros(b(1),b(2));
outy = zeros(b(1),b(2));
for i = 1:b(1)
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    for j = 1:b(2)
        new = A*trans*[j;i;1];
        outx(i,j) = round(new(1)/new(3));
        outy(i,j) = round(new(2)/new(3));
    end
end

%% Fill the gaps
%%Fill in the gaps By using Median Filter
b1 = size(f);
for i = 2:b1(1)-2
    for j = 2:b1(2)-2
        if f(i,j)==0
            f(i,j) = median([f(i-1,j-1),f(i-1,j),f(i-1,j+1),f(i,j-1),f(i,j),f(i,j+1),f(i+1,j-1),f(i+1,j),f(i+1,j+1)]));
            if a1 == 1
                f(i,j,2) = median([f(i-1,j-1,2),f(i-1,j,2),f(i-1,j+1,2),f(i,j-1,2),f(i,j,2),f(i,j+1,2),f(i+1,j-1,2),f(i+1,j,2),f(i+1,j+1,2)]);
                f(i,j,3) = median([f(i-1,j-1,3),f(i-1,j,3),f(i-1,j+1,3),f(i,j-1,3),f(i,j,3),f(i,j+1,3),f(i+1,j-1,3),f(i+1,j,3),f(i+1,j+1,3)]);
            end
        end
    end
end
end
%% Display the Images
figure;
imshow(uint8(a));
title('Original Image')
figure;
imshow(uint8(f));
title('Transformed Image')
toc
%% Save the image ?
in2 = input('Do you want to save the image ? (Press 1 for yes 2 for No) : ');
if in2 == 1
    [file,path] = uinputfile('*.');
    f2 = fullfile(path,file);
    imwrite(uint8(f),f2);
end

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In this lab we perform the two task transform the image and rotate the image firstly when we run the code ask us about our transforming task what we want to perform rotate the image or transform the image if we press 1 matlab perform rotate and ask about the angle of rotation if we press 2 matlab transforming the image and ask about further we perform the transform and 2 for further

