PREMIER UNIVERSITY

Department of Computer Science & Engineering

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Report No	:	08
Name of Report	:	Image Processing using MATLAB
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Course Instructor	:	Mohammed Saifuddin Munna

Submitted By :

Name	**: Mohammad Hafizur Rahman Sakib**
ID	**: 0222210005101118**
Section	**: C**
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REMARKS

Name of Experiment: Image Processing using MATLAB

Objective :

The primary objective of this study is to establish an image manipulation framework that systematically incorporates resizing, contrast improvement, and segmentation methods on visual elements. The framework is crafted with the aim of amplifying the general visual appeal of images and streamlining the detection and examination of individual entities within the modified images.

Theory :

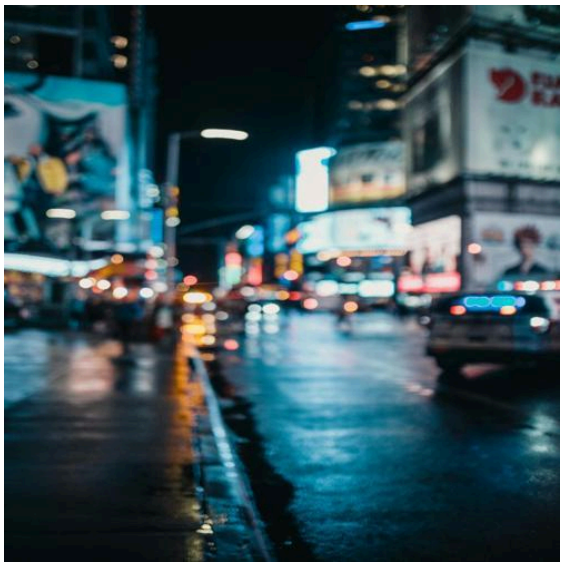
Image manipulation holds a crucial position in computer vision, offering a variety of methods to enhance and scrutinize visual content. The proposed workflow begins with the adjustment of the original image size to a standardized dimension, ensuring consistency for subsequent examinations. Following this, contrast improvement is applied to each color channel, elevating the overall image quality. The transition to grayscale and the integration of edge detection methods contribute to better-identifying object boundaries. To fine-tune the segmentation outcomes and attain a more accurate delineation of individual entities, morphological operations are utilized in the concluding phases of the workflow.

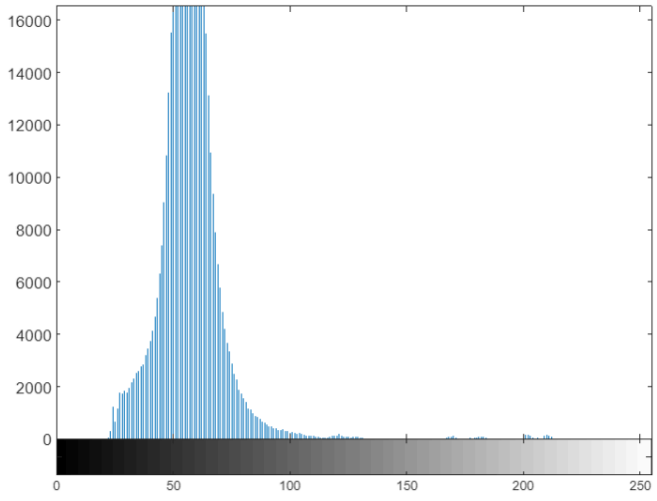
Codes :

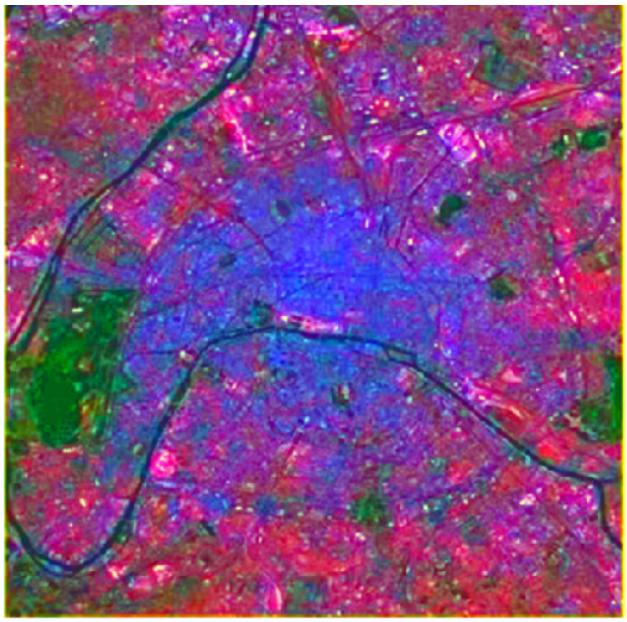
```
A = imread('test.jpg');

imshow(A);

B = imresize(A,[500 500]);

figure;

imshow(B);

imwrite(B,'NEW_map.tif');

Write the resized image data, B, to a file.

imwrite writes the file, myNewFile.tif, to the current folder.

A=imread('map.jpg');

imshow(A)
```

```
figure;
imhist(A(:,:,1))
r=A(:,:,1);
g=A(:,:,2);
b=A(:,:,3);
figure;
plot3(r(:),g(:),b(:),'.');
grid('on')
B=imadjust(A,stretchlim(A));
figure;
imshow(B)
imwrite(B,'NEW_map.jpg');
C=decorrstretch(B,'Tol',0.01);
imwrite(C,'Final Map.jpg');
figure;
imshow(C)
```

Outputs :







Discussion:

Within this MATLAB experiment focusing on image processing, we delved into three pivotal techniques: employing image smoothing, executing edge detection using the Sobel operator and Canny edge detector, and enhancing images through histogram equalization. Adjusting the kernel size in Gaussian smoothing showcased increased efficacy in noise reduction; however, an excessively large size led to the unfortunate loss of essential image details. The Sobel operator adeptly emphasized both vertical and horizontal edges, whereas the Canny edge detector exhibited superior performance, presenting fewer false positives.