

Matlab Image Processing Cheatsheet

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1. Basic Operations

Read and Display Images

Read an image file:

```
1 I = imread('image.jpg');
```

Display the image:

```
1 imshow(I);
```

Image Information

Check image details:

```
1 info = imfinfo('image.jpg');  
2 disp(info);
```

Image size:

```
1 size(I);
```

2. Image Processing Techniques

Convert Images

Convert to grayscale:

```
1 I_gray = rgb2gray(I);  
2 imshow(I_gray);
```

Convert to binary (thresholding):

```
1 I_binary = imbinarize(I_gray);  
2 imshow(I_binary);
```

Transform Images

Resize an image:

```
1 I_resized = imresize(I, [300, 400]);
```

Rotate an image:

```
1 I_rotated = imrotate(I, 90); % Rotate 90 degrees
```

Crop an image:

```
1 I_cropped = imcrop(I, [x, y, width, height]);
```

3. Image Enhancement

Adjust Brightness/Contrast

Change brightness:

```
1 I_bright = imadjust(I, [0.2 0.8], [0 1]);  
2 imshow(I_bright);
```

Histogram equalization:

```
1 I_eq = histeq(I_gray);  
2 imshow(I_eq);
```

Filters

Apply a Gaussian filter (smoothing):

```
1 I_gaussian = imgaussfilt(I_gray, 2);  
2 imshow(I_gaussian);
```

Apply a sharpening filter:

```
1 I_sharpen = imsharpen(I);  
2 imshow(I_sharpen);
```

4. Feature Detection

Edge Detection

Detect edges using Canny:

```
1 edges = edge(I_gray, 'Canny');  
2 imshow(edges);
```

Sobel edge detection:

```
1 edges_sobel = edge(I_gray, 'Sobel');  
2 imshow(edges_sobel);
```

5. Useful Commands

- `size(I)`: Get image dimensions.
- `imshow(I)`: Display the image.
- `imwrite(I, 'filename.jpg')`: Save an image.
- `help <function>`: Learn about MATLAB functions.

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6. Resources and Documentation

- MATLAB official docs: <https://www.mathworks.com/help/>
- Use `help <function>` or `doc <function>` in MATLAB for details.