

# Lecture 3: Digital Image Fundamentals

## Part 5: Scaling Issues

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### Notes:

- Sample images are available in both Matlab IPT *imdata* folder and *images* folder in the current directory. (You may need to add images folder into your path.)
- Related lecture: Lecture3 - Digital Image Fundamentals
- pdf versions of the .mlx files are also available for those using GNU Octave

```
% clear workspace variables and close windows
clc, clearvars, close all;
```

```
I1 = imread('cameraman.tif');
I2 = imread('circles.png');
I1 + I2; % this operation is not allowed
```

Error using +  
Integers can only be combined with integers of the same class, or scalar doubles.

```
I2u = uint8(I2); % convert I2 to the same class with I1
max(I2u(:))
```

```
ans = uint8
```

```
1
```

```
I2u = 255*I2u; % scale it to the same range
I3 = I1+I2u; % now it is allowed
max(I3(:)) % is something wrong?
```

```
ans = uint8
```

```
255
```

```
imshow(I3)
```



```
% convert images to double to perform arithmetic operations
```

```
I1d = double(I1);
```

```
I2d = double(I2u);
```

```
I3d = I1d+I2d;
```

```
max(I3d(:))
```

```
ans = 507
```

```
imshow(I3d) % what is wrong?
```

```
imshow(I3d,[])
```



```
imshowpair(I3, I3d,'montage')
```

