

Help file for Assignment 2

1. Low-pass and high-pass filtering:

```
import cv2
```

```
filteredImage = cv2.filter2D(image, depth, kernel)
```

image = The *ndarray* containing the image data

depth = color depth, use -1 for same depth as original image

kernel = The filter kernel defined as a matrix. For example, a 3x3 low-pass filter with scaling factor 10 can be defined as follows:

```
import numpy as np
```

```
kernel = np.matrix      ([ [1.0, 1.0, 1.0],  
                          [1.0, 2.0, 2.0],  
                          [1.0, 1.0, 1.0] ] / 10.0
```

2. Gaussian filtering:

```
import scipy.ndimage as ndimage
```

```
filteredImage = ndimage.gaussian_filter(image, sigma=N)
```

N = the sigma value

3. Median filtering:

```
import cv2
```

```
filteredImage = cv2.medianBlur(image, kernelSize)
```

kernelSize = number of rows and columns of kernel matrix (must be an odd number). *kernelSize*=3 means a 3x3 matrix, *kernelSize*=5 means a 5x5 matrix etc.

4. Zooming images:

In assignment 4 it may be useful to zoom the images to smaller size (so that you can see them better on the screen). The code below zooms the image *img* to 50% of its original size:

```
#get height and width of the image
```

```
height, width, colorspace = image.shape
```

```
zoomPercentage = 0.5
```

```
zoomedWidth = int(zoomPercentage*width)
```

```
zoomedHeight = int(zoomPercentage*height)
```

```
image = cv2.resize(image, (zoomedWidth, zoomedHeight))
```