

## PS2 Report

### #1

- 1.1. Loading of image 'peppers.png' as a list of arrays for numpy/scipy/opencv to interpret properly.
- 1.2. Blurring of image with Scipy's built in Gaussian filter, kernel standard deviation is set at 3.
- 1.4. DFT of blurred peppers.png taken.

### #2

- 2.1. 'lowcontrast.jpg' loaded as an array with each value representing individual pixel brightness
- 2.2. Brightness values compiled into a histogram from which the cumulative distribution function is calculated, which is then normalized to a slope of 1. These normalized values are re-encoded as an array and displayed as an image with higher contrast than the original.

**#3** Manual convolution of 'einstein.png' in vertical and horizontal directions using 1d Gaussian, box, and Sobel kernels individually. Kernels input into convolve1d are as follows:  
 $g=[1,4,6,4,1]$   $b=[1,1,1]$   $s=[-1,0,1]$

**#4** 'zebra.png' loaded and convolved through vertical and horizontal Sobel filters separately, using the same kernel and lines as in #3.  $\text{np.hypot}$  is used to compute the magnitude from the vertical and horizontal filtered images, which is then displayed as a single edge-detected image. 'zebra.png' was chosen specifically for its strong edges.