EE4902 Part 2 Assignment 1

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# Derive the **grayscale transformation** for contrast stretching.

The transformation function for linear contrast stretching is as follows:

Let ‘r’ be the pixel in the original image and ‘s’ is the pixel in the contrast stretched image. In a grayscale image, a pixel’s value ranges from 0 to 255.

Let the original image contain:

In low contrast images,

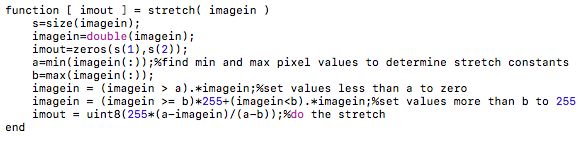
Let the enhanced image be having

To linearly map f to g:

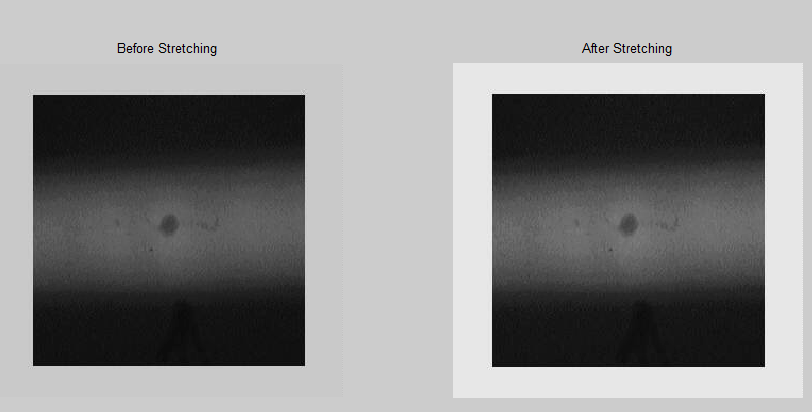
Since , the enhanced pixel value is:

# Experiment contrast stretching for images using the web site below.

Code in Matlab was implemented to transform the image pixels. The code used is as follows:



The contrast stretched images were then compared with the original image and the results are presented as follows:







To further analyze the effect of contrast stretching, the histogram of the image was obtained. A low contrast image was generated by dividing the original image pixels by two, and then adding an offset of 80.

|  |  |
| --- | --- |
| Low contrast image | Histogram |
|  |  |

|  |  |
| --- | --- |
| Contrast stretched image | Histogram |
|  |  |

As evidenced by the histogram of the two images, contrast stretching will evenly distribute the pixels across a larger dynamic range, resulting in a better contrast.