Image Processing
Mini Project 2
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Abstract

This document presents both the target and duplicated images with minimal commentary. Detailed information can be found in the project's .m (MATLAB) file.

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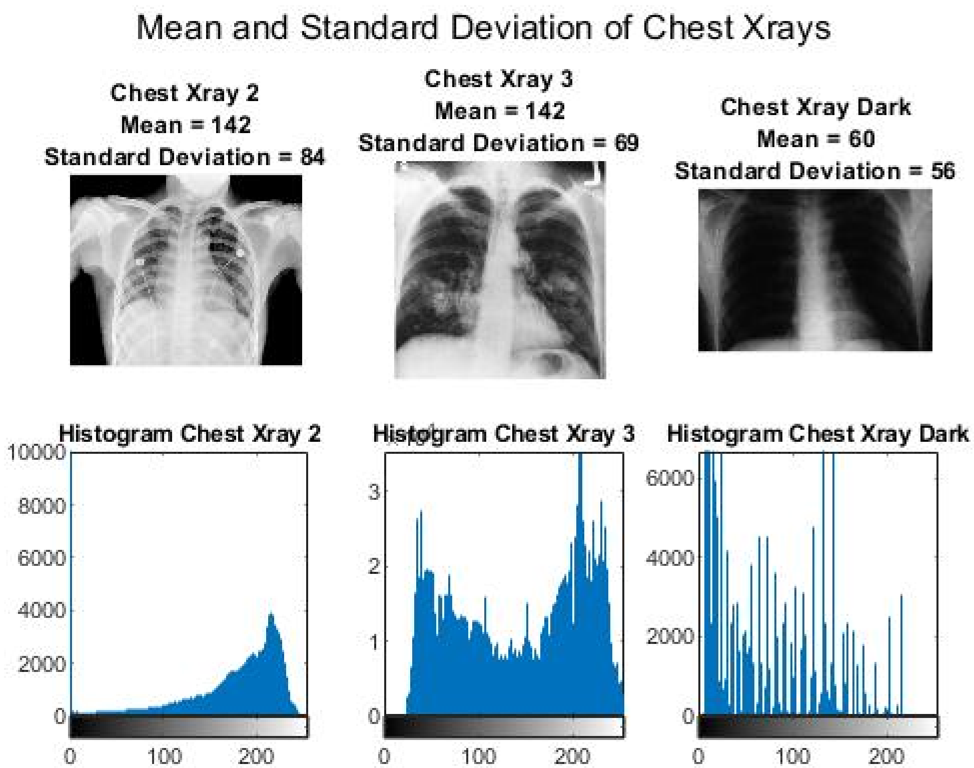

Figure 1: Demonstrating Image Contrast via Standard Deviation from a Median Mean

The histograms reflect how well each image is contrasted.
The first image on the left has obfuscated contrast, even though the standard deviation is high even though its mean is near center and has a high standard deviation. Normalization of the image should produce a closer mean to center 128 in addition to a larger standard deviation.

The center image is the most ideal present as an example for contrast. Once again normalization would improve the mean as well as standard deviation. This second image is superior to the first on account of how its histogram or standard deviation is the result of darker pixels being balanced in quantity in relationship to the brighter pixels.

The far right image is the foil to the other two insofar as it presents how a non-center mean can
dimiish visibility. This is especially true for such a small mean that doubles to minimize maximum standard deviation values.

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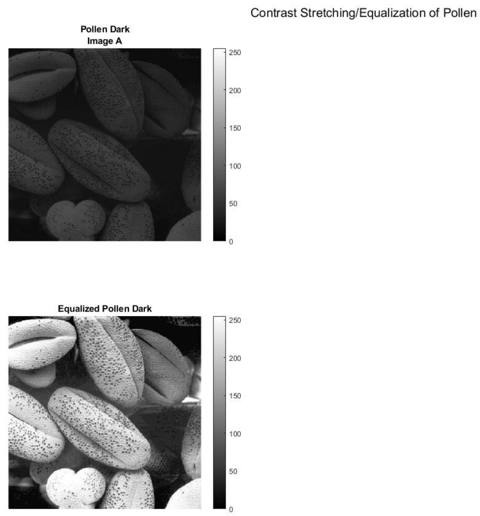

Figure 2: Improving Contrast for Two Images of Identical Objects

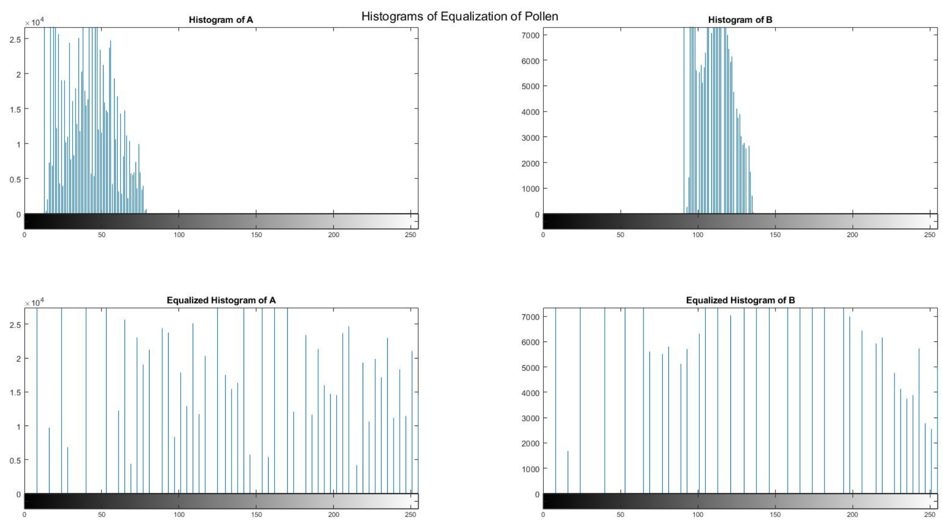

Figure 3: Pixel Intensity Histograms of Respective Images

The histograms reflect how equalizing an image will adjust blatent non-centered means to center as well as expanding the standard deviation to improve contrast as is discussed in the problem immediately above.

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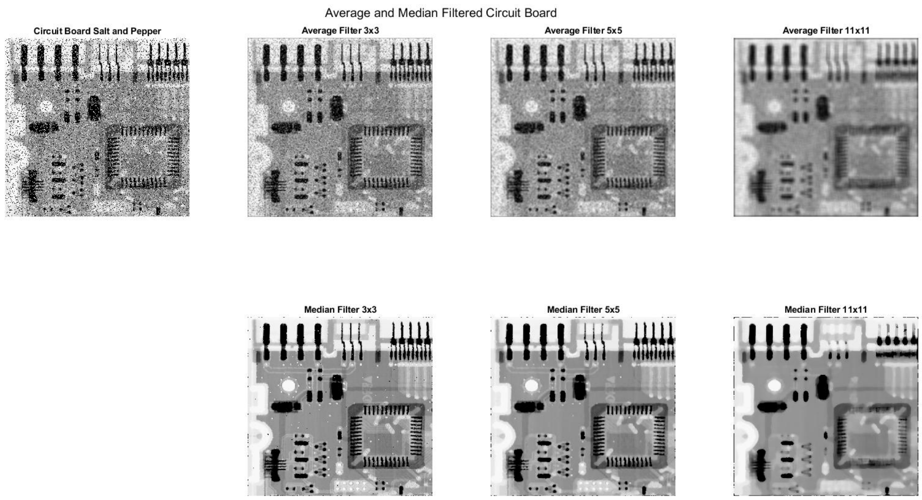

Figure 4: Filter Results on Salt & Pepper Circuit Board

There is a direct relationsihp to size of the average filter and how much noise is visible. However, as much as the larger average filters remove more noise, they effectively remove fine details such as the on-board FPGA's or Processor's pin connections.

The median filters seem to more effectively annihilate noise and produces a crisper image with the same fault as the filters become larger.

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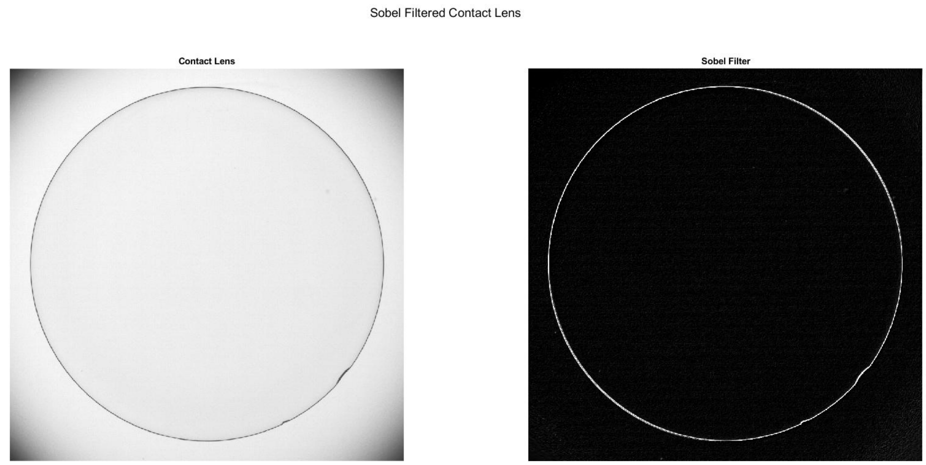

Figure 5: Sobel Filter Edge Detection

The sobel filter detects edges as one may note the lack of effect from the pixel intensity level in the corners producing the exact value as the center's, but the intense gradient at the edge of the contact lenses triggers the proper results.

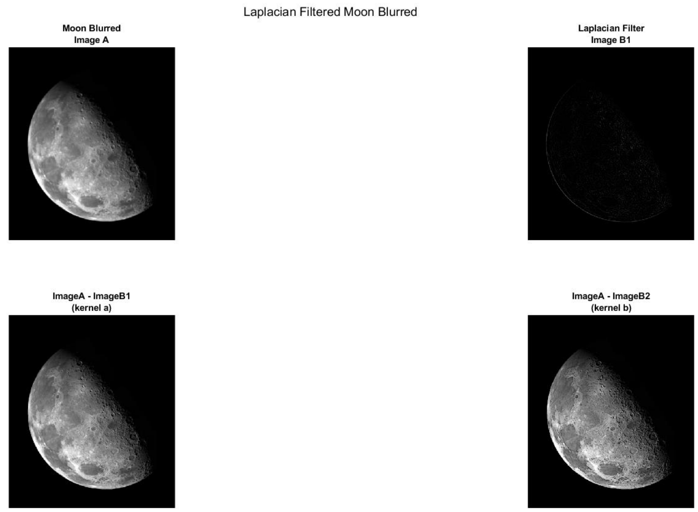

Figure 6: Utilizing a Laplacian Filter to Increase Image Definition

Note: ImageB2 is not displayed; IamgeB2 is the negative 8 core laplacian while ImageB1 is the negative 4 core Laplacian; however, both have all 8 neighbors with identical values.

There is more detail obtained by negating the more intense laplacian filter from the original blurred image in the top left.

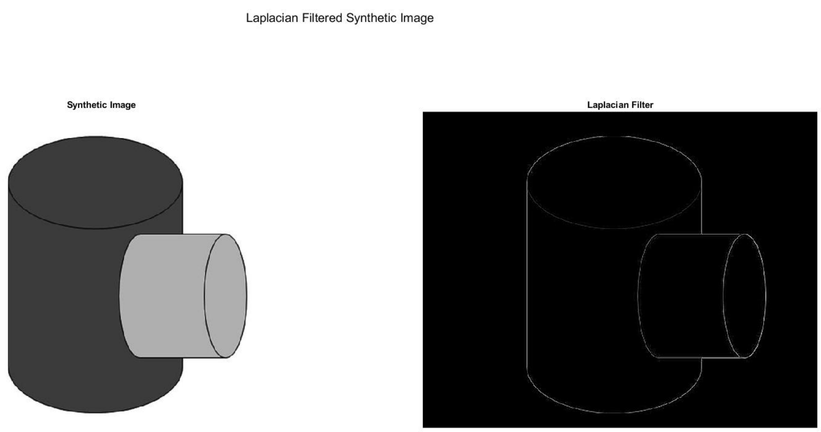

Figure 7: Utilizing a Laplacian Filter to Detect Edges of an Arbitrary Object

Regardless of the abstract or synthetic rigidity of an image, the laplacian filter is able to detect boundaries or edges effectively.