

Homework II

1. The histogram of an image \mathbf{A} is $h_{\mathbf{A}}(l) = l$, ($l = 0, \dots, 255$). A point function

$$g(l) = \begin{cases} l & 0 \leq l < 128 \\ 255 - l & 128 \leq l \leq 255 \end{cases}$$

Let $B(i, j) = A(i, j)$. Calculate $h_{\mathbf{B}}(l)$ without a computer. Show all your work.

2. Implement histogram based segmentation on your image. Identify the peaks of your histogram with the “objects” that they correspond to. Show your image, its histogram, the ranges, etc. Show the identified objects. Finally construct the histogram segmented image.
3. Derive the mean and variance for continuous amplitude Gaussian and uniform densities.
4. Equalize your image. Show before and after images and histograms. Is the histogram of the equalized image uniform? Which regions got stretched/compressed? (Be as accurate as possible)