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ECE 661 Homework 6

**Theory Question**

Lecture 14 will present two very famous algorithms for image segmentation: The Otsu Algorithm and the Watershed Algorithm. These algorithms are as different as night and day. Present in your own words the strengths and the weaknesses of each. (Note that the Watershed algorithm uses the morphological operators that we will discuss in Lecture 13.)

**Overview**

In this assignment, we will attempt to separate the foreground of an image from the background. This will be accomplished by separating each image into its red, green, and blue channels. Then, we will use the OTSU algorithm, and recombine the images on completion

**Otsu’s Algorithm**

Otsu’s algorithm finds the threshold of gray values for distinguishing the foreground from the background. Of course, this assumes that there is indeed such a threshold that will allow us to make the discrimination. It does this by looking at the bimodal distribution of gray levels in a binary image and finds the threshold that maximizes the variance between the two classes. So, we need find the weighted sum of the variances between the two classes. This is done with the following equation

Here, the weights applied to each variance are computed by totaling the probabilities