Clemson University

ECE 4310: Computer Vision

Lab 2: Optical Character Recognition

Sarah Anderson

Due: September 15, 2020

**Purpose:**

The purpose of this lab is to create a matched filter that reads an image and identifies a certain smaller image within it. Also, to calculate the matched spatial filter (MSF) and normalized the image to 8-bits. It must also calculate the ROC curve with all of proper calculations stored somewhere (I stored mine in a csv file). With this ROC curve, determine a threshold and calculate the true positives, false positives, true negatives, and the false negatives using the ground truth file given.

**Input:**

**A close up of a newspaper

Description automatically generated**

Figure 1: Input Image



Figure 2: Template Image

**Output:**

**A picture containing rug, curtain, old, standing

Description automatically generated**

Figure 3: MSF Image (not 8-bit)

A screenshot of a cell phone

Description automatically generated

Figure 4: 8-bit MSF Normalized Image (No Threshold)

A close up of a piece of paper

Description automatically generated

Figure 5: Truth Table

A screenshot of a cell phone

Description automatically generated

Figure 6: ROC Graph

A picture containing skiing, night, dark, photo

Description automatically generated

Figure 7: 8-bit Normalized MSF Image with 200 Threshold

**Conclusion:**

Based on the ROC graph, I have determined that the best threshold is near the “knee” of the curve. The threshold that I choose is 200. At that threshold, it gives me the best tradeoff for the performance of the threshold.