

Purpose

The purpose of partA was to teach us about basic data grouping methods such as nearest neighbor and k means for image segmentation.

Method

Images T1 and M1 were manually produced by getting the average of every 4 by 4 pixel block and assigning an appropriate class label to said block. The label decided the coloring of the four by four pixel block.

Image K1 was created using the K means algorithm. The K means algorithm follows the following steps

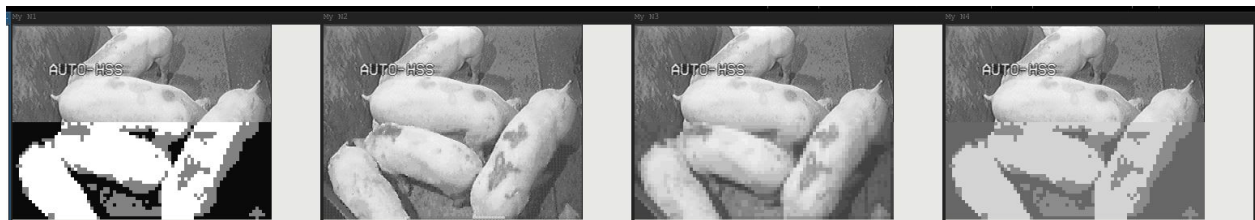
1. Assign random centers in the image
2. Assign points to those centers
 - a. You assign a point to the closest center
3. Re-assign the centers based on the average value of the points
4. Repeat steps 2 and 3 until the centers do not change

Images N1 to N4 use the nearest neighbor algorithm in some way. The nearest neighbor algorithm is a modification on the k nearest neighbor algorithm where k is 1. The algorithm works in the following way.

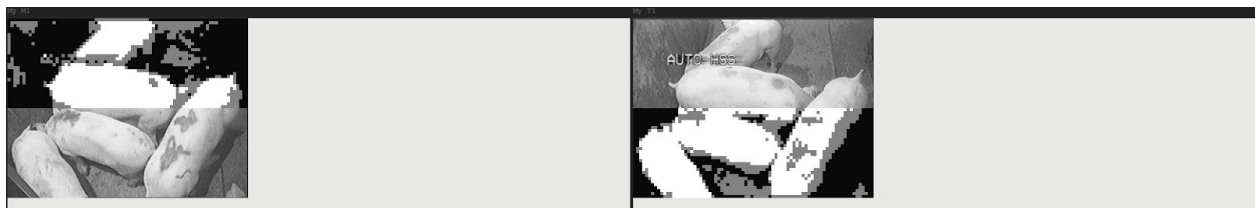
1. Look at k points closest to the new point you would like to classify
 - a. Make sure that k is odd
2. Classify the new point as the majority of the data points
 - a. Example if it is k=3 and two of the data points are green and one is red the new point gets classified as green
3. Repeat until all data is classified

Results

N1-N4



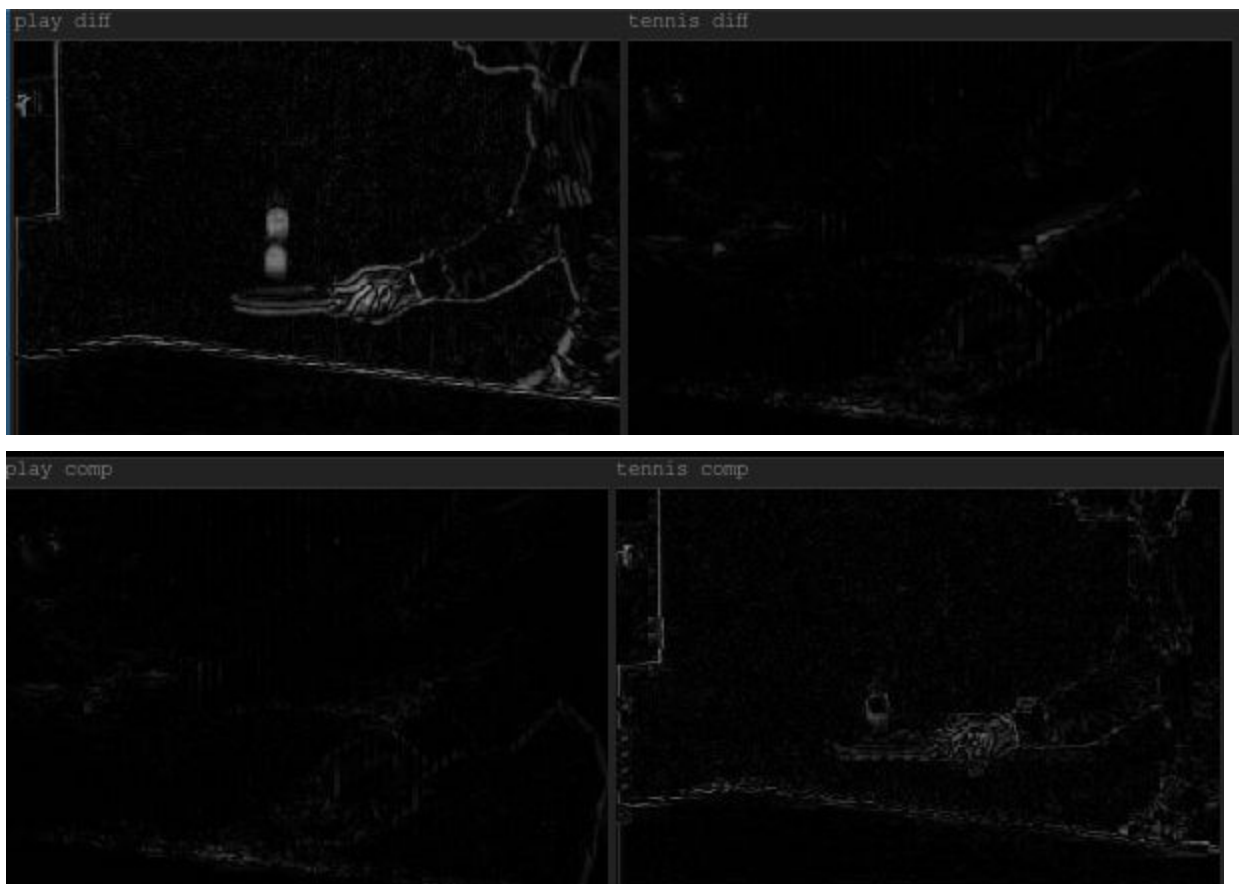
T1 and M1



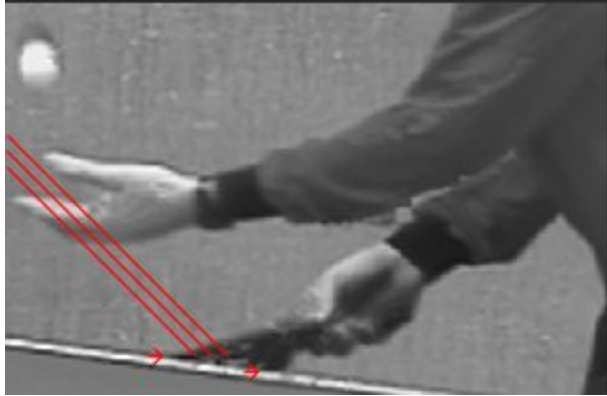
K1



PartB



play arrow



tennis arrow

