TEXTURE AND COLOR GRAPH-BASED IMAGE SEGMENTATION

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INTRODUCTION

Image segmentation is the partitioning of an image to multiple regions based on similarities in color, texture, contrast, intensity, etc where each region is internally homogeneous and the union of two adjacent regions is nonhomogeneous

This research implements a method of segmentation using graphical analysis based on texture and color

OBJECTIVES

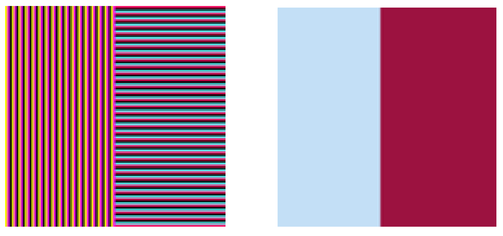
The goal of our method in this research is to ensure the program's ability to recognize when a group of segments makes up one object.

Ideally, the program created from this research will segment in the way a human eye would.

METHODS

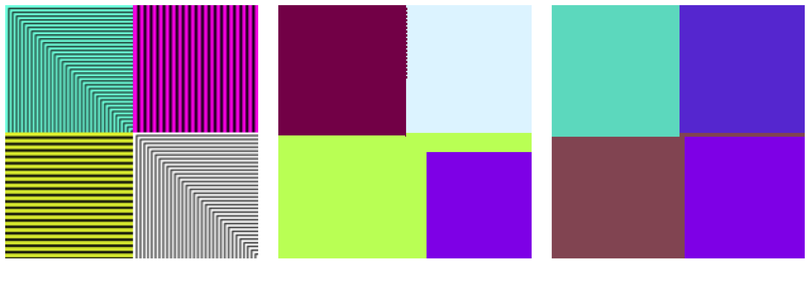
The approach in this research applies local binary codes from local binary patterns (LBP) to each pixel to measure texture in a 3 x 3 neighborhood. Each pixel is then assigned a four dimensional vector with its texture feature and *RGB* color space as parameters. The euclidean distance between vectors measures their dissimilarity. Regions are created based on dissamilarity of points.

RESULTS



Left: the original 100 x 100 ppm file
Right: Resulting segmentation with sigma =0, k=550, and *min* =2100

Left: the original 600 x 600 ppm file
Right: Resulting segmentation with sigma =.50, k=5000, and *min* =10000



Left: original 200 x 200 ppm image with 4 textures. **Center**: Results with sigma =.25, k=550,and *min* =2100. **Right**: is the segmented result with sigma =.25, k=1000,and *min* =2500

SUMMARY & CONCLUSIONS

This graph based segmentation yields a segmentation with the intended results. For the 100 x 100 images with 2 distinct textures, the parameters with sigma values 0 to .25 with k=550 and *min_size* = 2100 produced the best results. Larger images with larger textures pose an issue to the program.

In the future, this program can be altered to yield an accurate segmentation of larger images with more complex textures.

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