

## 1 Problem Statement

Edge detection is an important aspect of image processing, and serves as a building block for computer vision applications. Ninety percent of images contain the same edge information in gray-scale and color [1]. However, the remaining ten percent could contain valuable information for various cases in edge detection.

An example when color edge detection would provide more information than gray-scale edge detection occurs when objects with different hues but with equal intensities lie next to each other in an image [1]. A gray value edge would not be detectable in this situation. Therefore a color sensitive edge detection method would be desirable.

In the larger scheme of computer vision, this issue would not be important in simple object avoidance [1]. However, it would be very crucial in some situations. For example, a robotic device that needed to distinguish between different size objects of different color would need a color edge detection scheme to determine which object to act upon.

## 2 Project Goals

The paper “A Comparative Study On Color Edge Detection” by Andreas Koschan [1] presents several different methods for color edge detection. Some of the methods presented by Koschan are more difficult and more computationally costly than some traditional methods which he also explores. Koschan attempts to compare results of the traditional methods and the more advanced methods. Traditional methods he uses are the Sobel operator, the Laplace operator, and the Mexican Hat operator. Two more advanced methods used are the Cumani and Alshatti-Lambert approaches [1]. Koschan discovers that the best quality edges are determined with the more advanced approaches.

The goal of this project for ELEC 6430 will be to attempt to implement some of the methods used in Koschan’s experiment. If the implementations are successful, they will be used in the same manner and an attempt to verify Koschan’s results will be made.

### 2.1 Project milestones

1. Create and test an algorithm that implements a traditional edge detection algorithm extended to color images.
2. Implement one of the more advanced methods used by Koschan and test.
3. Perform an experiment to compare the traditional method vs. the advanced method.

## References

- [1] Andreas Koschan. A comparative study on color edge detection. *2nd Asian Conference on Computer Vision*, III:574–578, December 1995.