TRAFFIC LIGHT DETECTION

SWATI BHARTIYA (sxb4298@rit.edu)
ADVISOR : DR. LEON REZNIK
ROCHESTER INSTITUTE OF TECHNOLOGY

MOTIVATION
The need for a system which is able to detect and report traffic lights which are not working correctly is the motivation behind this project.

APPROACH
PREPROCESSING
• Apply adaptive histogram equalization to the entire dataset.
ACQUIRE DATASET & GENERATE MODEL
• For each training image, extract traffic light pixels
• Convert them to YCbCr color space.
• Generate a kNN classifier with these values.
TEST MODEL
• For each image in the testing dataset
• Apply a Gaussian Blur to the image.
• Convert the image to the YCbCr color space
RECOGNIZE COLOR
• Based on the distance between the cluster centroids and the individual point on the test image, the regions are divided into yellow, green and blue
• Classify each point of the test image using the kNN classifier based on the distance between a pixel of the image and the centroid of the red, yellow and green clusters.
DETECT CIRCLES
• Generate the binary image representation of the original image by using an appropriate threshold value determined by visually inspecting the results.
• Detect all circles in this binary image for the given radius range.

APPLICATION
1. Develop an Android application using which a user can take a picture of a broken traffic light and report it to the concerned government authority.
2. Can be used to assist self-driven vehicles in order to detect the presence of a traffic light in the vicinity and the state of the traffic light as well.

OBSERVATION & FUTURE WORK
• Model Accuracy – 80%
• The circle detection algorithm could be improved by comparing the ratio of area of each quadrant of the encompassed by the bounding box
• The model can be enhanced to learn the other kinds of defects that could indicate faulty traffic lights

ACKNOWLEDGEMENTS
I would like to express my gratitude to my advisor Dr. Leon Reznik who guided me throughout this project and provided valuable advice

REFERENCES