

# Image Processing Based Smart Traffic Control System

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**Abstract**— Day by day increasing the population of vehicle on roadside which required the change of traffic signal timing. In 21<sup>st</sup> century most of the country uses CCTV camera which is installed in maximum city. The demand for image processing based smart traffic control (STC) is very essential as it control the traffic density based on the increasing or reducing the delay of traffic light. Our project is based on the same concept we use the image which process through the image processing algorithm. The algorithm provides the decision for the traffic signal. The various methods are discussed based on the existing technique.

**Keywords**—Image processing, thresholding, Edge detection.

## I. INTRODUCTION

Fast transport systems and fast moving systems they are the senses of economic development in any nation. Misconduct and traffic congestion lead to long periods of time waiting times, loss of fuel and money. Therefore much needed for speed, economy and efficiency national development traffic management system. Monitoring and controlling traffic in the city is huge problem in many countries. By constantly growing number of vehicles on the road, Traffic Monitoring Authority must find new ways to overcome a problem. Another way to improve traffic flow and safety is the current transport system is to use automation as well Intelligent controls. As a number of road users constantly increasing, and the services currently provided infrastructure is limited, smart traffic control will do has become a major issue in the future [1]. Traffic jams may result from traffic jams to meet. To avoid congestion there are many vehicles management strategies available. But there is no technology perfect in itself as real-time conditions are common it changes continuously and the system has to adapt itself changing in ever-changing circumstances. The proposed traffic management strategy that changes itself naturally, therefore to get into the ongoing change of real-time traffic conditions. In this system time is allocated to the traffic light of a certain route depending on traffic congestion most importantly for

an ambulance and also for other vehicle. The purpose of the proposed system is to improve the efficiency of existing automated traffic display system. System it will be a signal controller that is compatible with image processing. Time will be calculated each time you change automatically depending on the traffic load. Proposed the system will operate based on the traditional system.

### Light Traffic Control

Traffic lights are used to control the flow of traffic. This is a traffic signal when properly maintained it can control traffic congestion and prevent congestion. A traffic light on the road has 3 symbols - red, yellow and green. People are made to hold back so that the green signal can continue. The red signal delay causes a longer wait due to congestion. CCTV cameras are installed almost all crosses in urban areas as well as high-risk areas and areas prone to overcrowding. This will improve traffic detention and assistance for police violators. With the help of these CCTV cameras, we can calculate congestion of cars on the road. Image processing is the use of computer algorithms to perform image processing in digital images. This process controls traffic signals on the road to avoid unnecessary traffic congestion.

## II. TECHNIQUES USED

### A. Available Methods

There are already many proposed measures to monitor traffic to avoid traffic congestion.

The system of traffic management that was previously implemented in many cities is based on fixed or manual time management control. However, new initiatives in a few cities have focused on the implementation of 'Adaptive Traffic Control System' (ATTCS). In this system, with the help of traffic detectors, traffic congestion is available to all approaching 1 intersection. Time-dependent traffic light control system has a time limit for that change traffic between different directions. Robots OPEN and OPEN

themselves automatically based on the timer value. Therefore, cars are made to wait longer even on an empty road, or when traffic jams too small. Using sensors is another way to control traffic by finding the number of vehicles. And much more standard traffic control strategy to control traffic manually. Manual control involves the need for traffic police. Traffic signs can be changed by the police manually based on vehicles and traffic flow on the road.

### B. Challenges on Existing Roads

A time-based traffic control system is one of the most common methods or strategies to control traffic. But this method of operation is dependent on time rather than congestion. Because of this, cars have to come together wrong delay while waiting. Cars are made to wait even on an empty road over time a control system that can also contribute to traffic congestion or congestion. Sensors can be used to detect cars once control traffic appropriately. But even in this way, time is wasted by the green light on the empty road. Manual control involves the need for traffic officers to change road signs correctly. This way too it needs staff. Although many methods are already in place to control traffic, these methods are still possible to bring congestion for a variety of reasons. Light traffic control system based on image processing strategies can effectively address the problem of traffic congestion and automatic signing.

### C. Different Techniques

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#### Adaptive Traffic Control System

There are already many proposed measures to monitor traffic to avoid traffic congestion. The system of traffic management that was previously implemented in many cities is based on fixed or manual time management control. However, new initiatives in a few cities have focused on the implementation of 'Adaptive Traffic Control System' (ATTCS). In this system, with the help of traffic detectors, traffic congestion is available to all approaching 1 intersection. Time-dependent traffic light control system has a time limit for that change traffic between different directions. Robots OPEN and OPEN themselves automatically based on the timer value. Therefore, cars are made to wait longer even on an empty road, or when traffic jams too small. Using sensors is another way to control traffic by finding the number of vehicles. And much more standard traffic control strategy to control traffic manually. Manual control involves the need for traffic police. Traffic signs can be changed by the police manually based on vehicles and traffic flow on the road

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### III. PROPOSED TECHNIQUE

The proposed system aims to make the traffic signal higher efficient and feasible. Therefore, reduce traffic as well through time. The proposed system will be based on congestion which means it will deliver which is important for a relatively large route car. Image processing is the method to be used to calculate congestion. Images will be captured using a data set. The photos found are go through the process of image processing. Now, the difference will be compared and assigned to the essentials.

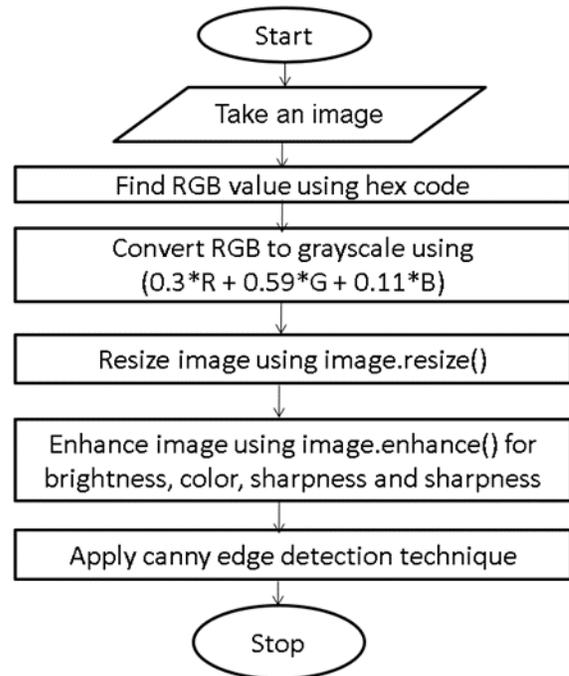


Fig.1 Flow chart of traffic management system

### IV. IMAGE PROCESSING TECHNIQUE

Image processing is any type of signal processing that input is an image, such as a photo or video frame; image

processing output may be image or, a set of features or related parameters picture. Many methods of image processing are included to treat the image as a two-sided signal as well to use common signal processing techniques in it. Image processing usually refers to digital image processing, but optical and analog image processing is also possible. This article is about general strategies that apply to all of them see. Image capture (to produce an input image first) refers to as Imaging.

### 2.1 Image Acquisition

The first stage of any image processing project is image capture phase. After the picture is found, various processing methods can be applied to the image to perform the many different tasks required today. However, if the image is not obtained satisfactorily then the intended tasks may not be accomplished, even if help with some form of image enhancement. Digital image acquisition is the creation of digital photography, usually from a visible location. The word is often thought of to say or incorporate processing, printing, storage, printing, and display of such images. The most common way is digital photography digital camera but other methods also work.

### 2.2 RGB to Gray Conversion

In photography and computer, grayscale or grayscale digital image is a picture in which the value of each pixel is present one sample, that is, contains only the strength information. Images of this type, also known as black-and-white, are composed only of shades of gray, which differ from dark with a light tinge to a very strong white. Gray images are different from bi-tonal images in black and white, which is the essence of the computer images are images of only two colors, black, and white (also called bilevel or binary images). Gray area the images have many shades of gray in the middle. Gray area images are also called monochromatic, that is the presence of only one color (mono) (chrome).

### 2.3 Image Enhancement

Image enhancement techniques in image processing are powerful you increase the signal-to-noise ratio and emphasize image features by changing the color or intensity of picture. The following activities in the picture development:

- Photo blur
- Independent color management of the device
- Image modification
- Image modification

### 2.4 Acquisition of the edge

Edge detection is an important tool in photography processing and computer perspective, especially in areas for feature detection and feature release, intended to identify points in a digital image where the image the light changes sharply or, officially, to him non-continuity. Same problem finding discontinuation in the 1D signal is known as step detection. I aim to detect sharp changes in image brightness

capturing important events and changes in world architecture. It can be shown that it is less than general imaginative image design model, non-continuity in the light of the image may be consistent,

- Lower progress,
- Not continuing to look up,
- Material changes as well
- Variation in spider light.

In the ideal case, the effect of using the detector on the edge in the image may lead to a set of connected curves for that show the parameters of the objects, the parameters of top signs and associated curves discontinuation in higher orientation. Thus, to use the algorithm for finding the edge in the image is very likely reducing the amount of data to be processed and possible therefore filter information that may be considered minor appropriate, while maintaining an important structure image structures. If the step to getting the edge is effectively, the next translation task the information content in the first image may be made very easy. However, it is not always possible for such good things to happen edges of real-life images of medium complexity. Edges the output of meaningless images is often distorted separately, which means that the curves are not curved connected, edge margins missing and false the edges do not correspond to the interesting events in image - thus making the next task difficult translating image data. Strategies for finding the edge Finding the edges of the image is done by a few operators used in



**Figure 2: Edge detected Image MATLAB.**

2.4.1.1 Using the Sobel User contains a pair of  $3 \times 3$  convolution kernels as shown in Figure 1. One kernel is the other is simply rotated  $90^\circ$ .

#### 2.4.1.2 Robert Cross

The Roberts Cross user makes it easy, quick to calculate, to measure 2-D local inclination in picture. Pixel values per output area represent average total gradient size of insert an image at a time. User contains a pair of 2 convolution particles as shown in Figure 1.8.3 a single letter is rotated  $90^\circ$ . This too similar to a Sobel operator.

#### 2.4.1.3 Prewitt operator

The Prewitt operator is similar to the Sobel operator and is in use to find straight and horizontal edges in the pictures.

### Conclusion:

A promising result of which includes image processing in traffic light control. Previously in automatic traffic control the use of the timer has been interrupted that time is spent on the green light of emptiness the road. This problem is avoided by this method. And it works together with pictures so it will produce better viewing results than electric sensors in automatic traffic light control. All in all, the system is good but still needs to be improved to achieve it one hundred percent accuracy. In the future this approach may be achieved to provide one hundred current results with upcoming technology

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