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Dynamic Traffic Signaling System

Dr. D. S. Mantri[1], Saurabh Khamkar[2], Sharau Moon[3]
Professor, Department of Electronics and Technology[1]
Student, Department of Electronics and Technology[2,3]
Sinhgad Institute of Technology, Lonavala, Maharashtra, India

Abstract: *The most significant issue which is being looked at by the advanced world is the traffic blockage in the City communities and towns. The system attempts to reduce the possibility of traffic jams, caused by traffic lights, to a limit.The system is contingent on count of vehicles and comprises of raspberry-pi which positively analyses the situation as a result of which the traffic lights delay is alteredfor each lane. Thus, it updates distinguish ranges for traffic light delays and sets those accordingly. The cameras are placed at traffic intersections for analyzing the traffic thickness. A camera is placed along with the traffic light. It catches picture groupings. Picture handling is a pompous technique to tackle the transition of the traffic light. In presence of an emergency vehicle the red sign on the traffic signal turns green with assistance of Message Queuing Telemetry Transport (MQTT) which gives a reasonable method of convenience to crisis vehicles. This recorded vehicle count data can be used in future also to investigate traffic conditions at respective traffic lights connected to the system.For germane analysis, the record data can be downloaded via interaction between the computer and the raspberry-pi after which it will send the appropriate signal to the LED light system. In the future this technique canbe often used to enlighten individuals about traffic conditions at different locations.*

Keywords: Traffic control, Raspberry Pi, Camera, Traffic light

I. INTRODUCTION

We present a network to manage the jurisdiction of traffic light by the means of image processing. The system ascertains the vehicles via images rather than utilizing electronic sensors implanted in the pavement. A camera is directed to be set around the traffic light. It will capture image sequences. In order to supervise the transition of the traffic light, Image processing is a preferable approach. It can help in attaining a decline in the traffic congestion and avoiding the squandering of time by displaying a green signal on a vacant road. It is also more authentic in evaluating the count and presence of vehicles since actual traffic images are used.it functions much better than those systems that rely on the detection of the vehicles' metal content owing to the fact that it visualizes the feasibility. Raw images acquired from cameras or sensors, aircrafts and satellites or pictures taken in normal day-today life.for various applications fixed on space probes are enhanced by the means of image processing.

An Image is rectangular graphical object.Image processing revolves around matters concerning compression techniques, image representation, and various other distinguished complex operations, which can be carried out on the image data. The operations that are reared on image processing are sharpening, blurring, brightening, edge enhancement etc.(image enhancement operations).Any form of signal processing for which the input is an image is termed as image processing, such as frames of motion video or simple photographs; the output can either exist as an image or as a set of traits or parameters concerning the image. Most image processing techniques involve applying standard signal- processing techniques to it by treating the image as a two- dimensional signal. Although Image processing usually depicts digital image processing, yet optical and analog image processing also exist. The last four to five decades have witnessed numerous advanced techniques being developed in Image Processing. Most methods are developed to lend a helping hand in enhancing images acquired from spacecrafts, unmanned space probes and military reconnaissance flights. Image Processing systems are becoming widely popular due to easy availability of powerful personnel computers, large memory devices, graphics software's and many more.

Digital camera captures images of lanes which are further processed in order to calculate the traffic density of concerning lanes. Cameras being highly cost efficient as compared to other devises such as sensors is the reason why

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calculation of traffic density is done via image processing.Utilizing the aforementioned excellent virtues of image processing we present a network that can be helpful for supervising the traffic. This methodology processes the traffic density according to the calculation of traffic density and the number of objects identified. Let 'n'be the threshold value, if the count of vehicles detected is higher than 'n', heavy traffic density is considered, similarly if the count of vehicles is lower than 'n'then the traffic density is also said to be low Now the threshold value can be set according to our requirement. Threshold value is a developer dependent static value.

II. MOTIVATION

Overcrowded area of city traffic has become most concerning issue in day today life.

III. OBJECTIVES

Here we have created a signaling system that solves traffic problems in urban areas. This system has the following advantages:

- It is cost efficient.
- Emergency vehicle will be prioritized.

IV. PROBLEM STATEMENT

Traffic sign recognition (TSR) is laboured to supervise traffic signals and to control or restrain certain activities in traffic environments. In existing traffic management systems, technologies such as RFID and GSM are brought under use in order to produce cost efficient solutions.

V. METHODOLOGY

Images are rescaled to fixed resolution. The above rescaled images are then inter-converted from the RGB scale to Gray. 'Canny edge detection technique' is brought under use for the Edge detection of pre-processed images. The output images of the aforementioned step are further matched via pixel-to-pixel matching technique. The timing allocation is then made depending on the number of the vehicles calculated, after matching. First the signal is set to red. It then turns yellow for 6 seconds, after which, the process is analysis based, i.e., Higher traffic density will immediately cause the signal to turn green whereas if the traffic density is low, then red signal will resume to display.

VI. LITRATURE SURVEY

Titles	Author	Description
CACMAC and PID controller-based highway traffic density control	Xinrong Liang; Jiexia Fu; Mu Yan Xinrong Liang	In this paper, a credit assignment cerebellar model articulation controller (CACMAC) and proportional-integral-derivative (PID) controller based composite control method is applied to manage the highway density. To begin with, the evolution process of highway traffic flow is accurately described by establishing a microscopic traffic model. It is followed by, the study of the characteristics, principles, and algorithm of CACMAC-PID compound control in detail. Then, CACMAC-PID compound control-based road density controllers are designed by combination of a nonlinear feedback technology with the highway traffic model
A traffic cellular automaton model considering spontaneous braking and driver scope awareness parameters	Steven Ray Sentinuwo ; KoheiArai	This paper proposes the recognition of road traffic flow density by assessment of traffic agent utilization. This research also presents the concept of traffic agent as a contemporary approach monitoring and surveillance of the traffic at various locations.
Smart autonomous traffic light transitioning	G. Merlin Suba; S	This paper is revolving around the implementation and development of Sensor based Traffic Light System with Dynamic

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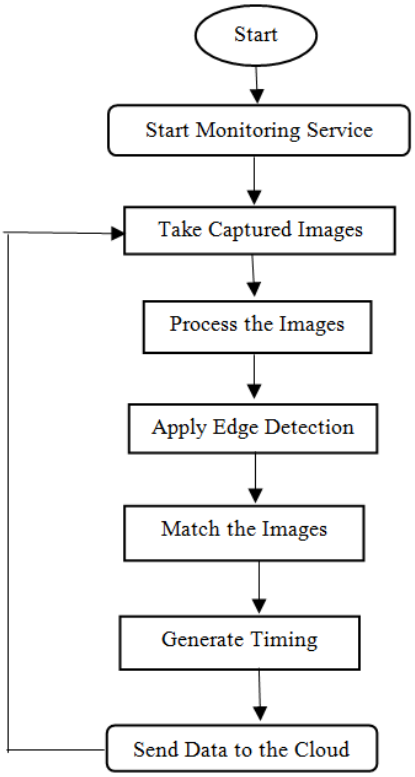
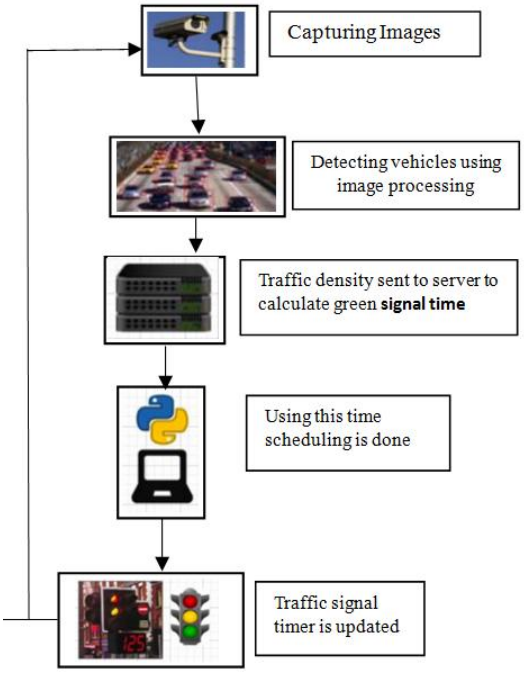
based on sensor-based traffic density measurement.	Karthik; K Yokesh	Control which affectively manages the increase or decline in the Average Trip Waiting Time (ATWT)as a result.

VII. SYSTEM FLOW DIAGRAM



VIII. FRAME DIAGRAM



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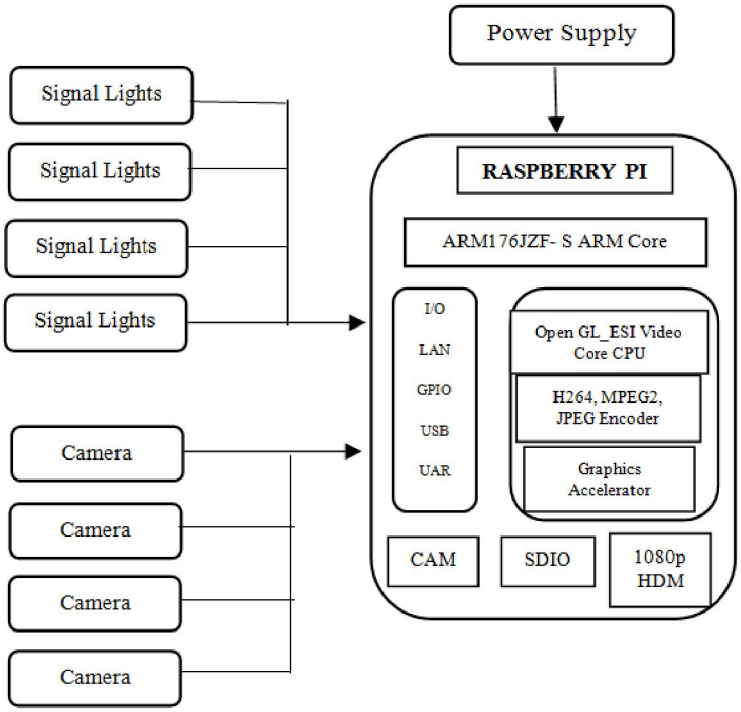
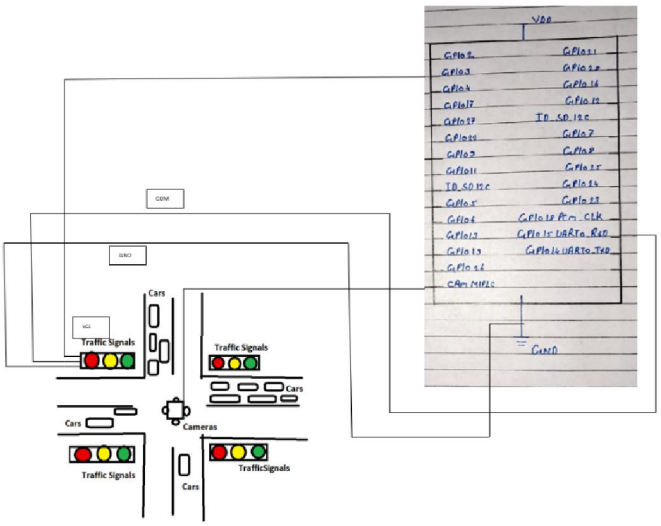
IX. BLOCK DIAGRAM



X. CIRCUIT DIAGRAM



XI. HARDWARE AND SOFTWARE

Hardware:

1) Raspberry Pi
2) Camera
3) LED
4) Power Supply
5) SD card

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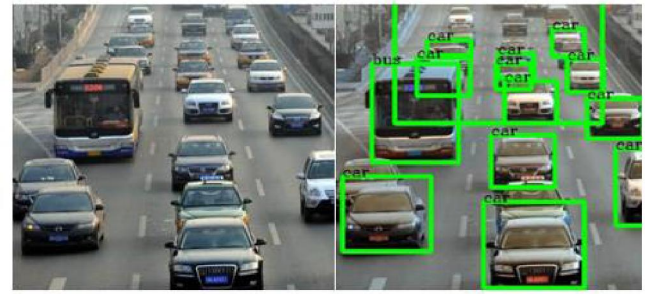
Software:

1) Open CV.lib
2) Python IDE 37.8

XII. ADVANTAGES

- Emergency vehicles like ambulances, fire engines etc are provided with a higher priority.
- Low-cost system.
- Aiming to overcome many defects and improve the traffic management by using Real time smart traffic light control system.

XIII. RESULT



XIV. ACKNOWLEDGMENT

It gives us great pleasure in presenting the preliminary project report on 'Dynamic Traffic Signaling system.' I would like to take this opportunity to thank our internal guide Dr. D. S. Mantri provided all the help and guidance we needed. We express our heartiest gratitude to him for his immense support. His advice proved to be very enlightening.

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