



DYNAMIC TRAFFIC SIGNALING SYSTEM

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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 altered for 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 can be often used to enlighten individuals about traffic conditions at different locations.

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

[1] 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

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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 devices such as sensors is the reason why 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.

[2] MOTIVATION:

- Overcrowded area of city traffic has become most concerning issue in day today life.
- By addressing these motivations, dynamic traffic signalling systems have the potential to enhance traffic efficiency, reduce congestion, improve safety, and contribute to a more sustainable and intelligent transportation network.

[3] 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.

[4] PROBLEM STATEMENT:

Design and develop dynamic traffic signaling control system, to control traffic using camera.

[5] FRAME DIAGRAM

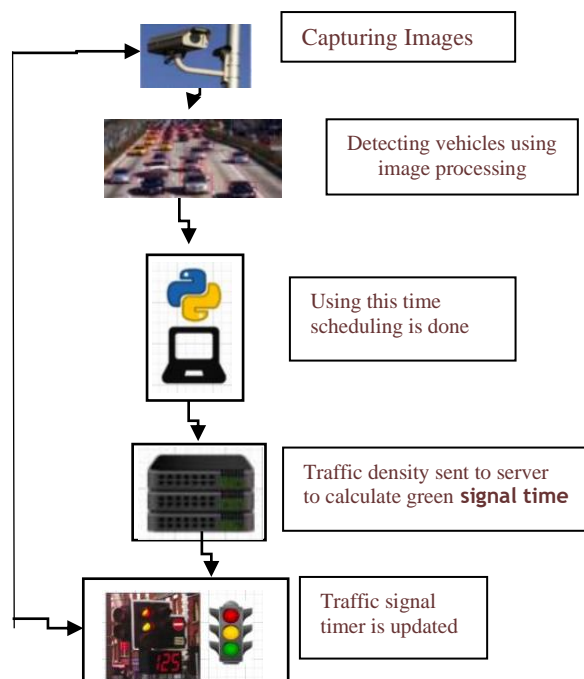
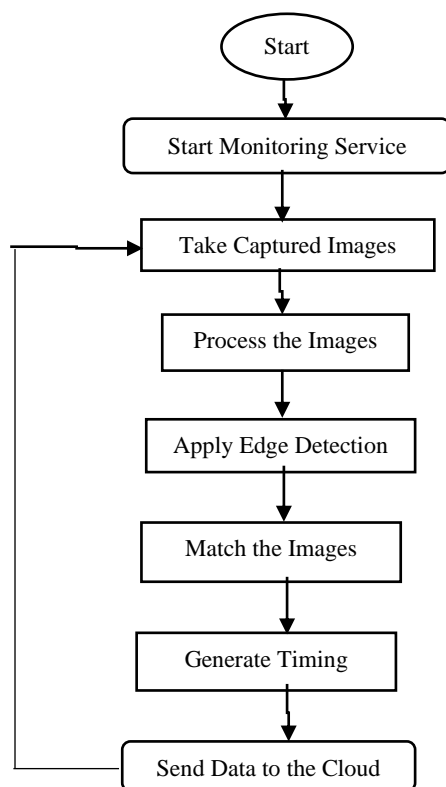


Figure: 1. FRAME DIAGRAM

[6] SYSTEM FLOW DIAGRAM



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Figure 2. SYSTEM FLOW DIAGRAM

[7] BLOCK DIAGRAM:

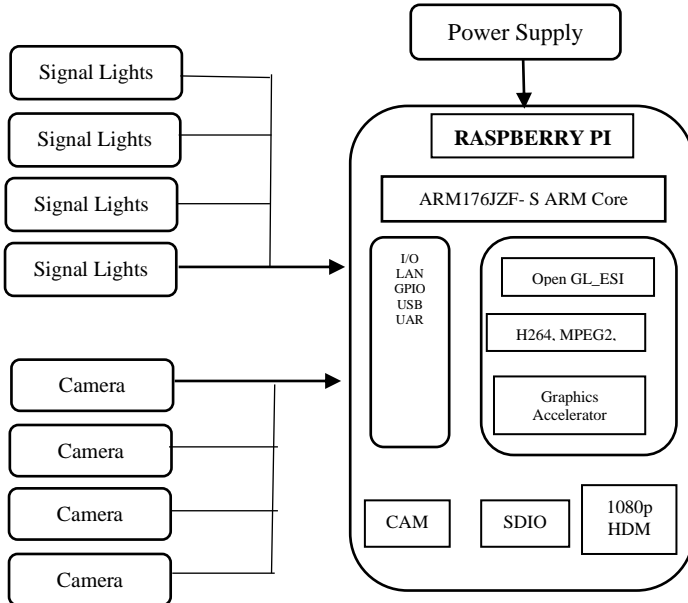


Figure 3. BLOCK DIAGRAM

[8] CIRCUIT DIAGRAM:

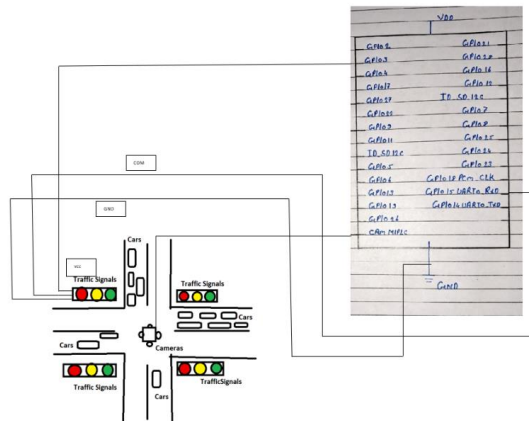


Figure 4. CIRCUIT DIAGRAM

[9] HARDWARE AND SOFTWARE:

- Hardware: 1) Raspberry Pi
 2) Camera
 3) LED
 4) Power Supply

5) SD card

Software: 1) Open CV.lib
2) Python IDE 37.8

[10] RESULT:

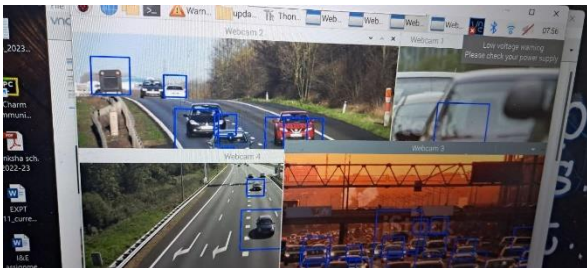


Figure: 6.1

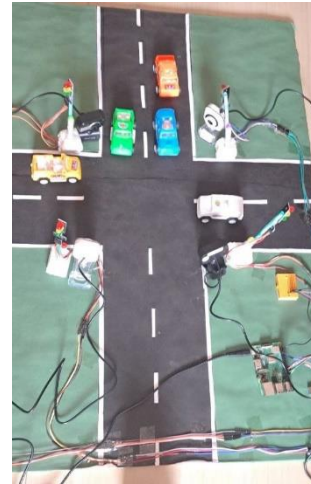


Figure: 6.2

[11] CONCLUSION:

In conclusion, the dynamic traffic signaling system has the potential to revolutionize the way we manage traffic in urban areas. With its ability to adapt to changing traffic conditions, utilize real-time data, and optimize signal timings, it offers a more efficient, safer, and environmentally friendly approach to traffic management. Continued research, development, and implementation of this system have the potential to greatly improve the quality of life for commuters and enhance the overall transportation infrastructure of cities.

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Author[s] brief Introduction

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