

RASPBERRY PI BASED SIGNAL BREAKING AND EMAIL SYSTEM

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ABSTRACT

Traffic jam is an uncompromising issue across the world and it has become a bad experience for the daily traveler. In most of the metropolitan arrangements to make traffic light controllers more intelligent. The development of new technologies such as communication networks and image processing is being used regulation of the traffic demand at each intersection in the network is the key features involved in this method. So we have to avoid traffic accidents and shorten the length of the queue at the traffic signal. The main objective of the system is to monitor the traffic signal and control traffic light sequence. In most of countries the accidents are caused due to red signal breaking. The system will continuously monitor traffic signal. If any person or vehicle breaks the red signal, system will capture image of that. It will send it to the mail of RTO office. To take the action against the user. Therefore system will detect traffic rule break and also monitor traffic light sequence.

Keyword- CMOS(Complementary Metal Oxide Semiconductor), Metal sensor, Raspberry pi, RTO, Traffic.

1. INTRODUCTION

With the increasing buying power of common man today the number of vehicles on the road is creating heavy traffic that is difficult to control and maintain safety. This problem is much serious and unsafe for ordinary, especially in large cities like Pune, Bengaluru and Mumbai. Growth of traffic here is nonlinear as compared to the development of infrastructure like roads, intersections and bridges. It is difficult for most of the time and sometimes impossible to modify or broaden them in existing cities. New construction takes its own time with all constraint. To smoothen flow of traffic at intersection, options available with traffic control department are to impose one way use traditional traffic monitoring and controlling in addition to existing automatic signaling system. Traditional system is effective but is limited by the time human can work. Human intervention is there to take clever, critical decision and handle emergencies.

Traffic policemen decide time for traffic signal control depending on the density at particular lanes. Existing automatic system uses preset signal timings to control traffic at intersection. Time to be Preset time is again decided by the traffic officer depending upon his/her survey about traffic condition for a particular intersection. Most of the time, these methods are ineffective, because of sudden fluctuation in flow of traffic apart from peak hours. The cyclic signaling method with existing preset timing in automated system will be inappropriate in situation of waiting, even if few or no vehicles available on the other road. Fixed timing will not be inappropriate in case large number of vehicles waiting to cross the junction. Inconvenience will be caused by unnecessary waiting; people will lose time, miss opportunities and get frustrated. Traffic congestion problems create a deep impact on company's production and transportation of goods. Need is for automatic adjustment of the signal timing with changing traffic conditions, in similar fashion as to what the officer does in traditional system. System must be capable to handle emergencies.



Fig.1.1-General Traffic System

2. LITERATURE SURVEY

Table 2.1 Journal Paper Assessment

Author Name	Title
1. Aditi Dambe, Upasana Gandhe, Varsha Bendre.	Automatic penalty charging for violation of traffic rules.
2. Harpal Singh, Satinder Jeet Singh, Ravinder Pal Singh.	Red light violation detection using RFID.
3. Ayush Agrawal , Aman Saluja.	License plate recognition for remote monitoring of traffic
4. Smita Kulkarni, Nikita Prabhu	Automatic penalty charging for traffic regulation.
5. Karmel Manaa, Maram Rabee'a, Loay Khalaf.	Traffic control by digital imaging cameras.

From the Table-2.1 the literature review was conducted to survey past work on traffic signal control. The automatic penalty charging system will continuously monitor the vehicles using RFID reader and RFID transceivers and automatically gain penalty according to RTO rules. Charging amount will be automatically stored in smart card. If a driver fails to pay the charges in given period of time, his/her license will be suspended and the car won't start. LCD is used to display all information about penalties and other required details. Authors wants to reduce traffic accidents, jamming and to improve traffic discipline [1]. In this system during the red light period, two cameras and magnetic loop sensor are activated to capture three pictures of vehicles. Then image compression and number plate

recognition is the data of violation time and other details sent to monitoring centres using GPRS network. RFID tags stores vehicle identification number which included priority of vehicle, type of vehicle and the vehicle number. The proposed work considers not only priority of the vehicles but also density of vehicles on the road and controls the traffic light sequence [2]. The system includes USB camera which captures image of number plate of a vehicle, whenever any vehicle attempts to cross the traffic light illegally. It transmit processed characters using image processing to control room. The extracted characters from number plate are send to processor then the registration number send to control room. The system proposed to reduce accidents, to reduce man power required which in a way is reduction to corruption [3].

In this system if the car is on zebra crossing, PUC has expired or if there is illegal signal crossing, penalty will be charged. The car owner has to pay penalty through RTO office, to make smart card reusable. Relay gives indication for car ignition system. Author wants to provide congestion free journey. They want to keep record of insurance, License and PUC of car owner [4]. The paper discusses the production of traffic control camera used to obtain red light violation, license plate recognition and speed detection of vehicles. Speed of vehicle that crosses traffic light with accuracy of 15%. Reduce congestion on street with better accuracy [5]. The traditional systems has some disadvantages like blurry image, poor resolution, dirt on number plate due to which it is difficult to extract number from the image. The installation problems, complexity and cost are some parameters which are also need to take into consideration while designing the efficient system. Thus we came up with the system which offers a mobile, robust and cost effective solution with simple and fast set up process.

3. SYSTEM OVERVIEW

3.1 Block Diagram

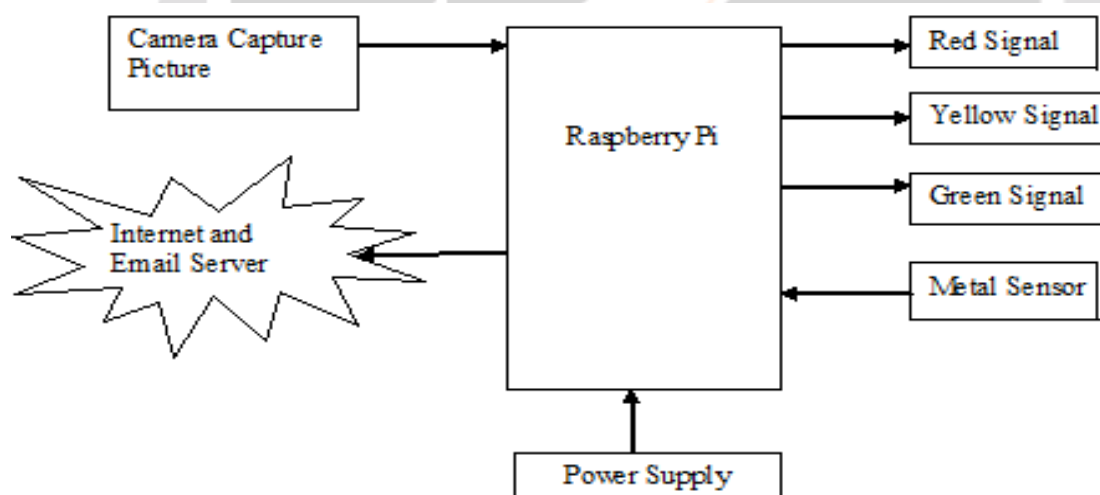


Fig. 3.1-Block Diagram

The main objective of the system is to monitor the signal and control. System will continuously monitor the signal and if any person breaks the signal system will capture the image and will send it to the mail of the concern person to detect the traffic rule break and system will also monitor the traffic light sequence.

3.2 Block Diagram Description

3.2.1 Raspberry Pi 3 model B

Raspberry pi is a credit card sized bargain micro Linux machine. The goal behind creating raspberry pi was to create low cost device that would improve programming skill and hardware understanding for students. The latest model of raspberry pi comes sporting 1 GB of RAM, 1200 MHz quad-core ARM cortex-A53 processor. It is an open hardware with the exception of its primary chip, the broad communication SOC which runs the main component of the board-CPU, graphics, memory, USB controller etc. The model B+ is the final revision of the original raspberry pi. It has 512 MB RAM, four USB port, 40 GPIO pins and an Ethernet port.

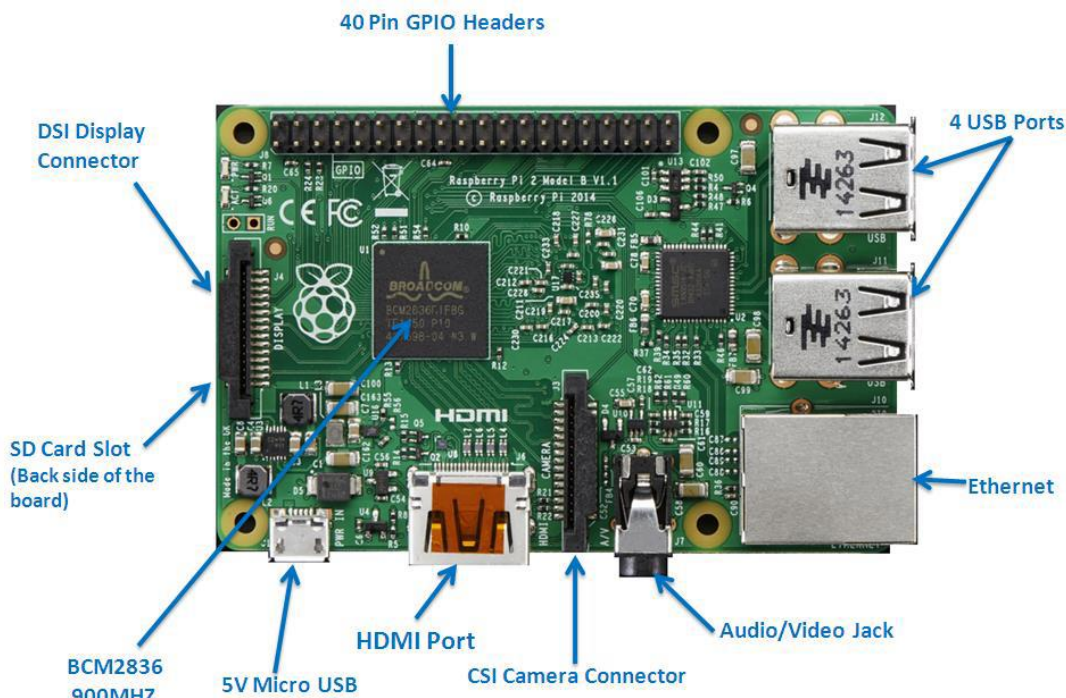


Fig.3.2 -Raspberry Pi 3 Model B (Latest release of Raspberry Pi)

3.2.2 Power Supply

The raspberry pi 3 is powered by a +5.1V micro USB supply. Exactly how much current (mA) the raspberry pi requires is dependent on what you connect to it. We have found that purchasing a 2.5A power supply from a reliable retailer will provide you with sufficient power to run your raspberry pi.

3.2.3 PI Camera

The PI camera used in this system to capture the vehicles picture who will break the rules and save it in jpeg format.

3.2.4 Metal Sensor

The heart of this sensor is the inductive oscillator circuit. Which monitors high frequency current loss in coil. The circuit is designed for any metallic body. Detection by detecting the variation in the high frequency eddy current losses. With an external tuned circuit they act as an oscillator output signal level is altered by an approaching metallic object. Output signal is determine by supply current changes. Independent of the supply voltage, this current high or low according to the presence or the absence of a close metallic object. If the metal object near the searching coil, the output current will flow more. On the other hand, the current will be decrease when the object is far from the searching coil.

3.2.5 Python

Python is a widely used high-level programming language for general-purpose programming, created by Guido van Rossum and first released in 1991. An interpreted language, Python has a design philosophy that emphasizes code readability and a syntax that allows programmers to express concepts in fewer lines of code than might be used in languages such as C++ or Java. The language provides constructs intended to enable writing clear programs on both a small and large scale. Python features a dynamic type system and automatic memory management and supports multiple programming paradigms, including object-oriented, imperative, functional programming, and procedural styles. It has a large and comprehensive standard library.





4. CONCLUSIONS

This system shows two different types of sensors which are improving the overall sensing probability and the metal sensors. As well as we are providing the facility of sending live images to certain (Authorized) person via electronic mail.

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BIOGRAPHICS

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