Indian J.Sci.Res. 17(2): 321-324, 2018 ISSN: 0976-2876 (Print)
ISSN: 2250-0138(Online)

SMART TRAFFIC MANAGEMENT SYSTEM FOR METRO CITIES

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Abstract-Traffic congestion Movement clog is a noteworthy issue in numerous urban communities of India alongside different nations. Disappointment of signs, poor law requirement and awful activity administration has prompt movement clog. One of the significant issues with Indian urban communities is that the current foundation can't be extended more, and in this manner the main alternative accessible is better administration of the activity. Activity blockage negatively affects economy, nature and the general personal satisfaction. Subsequently the opportunity has already come and gone to adequately deal with the activity clog issue. There are different strategies accessible for movement administration, for example, video information examination, infrared sensors, inductive circle recognition, remote sensor organize, and so forth. Every one of these techniques are compelling strategies for brilliant movement administration. Yet, the issue with these frameworks is that the establishment time, the cost caused for the establishment and upkeep of the framework is high. Henceforth another innovation called IOT and by utilizing IR sensors to check the level of activity is presented which can be combined with the current flagging framework that can go about as a key to shrewd movement administration continuously. This new innovation which will require less time for establishment with lesser expenses when contrasted with different strategies for activity clog administration. Utilization of this new innovation will prompt decreased movement clog. Bottlenecks will be distinguished early and henceforth early preventive measures can be taken in this way sparing time and cash of the driver.

Keywords -Raspberry pi,UVC Camera,IR Sensor,Zigbee,Linux OS

I. Introduction

One of the major problems faced by cities today is traffic congestion. Traffic jams causes a rise in the cost of transportation as well as it affects the routine lives of people. The problem of traffic congestion pervades everywhere, but mega cities are the ones that are most affected by it. The ever increasing nature of traffic makes it difficult to estimate the road traffic density in real time so as to make better traffic related decisions and manage the traffic more efficiently. There are several reasons for this sudden surge in the traffic, in urban regions. The main reason can be attributed to rise in the population which in turn has caused rise in the number of vehicles on the road. Also there are several other reasons for congestion like insufficient capacity of roads, large red light delays, incomplete information regarding traffic, inefficient transport management, unrestrained demand etc. Insufficient capacity and unrestrained demand are interrelated but signal delays are hard coded and do not depend on the amount of traffic density. Therefore there is a need to optimize the traffic control system and make it more dynamic so as to accommodate the varying traffic density.

Traffic congestion on road networks is nothing but slower speeds, increased trip time and increased queuing of the vehicles. When the number of vehicles exceeds the capacity of the road, traffic congestion occurs. In the metropolitan cities of India traffic congestion is a major problem. Traffic congestion is caused when the demand exceeds the available road capacity. This is known as saturation. Individual incidents such as accidents or sudden braking of a car in a smooth flow of heavy traffic have rippling effects and cause traffic jams. There are even severe security problems in traffic system due to anti social elements which also leads to stagnation of traffic at one place.

II. Existing System

In traditional traffic monitoring system, each intersection is controlled by its own controller which sends signals to the intersection's traffic lights for changing their states. Each intersection controller works independently of each other with no way of being remotely monitored or controlled.

III. Proposed System

With the rise of the Internet technology, embedded Web technology goes into the mainstream at present, and various web scripts and servers support the program running on an embedded device. The managers can manage and monitor traffic situations through the Web browsers. In this work we have utilized the emerging

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embedded web server technology to design a web-based traffic management system that can remotely control and monitor the traffic at various road intersections simultaneously. The system is aimed at improving the traditional traffic monitoring system by incorporating better management and monitoring schemes as well as providing road users with real time information. The design and implementation of a sensor network system for monitoring the flow of the traffic through temporary construction work zones.

A. Raspberry Pi

Raspberry pi B is a portable, powerful and minicomputer. Programmable PC that runs in open-source Robot operating system. The board consists of Video Core IV graphics processing unit (GPU), ARMv7-compatible quad-core one, 512 MB of RAM. It has a Micro SD to boot media and for persistent storage. One powerful feature of the Raspberry Pi is the row of GPIO -General Purpose Input/output pins along the edge of the board (refer Fig.1.1). These pins are a physical interface between the Pi and the outside world. At the simplest level, these are called as switches. Seventeen of the 26 pins are GPIO pins; the others are power or ground pins.

B. UVC CAMERA

An UVC (or Universal Video Class) driver is a USB-classification driver. A driver empowers a gadget, for example, your webcam, to speak with your PC's working framework. Also, USB (or Universal Serial Bus) is a typical sort of association that takes into account rapid information exchange. Gadgets that are furnished with an UVC driver, for example, the Logitech® QuickCam® Pro 9000 for Business, are equipped for spilling video.

C. IR SENSOR

IR a similar guideline in ALL Infra-Red closeness sensors. The essential thought is to send infra red light through IR-LEDs, which is then reflected by any question before the sensor.

At that point you should simply to get the reflected IR light. For recognizing the reflected IR light, we will utilize an extremely unique procedure: we will utilize another IR-LED, to distinguish the IR light that was radiated from another driven of precisely the same. This is an electrical property of Light Emitting Diodes (LEDs) which is the way that a drove deliver a voltage contrast over its leads when it is subjected to light. As though it was a photograph cell, however with much lower yield current. At the end of the day, the voltage created by the leds can't be - in any capacity - used to produce electrical power from light, It can scarcely be recognized. that is the reason as you will see in the schematic, we will utilize an Op-Amp (operational Amplifier) to precisely identify little voltage changes.

D. ZigBee Technology

There are a huge number of measures that deliver mid to high information rates for voice, PC LANs, video, and so forth. Be that as it may, up till now there hasn't been a remote system standard that meets the one of a kind needs of sensors and control gadgets. Sensors and controls needn't bother with high data transfer capacity however they do require low inertness and low vitality utilization for long battery lives and for extensive gadget clusters.

E. LINUX Operating system

Linux or GNU/Linux is a free and open source programming working framework for PCs. The working framework is a gathering of the fundamental guidelines that tell the electronic parts of the PC what to do and how to function. Free and open source programming (FOSS) implies that everybody has the flexibility to utilize it, perceive how it works, and changes it.

F. QT EMBEDDED FRAME WORK

Qt is a cross-stage application system that is generally utilized for creating application programming with a graphical UI (GUI) (in which cases Qt is delegated a widget toolbox), and furthermore utilized for creating non-GUI projects such as command-line devices and consoles for servers. Qt utilizes standard C++ however makes broad utilization of an uncommon code generator (called the Meta Object Compiler, or moc) together with a few macros to advance the dialect.

IV. Working Principle

In this venture, we are giving the entire portrayal on the proposed framework engineering. Here we are utilizing Raspberry Pi board as our stage. It has an ARM-11 SOC with coordinated peripherals like USB, Ethernet and serial and so forth. On this board we are introducing Linux working framework with important drivers for every single fringe gadget and client level programming stack which incorporates a light weight GUI in view of XServer, V4L2 API for cooperating with video gadgets like cameras, TCP/IP stack to speak with organize gadgets and some standard framework libraries for framework level general IO operations. The Raspberry Pi board furnished with the above programming stack is associated with the outside system and a camera is associated with the Raspberry Pi through USB transport.

The design of the web server has the accompanying layers.

- In the lower level the web server has the physical facilitating interfaces utilized for putting away and keeping up the information identified with the server.
- Above the Physical facilitating interface the server has HTTP server programming and other web server

parts for sidestep the immediate association with the physical cooperation with the lower levels.

- The last layer has the apparatuses and administrations for collaborating with the video streams which incorporates the Image codec and putting away interfaces, association administrators and session control interfaces and so forth.

Subsequent to associating every one of the gadgets control up the gadget. At the point when the gadget begins booting from streak, it initially stacks the linux to the gadget and instate every one of the drivers and the center part. After introduction of the piece it initially check climate every one of the gadgets are working legitimately or not. After that it stacks the record framework and begins the startup scripts for running fundamental procedures and daemons. At last it begins the primary application.

At the point when our application begins running it initially checks every one of the gadgets and assets which it needs are accessible or not. After that it checks the association with the gadgets and offers control to the client.

The Interface for the client has the accompanying things.

- A mark for showing the picture which is originating from the picture.
- Text-boxes for demonstrating the sensor esteems.

The load up consistently peruses information from the camera and in the meantime it peruses the information from the sensors. The scheduler is observing the procedure committed for camera perusing and sensor perusing. The camera read picture and sensor esteems with scheduler data will send to the web server. There the client before the web server will observing the needs and the sensor and camera information. At whatever point the client needs to change the needs of the procedures at that point utilizing the web interface he can change the needs. At whatever point change is happened then the web server send the adjusted signs to board. At whatever point the board got the alteration, it will send the scheduler to change the needs.

Applications

1. Remote gadget control
2. Surveillance

Favorable circumstances

• As ARM11 CPU is utilized, future change is done effectively as indicated by our need.

• It can be adjusted and can be connected to other computerization applications moreover.

V. Future Scope

- The cost of ARM11 is increasingly that is the reason in future we can actualize this framework utilizing ARM CORTEX A8, Beagle bone and so forth and additionally refreshed processors with high frequencies will work fine.
- As the storage room is likewise less in future we can likewise record these live gushing information by associating outer memory stockpiling.
- We can finish our venture utilizing remote innovation.
- In future we can give greater security to information by utilizing encryption, decoding methods.

VI. Conclusion

The venture "Keen activity administration framework for metro urban communities" has been effectively composed and tried. It has been created by incorporating elements of all the equipment parts and programming utilized and tried.

Nearness of each module has been contemplated out and set deliberately in this way adding to the best working of the unit.

Besides, utilizing very propelled ARM 11 Processor board and with the assistance of developing innovation the venture has been effectively actualized.

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