

Smart Traffic System Using Raspberry-Pi

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Abstract: In our day by day life circumstance blockage in rush hour gridlock is a major issue in the present way of life. One of the principle purposes behind the traffic is an expansive postponement or the time settled for the red light in the flag and it did not depend on the quantity of the vehicle in a specific course. In our task, we proposed the improvement of traffic framework controller in a street intersection utilizing a microcontroller. This venture endeavors to lessen the event of blockage caused by traffic lights, to a degree. The proposed venture depends on raspberry-pi. Here we are utilizing Raspberry Pi it is only the little size of the PC that can deal with about traffic frameworks. The raspberry Pi3 Model B+ is the third era Raspberry Pi. This ground-breaking Mastercard measured single board PC can be utilized for some applications and oust the first Raspberry Pi Model which comes prior. This model contains IR transmitter and IR recipient are settled at the conceivable bearing on the traffic flag streets. In view of the quantity of vehicles check, the raspberry chooses and controls the traffic flag time span thus. The vehicle tally delivered from raspberry information will be recorded. For right characterization, the record subtleties can be put away to the controller by educating raspberry-pi to the PC framework then it will send right postponement of the flag into the LED lights. We need to utilize a few gadgets like Raspberry Pi, IR Sensor or Magnetic sensors, RFID, LED lights and a few associations. This paper proposes a clever traffic control framework to maintain a strategic distance from the sitting tight for crisis vehicles and recovers the season of vehicles. Here we planned the framework with the reason to clear the traffic as per the thickness of vehicles by depending on the path.

Keywords: Literature surveys, Scanners, Sensors and actuators, Hardware-software

I. INTRODUCTION

Traffic is the greatest and most critical issue not yet completely practically acknowledged by every one of the explorers on the planet. In any case, we can attempt to build the fulfillment of them by applying ongoing advancements. When coming to India, it is the second biggest populated place in the earth and still, it is creating and however it pulls in different financial specialists to begin the business here or advertising their items. Foundation enhancement is ease back when contrasted with the expansion in the quantity of cars, due to space and financial issues. Additionally, Indian streets are non-path (not all together) based and no uniqueness. New advances like RFID and GSM are can be utilized in a current traffic control framework to give a superior answer for the above issue. The span of the comparing signal light is now settled in the rush hour gridlock framework and it did not depend on the quantity of the vehicle in a specific bearing. The proposed framework endeavors to diminish the traffic to offer better or sensible hanging tight time for trespassers. We have built up a savvy framework utilizing RASPBERRY-PI, IR sensor to accomplish the ideal outcomes. We go for controlling traffic thickness utilizing IR sensor. The IR gadget will be enacted when any vehicle crosses on street between IR transmitter and Receiver. Raspberry-pi screens the IR framework and expands the counter number esteem at whatever point vehicles crossing out and about. It stores vehicles counter qualities in its stockpiling. In light of the quantity of vehicles check, the raspberry chooses and controls the traffic flag time term as n yield. It will give green flagging high-thickness traffic path, that equivalent time it demonstrates the red flag in alternate ways. An administrator working on traffic framework can control Raspberry-pi to see the recorded subtleties, and changing sign timings, flush the capacity and so on. The fundamental controller on a server can get to traffic conditions on any intersection traffic signals and close-by streets to decrease traffic clog by a sensible time

II. LITERATURE SURVEY

For our undertaking, we gathered some essential data from different research papers. This examination papers contains data about microcontroller board like conventional traffic flag framework, IR and Magnetic sensors, RFID peruser and RFID tag, raspberry pie, and so on. We additionally inspire a thought regarding how to build up a framework utilizing Arduino programming. So we referenced some vital papers from which we can ready to build up our framework.

1. A Ranganath, T SreeValli, Aug 2015.
Intelligent Management System for Density Based Control, Stolen Vehicle And Auto Clearance.
2. Rajsheswari sunder, Santhoshs Hebbber, and varaprasad Golla, Feb 2016.
Implimenting intelligence Traffic control system for congestion control, Ambulance Clearness, and Stolen Vehicle Detection.
3. Faisal A. Al- Nasser, Hosam Rowaihy, 2011.
Simulation of Dynamic Traffic control system based on Wireless sensor network.

III. PROPOSED SYSTEM

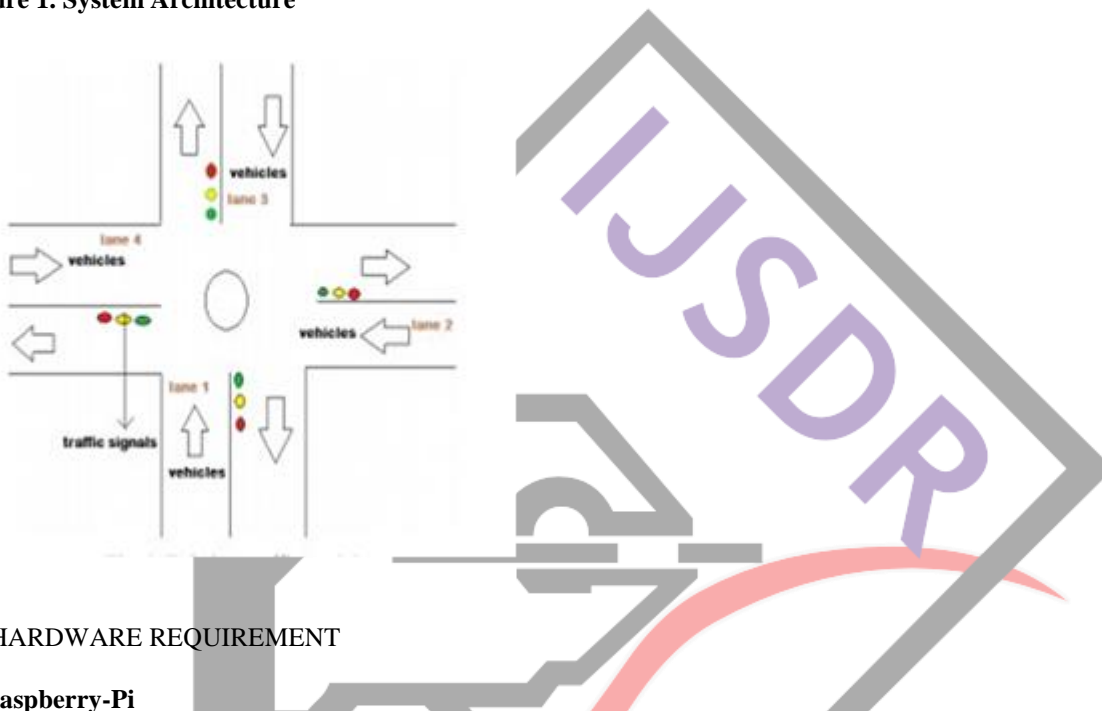
Proposed framework is that the installed framework, that is utilized to get to every single ongoing innovation and working extremely quick, keen, attractive outcomes, absolutely will be a brilliant framework. In this proposed framework, we thought of thought of utilizing IR sensors/attractive sensors and raspberry pi.

Undesirable traffic blockage, inappropriate time the board, Traffic line isn't known to traffic police and Use of manual upkeep will be stayed away from. The upsides of proposed technique has the accompanying preferences The traffic framework will end up more intelligent and they can work without human connection specifically.

This can assist the people with avoiding the wastage of time sitting tight in rush hour gridlock for long time; work worry for traffic police can be decreased. Even however time what we take to cross signs might be a few seconds yet they are progressively significant.

In the following part we give our proposed strategy with Color changer time adding machine Algorithm for NEWS bearings, this will gives all around performed outcomes when contrasted with other existing techniques which we will pursued, essentially the calculation pursued for just four heading yet we can change the quantity of headings relies on the quantity of streets in an intersection.

Figure 1. System Architecture



IV. HARDWARE REQUIREMENT

1. Raspberry-Pi

The Raspberry Pi is a little single-board PCs created in the UK by the Raspberry Pi Foundation. The unique model ended up unmistakably more prominent than anticipated, selling outside its objective market for utilizations, for example, apply autonomy. It does exclude peripherals, (for example, consoles and mice) and cases. The association behind the Raspberry Pi comprises of two things. The rst two models were created by the Raspberry Pi Foundation. After the Pi Model B was discharged, the Foundation set up Raspberry Pi Exchanging, with Eben Upton as CEO, to build up the third model, the B+. Raspberry Pi Trading is in charge of building up the innovation while the Foundation is an instructive philanthropy to advance the educating of essential software engineering in schools and in creating nations. The Raspberry Pi 3 Model B+ is the most recent item in the Raspberry Pi 3 territory : Broadcom BCM2837B0, Cortex-A53 (ARMv8) 64-bit SoC @ 1.4GHz 1GB LPDDR2 SDRAM 2.4GHz and 5GHz IEEE 802.11.b/g/n/air conditioning remote LAN, Bluetooth 4.2, BLE Gigabit Ethernet over USB 2.0 (greatest throughput 300 Mbps) Extended 40-stick GPIO header Full-estimate HDMI 4 USB 2.0 ports CSI camera port for interfacing a Raspberry Pi camera DSI show port for associating a Raspberry Pi touchscreen show 4-shaft stereo yield and composite video port Micro SD port for stacking your working framework and putting away information 5V/2.5A DC control input Power-over-Ethernet (PoE) bolster (requires separate PoE HAT)

2. RFID

Radio-recurrence identification (RFID) utilizes electromagnetic elds to automatically recognize and track labels appended to objects. The labels contain electronically-put away data. Aloof labels gather vitality from an adjacent RFID perusers cross examining radio waves. Dynamic labels have a neighborhood control source, (for example, a battery) and may work many meters from the RFID peruser. Not at all like a standardized tag, the label require not be inside the observable pathway of the peruser, so it might be implanted in the followed article. RFID is one technique for programmed identification and information catch (AIDC). RFID labels are utilized in numerous ventures. For instance, a RFID label connected to a vehicle amid creation can be utilized to keep tabs on its development through the sequential construction system; RFID-labeled pharmaceuticals can be followed through distribution centers; and embedding RFID microchips in domesticated animals and pets empowers positive identification of creatures. Since

RFID labels can be connected to money, apparel, and assets, or embedded in creatures and individuals, the likelihood of perusing by and by connected data without assent has raised genuine protection concerns. These concerns brought about standard specifications advancement tending to security and security issues. ISO/IEC 18000 and ISO/IEC 29167 use on-chip cryptography strategies for untraceability, tag and peruser authentication, and over-the-air protection.

3. Infrared sensor

An infrared sensor is an electronic gadget that discharges so as to detect a few parts of the environment. An IR sensor can quantify the warmth of an article just as recognizes the motion. These sorts of sensors estimates just infrared radiation, as opposed to producing it that is called as an inactive IR sensor. More often than not in the infrared range, every one of the items emanate some type of warm radiations. These sorts of radiations are undetectable to our eyes, that can be identified by an infrared sensor. The producer is essentially an IR LED (Light Emitting Diode) and the finder is just an IR photodiode which is delicate to IR light of indistinguishable wavelength from that discharged by the IR LED. At the point when IR light falls on the photodiode, The protections and these yield voltages, change in extent to the greatness of the IR light got.

4. Magnetic Sensors

Attractive sensors convert attractive or attractively encoded data into electrical signs for handling by electronic circuits, and in the Sensors and Transducers instructional exercises we took a gander at inductive nearness sensors and the LDVT just as solenoid and hand-off yield actuators. Magnetic sensors are strong state gadgets that are ending up increasingly more famous on the grounds that they can be utilized in numerous different sorts of utilization, for example, detecting position, speed or directional development. They are additionally a prevalent decision of sensor for the gadgets fashioner due to their non-contact wear free activity, their low support, vigorous plan and as fixed lobby ect gadgets are safe to vibration, residue and water. One of the primary employments of attractive sensors is in car frameworks for the detecting of position, separation and speed. For instance, the precise position of the wrench shaft for the ring point of the start plugs, the situation of the vehicle seats and safety belts for air-pack control or wheel speed identification for the stopping automation, (ABS). Magnetic sensors are intended to react to a wide scope of positive and negative attractive elds in an assortment of different applications and one sort of magnet sensor whose yield flag is a component of attractive eld thickness around it is known as the Hall Eect Sensor. Corridor Eect Sensors are gadgets which are initiated by an outer attractive eld. We realize that an attractive eld has two critical qualities ux thickness, (B) and extremity (North and South Poles). The yield motion from a Hall ect sensor is the capacity of attractive eld thickness around the gadget. At the point when the attractive ux thickness around the sensor surpasses a certain pre-set limit, the sensor identifies it and produces a yield voltage called the Hall Voltage, VH.

IV. ALGORITHM

Algorithm for NEWS Direction:-

Initialize starttime=7.00 am, endtime=10.00 pm;

Repeat below steps start from starttime to endtime set C

if counter=1

calculate time delay for green as number of vehicles at north multiplied by 3 in seconds switch on green for time delay switch on yellow for 3 sec and & off green signal

if counter=2

Calculate time delay for green as number of vehicles at east multiplied by 3 in seconds switch on green for time delay switch on yellow for 3 sec on & off green signal Go to red signal

if counter=3

Calculate time delay for green as number of vehicles at west multiplied by 3 in seconds switch on green for delay switch on yellow for 3 sec on & off green signal Go to red signal

if counter=4

Calculate time delay for green as number of vehicles at south multiplied by 3 in seconds switch on green for time delay switch on yellow for 3 sec on & off green signal Go to red signal

End

Switch on yellow lights in all directions

VI. MATHEMATICAL MODEL

Input: Collecting input from sensors and RFID reader.

Output: Execution of appropriate signal.

Functions: Verification of collected data with the help of database.

$$S = (I, O, F)$$

Where S: System

I = {D} are set of Input

Where, D: Data from sensors and RFID

F = {MD, UD} are set of functions

MD: Matching Data

UD: Unmatched Data

O = {GS, NC} are set of output

GS: Green signal

NC : No Change

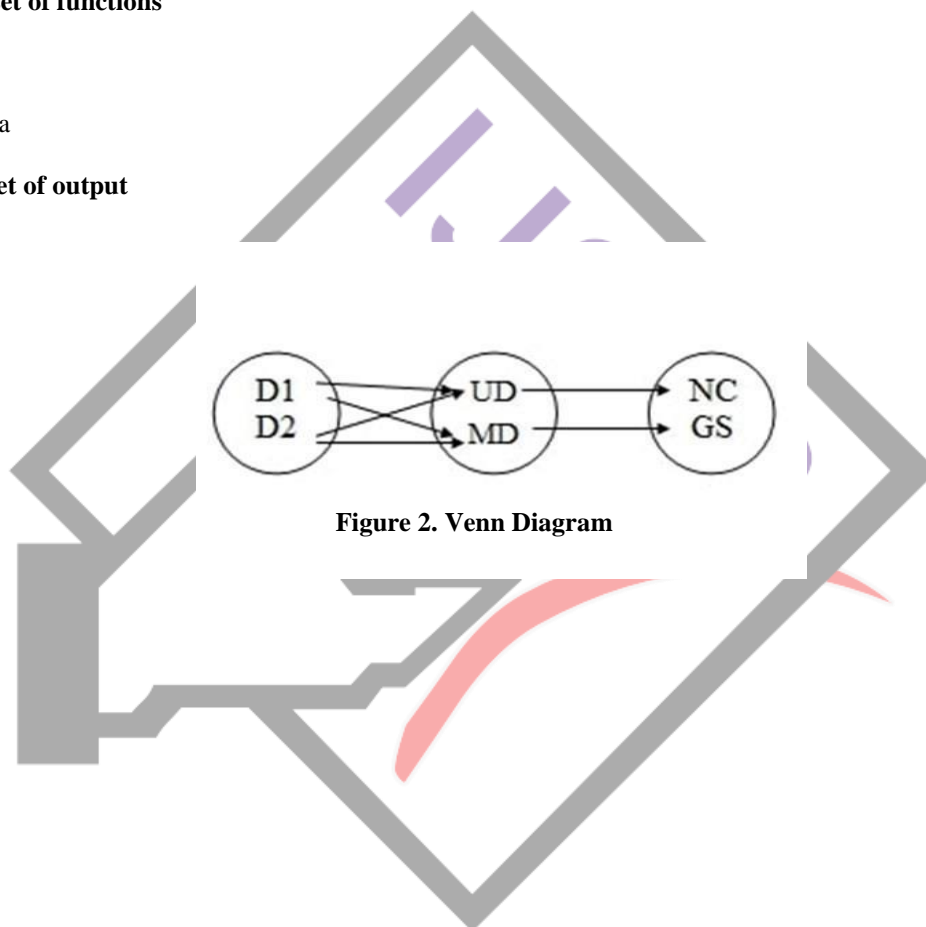


Figure 2. Venn Diagram

VI. FLOWCHART

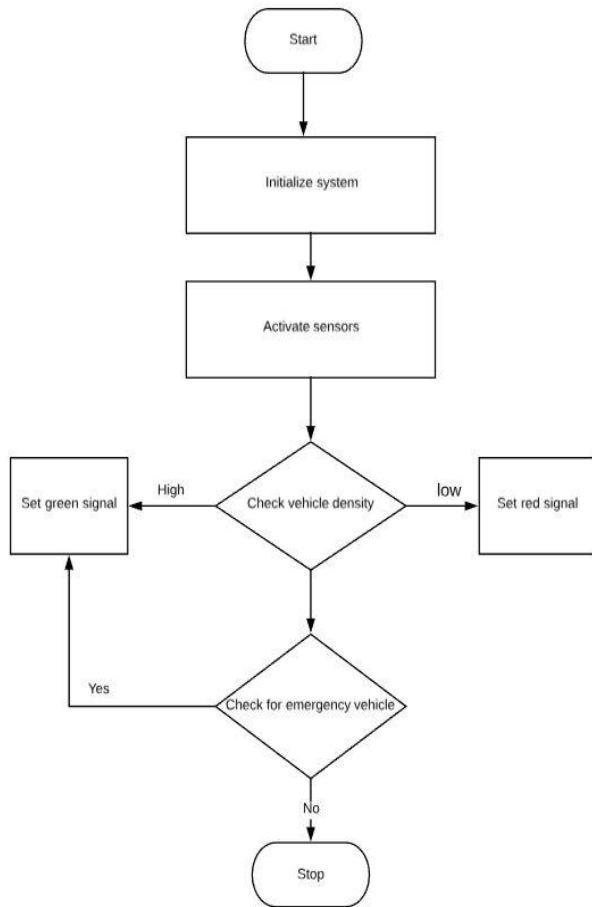


Figure 3. Flow Chart

VII. CONCLUSIONS

This proposed model abates the events of roads turned parking lots, brought about by high red flag delays and gives the expected time to vehicles to cross the signs. Here we planned the framework with the reason to clear the traffic as per thickness of vehicles by depending on the path. In this framework, we discover the traffic thickness utilizing Round robin calculation and Decision making calculation. So traffic blockage will be controlled with no semi-robotized or manual support. In this framework we utilized infrared (IR) sensors. In future, these IR sensors can be supplanted by attractive sensors. So the thickness of vehicles can be determined with no unsettling influences and commotion.

1. Emergency vehicle can be pass effectively.
2. This keen trac framework diminishes the issue of trac jams.
3. It illuminates issue of trac police.
4. Trac blockage will be controlled with no semi-robotized or manual upkeep.
5. Reducing foundation harm. Enhancing trac safe.

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