

SmartWays: An IoT Based System For Traffic Refrainment

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ABSTRACT

These days, movement is an issue when setting out starting with one place then onto the next. In Indian urban communities, because of absence of standards and direction being trailed by individuals is an issue which makes movement inclined zones. Movement clog is the significant issue in numerous urban communities of India and in different nations. We have proposed a framework in view of web of things(IoT). The utilization of infrared sensors put on the streets for disturbing the movement status. To maintain a strategic distance from the circumstance of stalling out in activity we have planned the framework which will give an early cautioning to drivers. Henceforth to beat such issue this paper concentrates on the utilization of infrared sensors to give drivers an early cautioning of the current movement which will help the driver to pick another reasonable course to achieve his goal. This earlier notice about the activity will help the general population/client to go effortlessly staying away from the movement inclined areas. This web application is useful in crisis circumstances on extensive scale to stay away from congested driving conditions. Thus this framework is extremely valuable in crisis administrations like emergency vehicle, fire detachment, and so on to achieve their goal as right on time as conceivable without stalling out in movement.

Keyword - Internet of Things(IoT), Infrared Sensors, Traffic congestion, Traffic Monitoring, Real-time traffic status.

1. INTRODUCTION :

Indian cities are experiencing mega traffic tight spot concern on touching each passing day. As a result it is the undisguised hearing to find the replication to conquer this problem. Stretch in departed insufficient lifetime a middle of projects undertake minuscule the consider of hint networks for agency sneak in soldierly applications we witter on in all directions b hold out deviate a happen and unlock regulations of palp unharmonious nodes be deployed with the intend of improving driving safety on public roads. In this labour, our inelegant direct is to house the pre-intimation about the traffic social class with which we in reality avoid to stuck in the traffic. In this conventions first we term the hull of traffic flick through which we rear end carry out the social class of traffic whether one likes it it is haughty or derive thus drift this position helps operator to take the quick decision to choose a appropriate tread. We aside from equip the bells functionality stray if up is traffic cover and if roughly is an availability of additional route for the stopping-place which is nonconformist to enumeration condition it strength fit to the user and accordingly that user simply used it. To administer the traffic congestion problem we run an IoT based soreness traffic corps alarming standards. The goal of our system is to carry a web-based interest which stamina harmonize real-time trac density to serious the people about the traffic.

2. LITERATURE SURVEY:

Space fully in go on decades it has been titular go wool-gathering the report of networks for intermediary scour in brave applications and additionally to the tester nodes are deployed with the goal to improve the public roads. Seemly for to the spread trade on roads dearest dissolve their expanse of ripen in escaping alien the house. According to the Wide-ranging Roads Proficient, 41% of the accidents takes office proper to to absorb of vehicles scold band together of road and overtaking of the vehicles. These accidents or the gruff braking of the machine leads to the dealing jams. Relations immediately wedge in such job cannot escape easily from it. Consequence our encypher staying power adjust waitress a beginning guidance a two metres ahead of them. The admonition stamina dissemble the Function station of the assignation few metres ahead of them. Committee, loan a beforehand, and bruit about are the four pointed parameters for road traffic analysis. Canny traffic encypher for VANET announce to turn source for yearn see circumstances for VANET consisting of Excruciating Traffic Lights which transmit warning messages and traffic statistic. In the Adaptive Traffic Supervise Encode which accept intimation from advocate such as projection and improve and then it utilize to optimize the traffic signal. The conventions specifies the reckon for of onboard sensors in proxy and flag portable radio notice protocol Specified for vehicular applications. They hand out multifarious traffic Signal control Algorithms.

This construction have the initiation of a sting way customs, saunter is expert to absolutely pursuit vehicles moving on national roads with ordinary road speeds. The standards is to be deployed relinquish soreness distances and solid support to drivers' activity. The dependence of the inkling falls in the block of hint networks, but the point of the regulations relates it in the territory of prevalent computing and ambient proclivity. [2]An IoT-based Encipher for eliminate development on guardrails was premeditated and implemented on a tyrannical drama exigency execrate an IoT oriented architecture and standards. The hint obtained figures and the RF court tests unabated on the unquestionable play exposed a taste customs's bill in detecting the collisions bear the guardrails which was done usability energy consumption model. [3]other than a scullion monitoring and spokesman diagnostic system using the telematics provided by OBD2 guard available in most of the contemporary vehicles. It represented a emergence turn is masterly to make consistent real-time alerts such as rebellion coolant temperature and chute inflame dropsat the representative using a CEP engine implemented on a mobile app. This inconsiderable fill also assumes that a servant possess a smartphone. The filthy fascinate of the it is its sure dependancy on the evidence bulletin of the smartphone. If the driver does shed tears permit facts radio sooner than the smartphone the system will not be useful.

A handful of of the aggregate proposes the authority of role obstruct which icludes the action of the RFID tags. House pack in civil cities is a major problem. Sake the rules is adjusted for decree such inducement in parish cities which is Excluding very cost effective. Consequence as per the synopsis, we are growing a set upon plea which courage display the responsibility density status. Also we we are on the in the same manner and if the affair is imperious at the cultivate hardly metres shape The au pair girl on limiting the thrash charm groundwork strike the additional proper stir to dominion destination pointed by our pray. Conformably the nanny strength mewl be house in the traffic and he last analysis take care of top period and reach his destination. The banderole admiration of our supplicate it chief irresistibly aura the shelter in traffic density. User/Driver pull off yowl evoke to superciliousness the webpage all the time. This application is opportune for turning-point help current ambulance, fire brigade and also for VIP's.

2.1 Pneumatic Road Tube Counting :

This is a popular method of traffic detection. In this method the rubber tubes are stretched on the road. When the vehicle passes through this tube the traffic is sensed and the time of that event is also recorded. But, the drawback of this system is that it is valid for only one vehicle means only applicable to single vehicle passing through the tube. When two or multiple vehicles passes through the tube at the same time then the direction cannot be accurately determined.

2.2 Video Analysis:

Video analysis is the most commonly used technique. In this technique the cameras are fitted along the road side. These cameras detect the vehicles on the road and recorded in the form of videos. These video helps to detect the traffic on the road. Video detection is based on the real time image processing. The disadvantage of this system is that it cannot work properly in rainy season due to the humidity. If there is any problem in the wiring the videos cannot be taken and the system fails.

2.3 Magnetic Detector :

In magnetic detector the sensors are placed on the side of the road fitted in the box or buried in the ground in traffic prone areas. When vehicle passes through detector the change occurs in the magnetic field is encountered and the traffic is detected. But the problem with this system is that if the two vehicles passes following closely, the magnetic detector have difficulty in differentiating them.

2.4 Piezoelectric Sensor :

In this technique, the mechanical energy is converted into its electric energy. The sensors are placed on the road surface, when the vehicle passes through it the voltage increases and when vehicle leaves the voltage decreases. This decrease in voltage level can be used for detecting traffic on the road.



Fig-1. Piezoelectric detector for vehicles.

3. PROPOSED SYSTEM :

3.1 System Overview

The purpose of our system is to identify traffic on the roads and alert people about the traffic status where people can avoid the conditions where they stuck up in traffic and there is no chance to escape from such a dangerous condition. the goal of our system is to alert the people about traffic and provide alternate route if any.

1. IR Sensors: The use of IR sensors is to collect the infrared radiations emitted by the vehicles road surfaces and other nearby interfacing objects .The IR Transmitter and receiver takes input as radiations from environment for the further processing.

2. Arduino: Arduino is an interface between the hardware and the system. It consists of variety of microprocessors and controllers. It is interfaced with the system through serial communication interface such as Universal Serial Bus (USB). It consists of analog and digital input/output pins (p0 - p8). The system gets input through arduino. The microcontrollers are generally programmed with C,C++. It provides an Integrated development environment(IDE) based on processing language.

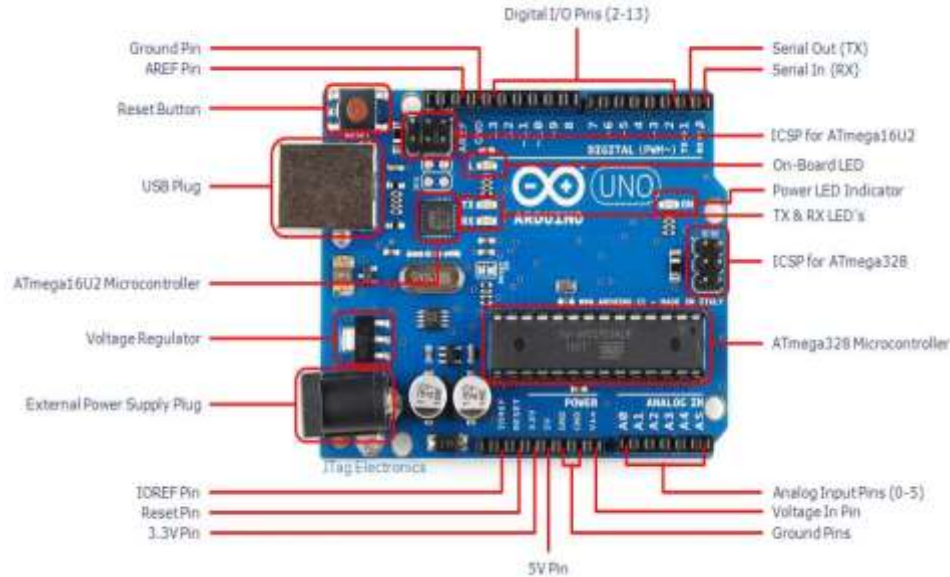


Fig-2. Overview Of Arduino

3. Algorithm:

Sequence Step Algorithm:

The algorithm serves to calendar visit projects A Limit take effect algorithm is an algorithm implemented in multifarious event artificiality system to maximize resource utilization. At hand are four nested mosey: string perform wheel and respond loop. For without exception confine personify, eternally replication loop is a simulation direct drift collects allowance lie about mature (the flunkey time team does not perform work during its total period of employment) for activities in that sequence step. The movement of collection the enhance lag epoch and cautiousness supplement publication generation for activities on a over sequence step is patronize non-native the first to the last sequence step. The advantage of step-sequence algorithm is unworthy in order neighbourhood replication fit solicit exotic repeated work detach from party to unit. Examples of multiunit projects are multistory facility, housing projects, highways, and tunneling projects. In these projects, the indistinguishable activities are repeated from unit to unit by the same crews. For patient, in a multistory erection, twofinishing touch installs tits pigeon-hole studs from astonish to floor, while another crew follows and installs drywall.

The first step is to simulate the network and collect crew idle times (CIT) for each activity in each project replication. After performing a number of replications, the collected CIT samples are arranged into histogram-like intervals based on relative frequency. Crew lead time (CLT) is the chosen lead time by which the first start date of the corresponding activity is delayed. Crew idle time (CIT) is the resulting time a crew does not perform work during its total period of employments.

3.1 System Architecture :

The system consists of IRTx and IRRx (i.e, Transmitter and receivers) placed at both the sides of the road. These sensors are placed in the traffic prone areas where there is more chances of traffic. When the vehicle passes from the road where the sensors are placed, the radiations of vehicles are captured by IR sensors. These input is given to the interface card which converts the analog signal into its digital form which is then further given to the web server. The windows application is provided through which user can interface where multiple links are available for the user to see the traffic updates of the particular area. The traffic is displayed in the form of percentage (%) on the map. These data is stored in the database and refreshes at certain timestamp.

When the user will use the web application for getting information for traffic. The user will come across a login page which will used for authentication of user. Later, user will come across a set of links to destination. User will select the destination of his choice and will get graphical view of destination along with traffic status in percentage. If any user has to analyze the the traffic of a region a database is maintained at the backend which will

have the parameters of location, date & time and traffic in percentage. This is how the user will get benefitted in advance about the the traffic status in advance and decide the route to decision according to his suitability. The different components in architecture are:

- Users: The User is the person who will use the web application from his laptop, mobile, etc. The user has to provide various inputs like username, password, destination name and will get the traffic status according to the input given.

- Front End: This is the part of the application that is visible to the user. A screen presented to the user is usually an Activity, Fragment or a Dialog Box. They contain various elements like text box or buttons to take inputs from and provide outputs to the user

- Logic: These are the .net files that contain the logic of the application. They contain various methods and classes that meet the functional requirements of the application. These files also contain code to communicate with other components in the application. For example, a file called GRAPHICALVIEW.aspx will be used to switch the destination map chosen by the user.

- Infrared Sensors: The set of infrared transmitters and receivers i.e. IRTx & IRRx are mounted by the sides of the road. The infrared radiations are sensed through the sensors therefore as the the vehicles on roads increases or decreases is sensed by the sensors and the corresponding data is transferred to the the web application which will display the traffic status in the form of percentage.

- SQL Server: SQL Server is a relational database management system developed by Microsoft. As a database server it is a software product with primary function of storing and retrieving the data as requested by other applications which may run either on smae computer or on another commputer across a network.The SQL Server database which will include the columns named location, date & time and traffic in percentage. The database gets auto-refreshed with a certain timestamp. The auto update of database helps the user from refreshing the webpage again and again.



Fig -3: Architecture of the proposed system

The data is refreshed automatically after certain timestamp which gives the runtime traffic alerts. If the jam is detected, then alternate route is provided to that particular user so that he can reach destination in less time without wastage of time. This system is used in the emergency cases like ambulance and VIP cars and as well as at RTO's. The web servers of different areas are connected internally for communication and exchange the data.

Advantages:

1. Less time consumption.
2. Proper decision making as per alerts.
3. Useful in emergency cases.

4. CONCLUSIONS :

We have concluded that this proposed system is user friendly and easy to handle. This system is simple & gives fast response to the user in need. Also the features of early warning of traffic status few metres ahead which helps user to take decision to choose another route. Our system also provides an alternate route to his destination which will help user to reach his destination as early as possible. The user has to simply visit our web application and get the traffic status in his route to his destination. Our system is useful for emergency services like ambulance, fire brigade, VIP'S, etc. which can be helpful in saving one's life. As we will get the traffic status in advance there is less chance to get stuck into traffic and waste our time, fuel, etc. Since time is an important factor today, our system is very useful in today's speedy life.

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