Real Time Traffic Recognition And Vehicle Tracing

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Abstract - *A definite and robust vehicle detection and tracking system is one of the key modules for intelligent vehicles to grasp the surrounding environment. Now-a-days, Traffic congestion is also the major problem in the whole world. So in order to reduce traffic in the city and track the vehicle a traffic surveillance system is proposed. Global positioning system is becoming popular for tracking the vehicle. The vehicle tracking system uses the GPS module to get geographic coordinates at regular time intervals. In this paper we proposed hybrid and novel system which concurrently gives the location of vehicle with flow of on road traffic. Using GPS kit we will detect parameters like Speed, Latitude, Longitude, Path of the vehicle etc. Video camera is a favourable traffic sensor because of its low cost and its potential ability to collect a large amount of information. The system involves analysis a sequence of road images which represent the flow of traffic for the given time period and place.*

Key Words: GPS, GSM, Data mining, Image Processing.

1.INTRODUCTION

The number of vehicles in India is quickly increasing which causes many issues. In modern era we have to face many problems one of which is traffic congestion. This problem becoming more serious day after day. Traffic congestion is identified by slower speeds, longer trip times, and increased vehicular line up. The major cause leading to traffic congestion is the more number of vehicle which was caused by the populace and the development of economy. The another major problem is vehicle theft. Now a day's almost all of the community having an own vehicle, theft of vehicle is happening on parking and sometimes driving insecurity places. The safety of vehicles is supremely needed for public vehicles. To overcome such problems like traffic jam and vehicle theft we proposed a system ,which mainly consist two parts:-

1.1 Real time vehicle detection and tracking system

Vehicle detection and tracking system placed in the vehicle, to track the location and locking engine motor. The place of the vehicle discovered by using Global Positioning system(GPS) [6]. *GPS* technology became a reality through the accomplished of the American military, which established

a satellite-based navigation system consisting of a network of total twenty four satellites orbiting the earth. GPS is also known as the NAVSTAR (Navigation System for Timing and Ranging).These systems constantly watch a moving Vehicle and report the status on user demand. This system is used for traffic details and time on which vehicle stopped for more than some interval with the help of GPS location. GPS modules are well known for navigating, positioning, time and other purposes. GPS antenna receives the region values from the satellites. GPS gives orientation about: 1) Position at that time 2) Message transmission time. GPS works all across the world and in all types of weather thus helping users track locations, objects, and even individuals! GPS technology used by any person if they have a GPS receiver.

1.2 Traffic analysis

The traffic control system is being discussed and studied because it can provide meaningful and useful information such as heaviness of traffic , the length of chain, average traffic speed and the total vehicle in fixed time interval. Generally, the traffic control system requires more sensors. Video camera is a promising traffic sensor because of its cheap and its potential ability to collect a huge amount of information.[5] Traffic detection module gives exact number of vehicles on road for traffic analysis. Which uses video of traffic at particular location. In our proposed system we describe a computer vision system to count number of vehicles on road in particular time period and place. The approach utilized to analyze traffic videos using a system which works on the Blob algorithm containing the modules like background subtraction, blob detection, bounding box, blob tracking and vehicle counting .As the key goal for a traffic control system, the evaluation of traffic conditions can be represented by the following parameters: traffic flow rate, average traffic speed, the length of queue and traffic density.

2. Literature Review

Real-time tracking is field of research for many researchers. Recently the various anti-theft modules like steering wheel locked equipment, network tracking system and traditional electronic alarm are developed along with client identification and real time performance monitoring. The paper presented by-

El-Medany, W.; Al-Omary et al[1] gives a real time tracking system that shows accurate localizations of the tracked vehicle along with low cost. GM862 cellular quad band module is used for implementation. A monitoring server and a GUI on a website is also developed using Microsoft SQL Server 2003 and ASP.net to show the proper location of a vehicle on a that map. The paper also provides information related to the vehicle status such as speed, mileage, etc.

Hu Jian-ming; Li Jie; Li Guang-Hui [3]:By using GSM and GPS module they describe an automobile anti-theft system . The system is developed using high speed mixed type single-chip C8051F120 and By making the use of vibration sensors stolen automobiles are detected. The system remains in contact with automobile owner through the GSM module.

Fleischer, P.B.; Nelson et al[4] describes development and deployment of GPS (Global Positioning System)/GSM (Global System for Mobile Communications) based Vehicle Tracking and Alert System. This system allows inter-city transport companies to track their vehicles in real-time and provides security from armed robbery and accident occurrences.

Le-Tien, T.; Vu Phung [2]:They describes a system which is based on the Global Positioning System (GPS) and Global System for Mobile Communication (GSM). It gives the practical model for routing and tracking with mobile vehicle in a large area outdoor environment . To acquire moving direction of a vehicle the system makes use of Compass sensor-YAS529 of Yamaha Company and Accelerator sensor-KXSC72050 of Koinix Company . The system will get the positions of the vehicles via GPS receiver and then sends the data to supervised centre by the SMS (Short Message Services) or GPRS (General Package Radio Service) service. The supervised centre comprises of a development kit that supports GSM techniques-WMP100 of the Wavecom Company. then position of the mobile vehicle will be displayed on Google Map. G. Salvi1:In this paper they represent a system to trace and count mobile vehicles in traffic regions. They used virtual loop-based method for detecting and counting moving vehicles . Long term tests on traffic. congestion shows that the proposed system in this paper reliable to estimate real-time traffic flow rate.

Dan Yang1 , Yantao Chen1 , Richen Liu2:[7] for detecting vehicles in video ,this paper introduced a method called as background subtraction. The model was based on the framework of the probability density function of kernel. This method can capture the moving vehicles rapidly and accurately from the video.

Meru A.V* ,Mujawar I.I :[8] for moving vehicles detection background subtraction method gives us accurate result. It also evaluated the better segmentation for moving vehicles and produces good output within a microseconds. After detecting the vehicles, counting is accurately done by using the Gaussian mixture model and BLOB analysis method. BLOB analysis creates the accurate bounding boxes to each of vehicles on four way traffic road. The road which having more traffic gives the first priority to that particular road. We control the traffic by maximizing or minimizing the time period of that particular road.

In this system user will able to track vehicle using GPS , also able to check vehicle details on live tracking page – carrier, last seen, Door, Battery, Temp, GPS, Speed, Latitude, Longitude, Address, Time. Address, Speed, KM Travelled, Ignition etc. Using GPS kit parameters system will detect approximate traffic of that area and able to show details on the map.

3. Existing Methodology

Taking after the current frameworks used to track the vehicle and control the movement and their downsides are talked about beneath:
I. The Normal Vehicle-Actuated Control
II. Manual Controlling
III. Programmed Traffic Light

I. The Normal Vehicle-Actuated Control

It endeavours ceaselessly to confirm motion on the premise of altered time interim. The primary impediment is that the control calculation takes a gander at the vehicles on green flag while not considering the quantity of vehicles holding up at red flag. The most straightforward kind of this establishment has a locator situated at a specific separation before the stop line at a crossing point approach, and a controller delicate to signs sent by the identifier. This basic activity incited signals experience the ill effects of a portion of an indistinguishable shortcoming from those of settled coordinated signs.

II. Manual Controlling

The name demonstrates it require labour to control the movement. Activity polices are assigned relying upon the nations and states to control a required zone or city movement. The movement polices will have things like sign board, sign light and shriek to control the activity. They will be told to wear particular outfits with a specific end goal to control the activity. In the manual controlling framework more labour is required. Since the quality of movement police is poor it is unrealistic control activity physically in all range of a city or town. The issues on account of human movement control are: 1)Only talented administrators can settle on reasonable judgments and choice, on the grounds that the circumstance is exceptionally convoluted and numerous components ought to be considered at control.2)The work heap of talented administrators is high, since they generally settle on choices as indicated by activity condition at brief time interims.3)It is extremely hard to enhance the procedure of activity control, on the grounds that the genuine procedure of the administrators' judgment is not depicted obviously.

III. Programmed Traffic Light

It is controlled by clocks and electrical sensors . The lights are consequently getting ON and OFF contingent upon the

clock esteem changes. While utilizing electrical sensors it will catch the accessibility of the vehicle and flags on every stage, contingent upon the flag the lights naturally turn ON and OFF. In programmed activity controlling, a movement light uses clock for every stage. Another route is to utilize electronic sensors with a specific end goal to identify vehicles, and create flag that to this technique the time is being squandered by a green light on a void street. Movement clog likewise happened while utilizing the electronic sensors for controlling the activity.
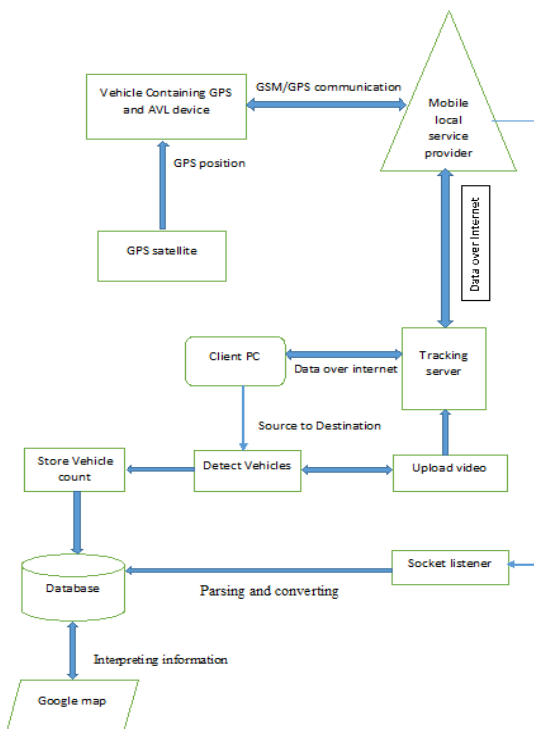
4. Proposed Architectural Diagram

Fig -1: Architecture Diagram

This architecture consists of three main parts namely server ,client and web portal/android. The working rotates amongst these parts only. Information about vehicle will be stored on database with the help of GPS. The duty of GPS is to track the vehicle transfer it over internet ,then after transferring the data server will track the vehicle and will provide it to client on android and web portal. Similarly, when client wants to know the traffic of a particular area, through GPS kit it would detect the vehicles, upload the video to tracking server and it will display count of the vehicle present. this all information will be stored on database so that whenever we wish to check the replay of our vehicle as where was it yesterday or day before yesterday we would check it easily.

5. CONCLUSIONS

In this paper, we have mentioned the remedies to tackle problem of vehicle theft using GPS Kit. This Kit would help us to find the exact location of our vehicle with parameters such as Speed, Time, Latitude, Longitude, IGN ON/OFF. Use of video camera for analysis of traffic is made as it accepts huge amount of data with hardly any expense. For traffic analysis with the help of video camera Blob detection technique is used to count number of vehicles on road in particular time and place. Due to this on road traffic would be easily detected and vehicle would be more secure.

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