

Implementation on Priority Based Signal Management in Traffic System

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Abstract - In the densely populated area traffic control system is the main mechanism to control the traffic. The proposed system is the Priority Based Signal Management in Traffic System which deal with traffic load in each side of lane during high density traffic on road at specific time. Here we are considering the main scenario at time when the traffic is extended for, less no. of vehicles then signal activate for less number of time. If the traffic gets on increasing on other side of lane then, the problem with previous algorithm is that, the vehicles on other side those arrived first as compared to others have to wait. Conventional traffic system is not capable of handling dynamic traffic flow. We first formulate the vehicular traffic signal control problem as a job scheduling problem on processors. In our system we switch the signal if the density of vehicle is high then the maximum time is allocated. This paper describes brief study of traffic system. Traffic system uses the on demand concept by forwarding the alert message to the previous square. We also introduce emergency vehicle. Then we conclude the system working.

Keywords - RSUs, WSN, Intelligent Traffic system (ITS), Traffic Control Unit (TCU)

I. Introduction

Now a day's traffic management in urban areas plays a very important role. The dynamic traffic causes congestion or improper management of traffic system. The proposed system will examine the possibility of deploying an intelligent real-time traffic signal controller, which will receives information transmitted from vehicles, and used this information to schedule the traffic signal at the intersection. To monitor the density of the traffic, we will keep the Road Side Unit (RSU) besides the road and depends upon the count from the Road Side Unit (RSU), the delay of the traffic signals will be increase or decrease. The Improved Priority Based Signal Management in Traffic System is to solve traffic congestion problem which is a big problem in many cities for solving the problem, we have designed a framework for a dynamic and automatic traffic light control system and developed a simulation based model with codes in to help build the system. It is possible to propose dynamic time-based coordination schemes where the green signal time of the traffic lights is assigned based on the present conditions of traffic.

The Improved Priority Based Signal Management in Traffic System is based on the time as well as the density. The

Road Side Unit (RSU) continuously keeps watching density on all sides and the maxgreen signal is given to the side on priority basis, the side with next priority level follows the first priority level. With the help of this system traffic can be cleared without irregularities and time delay though there is no traffic on the other side can be avoided. Maximum density of traffic will allow traffic with maximum timing assigned Minimum density of traffic will allow traffic with minimum timing assigned communicate with the Vehicle with the help of these it count the density of the vehicle. According to that information transmitted from the vehicle or density it will provide the delay to the signal. Calculating average density information transmitted to the before square. Emergency vehicle broadcast the emergency packet to the RSU. RSU will send Acknowledge packet to the TCU to clear the particular lens.

II. LITERATURE REVIEW

Density, speed, and flow are the three critical parameters for road traffic analysis. High-performance road traffic management and control require real-time estimation of space mean speed and density as input for large spatial and temporal coverage of the roadway network. In Adaptive Traffic Control System which receives information from vehicle such as position and speed and then it utilize to optimize the traffic signal. The system specifies the use of onboard sensors in vehicle and standard wireless communication protocol Specified for vehicular applications. They implement various traffic signal control Algorithms [1]. Intelligent traffic system for VANET suggest that creation for smart city framework for VANET consisting of Intelligent Traffic Lights which transmit warning messages and traffic statistic. In That System Various Routing Protocol Has Been Discus And Compare. They suggest that AODB is best suited for Intelligent Traffic Light [2]. Author suggests in reference [3] the data forecasting model for transmitting data from one to other. This article studied about the dynamic traffic control system and based on radio propagation model for predicting path loss & link. The author suggests in reference [7] Intelligence road Traffic signaling System. In that system OBU's used. OBU's used destination information for calculating load traffic on road for reducing the conjunction on road. The general belief is that it is more difficult to estimate and predict traffic density than traffic flow .In Intelligent Traffic Light and Density Control using IR Sensors and Microcontroller [4] the author propose that the delay of Signal not depend on traffic density. The Author optimize the traffic

using microcontroller this system reduce traffic jams problem cause by traffic light to extent. The system contains IR Transmitter and IR Receiver. IR count the vehicles on the road Microcontroller generates the result.

[8]Priority Based Traffic Lights Controller Using Wireless Sensor Network the author implements Adaptive Traffic control System based on (WSN) wireless sensor Network. In that System Time manipulation Used for controlling Traffic Light. This System Control Traffic over Multiple intersections.

As such, it is becoming very crucial to device efficient, adaptive and cost-effective traffic control algorithms that facilitate and guarantee fast and smooth traffic flow that utilize new and versatile technologies. An excellent potential candidate to aid on achieving this objective is the Wireless Sensor Network (WSN). Many studies suggested the use of WSN technology for traffic control. In, a dynamic vehicle detection method and a signal control algorithm to control the state of the signal light in a road intersection using the WSN technology was proposed.

In this paper, an intelligent traffic light control system based on WSN is presented. The system has the potential to revolutionize traffic surveillance and control technology because of its low cost and potential for large scale deployment.

III. PROPOSED SYSTEM

Traffic Light scheduling is a critical problem. Even for single junctions there might be no exacts solution. With multiple junctions in the traffic system, the problem becomes more critical, as the state of one light lane the flow of traffic towards many other lights. Another problem is that the flow of traffic continuously changes, depending on the time. The priority Based Signal Management in Traffic System track traffic density at junctions using Road Side Unit (RSU) and control the traffic signals Red &Green indication. The delay given for Red or Green Signal at a square wills dynamically determines traffic density by communicating with the vehicles Road Side Unit (RSU). The uniqueness of our work is that the control is not just based on traffic density calculation but also priority. The Improved Priority Based Signal Management in Traffic System is capable enough to track multiple priority based vehicles. Vehicular Ad Hoc Network (VANET) is a network in which each node represents a vehicle equipped with wireless communication technology and can communicate with other nodes like other vehicles or Road Side Units (RSUs).

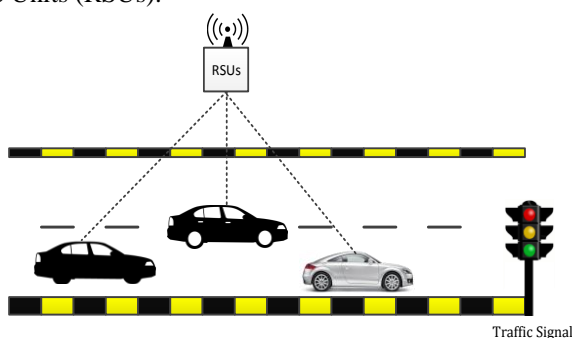


Figure1: Roadside Units Communication with Vehicles

The main goal of VANET is to provide safety and comfort for passengers on road. A Road Side Units (RSUs) is an access points, used together with the vehicles, to allow information dissemination in the roads. The concern data can be used to create Priority Based Traffic Management Systems, which can automatically update traffic light delay, Congestion in road traffic is a serious issue and timing of traffic light is pre-defined or fixed in the traffic light and it is independent on traffic density. Therefore optimizing traffic light control to overcome the traffic congestion on intersection increasing demand is arises. To overcome the problem of traffic congestion at road intersection at the Priority Based Signal Management in Traffic System is introduced. Priority Based Signal Management in Traffic System will calculate the density of vehicle on the road for flow traffic smoothly without conjunction. The system also proposes the Priority Based traffic light signaling which help to assign the priority to the lanes with highest traffic density as per demand in order to control the traffic smoothly. Overcome the traffic jam problem. Reduces the delay. And Avoid Conjunction.

IV. METHODOLOGY

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To overcome the problem of traffic congestion at road intersection at the Priority Based Signal Management in Traffic System is introduced. Priority Based Signal Management in Traffic System will calculate the density of vehicle on the road for flow traffic smoothly without conjunction. The system also proposes the Priority Based traffic light signaling which help to assign the priority to the lanes with highest traffic density as per demand in order to RSU Will Manage Number of Adhoc Connection. In our system we use the following module,

```
TCU Received density from RSU 2 With Density
Count: 1
TCU Received density from RSU 3 With Density
Count: 1
TCU Received density from RSU 4 With Density
Count: 1
TCU Received density from RSU 1 With Density
Count: 1
TCU Received density from RSU 2 With Density
Count: 1
TCU Received density from RSU 3 With Density
Count: 1
TCU Received density from RSU 4 With Density
Count: 1
TCU Received density from RSU 1 With Density
Count: 1
TCU Received density from RSU 2 With Density
Count: 1
TCU Received density from RSU 3 With Density
Count: 1
TCU Received density from RSU 4 With Density
Count: 1
TCU Received density from RSU 1 With Density
Count: 1
```

Figure2: Density calculation using RSU

1. Density Calculation:

Wireless technologies, through vehicular networks, enable peer-to-peer wireless communications vehicles and infrastructures (V2I). A Road Side Unit (RSU) establishes the connection i.e. Adhoc just to inform the Arrival of Vehicle. The capacity of vehicles to communicate with an infrastructure depends on the number and radio coverage of existing RSUs in the nearby area. RSUs inform to switch the Green time as per the number of connection.

2. Signal Switching:

It will switch the Signal on the regular pre-defined interval of time. The signal will switch on the basic of information provided from the A Road Side Unit (RSU).

3. on Demand:

Calculate the Average density information provided from the RSU. A Road Side Unit (RSU) pass the Alert message to the Previous Square. They will pass the Message at the Specified length. Rout the traffic at the particular direction.

4. Introducing Emergency Vehicle:

RSU will continuously communicate with the vehicles. Emergency Vehicle broadcast emergency packet which will receive by the RSU. It will send Acknowledge to the TCU (Traffic Control Unit) to clear particular lane till the time ok packet generated by the emergency vehicles.

V. DISCUSSION

Using proper data collection for the lane and proposing signal management system. The traffic scenario in which only one lane consist of vehicles and other lane being empty, but still the vehicles need to wait for the signal get to green is very large the solution not provided to the signal then the tendencies of road disasters may occurs such as accidents.

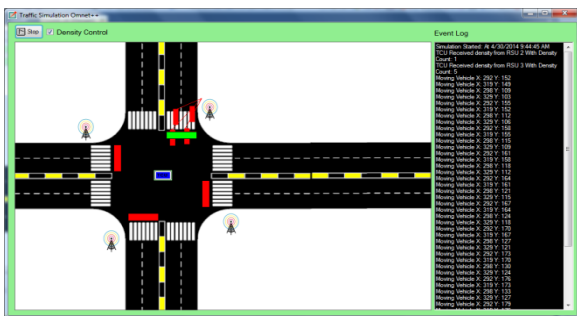


Figure3: Simulation for Traffic Demonstration

The propose system will overcome this problem signal switch according to the traffic condition. If the traffic is heavily loaded on side then we use the diversion concept alert message passed to the previous square, the emergency vehicle passes from road will start the green light. The propose system will be flexible enough to be enhanced in order to handle future traffic.

VI. PROBLEM DRFINITION

To overcome the problem of traffic jam at intersection at the Traffic Signal system is introduced. Proposed system calculates the density of vehicle with the help of RSU. In the propose System RSU Continuously Communicate with the Vehicle with the help of these they calculate the traffic density. RSU will manage number of Adhoc Connection. It will help RSU to increase or Decrease Green Time. Or Switch the Signal On the basic of information provided by the RSU. Priority Based Signaling which helps to gives the priority to the vehicles this approach used to control the traffic smoothly. By forwarding the message to the previous square we overcome the traffic jam problem. Reduces the delay. Avoid Conjunction. Our System provides the priority to the Vehicle. In that we also introduce Webster's method, pretend signal control method.

VII. CONCLUSION & FUTURE SCOPE

In this paper we present detail study of traffic control system. This system when implement will overcome the problem cause by traditional traffic system. Here the first objective that are calculating the density of traffic on the road .second, deploying Priority based signaling which will help to give priority to the vehicle are studied successfully. This traffic signal management approach properly designed, operated and maintained. The propose approach will consider not only the density of the traffic but also priority of the vehicles. If the density of the road traffic is high then Maximum density of traffic will allow maximum default timing for traffic lights. Minimum density of traffic will allow traffic with minimum timing for traffic lights. In our Priority based signal management system introduce the on demand Concept in which they calculate the average density of the traffic with the help of RSU and alert the previous square in specified length to rout the traffic at particular direction. We also introduce emergency vehicle. This system aims at saving a large amount of man-hour cause by traffic problem. In the future this system may be implemented for the practical implementation which will work for various dynamic traffic flows.

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