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Research paper



IoT based smart traffic signal monitoring system using vehicles counts

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Abstract

Traffic signal management is one of the major problematic issues in the current situation. Such scenarios, every signal are getting 60 seconds of timing on the road at a regular interval, even when traffic on that particular road is dense. As per this proposed model in this article, which will be optimized the timing interval of the traffic signal purely depends on the number of vehicles on that particular roadside. The major advantage of this system is that it can able to decrease the more waiting time for the drivers to cross road signal. In this model, we are using the clustering algorithms model which is based on KNN algorithm. Using this algorithm new model will be liable to determine expected required timing as per provided inputs to the signal which is vehicles count. The input of these systems is vehicles counts on each side of the road from crossing signal. And this input will be determined on **much time is to be provided**. "Case studies on this system are traffic network and real-time traffic sub-networks are organized to get the effectiveness of the proposed **model.**"

Keywords: Internet of things, traffic automation, k nearest neighbours.

1. Introduction

"One of the important things in the Internet of things in smart cities is the Intelligent Transportation System (ITS). ITS improves Vehicle to vehicle and Vehicle to Infrastructure communication for improving road facilities rather than increasing road capacities or developing new roads. This is possible because of ITS, it utilizes advanced information and communication, and this communication will be helpful for decreasing traffic congestion and to reduce the accidents on the road, which is dangerous in the **urban areas.**"

"Managing traffic signal timing is one if the key thing in the urban areas. Managing to time on the road will decrease the waiting time of the drivers on the road, and that will help to reduce the fuel consumption. This is done with the help of the ITS." In this system, we are going to use IR Sensors. IR sensor is also called as an Infra-Red spectrum. IR sensors have 2 parts in it, one is the transmitter and second is a receiver. The transmitter is used to transmit the light and receiver keeps on receiving the light. When this connection is interrupted, the counting process is started, i.e., when the receiver does not receive the light transmitted by the transmitter it is said that the object is there in between transmitter and receiver. The line of sight concept is used in this approach."

2. Proposed System

Everyday traffic congestion bigger issues are a daily basis. So automation systems are currently not available in India. We need of IoT to utilize in the traffic signal monitoring systems and to control it in an advanced controlling system. Any system is designed to act smartly with higher control features for all four side way traffic systems. Every road towards heavy traffics of vehicles in higher counts. We need to define the priority level of traffic in our TMS on the basis on which least or highest priority. Traffic management system–TMS key appliances to control over traffic as per population of vehicles ID that particular area. So every road lane needs IR sensor to monitor and capture data of vehicles count in that lane. In this proposed system depends on the count of vehicles from the road lane IR data we are allocating higher time rate for that signal. This systems model using more numbers of IR sensors, for automation control microcontroller, with Bluetooth controller, as well as Android mobile device and finally PC-server. Any of these sensors surround with IR transmitter & receiver for placing in both directions of road lane.