"Smart Traffic Monitoring and Controlling Using IOT and Cloud"

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Abstract

Over the years, there has been a sudden increase in the number of vehicles on the road. Traffic congestion is a growing problem everyone faces in their daily life. Manual control of traffic by traffic police has not proved to be efficient. Also the predefined set time for the signal at all circumstances (low and high traffic density) has not solved this problem. A model to effectively solve the above mentioned problems by using Internet of Things (IOT) is proposed. We use cloud for internet based computing, where different services such as server, storage and application are delivered for traffic management. A network of sensors is used to track the number of vehicles and the traffic congestion at the intersections on a road and rerouting.

Introduction

will be done on the basis of the traffic density on the lanes of a road keywords sensor, microcontroller,   IOT and cloud computing. A smart traffic management system utilizing sensor data, communication and   auto-mated algorithms is to be developed to keep traffic flowing more smoothly. The aim is to optimally control the duration of green or red light for a specific traffic light at an intersection. The traffic signals should not flash the same stretch of green or red all the time, but should depend on the number of vehicle present. When traffic is heavy in one direction, the green lights should stay on longer; less traffic should mean the red lights should be on for longer time interval. This solution is expected to eliminate inefficiencies at intersections and minimize the cost of commuting and pollution in 2014, 54% of the total global population was urban residents. The prediction was a growth of nearly 2% each year until 2020 leading to more pressure on the transportation system of cities. Additionally, the high cost of accommodation in business districts lead to urban employees living far away from their place of   work/education and therefore having to commute back and forth between their place of residence and their place of work. More vehicles moving need to be accommodated over.

Literature Review

1. Cloud based traffic management proposed by Javorski p. (2013) and many other universities. loud infrastructure is used to know the accurate data flow, density of vehicle, throughput time, waiting time on the cluster nodes which act as an agent and it collect the traffic information from all the platform of nodes and directs them to the base station where data can be stored in the data centre for analysis.

2. In different methods for implementation of traffic motoring system with IOT device. In traffic density calculation, vehicle classification is achieved by video monitoring system. Camera are used at junction, according to the density of vehicle; traffic light switching is done by use of algorithm. Hence reducing

congestion, waiting time and fuel consumption. MATLAB video and image processing toolbox is used for the implementation.

Related Works

In the field of IOT, many systems are proposed in order to control, manage the traffic system effectively. Each of the systems use different types of technologies, components for managing Traffic congestion like IR Sensors, RFID's, Zig bee, Traffic warning systems, Bluetooth etc. The following are some the works that are related to our project. In the past ten years, the Internet of Things evolution has been unprecedented. Recently, various driver assistance systems have been actively developed that use both information communication technology and on-board sensors. Invisibility of traffic signal caused by huge vehicles blocking the view, prevent traffic congestion at toll gates and give advanced collision warning to the drivers. A microcontroller with a RF module will be installed and is programmed to each automobile passing by. Later it displays signal status on the traffic signal status display system installed inside the automobile. This system installed in the vehicle is also capable of giving collision warnings to the driver. IOT links the objects of the real world to the virtual world. It constitutes to a world where physical objects and living beings, as well as virtual data and environments, interact with each other. Urban IOT system that is used to build intelligent transportation system (ITS) has been developed. IOT based intelligent transportation systems are designed to support the Smart City vision, which aims at employing the advanced and powerful communication technologies for the administration of the city and the citizens. ITS uses technologies like near field communication (NFC) and wireless sensor network (WSN).Automation combined with the increasing market penetration of on-line communication, navigation, and advanced driver assistance systems will ultimately result in intelligent vehicle highway systems (IVHS) that distribute intelligence between roadside infrastructure and vehicles and in particular on the longer term, are one of the most promising solution to the traffic congestion problems.

Proposed System

The first and primary element of this system is the IR sensor and Node MCU microcontroller. Arrangement of IR sensor of 1 lane at two different position as for other lanes also. Which determines whether the vehicle is presence or not and ultimately send vehicle information to the microcontroller. Microcontroller sends real time data to the cloud and this data of cloud which will also see in the application i.e. traffic monitoring application shows that which signal is ON/OFF and also shows which lane having congestion. According to this it will be monitor and which lane having congestion that lane's signal get first priority and get more time. This system is based on vehicle count, we set a limit of traffic. When any lanes of traffic gets that limit of traffic congestion then that lane's signal start after which one signal is ON currently and clear the traffic congestion.
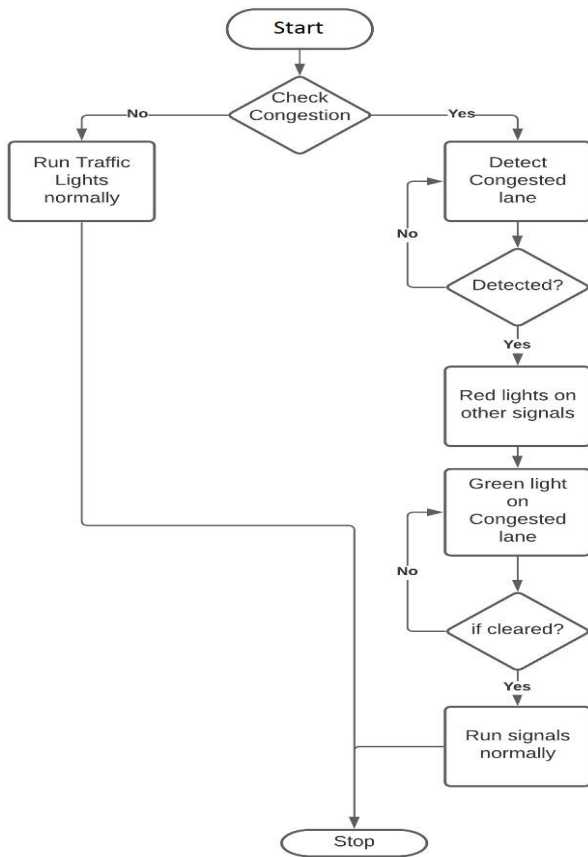
Conclusion

This project is designed for the proposed to reduce the huge traffic congestion easily and conveniently. The system can be also additionally reduces the work load of officers who would have to direct traffic in unexpected situations.

References

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