Smart Traffic Management using IoT

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ABSTRACT

In this work, we propose an IOT based automated traffic signal monitoring as well as a control system that automates complete traffic signalling system automation and also allows for manual override over the internet. The system uses Arduino based circuit system to monitor traffic signal densities and transmits this data to the controllers. We use IOTGecko to develop the online GUI-based system to monitor the traffic densities. The system shows current densities to help monitor traffic conditions on roads. Also, the system provides an option to the controllers to override any signal and make it green in case of any ambulance or important vehicles pass through while keeping other signals red. This puts forth a traffic signal monitoring and controller system that can be operated remotely over the internet from anywhere with manual override ability.

Keywords: Smart Traffic Management, Traffic monitoring, Traffic Controlling, IoT.

INTRODUCTION

The wide variety of motors on the street has risen dramatically in current years. Congestion is a growing trouble that everybody offers on an everyday basis. Manual site visitors managed through site visitors law enforcement officials have now no longer been established to be effective. A version is designed to efficiently clear up the above-noted troubles through the usage of the Internet of Things (IoT). A community of sensors is hired to hint at the number of motors and the site visitor's congestion on the intersections on a road, and rerouting can be primarily based totally on the site visitor's density at the route's lanes. The Internet of Things (IoT) is used in this study to create a system to manage traffic more effectively. In the modern troubles of the world, city mobility is one of the most important troubles, mainly in metropolitan cities. The purpose of this is to advise an Internet of Things-primarily based decentralized method to

optimize site visitors at the roads and to control and monitor the traffic and provide the path for specific emergency vehicles condition of emergency like an ambulance.

Key issue:

With the fast growth of the population, traffic monitoring and control has become a great challenge. Increasing vehicles creates lots of problems like...

- Time wastage.
- Fuel wastage.
- Air and sound pollution.
- Even death by getting stuck in emergency vehicles.

Problem Statement

Lack of efficient Traffic management to replace the faulty and inefficient system leading to congestion and critical emergency vehicles.

SYSTEM DESIGN AND DEVELOPMENT

This section discusses the proposed system model, different software and hardware components required, and algorithms to implement the proposed system. The proposed system model is presented in the Figure below, which has components installed at the roadside. The roadside setup includes sensors and signal boards. The sensors and boards will be installed between two road segment intersections.

Block Diagram :
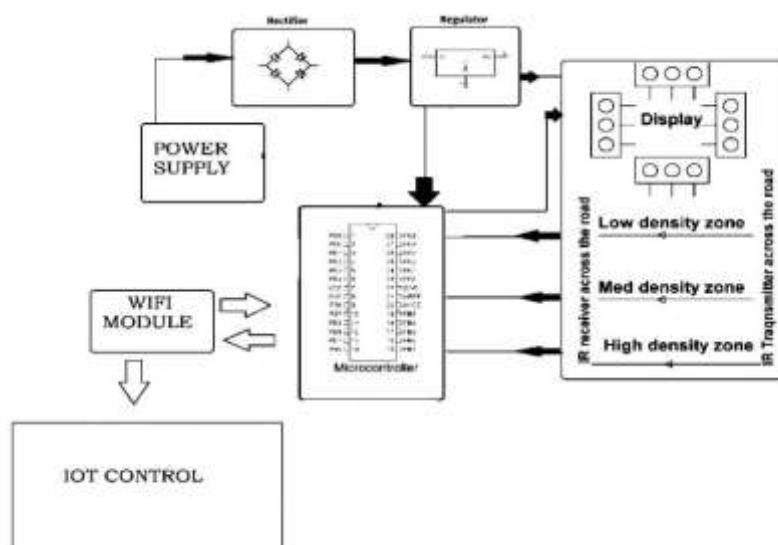
Hardware Specifications:

- ❖ Rectifier
- ❖ Regulator
- ❖ Power Supply
- ❖ LCD Display
- ❖ Wifi Module
- ❖ Led's
- ❖ Atmega 328 Microcontroller
- ❖ IR Sensors
- ❖ Resistors
- ❖ Capacitors
- ❖ Diodes

Software Specifications:

- Arduino Compiler

- IOTGecko to develop an online GUI based system

CONCLUSION & FUTURE WORK

Any city's livability and progress largely depend upon the traffic system. Therefore, the increase of vehicles with the rise in population will not be a matter at all if the smart traffic system is implemented using the IoT-based technique. Since the number of cities is increasing day by day, machine learning-based data-driven methods and AI can play a promising role in the integration and development of smart services in the presence of infrastructure lacking. Its growing facility inspires researchers to extend its implication to the overall lifecycle of the vehicle production system.

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