ABSTRACT

The density of Traffic has grown tremendously in the past few years and due to which lot of problems arises because of delay in traffic. So to avoid and overcome these problems the intelligent traffic control system to pass emergency vehicles smoothly is proposed in this paper. Each individual vehicle is equipped with special radio frequency identification (RFID) tag (placed at a strategic location), which makes it impossible to remove or destroy. We use RFID reader, NSK EDK-125-TTL, and PIC16F877A system-on-chip to read the RFID tags attached to the vehicle. It counts number of vehicles that passes on a particular path during a specified duration. It also determines the network congestion, and hence the green light duration for that path. If the RFID-tag-read belongs to the stolen vehicle, then a message is sent using GSM SIM300 to the police control room. In addition, when an ambulance is approaching the junction, it will communicate to the traffic controller in the junction to turn ON the green light. This module uses ZigBee modules on CC2500 and PIC16F877A system-on-chip for wireless communications between the ambulance and traffic controller. The prototype was tested under different combinations of inputs in our wireless communication laboratory and experimental results were found as expected.

Keywords: RFID, traffic, IR sensors, Max 232.

I. INTRODUCTION

Transportation via road is the most widely used mode of transport throughout the country and probably the world at large. Constantly, there is an increase in the number of vehicles annually and its corresponding increase in the number of road users. The need to maintain order on our roads inevitably becomes a matter of concern and that is where traffic lights have become a very important item on the menu of road users. Unfortunately, these traffic control systems that currently exist have out-lived their purpose and as a result, they cannot handle the number of vehicles on our roads today and the consequence of this is severe traffic congestion that exist in most parts of the cities in the country. One way to improve traffic flow and safety of the current transport system is to introduce automation and intelligent control methods to roadside infrastructure and vehicles. Transportation research has the goal to optimize transportation flow of people and goods. As the number of road users constantly increases, and resources provided by current infrastructures are limited, intelligent control of traffic will become a very important issue in the future. The main objective of this paper is to design an embedded system that operates along with image processing techniques to be implemented in a traffic light control system, which ensures a safe and efficient traffic flow. Techniques to be implemented in a traffic light control system, which ensures a safe and efficient traffic flow.

Fast transportation systems and rapid transit systems are nerves of economic developments for any nation. All developed nations have a well-developed transportation system with efficient traffic control on road, rail and air. Transportation of goods, industrial products, manpower and machinery are the key factors which influence the industrial development of any country. Mismangement and traffic congestion results in long waiting times, loss of fuel and money. It is therefore utmost necessary to have a fast, economical and efficient traffic control system for national development. The monitoring and control of city traffic is becoming a major problem in many countries. With the ever increasing number of vehicles on the road, the Traffic Monitoring Authority has to find new methods of overcoming such a problem. The measures taken are development of new roads and flyovers in the middle of the city; building of several ring such as the inner ring road, middle ring road and outer ring road; introduction of city trains such as the light rapid transit (LRT), and monorails; restricting of large vehicles in the city during peak hours; and also development of sophisticated traffic monitoring and control systems. Growing numbers of road users and the limited resources provided by current infrastructures lead to ever-increasing traveling times. One way to improve traffic flow and safety of the current transportation system is to apply automation and intelligent control methods to roadside infrastructure and vehicles [7]. Transportation research has the goal to optimize transportation flow of people and goods. As the number of road users constantly increases, and resources provided by current infrastructures are limited, intelligent control of traffic will become a very important issue in the future. The problems of typical conventional traffic light Controller are mentioned below:

A. A. Heavy Traffic Jam
With increasing number of vehicles on road, heavy traffic congestion has substantially increased in major cities. This happened usually at the main junctions commonly in the morning, before office hour and in the evening, after office hours. The main effect of this matter is increased time wasting of the people on the road. The solution for this problem is by developing the program which different setting delays for different junctions. The delay for junctions that have high volume of traffic should be setting longer than the delay for the junction that has low of traffic. This operation is calling Normal Mode.

B. No traffic, but still need to wait
At certain junctions, sometimes even if there is no traffic, people have to wait. Because the traffic light remains red for the preset time period, the road users should wait until the light turn to green. If they run the red light, they have to pay fine. The solution of this problem is by developing a system which detects traffic flow on each road and set timings of signals accordingly. Moreover, synchronization of traffic signals in adjacent junctions is also necessary.

A. Emergency car stuck in traffic jam
Usually, during traffic jam, the emergency vehicle, such as ambulance, fire brigade and police will be stuck especially at the traffic light junction. This is because the road users waiting for the traffic light turn to green. This is very critical problem because it can cause the emergency case become complicated and involving life.

B. Lack of Traffic Information to users
Present traffic systems fail to provide traffic information including congested roads and alternate routes available in case of congestion. In the proposed Intelligent Traffic Light Controller (ITLC) all these limitations of existing controller are eliminated. The proposed project of ‘Intelligent Traffic Light Controller’ uses embedded system (microcontroller 89C51) and has advantages of efficient control, GSM...
Radio Frequency Identification (RFID) is an IT system that transmits signals without the presence of physical gadgets in wireless communication. It is categorized under automatic identification technology, which is well established protocol. The working of an RFID system is very simple. The system utilizes tags that are attached to various components to be tracked. The tags store data and information concerning the details of the product of things to be traced. The reader reads the radio frequency and identifies the tags. The antenna provides the means for the integrated circuit to transmit its information to the reader. There are two types of RFID categories, active and passive tags. The tags that do not utilize power are referred to as passive and they are driven by an antenna that enables the tag to receive electromagnetic waves from a reader. On the contrary, active tags rely on power and they have inbuilt power sources that enable it to send and receive signals from RFID reader. RFID range depends on transmit power, receive sensitivity and efficiency, antenna, frequency, tag orientations, surroundings. Typically, the RFID range is from a few centimeters to over hundred meters. FID ciency, antenna, frequency, tag orientations, surroundings. Typically, RFID range depends on transmit power, receive sensitivity and efficiency, antenna, frequency, tag orientations, surroundings. Typically, RFID range depends on transmit power, receive sensitivity and efficiency, antenna, frequency, tag orientations, surroundings. Typically, RFID range depends on transmit power, receive sensitivity and efficiency, antenna, frequency, tag orientations, surroundings. Typically, RFID range depends on transmit power, receive sensitivity and efficiency, antenna, frequency, tag orientations, surroundings. Typically, RFID range depends on transmit power, receive sensitivity and efficiency, antenna, frequency, tag orientations, surroundings. 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presentations, surroundings. Typically, the RFID range is from a few centimeters to over hundred meters. RFID reader uses frequency 125 KHz with a range of 10 cm.

**Conclusion:**

In a world which has more number of vehicles than human, the Intelligent Traffic Management System proves to be more efficient than any other control system. Through this we can not only control the flow of traffic but also handle the cases emergency vehicles such as police vehicles, an ambulance, fire brigade, etc. Using this Intelligent Traffic Management System, stolen vehicle can also be detected with ease.

**REFERENCES**


