COMPACTNESS BASED TRAFFIC SIGNAL MONITORING SYSTEM

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Abstract— In this project a new approach for controlling Traffic System is designed. The proposed system uses a concept of Internet of Things. An intelligent traffic controller is designed with components like arduino uno, IR sensors. Arduino is the main component which is used to control all, it acts like a controller. Density of the traffic will be decided with the help of IR sensors. And in order to give Green path (Zero traffic) for emergency vehicles RFID technology is used. Along with this RFID is used to trail stolen automobiles too. The paper proposes control of system in 2 modes i.e. 'automatic' without any human introversion and 'manual' with human introversion. The model was tested and the outcome of model is as expected.

Keywords—**IOT devices, IR Sensors, Traffic Control, Traffic control monitoring system.**

1. INTRODUCTION

Traffic congestion becomes a serious issue in our day to day activities. It brings down the productivity of individual and thereby the society as lots of work hour is wasted in the signals. Then traffic jam, traffic congestions may result from roads being blocked, bad roads, accidents on the road, lack of proper traffic light system to control vehicles, inappropriate driving by road users etc. This would make the journey longer due to the slow movement of the traffic and increased queuing of vehicles. Because of the traffic problem, this project is an intelligent approach to control the traffic and provide a proper control over the signal lights. To make the signal intelligent we are using IR (Infrared) sensor. The main advantage of this system is that it decreases the waiting time for vehicles. As we know that time is the most precious thing nowadays, so many of people breaks the traffic set of laws just to reach on time to their destination. The existing traffic system needs to be upgraded to solve the severe traffic congestion problems. So here we propose a simple, low-cost, and real time traffic signal system that aims to overcome many problems and improves the traffic system. The system is based on PIC microcontroller that evaluates the traffic density using IR sensors mounted on either sides of each road and dynamic timing slots with different levels. Our system will be very useful for solving most of the traffic congestion problems occurs today.

2. COMPONENTS USED

A. Arduino UNO

As shown in Fig.1, the Arduino Uno [6] is a microcontroller board which is based on the ATmega328 series controllers and has an IDE (Integrated Development Environment) for writing, compiling and uploading codes to the microcontroller. It has 14 digital input and output pins (of which 6 are PWM) and 6 analogue inputs for communication with the electronic components such as sensors, switches, motors and so on. It also has 16 MHz ceramic resonators, a USB connection jack, an external power supply jack, an ICSP (in-circuit serial programmer) header, and a reset button. Its operating voltage is 5v, input voltage 7 to 12v (limit up to 20v) [6].

Fig. 1 Arduino UNO

B. Ir sensor

An infrared sensor is an electronic device that emits in order to sense some aspects of the surrounds. An IR sensor can measure the heat of an object as well as senses the motion. These types of sensors measures only infrared radiation, rather than releasing that is called as a passive IR sensor. Usually in the infrared spectrum, all the objects radiate some form of thermal radiations [4]. They are of two types: quantum and thermal. Thermal infrared sensors use infrared energy as the basis of heat and are independent of wavelength. Thermocouples, pyroelectric sensors and bolometers are the mutual types of thermal infrared detectors. The photosensitivity of quantum type sensors is wavelength dependent. Quantum type sensors are further classified into two types: intrinsic and extrinsic types.
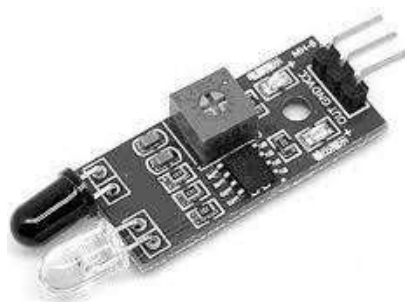

Fig. 2 ir sensor

C. LED(Light emitting diode)

Light emitting diode are semiconductor devices. Like transistors, and other diodes, LEDs are made out of silicon. What makes an LED give off light there are the small amounts of chemical impurities that are added to the silicon, such as gallium, arsenide, indium, and nitride. • When current passes through the LED, it emits photons as a byproduct. Normal light bulbs produce light by heating a metal filament until it's white hot. Because LEDs produce photons directly and not via heat, they are far more efficient than incandescent bulbs
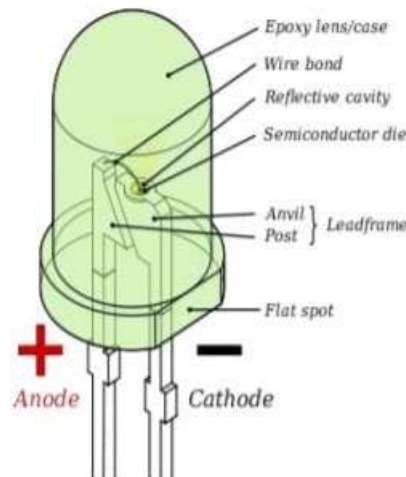
Fig. 3 LIGHT EMITTING DIODE

D. LCD DISPLAY

It is specially manufactured to be used with microcontrollers. It is used for displaying different communications on a miniature liquid crystal display. The model described here is for its low price and great capabilities, most frequently used in practice [9]. The devices made up of Liquid Crystal Displays (LCDs) like computers, digital watches and also DVD and CD players. They have become very mutual and have taken a giant leap in the screen industry by visibly replacing the use of Cathode Ray Tubes (CRT). CRT draws more authority than LCD and are also bigger and heavier. LCD's have made shows thinner than CRT's. Even while comparing the LCD screen to an LED screen, the power consumption is smaller as it works on the simple principle of blocking light rather than dissipating. Let us take a look at the occupied of an LCD.
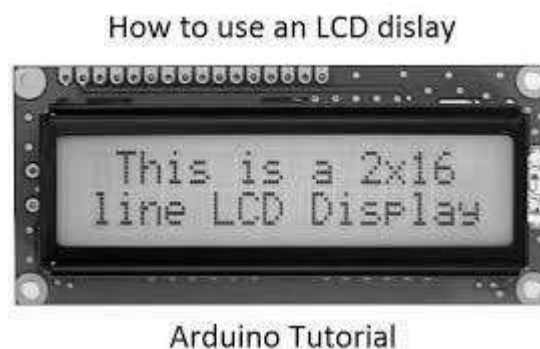

Fig. 4 LCD DISPLAY

E. Arduino IDE

The **Arduino   Integrated Development Environment**(**IDE**) is a cross-platform application (for Windows, macOS, Linux) that is written in functions from C and C++. It is used to write and upload programs to Arduino compatible boards, but also, with the help of 3rd party cores, other vendor expansion boards. The Arduino IDE maintenances the languages C and C++ . The Arduino IDE supplies a software library from the Wiring project, which provides many common input and output actions.

3. CONCLUSION

In this paper we have studied the optimization of traffic light controller in a city using Arduino and IR sensors. A traffic light system has been designed and developed with proper integration of both the hardware and the software. This interface is synchronized with the whole process of the traffic system. Automatically, this project could be programmed in any way to control the traffic light model and will be useful for planning proper road system.

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