

# Signaling and Vehicle Crossing Smart Intelligent System with Vehical Theft Detection

Mr. Ritesh Rajesh Gandhi<sup>1</sup>, Mr. Pratik Suresh Suryavanshi<sup>2</sup>, Mr. Musharraf Hussain Mulla<sup>3</sup>, Mr. Raghvendra Omprakash Singh<sup>4</sup>

<sup>1,2,3</sup>UG Student, Department Of Computer Engineering, G.M.V.I.T, Tala, Mumbai University

<sup>4</sup>Assistant Professor Department of Computer Engineering, G.M.V.I.T, Tala, Mumbai University

\*\*\*

**Abstract** - This project "Signaling and Vehicle Crossing with Smart Intelligent Sys- tem (SVCSIS)" aims at developing a fully functional computerized system to maintaining and alerting the oncoming vehicles , thus by reducing the road accidents. Though there are many different reasons behind Vehicle accidents, most accidents occur due to driver's unawareness and uncontrolled speed to overcome this problem we have designed the system which can reduce the accidents in the prone areas by alerting the drivers with the presence of oncoming vehicles. The system will make use of Infra-red Sensors to detect the oncoming vehicle on the main road which is 3-Path or T-shape. The whole system is based on the Arduino UNO which can be controlled or monitored automatically or manually. Also we are presenting a new approach to car theft detection and alerting system using RFID technology.

**Key Words:** T-shape, Arduino, Infra-red, RFID

## 1. INTRODUCTION

Vehicle accidents are considered one of the most destructive phenomena. Though there are many different reasons behind Vehicle accidents, most accidents occur due to driver's unawareness and uncontrolled speed. Also, there seems to be a problem reaching the spot of accident in time for lack of awareness. However with the advancement in the technology, different governing bodies are demanding some sort of computerized technology to control this problem of over speed driving. To rectify this unfortunate situation, we are proposing a Signaling and Vehicle Crossing with Smart Intelligent System that provides real time statics of traffic flow capable of detecting vehicle. This system can prevent dangerous accident which are caused near schools or colleges using smart IR detection system.

The overall project is divided into two categories

- Vehicle Detection, displaying LED signal.
- Vehicle Theft Detection and alerting using a buzzer.

The first part is managed by centrally controlled traffic signals and sensor regulates the flow of traffic. This reduces everyday congestion and accidents by smoothing traffic flows and prioritizing traffic in response to demand in real

time. Rather than timers, smart or intelligent sensor based traffic signals rely upon a system of sensors to detect when vehicle crosses the sensors. Then vehicle on other side of road is arriving at intersection then LED will be glow and oncoming vehicle will be alerted. This Smart signaling system is automatically as well as can also be controlled manually by the guard or respective person.

The second part is to ringing a buzzer when the vehicle is stolen. This part includes a RFID detector that senses the car theft, microcontroller and buzzer.

## Objectives

- To investigate the possibility of designing a simple, robust automated real- time traffic control system using low-cost electronic components that will easily be adaptable to the existing traffic conditions at the junctions, with minimal physical changes in the intersection.
- To investigate the workability and accuracy of electronic components.
- To provide practical solution that can be improved upon in future.
- It will help in reducing the occurrence of possible collision or accident and thereby improve the confidence of the driver.
- It will reduce human efforts and energy and reduce the accidents.
- To prevent theft of vehicles by alerting the security guards.

## 2. HARDWARE SYSTEM

This project aims at developing a fully functional computerized system to maintaining and alerting the oncoming vehicles, thus by reducing the road accidents. This project has many features which safely crosses the vehicle across the road, thus by reducing the possibilities of endangered highway touched school or colleges , or any nearby hospitals, and any places like 3- way(T-shape) road.

## 2.1 Existing system

Traffic Signal Control Systems (TSCS) have played an important role in traffic management throughout the world, especially in big cities. However, there is still no effective method to evaluate their performance and reliability. In this type of traditional system the signaling depends only on timer, this results in heavy traffic. And also they don't have any sensors for detecting the vehicles, thus by causing the measure accident at the crossing(3-way).

## 2.2 Components

- Arduino
- IR sensors
- RFID card and reader

**Arduino** - The Arduino UNO is an open-source microcontroller board based on the Microchip ATmega328P microcontroller. The board is equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits. The board has 14 Digital pins, 6 Analog pins, and programmable with the Arduino IDE (Integrated Development Environment) via a type B USB cable. It can be powered by a USB cable or by an external 9 volt battery, though it accepts voltages between 7 and 20 volts. "Uno" means one in Italian and was chosen to mark the release of Arduino Software (IDE) 1.0. The Uno board and version 1.0 of Arduino Software (IDE) were the reference versions of Arduino, now evolved to newer releases. The Uno also differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it uses the Atmega16U2 (Atmega8U2 up to version R2) programmed as a USB-to-serial converter.

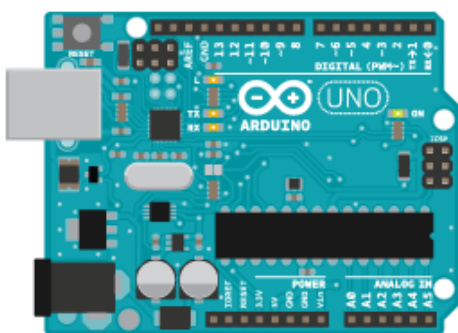


Figure 1 Arduino UNO

**IR Sensor** - An infrared sensor is an electronic device, which emits in order to sense some aspects of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion. Usually in the infrared spectrum, all the objects radiate some form of thermal radiations. These types of radiations are invisible to our eyes, that can be detected by an infrared sensor. The emitter is simply an IR LED (Light Emitting Diode) and the detector is simply an IR photodiode

which is sensitive to IR light of the same wavelength as that emitted by the IR LED.

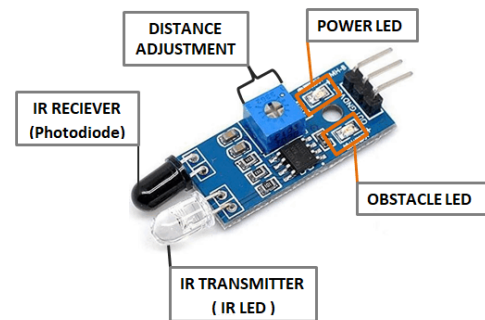


Figure 2 IR Sensor

**RFID card and Reader** - The use of Radio Frequency Identification (RFID) technologies is growing. Many different applications are implemented in various sectors, and used for very different purposes. RFID enables wireless data collection by readers from electronic tags attached to or embedded in objects, for identification and other purposes. The reader transmits radio frequency when powered ON. When the tag is placed near the reader, the RFID tag will receive the radio frequency via the antenna inside tag. The radio frequency received will be converted into electrical power that is enough for the tag to transmit the data back to the RFID reader. Further, the reader will transmit the tag ID to the external device by serial communication.



Figure 3 RFID Reader

## 2.3 Construction

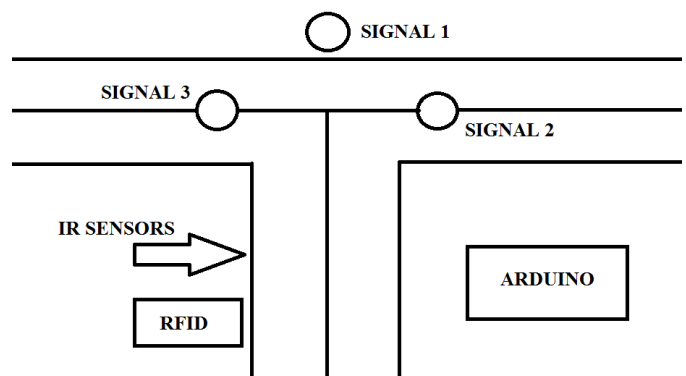


Figure 4 Construction

Signal 1 is for the incoming road from the T section while signal 2 and signal 3 is for the main road. The IR sensors detect the presence of the car. RFID reader reads the card ID number. The data of card number and card presence is sent to arduino. The arduino checks the card number and compares with preset number entered for stolen vehicle. If the stolen vehicles is identified is does not makes signal 1 green and also rings a buzzer.

### 2.4 Working

#### No car Present at T-section -

If there is no car turning to main road, then the signal 1 is kept red and signal 2 and singal 3 are made green to allow normal working of road.

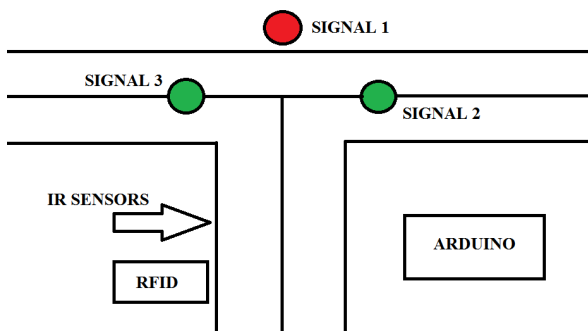


Figure 5 No Car at T-section

#### Normal Car at T-section -

If a normal car comes from T-section then IR sensor senses it. Arduino checks the ID number and if is does not matches the preset stolen ID then it makes the signal 1green and makes signal 2 and signal 3 red.

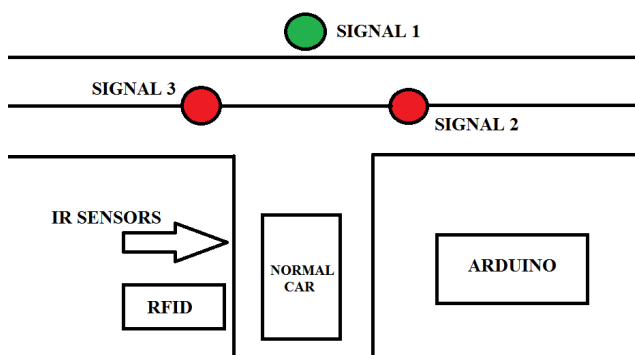


Figure 6 Normal Car at T-section

#### Stolen Car at T-section -

If Arduino identifies a stolen car at T-section, it keeps signal1 red and signal 2 and 3 green. It also rings a buzzer so that the guard comes to know about stolen car.

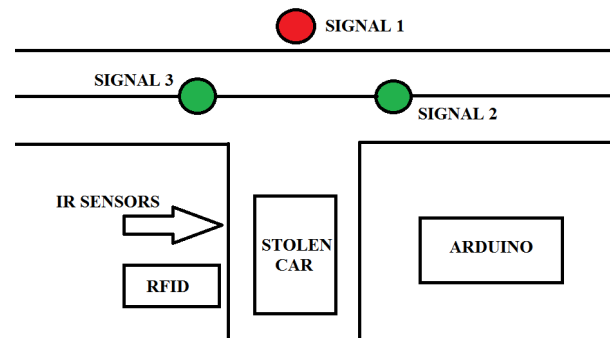


Figure 7 Stolen car at T-section

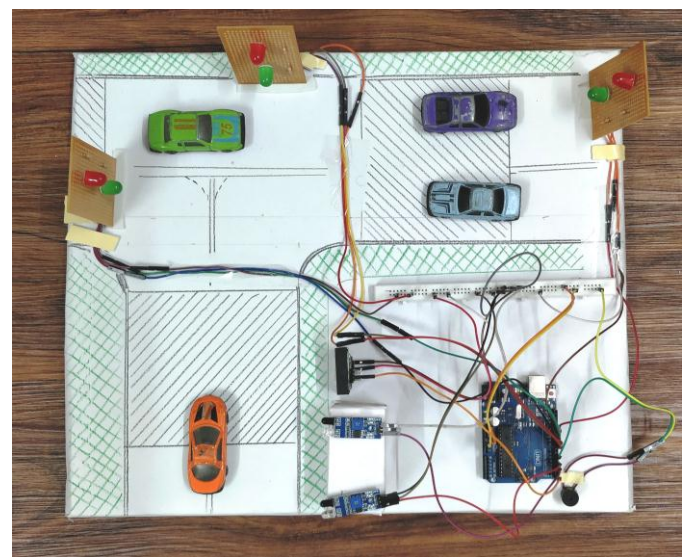


Figure 8 Actual Model

### 3. CONCLUSION

There is exigent need of efficient traffic management system in our country, as India meets with 384 road accidents every day. To reduce this congestion and unwanted time delay in traffic an advanced system is designed here in this project. With field application of this technology, the maddening chaos of traffic can be effectively channelized by sensing the presence of vehicle at T-section and allowing it to pass by making corresponding signal green. Also RF Reading device placed near by the road will read the card details and automatically validate card details. If any mismatch found the system will automatically ring a buzzer. We have successfully implemented the prototype at laboratory scale with remarkable outcome. The next step forward is to implement this schema is real life scenario for first hand results, before implementing it on the largest scale. We believe that this may bring a revolutionary change in traffic management system on its application in actual field environment.

**REFERENCES**

- [1] Intelligent Traffic Signal Control System Using Embedded System by Dinesh Rotake and Prof.SwapnilKarmore, Innovative Systems Design And Engineering, ISSN 2222-1727 (paper) ISSN 2222-2871 (online), Vol. 3, No. 5, 2012.
- [2] Priority Based Traffic Lights Controller Using Wireless Sensor Networks by Shruthi K R and Vinodha K, International Journal Of Electronics Signals And Systems (IJESS) ISSN: 2231- 5969, Vol-1 Iss-4, 2012
- [3] A. Chattaraj, S. Chakrabarti, S. Bansal, S. Halder and A. Chandra –An Intelligent Traffic Control System using RFID||, IEEE Potentials, vol. 28, no. 3, May-Jun. 2009, pp. 40-43.
- [4] Chong hua Li –Automatic Vehicle Identification System based on RFID||, Anti-Counterfeiting Security and Identification in Communication (ASID), 2010, pp 281-284.
- [5] International Journal of Innovative Research in Science, Engineering and Technology Volume 3, Issue 3, March 2014 Density Based Traffic Signal System by K.Vidhya, A.BazilaBanu.
- [6] Intelligent Cross Road Traffic Mangement System(ICRTMS) by Ahmed S Salama, Bahaa K Saleh and Mohamad M Eassa submitted at the 2nd International Conference on Computer Technology and Development(ICCTD 2010) in the year 2010.
- [7] Shilpa S. Chavan, Dr. R. S. Deshpande & J. G. Rana (2009) "Design of Intelligent Traffic Light Controller Using Embedded System" Second International Conference on Emerging Trends in Engineering and Technology.