An Intelligent Auto Traffic Signal Controller For Emergency Vehicles

Akash Bhan[1], Manas Mahajan[2], Harshit Khandelwal[3], Shreyash Wetal[4]
[1, 2, 3, 4] Dept of IT
[1, 2, 3, 4] Pimpri Chinchwad College of Engineering, Pune-411044, India

Abstract- *According to the existing scenario, we all know that traffic has been hindering our daily lives and of course, the emergency services of the country to a large extent. This is an issue of great concern because each minute delayed can unleash human lives. Be it an ambulance or even the fire brigade. The millennial s or even the Generation, at times, fail to recognize that these services are way more crucial than our occupied work schedules or pastimes. Hence, the need arises. We needed something that can filter these issues effectively and at the same time not cause any constraint to the local populace. So, we came up with an opinion that we could use the traffic signals and the vehicles of the respective emergency services as our model of the undertaking. If we fix IR sensors to the traffic signals as well as the respective vehicle, making decent use of the technology, other lanes could be blocked and the road where the help is coming from, be allowed movement. Therefore, releasing the jam and making it easier for the service to reach the desired. This strategy, as far as I can tell, can help us to a substantial degree*

Keywords- IR Sensors, IR Transmitter, IR Detector,Arduino,

I. INTRODUCTION

Traffic congestion is one of the major problems, the world is facing today. Traffic monitoring and controlling is a difficult task. The major cause leading to traffic congestion is the high number of vehicles which was caused by the population and the development of the economy. At times, road work and accidents further influence the complexity. Hence, traffic light optimization is a complicated process. Even for single junctions there might be no obvious solution and the problem becomes even more complex for the multiple junctions, as the state of one light in one junction directly influences the flow of traffic towards many other lights. With the ever-increasing vehicles on the road and the number of road users, the limited resources provided by current infrastructure lead to ever increasing travelling time of emergency vehicles

Hence, an intelligent control of traffic is an important issue to be considered. The Traffic Monitoring Authority need to find new methods of overcoming this problem like construction of new considered. The lanes for emergency vehicle and also development of sophisticated traffic monitoring and control systems. One way to improve the traffic flow so that we can save more life by reducing the wastage of golden period. Avoiding conditions of extreme traffic jams is highly important in the current situation.

There are several models for traffic simulation to make ways for emergency vehicle in our research, we have developed a cost-effective system using sensors and Arduino [1] to achieve the desired results. The primary objective of this proposed project is to identify the road with emergency vehicle if any. And turn the green light on of that particular lane so the emergency vehicle can pass through as soon as possible. The system contains IR transmitter and IR receiver which are mounted on the either sides of roads respectively. The IR system gets activated whenever a vehicle passes on road between IR transmitter and IR receiver. IR system is controlled by the micro-controller. Conventional technologies for identifying the emergency vehicle use the transmitter in the fitted in the emergency vehicle. In Introduction you can mention the introduction about your research

II. EXISTING SYSTEM AND IT'S DEMERITS

- Currently there is no technology for making a clear path for emergency vehicle. As the current system is control manually there is loss of life in golden hours. In present manual traffic control framework is used in numerous signals of India.
- The patient has to depend on mercy of the people in traffic to give him the way to hospital.
- Due to such traffic jams many times fire brigade gets delayed to reach the location of the fire which results in loss of life and property.
- Due to the limitation of existing system emergency vehicle get stuck in traffic which results in loss of lives and resources

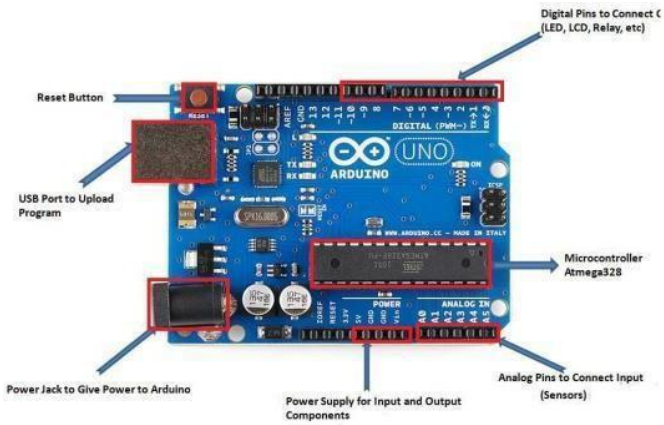
III. PROPOSED SYSTEM

- To overcome the drawbacks of existing system we will implement a new system.
- In this system, traffic clearance is done by turning Red signal into Green signal.
- In this system we Use IR Emitter which is present in an IR Sensor on the emergency vehicle and the signal.
- If the emergency vehicle is nearby signal the IR Sensor Will send the commands automatically to the signal.
- If Red signal is on, and IR sensor activated system will send command to turn it green.
- After few minutes the signal will come to its normal state by the program installed in Arduino.
- This is unique system which facilitate good solution to solve traffic issue for emergency vehicles.
- This mode is specially designed for making emergency vehicle a smooth way to reach hospital without any time lag. To mark its importance, we have given a blue indicator additional to the normal three indicators red, yellow and green

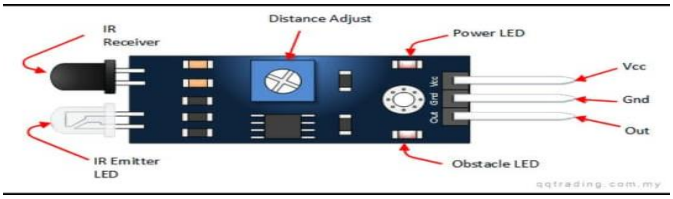
IV. COMPONENTS

1. ARDIUNO:

Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs like light on a sensor and turn it into an output like turning on an LED OR Display the Output of the Code which is Installed in its Software.



2. IR SENSOR:



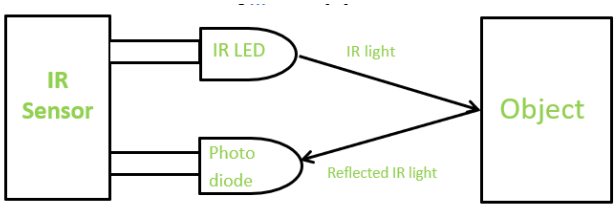


Fig 3 : Block diagram of IR Sensor[12]

- As shown in **Fig 2** and **Fig 3** the Ireled (white led) emits Ire light which is reflected by the object and then it is been received by the photo diode.
- IR sensor is a simple electronic device which emits and detects IR radiation.
- It Mainly Contains 2 parts - IR Emitter and IR Receiver. Emitter acts as a Source of Radiation and it Can be Sent as a Signal or a Command. And Receiver receives the radiation hence it is also called as IR detector and it can be used to Detect the Radiation sent by IR Emitter as A Signal or A.

V. METHODOLOG

1) EMERGENCY VEHICLE UNIT

- For implementation of this project, Emergency vehicle unit should be installed in every Emergency vehicle.
- It consists of Arduino sensor and connection to the battery of the emergency vehicle.

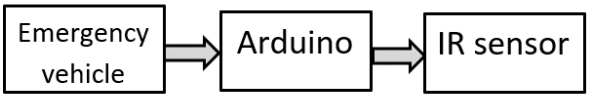


FIg 4 : Block diagram of Emergency vehicle unit

2) TRAFFIC SIGNAL UNIT

- For implementation of this project, Traffic signal unit should be installed in every signal.
- It consists of ArduinoSensor, which is connected to the power source of the signal and the traffic light.

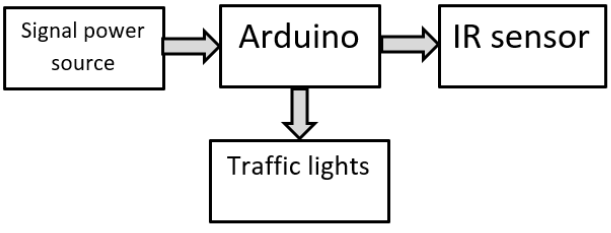
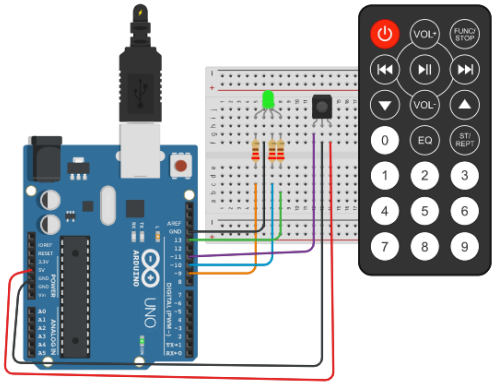


FIG 5 : Block diagram of traffic signal



As shown in the above fig the remote act as a ambulance unit and the Arduino act as a signal unit.

VI. BENEFITS

1) Ire sensor system helps at saving a large amount of man time caused by traffic problems and accidents.
2) It is also able to manage emergency tag vehicles.
3) In case of any sort of accident this system will let the emergency vehicle reach the hospitals on accurate time.
4) It will further help to regulate the traffic so the waiting time of the driver can be reduced.

VII. CONCLUSION

1) This system will help to detect an emergency vehicle and will change the traffic lights accordingly so that it can pass through and will save considerable time which would be a live saver for that person.
2) Therefore, the system would be efficient enough to detect accidents automatically and will provide a wide way to emergency vehicles so that they will reach out their destination in the least amount of time without getting stuck at a traffic intersection.