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### Retraction: Smart Traffic Assistance System for Ambulance Vehicles using Internet of Things (*J. Phys.: Conf. Ser.* **1916** 012127)

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IOP Publishing respectfully requests that readers consider all work within this volume potentially unreliable, as the volume has not been through a credible peer review process.

IOP Publishing regrets that our usual quality checks did not identify these issues before publication, and have since put additional measures in place to try to prevent these issues from reoccurring. IOP Publishing wishes to credit anonymous whistleblowers and the [Problematic Paper Screener](#) [1] for bringing some of the above issues to our attention, prompting us to investigate further.

[1] Cabanac G, Labbé C and Magazinov A 2021 arXiv:[2107.06751v1](#)

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# Smart Traffic Assistance System for Ambulance Vehicles using Internet of Things

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**Abstract.** The traffic lights also referred to as traffic signals are used to provide assistance in controlling city traffics and streamlining the present traffic situations. The traffic lights are used since 1868. They are employed by traffic sergeant to avoid congestion and to concern about the right flow of traffic in cities. As years passed, these lights are evolved with automatic controls, pedestrian supporters and so on. There are several standards followed in implementation and design. The intelligent traffic light controller is designed to develop a traffic signal based on avoidance of traffic congestion and also innovative control to clear the traffic for emergency vehicle. The ambulance would have a transmitter within it, which would transmit a signal to the receiver side, this will enable green signal in the corresponding pole. The light of the signal is controlled by automatic timers which are built in by discrete components. Arduino boards are used to control the automatic timers. This module helps to save the lives of many people as well as to avoid congestion.

**Keywords:** Ambulance, Arduino, Internet of Things, Traffic control, Congestion, Infrared sensor.

## 1. Introduction

At present, the world is developing at a very high speed. Due to large number of population the usage of vehicles also increased on the roads due to Industrialization and Urbanization. This results in roadblocks in big cities. Traffic-jam causes a lot of severe effects on transportation. The ambulance service is the most affected one in traffic congestion. There may be emergency or critical patients in an ambulance who needs immediate medical care and to be taken to the nearby hospital as early as possible. The appropriate treatment to the patient will be provided as soon as the patient reaches the hospital so that chances of living increase in serious conditions. Many lives will be lost if the time taken by the ambulance to reach the hospital is high. Based on the surveys, the heart attacks can be treated in 95% of the cases, if there is no delay by the ambulance and reaching the hospital without any traffic issues at correct time.

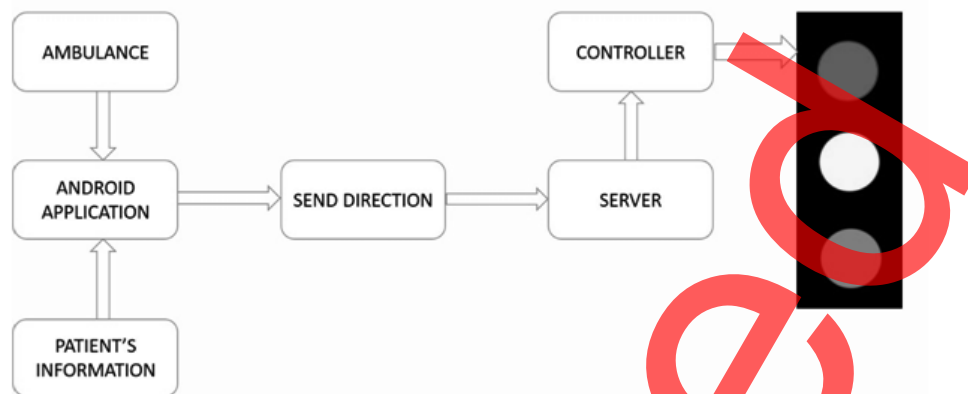
It is very essential to provide way for the ambulance. If the ambulance gets stuck in the traffic sometimes, it wastes a lot of time and results in loss of lives by waiting for the traffic to get cleared. We can overcome these problems by the upcoming technology like IoT i.e., Internet of Things. All the components are connected and the internet controls them in IoT. Thus, the influence of IoT in today's world is very significant as it helps in many ways to solve issues. It is proposed a way to control road traffic signals by designing Golden aid. The traffic light is controlled on as the ambulance reaches



closer to the intersection and as soon to manage is restored to the correct signal make up for value again the ambulance passes the certain signal. By implementing the IoT-based devise of the system, it can be illicit almost anywhere from making it globally comfortable and enhancing responsiveness. It can be used in situations such as traffic jams, management of emergency situations, VIP escort etc. Therefore, the system raises the chances of safeguarding many lives. An ambulance rescue system using GSM (Global System for Mobile Communication). GSM provides the information about the accident spot to the ambulance part and the timer will produce noise if there is an indication of accident. The central unit finds an emergency vehicle, which is close to the scene of the accident and the direct distance between the view of the accident, an ambulance and a nearby hospital. For data transmission, wireless technology is used. When the ambulance reaches the traffic intersection, the encoder converts the sequential in order into the corresponding information as it pass from the sender to the recipient [1,2]. When the signal is lost, it automatically changes to green. The decoder in the recipient component converts the same data into sequential data when it is recovered. This helps the ambulance to cross the intersection of the vehicles very quickly.

The prioritized traffic switching is done main concern wise, i.e., if two ambulances arrive at the same occasion, the earliest arriving ambulance will be given the first preference to cross the junction before the another ambulance reaches the occasion. Traffic Signals based on density with Innovative Clearance for Ambulance is proposed for the control of traffic systems. At normal times, the time of traffic signals changes automatically by finding the intensity at the interaction. Getting closer to an ambulance would have an android device that could set the time limit that triggers the green signal immediately on the desired side while blocking other routes with a red signal for a while. The Microcontroller AT89S52 is the brain that initiates the road signal in an organization. The LED is turned off and on automatically by making changes in the corresponding port pin of the microcontroller. Suddenly it the other lights turn red and have one green light only. During the change of signal from green to red, the current yellow led group and the succeeding group led changes to green. This process extends as a cycle. IR sensors are used for line-of-sight configuration to detect the density of traffic in a road signal. The number of vehicles is measured are properly controlled by timings. Clearance is activated by Bluetooth powered by android device in emergency vehicle. From the IR traffic information, it is allocated a maximum time for congested road. Traffic Congestion is a big issue on a day-to-day basis. In India currently Automation systems are not available. The traffic signal control systems need the usage of IoT [3,4]. The system is configured using Infrared sensors, microcontroller for automation control with Bluetooth controller, Android mobile device and PC-server. The Monitoring System in traffic uses various IRs in the IoT model which is used to take in real-time vehicle counting and update robotic signal time according to forecasting method using KNN technology. Therefore, congestion will be removed depending on the number of vehicles to increase or decrease the time for certain signals using data analysis by the KNN algorithm [5-8]. An emergency vehicle management system is proposed by automatically controlling road signs and access to the hospital using effective traffic management, so that the ambulance can cross all sections of the road without waiting. The server keeps a database of emergency vehicles and nearby hospitals for easy access.

The emergency vehicle is directed to the hospital by a server with a very short route. The proposed plan consists of five parts; vehicle unit, server station, ambulance unit, hospital unit and traffic control system.



**Figure. 1** Block diagram of traffic control system

The component which is installed in the vehicle detects the location of the accidental area and sends location to the main server. The main server finds the ambulance nearby accident spot and the less distant route between the emergency vehicle and the spot of the accident. When an ambulance arrives at the spot of the accident, the patient is rescued and a shortcut is made to the hospital with the help of a server station. At the same time the basic parameter of the patient is known within the ambulance itself and transferred to the hospital. Also, the ambulance creates a signal to inform the traffic on its way, before arriving at the traffic location. This will provide a clear way for an ambulance to reach the hospital in less time. Wireless technology is used to transfer data from one unit to another unit effectively. Figure 1 shows the proposed block diagram of the project. The patient's information is fed into the android application whenever the emergency vehicle reaches the accident location. Depending on patient's situation driver sends direction via android application to the server. The controller controls the traffic signals based on the command obtained from the server.

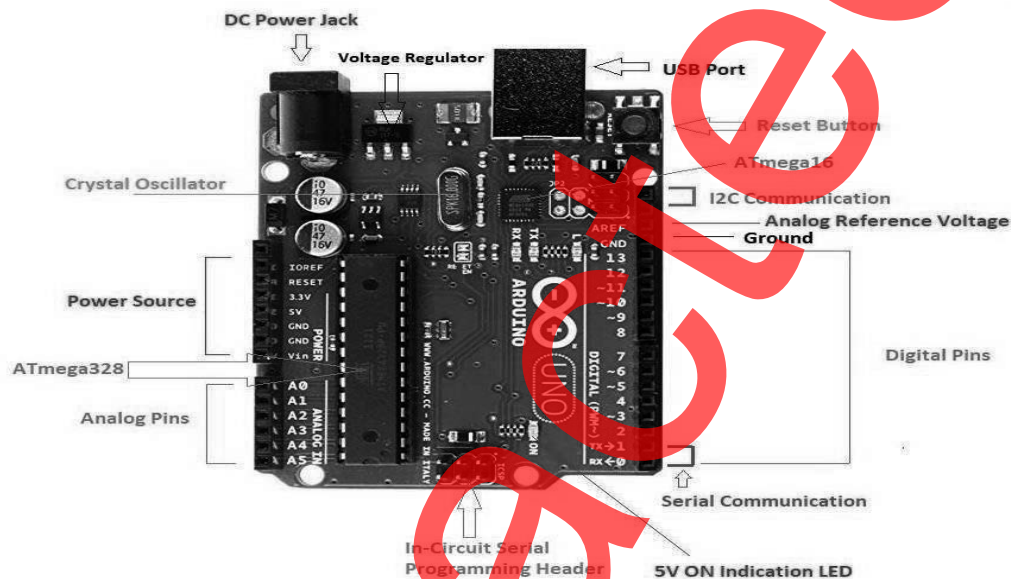
In the proposed model, the system is divided into two parts. First part consists of an android application which is the software module. Second module is the traffic signal implementation which is the hardware module. Android application is the first module. Whenever the emergency vehicle reaches the accident spot, the driver of the emergency vehicle will provide the patient's information in the application first which consists of patient's information such as name, blood group, gender, age and the current condition of the patient like whether it is serious or not based on various tests reports like Electrocardiogram, blood pressure, etc. This reports and information will be provided to the server in the hospital so that the staff in the hospital can be ready with the requirements required to the patient. Then, depending on condition of patient, the vehicle driver will send emergency or non-emergency message via android application to the server. Second is the hardware module of traffic control implementation. In hardware, Arduino is used for controlling traffic signal. It consists of Wi-Fi module. With the help of Wi-Fi module, information is captured from the server. By using this Wi-Fi module, the android application is directly connected to the traffic signal.

## 2. Ambulance Assist Traffic Control System

### a) Arduino UNO

Arduino Uno is a microcontroller board which is based on ATmega328. The board has fourteen (14) digital inputs / output pins (6 can be used as PWM outputs), six (6) analog inputs, 16 MHz quartz crystal, USB connection, power jack, ICSP header, reset button and is shown in Figure 2. It contains everything needed to support a microcontroller; simply connect it to a computer with a USB cable or by power. If a voltage higher than 12V is supplied, the board can be damaged due to overheating of

the voltage regulator. The range of 7 to 12 volts is recommended. 32 KB flash memory is available in ATmega328. Also, it has 1 KB of EEPROM and 2 KB of SRAM. The Uno is different from all previous boards in since FTDIUSB is not used to make a serial driver chip. Rather, it features ATmega8U2 configured as a USB to serial converter. "Uno" refers to one in Italian and was chosen to mark the release of Arduino 1.0 software. The Uno and version 1.0 will be the most reliable versions of Arduino, going forward. The Uno is the latest in a series of USB Arduino boards, as well as a reference model for the Arduino platform.



**Figure. 2** Arduino UNO

#### *b) Infrared Sensor*

Infrared technology has been utilized in day-to-day life and in industry for a wide range of purposes. For example, IR sensor is used in televisions to detect signals transmitted from a remote. The advantages of Infrared sensors are their less consumption of power, simple structure and simple features of them. An IR sensor is an electronic device. IR sensor can measure an object's heat and helps to detect movement. The active system of the infrared sensor is the same as that of the receiving object. This IR sensor incorporates an IR LED and an IR Photodiode. IR LED is a type of transmitter that emits IR radiations. The LED seems very much similar to a normal LED and the rays produced by this are invisible to the eyes of human beings. IR receivers receive most of the radiation using an IR transmitter. These kind of IR receivers are available in photodiode form. Infrared Photodiodes are different from conventional photodiodes in that they receive simple IR rays. Different types of infrared receivers exist mainly depending on the voltage, wavelength, packet, etc. If used by combining a transmitter and an IR receiver, then the length of the receiver should be same as that of the sender. The IR photodiode responds to infrared light generated by infrared LED. Photo-diode resistance and variation in output power is proportional to the IR light obtained. This is the basic operating system of the IR sensor. The conventional incandescent lamps have been already replaced by LEDs in traffic signal applications due their advantages such as high efficiency, less consumption of power and long-lasting life. Both high brightness & high-power LEDs are used by LED Traffic signals and LED clutter is formed from parallel and series combinations. An extra optical design (lenses) is required for finding specific luminous distribution intensity. An AC-DC circuit is required to convert AC to DC power if the signals in traffic are driven by AC power, that is suited for LED driver to drive LED cluster as represented in Figure 3. To establish the control over LED driver MCU unit is used to give correct traffic signals. This is a mini-LED traffic light display module with more



brightness, highly suitable for the implementation of traffic light system model. The features of LED Traffic Signal light module include simple wiring and small size.



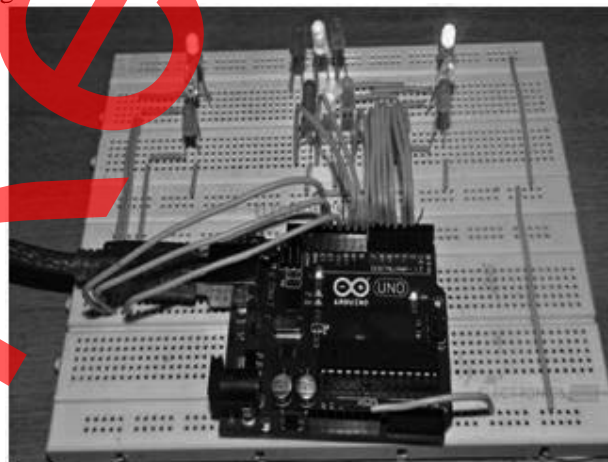
**Figure. 3** LED Traffic Signal light module

### 3. Results and Discussion



**Figure. 4** Locating the nearest hospital after sending information to the controller

Figure 4 shows the direction in locating the nearby hospital in the android application. The information fed by the emergency vehicle driver in the android application is sent to the hospital and the controller. If there is any traffic, the controller will clear the traffic and the shortest path will be chosen to reach the nearby hospital. For the validation the entire system is assembled as a prototype model as represented in Figure 5.



**Figure. 5** Experimental setup of ambulance assisted traffic control system

#### 4. Conclusion

The congestion issue in roads is obviously a serious problem that worries people and authorities. The impact of existing traffic system affects the health, economic, environmental domains and finance since it is less efficient. The less efficiency in monitoring may result in congestion, traffic jams and accidents. Due to the emerging of technologies and less of control devices, appliances and sensors, the capability to build user-friendly smart and intelligent control systems in order to solve congestion problems. By this proposed method, the ambulance can reach a particular spot without having it to halt anywhere until the location is reached. Thus, this system solves the problems of traffic congestion and it acts as a life saver. In future, it can be implemented using solar power. It can improve the efficiency of road networks to a higher extent, lower the costs involved in traffic operations, avoid road blocks at intersections, reduce the consumption of energy and emissions.

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