Avoidance of Fire Accidents on Running Buses by using IoT Smart System

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Abstract:

At present days the accidents that occurring with fire has became most problematic in transport vehicles. Which is leading to large disaster to human life's so in order to reduce these fire accidents a new methodology must be emerged which must be sensed by a device which is connected to proper gps system with internet. The main objective of our system is to find the fire accidents and inform to nearby fire authorities that is been linked with transport, the process which we proposed in this is that a sensor that detect the fire crash and accidents while we are moving in the buses or any other transport …etc, A module that has been connected to a module through longitude and latitude with sensor alarms. At last the data has been has discharged through the sensor to the available nearby fire departments or stations which follows a archetype.

Keywords: fire accidents, internet of things (IoT), node MCC, Gps, Buzzer

1. INTRODUCTION:

Our country places second position in population emerging it's been increasing further .so the main mode of transportation here is by buses or some other vehicles are used for transportation. As government and private sectors are been included in transportation but the secure to the life of people is been provided in the government sectors that may be concern to the accidents or fire accidents that may occur while traveling, in concern to the fire accidents so the fire extinguishers are placed in vehicles to rescue the human lives.

Every people read the news daily, and the news is about fire accidents. Recently in Warangal lorry and Fuel tank hit with each other two people burnt alive in 2019 January. Such kind of accidents happens it is huge loss to the family and government also. Like India in many other countries also fire accidents are happens frequently. Occurs in AC Buses because it is closed completely, and passengers require more time to rescue their lives. So our intention is to prevention is better than cure. to avoid fire attracts in buses we advise and design a system Using IOT.

Figure 1: Buses caught in fire

Figure: School bus catches fire

In our days news forwarded easily by the internet. Where we can able to find the solutions by using internet.

IOT uses absolutely connected devices and the systems to control the information collected by a embedded sensors. When fire attacks occurs the machines will mechanically communicates with help of network, so we can avoid the human lives loss and government property loss. So, prevention can be done for the loss of humans and as well as property. In our paper we are going to propose a device which mechanically observes to avoid human misfortune too property misfortune.

The system consists of Node MCU module, which bond GPS module, fore sensors and water sprinklers and alarm module. The information from these sensors force to set in motion the node MCU which thus actuates the, alert framework, water sprinkler framework, and GPS[3] module it will consequently shares area to cloud.

In today's world everything are often well-known to America by exploitation web. we are able to solve the matter by exploitation the web [2]. IOT refers to the utilization of showing intelligence connected devices and systems to leverage information gathered by embedded sensors and actuators in machines and different physical objects. once accident had happened the device mechanically shares the message to the hearth stations with facilitate of web, thus we are able to forestall the human loss and property loss. During this paper we tend to are style a tool that mechanically monitors to stop the human loss moreover property loss.

The device contains Node MCU module, which connect the device contains Node MCU module, which connects fire sensors, GPS module and water sprinklers and alarm system. The data from these sensors will activate the node MCU which in- turn activates the, alarm system, water sprinkler system, and GPS [3] module it will automatically shares location to cloud.

2 LITERATURES OF EXISTING METHODS:

There are several methods to avoid fire accidents and to reduce the severity of loss in case of fire accidents in public transport system. The existing method consists of fire extinguishers, and when fire is detected all the humans will use fire extinguishers shown below in figure 2 and they must break the glass of emergency door. And people must inform to police stations and fire

Figure 2: fire extinguisher

Information could not reach at right time due to improper communication. Preventive measures are to be implemented by human intervention only. It takes more time to implement preventive measures manually. Automotive industry has designed a standard Fire Detection and Alarm System (FDAS) &Fire Detection and Suppression Systems (FDSS) for Buses of Type III. Whenever the fire is detected it activates the alarm.

3. IMPLEMENTATION:

The block diagram of the proposed method is shown in figure 3.the proposed idea consist of a fire detector, buzzer, water motor, and a GPS module are connected to the controller which continuously monitors the whole vehicle automatically when the engine turns ON and it will be OF in state when engine turns OFF.

When the surroundings value crosses the rage of fire detector the design comes active state if fire detected. Our proposed system consists of a design which gives an alert to passengers and the person who is driving by alarming, water sprinkled and the locations of longitude and latitude can be shared automatically to the fire and police stations and nearby hospitals by using GPS modules [4]. By this human loss can be reduced.
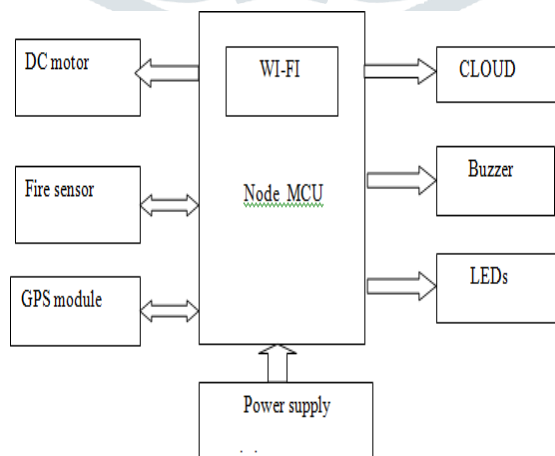

Figure. 3: Block diagram

The Node MCU comes into active state when the power is supplied to it. It is supplied or given by using usb cable. GPS module and fire sensors are connected to the Node MCU [5] and node MCU contains a inbuilt and by using hotspot Wi-Fi is connected. In which the data is collected from the sensor and by using GPS module the location will be shared, the buzzer and water sprinkler system will comes in to active state automatically

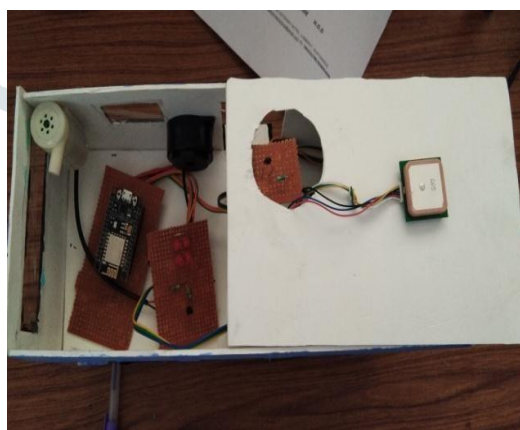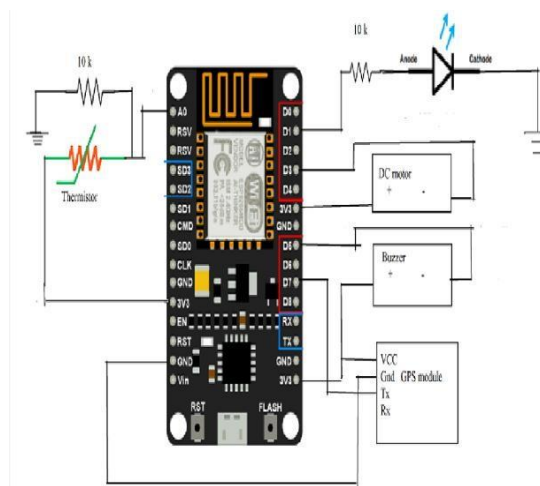**4.HARDWARE IMPLEMENTATION OF THE PROPOSED SYSTEM:**

Figure 4: implementation of hardware

We implemented a design that prevents the fire accidents on running vehicles or buses. The design consist of node MCU, Fire sensor it detects fire, DC motor for water sprinkler system and GPS module to send the location and buzzer to produce the sound.

The main component of our design is node MCU which act as a controller and it is connected to a bread board. The power to node MCU is supplied by using USB cable. it Mainly detects the fire and a sensor we have used thermistor is used to detect the fire. The working of thermistor is, when there is a smoke or fire on the surroundings it will detects. the water sprinkler system, we have used a DC motor, in a DC motor, there are permanent magnets on the outside and a spinning armature inside. The armature rotates, it is called as rotor. And it is placed in water tub. The GPS (Global positioning system) does not need any of the users to transmit the data it automatically tracks the location by a trilateration principle. The other component is buzzer it comes into active state when the fire is detected. This design is implemented by writing the code and dumping it in to node MCU by using Arduino software, and the power is also supplied by using the USB cable from the system. The Connections are made as shown in the circuit diagram.

4   HARDWARE MODULES:

Buzzer:
 A buzzer is a signaling device, typically used in automobiles, household appliances such as a microwave oven etc.
It consists of a number of switches or a sensor connected to a control unit that determines which button was pushed that usually illuminates a light on the control panel, and sounds a warning in the form of a continuous beeping sound

Figure. 5: Buzzer

5.1 Fire sensor: A thermistor is a type of resistor with the inverse proportional of temperature

5.2 GPS Module:

A GPS navigation device, GPS receivers is a device which is capable of receiving information from the GPS satellites and then it calculates the device geographical position by using the suitable software. GPS was produced by United States Department of Defense. Its official name is NAVSTAR-GPS. The GPS satellite group of stars is overseen by the United States Air Force 50th Space Wing.

Figure 6: GPS Module

5.3 DC water Motor:

A DC water motor is used to sprinkle the water that which works on 12v and 5v.

Figure 7: DC water motor

5.4 Things Speak

An open source cloud platform application think speak is used. It retrieves and stores the data from the sensor or the things connected to the systems through internet which uses hypertext transfer protocol (HTTP) from a local network to the cloud and also It updates all the data logs which is received from the sensors, tracking location applications, To use this user have to create an account which contains the different channels for monitoring of different parameters in system in a remote device. This cloud system enables the administrator to visualize the data in graphical representation with internet-based monitoring, energy output data is transferred to the router, and making it available through an online interface. The main advantage of this system is that the solar panel output information is available everywhere you get an internet connection.

5.   RESULT:

Our project is mainly used to reduce fire accidents in buses, the whole design is shown below, and as a small prototype we have made a bus with the sheets. there is a graph showing the values of surroundings that was detected by sensor and this can be seen by using the thing speak application as shown in the figure 8 and a message will be sent to cloud shown in figure 9. The location sharing can be seen by using sys4u application shown in figure10. Preventive measures are implemented. Human loss and property loss will be decreased or reduced. And the Information will reach at right time by using GPS module. As the data will be sent to cloud and a social network, in fire stations and police.
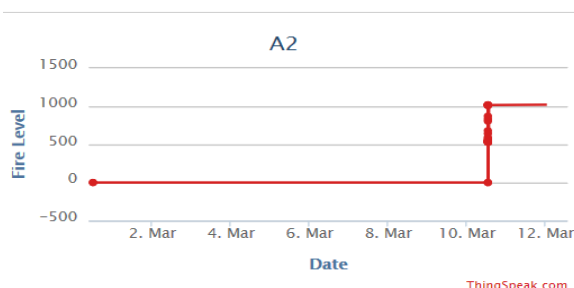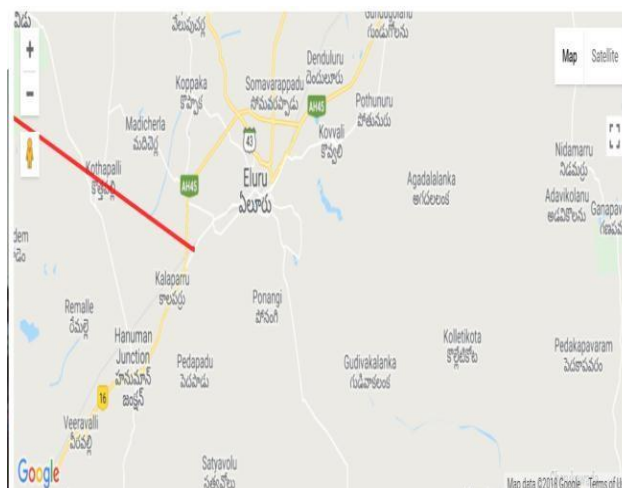

Figure 8: Thing Speak graph
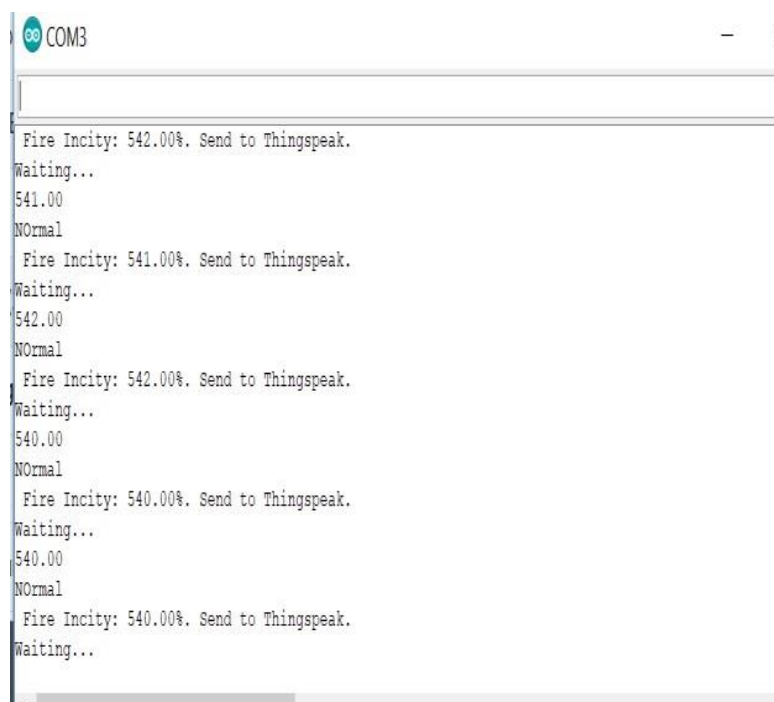
Figure 9: GPS location in Sys4u

Fig10: Values detected by fire sensor

7 CONCLUSION:

Internet of thing (IoT) has several number of applications and here we have applying in the field of fire safety and monitoring. IOT has a broad application in the field of real time applications mainly in security systems. This proposed system mainly focuses on reducing the human loss and the property loss when accident s happened. In our proposed system the preventive measures are implemented automatically by using IoT, So implementation time is very less, so the loss can be decreased. Many accidents may occurs during the night time, and sometimes the drivers is in sleepy condition, so he cannot control the bus, if there is a drowsiness detection then in that kind of situations a alert is given to the drivers in the form of a buzzer

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