

SMART ROADS AND INTELLIGENT HIGHWAYS

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ABSTRACT: *Now a days safety on roads is most important in our life because of increasing amount of accidents and there are some places where accidents are frequently occurring and there is a major problem of traffic jam. For that, we are designing a system called "Intelligent Highway System". It is an IOT(Internet Of Things) based project and an innovative technology for smart roads. This system represents where we can know the accident location ,temperature and moisture in the atmosphere directly to the mobiles via messages. The other major problem in the world is power consumption. Using this system, we can reduce the power consumption on highways or street light at night and day times. This process is done by the sensors. It is a program innovation that links different way of looking at things with innovative ideas that apply the opportunities offered by new technologies in smart ways. All the results are discussed in this paper.*

Key Words: *Smart roads, IOT devices, Wi-Fi module, IR sensors, Micro controllers.*

I. INTRODUCTION

In India, transportation, education, technology, security and employment are the major challenges because of these reasons India is still, developing country. To become a developed one, we have to think in a smart way. If we take about transportation system in India, we have railways, road ways, air ways and water ways. Our Indians consider road ways as one of the convenient means of transportation in spite of money glitches. In this road ways, the major problems are accidents and traffic jams and also there is pollution problem. To reduce these problems, we created a system called IOT based intelligent highway system with warning messages and diversions according to the climatic conditions.

This process is done by the sensors. Temperature sensor is used to detect the temperature, IR sensor is used to detect the object detection, Humidity sensor is used to detect the moisture in the atmosphere, MQ6 sensor is a gas sensor is used to detect the gases in the air, LDR is used to turn ON or turn OFF the light which depends on the day and night conditions.

LDR is used to turn ON or turn OFF the light which depends on the day and night conditions. All these sensors senses the data and send to the to the micro-controller. It sends the information to the server using Wi-Fi module.

II. EXISTING SYSTEM:

Google maps shows the traffic data of the road and does not shows the temperature. It shows all temperature of city but not at all corners and Traffic-signal control systems coordinate individual traffic signals to achieve network-wide traffic operations objectives. These systems consist of intersection traffic signals, a communications network to tie them together, and a central computer or network of computers to manage the system. Coordination can be implemented through a number of techniques including time-base and hardwired interconnection methods. Coordination of traffic signals across agencies requires the development of data sharing and traffic signal control agreements. Therefore, a critical institutional component of Traffic Signal Control is the establishment of formal or informal arrangements to share traffic control information as well as actual control of traffic signal operation across jurisdictions. Signal coordination systems are installed to provide access. A traffic-signal system has no other purpose than to deliver favorable signal timings to motorists. This system provides features that improve the traffic engineer's ability to achieve the goal. These are primarily access features. They provide access to the intersection signal controller for maintenance and operations. The more complete and convenient way of access, the more efficient and most effective system. In addition to control of traffic signals, modern systems

also provide wide ranging surveillance capabilities, including various kinds of traffic detection and video surveillance. They also provide more powerful traffic control algorithms, including the potential for adaptive control and predictive surveillance.

III. PROPOSED SYSTEM:

The main aim of this project is to minimize the cost. In this, we are using 8051 micro controller for cost effective and also for easy understanding. The other main purpose of the system is to reduce the power consumption during night times. At nighttimes street lights are switched on even there is no vehicle. So we have designed the system with IR sensor to sense the object and turns ON the light .If the vehicle is not present, it will be OFF. This system also includes detecting of gases, humidity in and turns ON the light .If the vehicle is not present, it will be OFF. This system also includes detecting of gases, humidity in atmosphere and temperature and also able to find out the accident location by pressing the switch on accident area and it sends the message to the ambulance.

IV. COMPONENTS&DESCRIPTION:

LCD:

A liquid-crystal display is a flat panel display or other electronically Modulated optical device that uses the light-modulating properties of liquid crystals. liquid crystals do not emit light directly, instead using a backlight or reflector to produce images and color or monochrome.

MQ-6 Module:

Are used in gas leakage detecting equipment in family and industry, are suitable for detecting of LPG, iso-butane ,propane, LNG, avoid the noise of alcohol and cooking fumes and cigarette smoke the module give out the concentration of the gases as a analog voltage equipment to the concentration of the gases.

LDR:

An LDR is a component that has a resistance the changes with the light intensity falls upon it .this allows them to be used in light sensing circuits.

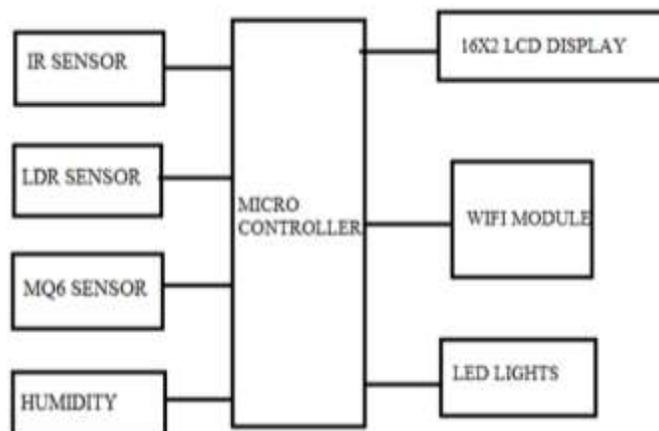
WIFI:

WIFI is a Technology for wireless local area networking devices based on the IEEE 802.11 standard WIFI is a trade mark of the WIFIalliance, which restricts the use other term Wi-Fi certified to products that successfully complete interoperability certification testing.

8051 microcontroller:

Is designed by Intel in 1981. It is an 8-bit microcontroller. It is built with 40 pins DIP (dual inline package), 4kb of ROM storage and 128 bytes of RAM storage, 2 16-bit timers. It consists of are four parallel 8-bit ports, which are programmable as well as addressable as per the requirement. An on-chip crystal oscillator is integrated in the microcontroller having crystal frequency of 12 MHz

Fig.1.Block diagram of smart roads and intelligent highways system



IR sensor:

An IR sensor is an electronic device, that 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 vehicle.

HARDWARE COMPONENTS:

- 1. Microcontroller
- 2. LCD
- 3. LDR
- 4. IR Sensor
- 5. LM35 Sensor
- 6. Power Supply
- 7. MQ6 gas sensor
- 8. Speaker
- 9. ESP8266 WIFI Module
- 10. Switch

V. SOFTWARE USED:

- 1. Keil IDE
- 2. Embedded 'c'
- 3. Progisp

VI. RESULTS&DISCUSSIONS:

TRAFFIC STATUS OUTPUT



Fig.2.Taffic status

Using IR sensors the traffic will be detected and send to the micro controller, then the information send to the cloud and display on the LCD screen.

ACCIDENT STATUS OUTPUT

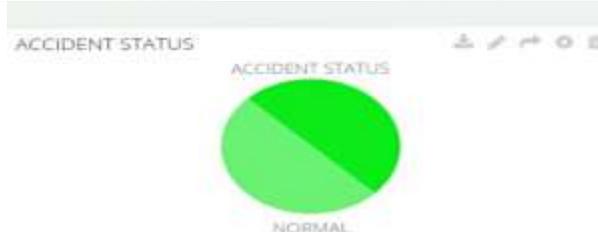


Fig.3.Accident status

Accident location will be detected by turning ON the switch and this information directly sends to the cloud, we can see the accident status in website

GAS STATUS OUTPUT



Fig.4.Gas status

MQ6 gas sensor is used to detect dangerous gases and sends to the cloud.

HUMIDITY STATUS OUTPUT

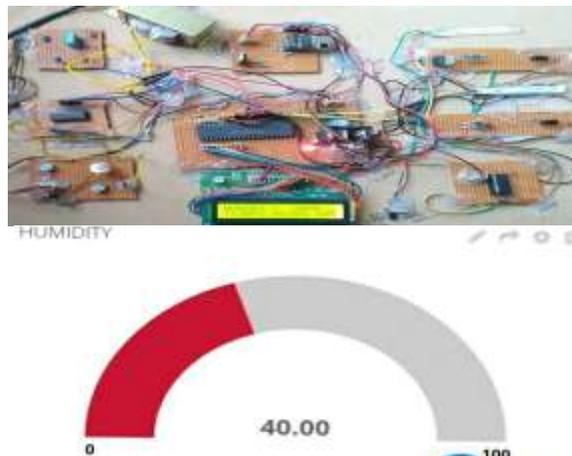


Fig.5.Humidity status

Humidity sensor senses the moisture content in the atmosphere and information sends to the cloud.

TEMPERATURE STATUS OUTPUT



Fig.6.Temperature status

Temperature sensor (LM35) used to detect the temperature and send the data to the cloud.

VII. CONCLUSION

In developing countries major problem is traffic in urban areas and traffic management is poor. In this work, we have studied that traffic problem and finding accident location is difficult. And also we can find out the temperature at that areas , humidity and power consumption. So we introduced a system that can minimize the traffic and accidents. Which is called smart roads and intelligent high ways. We are using IR sensors to detect the signal to micro controller about the traffic and monitor the temperature and humidity. we are designed it with low cost and in future we are believe that this represents the only first step in development of low cost deployable strategies for alleviating congestion in developing regions.

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