A Novel Smart Security System

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ABSTRACT

This paper deals with the implementation of Smart surveillance monitoring method using IVRS, (Internet Protocol) IP camera, GSM, GPS, IOT, WIRELESS MODULE, ULTRASONIC SENSOR. It can be used at Highways, Public places, chemical laboratories etc., where the audio and movement of objects are recorded by a Camera and transmit the data to the Server by using Internet of Things. It will be applicable for monitoring Public Places, highways, chemical laboratories etc. It is intimate call alert and SMS notification with GPS location, live video link to the Police Station, Ambulance Service, and Fire Service Station and nearer security guard. It can be used to identify accident, robbery, fire accident, building burning etc. IVRS can sense the abnormal voice activities. Thermal image camera captures the high temperature such as fire accident. IOT used to see the surveillance live video. It is help to deaf and dumb peoples. This system is highly secured and very effective.

Keywords: ATMEGA 2560, GPS, GSM, WIFI, IP Camera, Thermal Camera and IVRS

1. Introduction

This project is going to provide a solution to this problem. According to our project when a vehicle meets with an accident, a sensor situated on the vehicle will detect it immediately and send a message to the microcontroller. The microcontroller then sends the alert message with the help of GSM modem to a police control room or rescue team which will include the location with the help of GPS(1). This paper reports emotion recognition results from speech signals, with particular focus on extracting emotion features from the short utterances typical of Interactive Voice Response (IVR) applications. We focus on distinguishing anger versus neutral speech, which is salient to call center applications(2). The traffic sensor node that we investigate in this article contains one ultrasonic rangefinder and two PIR sensor arrays. Each array ingrate's three PIR sensors with different orientations. The presence of multiple PIR sensors allows more accurate traffic monitoring on a higher number of traffic lanes(3). This paper details the design and development of IoT based security surveillance system in buildings using Raspberry Pi Single Board Computer (SBC) with Wi-Fi network Connectivity. Adding wireless fidelity to embedded systems will open up various feasibilities such as worldwide monitoring and control, reliable data storage etc(4). The purpose of this project is to design a surveillance system which would detect motion in a live video feed and record the video feed only at the moment where the motion was detected also to track moving object based on background subtraction using video surveillance. The moving object is identified using the image subtraction method(5).This paper demonstrates the development of a low cost thermal imaging camera as an alternative to the commercial models. This device consists on a long wave infrared sensor which captures the infrared reflection from the physical objects. Thermal imaging camera technology has provided relevant developments for security systems, being used in surveillance activities such as law-enforcement, home intrusion detection and power line maintenance(6).

2. Proposed System

A novel ''smart security system'' is an intelligent security system combining the advantages of an to intimate call alert an SMS notification with GPS location, live video link to the Police Station, Ambulance Service, Fire Service Station and Nearer security guards, The central unit of the system is built on the basis of electronic components specific to the personal computers (PCs) and IVRS, (Internet protocol)IP camera, GSM, GPS, IOT, Thermal sensors, ultrasonic sensor, wireless module and controlled devices. The system is a complete solution and has various applications, e.g., monitoring Public Places, highways accidents, chemical laboratories fire accidents, building burning accidents, crime detection etc. It can be utilized both inside and outside the environment to increase security. Especially to alert nearer security guards. This paper aims to present accident emergency to intimate the Police

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Station, Ambulance Service, and Fire Service Station and nearer security guards. It can be used for deaf and dumb peoples. It can be control the over of vehicle.
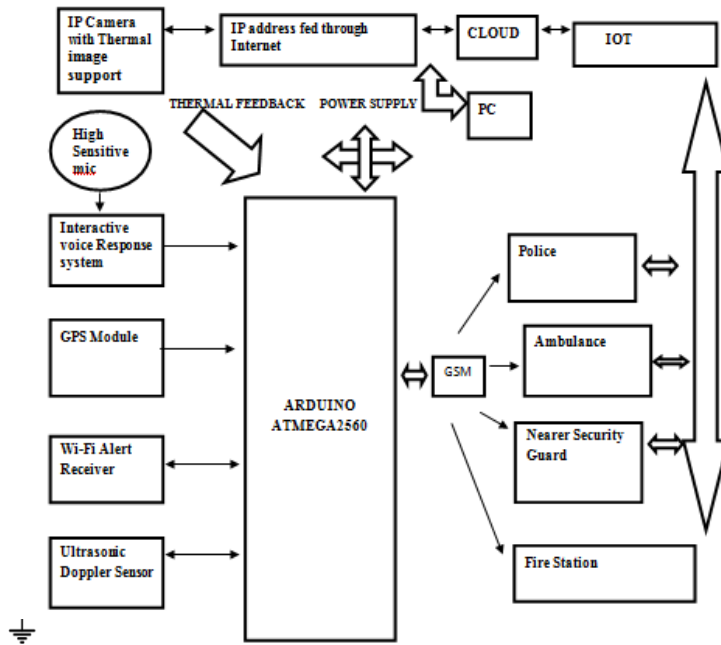
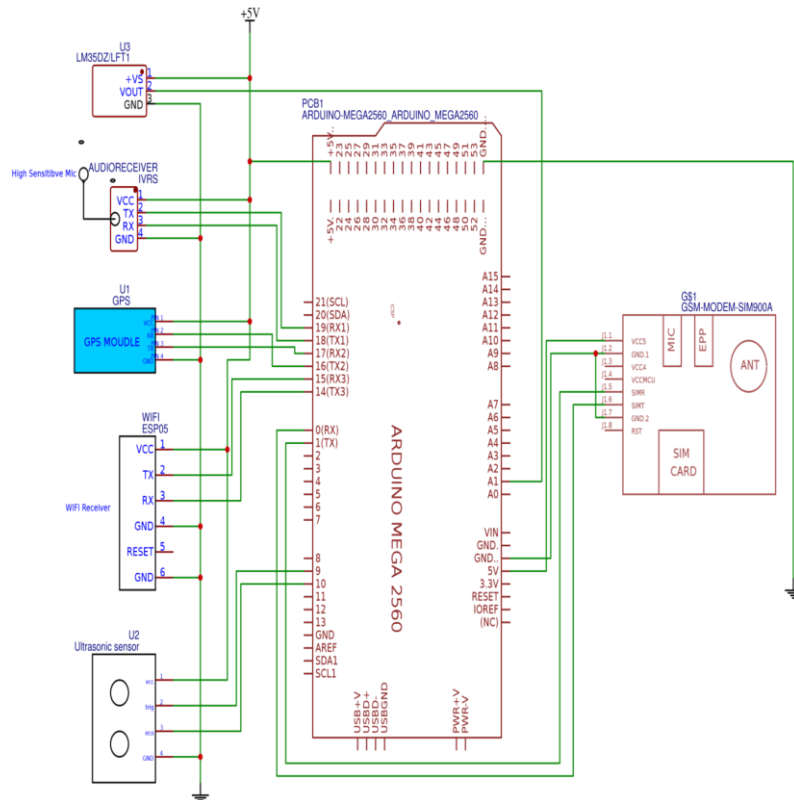**Figure: 1. .Block Diagram of Proposed system**

Figure: 2. Circuit Diagram of the Proposed System

3. Working of Proposed System

The circuit diagram has GPS, GSM, ULTRASONIC SENSOR, WIFI MODULE, and IVRS, ARDUINO mega 2560, IP Camera, Router and Thermal sensor. The IP camera has been streaming and storing in the cloud using IOT. If any abnormal voice and sound has been detected, IVRS can be act and sent feedback through Arduino controller.

Arduino has sent input to GSM and GPS, GPS can locate the place and GSM can sent intimate message and call to police station, ambulance, nearer security guard with IP address, Location and detected voice command, If Any fire accident occur thermal sensor can sent feedback input to the Arduino controller ,the Arduino can intimate message only to fire station through GSM

The Ultrasonic sensor can used to capture the over speed of the vehicle, If the vehicle has been exceed maximum level of the speed ultrasonic sensor can be capture and sent feedback to the arduino controller, the arduino controller sent input to the GSM ,the GSM has been sent Message to the police station.

The wifi module can be helps to deaf and dumb peoples. If any emergency of deaf and dumb people can press the wifi transmitter, the wifi receiver can receive the signal and sent message to Police station and ambulance through GSM.

3.1 GSM Modem

A GSM modem is a device which can be either a mobile phone or modem devices which can be used to make a computer or any other processor communicate over a network.A GSM modem requires a SIM card to be operated and operates over a network range subscribed by the network operator. It can be connected to a computer through serial, USB Connection.
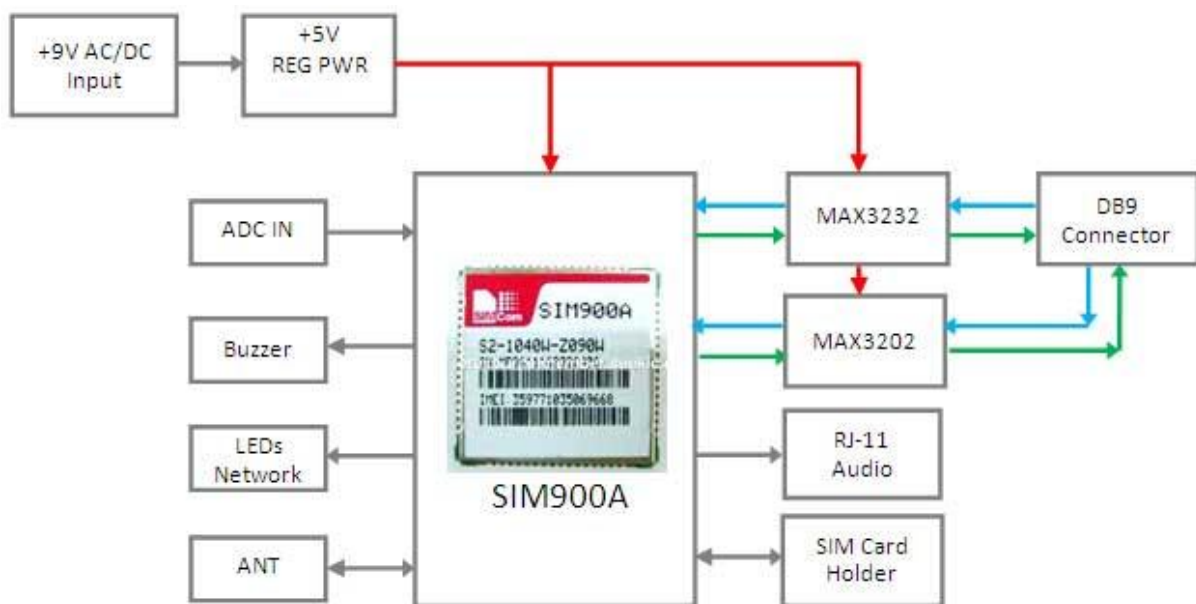

Figure: 3. Block diagram of GSM Module

A GSM modem can also be a standard GSM mobile phone with the appropriate cable and software driver to connect to a serial port or USB port on your computer. GSM modem is usually preferable to a GSM mobile phone. The GSM modem has wide range of applications in transaction terminals, supply chain management, security applications, weather stations and GPRS mode remote data logging

3.2 Ultrasonic Sensor

An ultrasonic sensor is an instrument that measures the distance to an object using ultrasonic sound waves. An ultrasonic sensor uses a transducer to send and receive ultrasonic pulses that relay back information about an object's proximity. High-frequency sound waves reflect from boundaries to produce distinct echo patterns. Ultrasound is reliable in any lighting environment and can be used inside or outside. Ultrasonic sensors can handle collision avoidance for a robot, and being moved often, as long as it isn't too fast. Ultrasonic are so widely used, they can be reliably implemented in grain bin sensing applications, water level sensing, drone applications and sensing cars at your local drive-thru restaurant or bank. Ultrasonic rangefinders are commonly used as devices to detect a collision.

3.3 Gps Module

Technical data sheet describing the cost effective, high-performance u-blox 6 based NEO-6 series of GPS modules, that brings the high performance of the u-blox 6 positioning engine to the miniature NEO form factor.

These receivers combine a high level of integration capability with flexible connectivity options in a small package. This makes them perfectly suited for mass-market end products with strict size and cost requirements.

Figure: 4. GPS Module

3.4 Interactive Voice Response System (Ivrs)

Advancement in technology has developed an intelligent man-machine interface technique that facilitates computers or machines or robots to be operated using the voice commands of human without using any input systems, such as keyboards or mouse. This human-machine interface (HMI) can be achieved using voice recognition modules. In this article, we will discuss about the voice recognition modules along with their working procedure and applications. Voice recognition is a technique that facilitates natural and convenient human-machine interface using the voice recognition module. It extracts and analyses voice features of human delivered to a machine or computer through the mic. Voice recognition technique is classified into many types based on different criteria such as scope of the users, number of words used for

recognition, naturalness of speaking. If the voice recognition level is more than 95%, then only the voice recognition is practically used.

Figure: 5. voice response system

3.5 Temperature Sensor (Lm -35)

Temperature is one of the most commonly measured parameter in the world. They are used in your daily household devices from Microwave, ridges, AC to all fields of engineering. Temperature sensor basically measures the heat/cold generated by an object to which it is connected. It then provides a proportional resistance, current or voltage output which is then measured or processed as per our application.

3.6 WI-FI Module

The nRF24L01 is a wireless transceiver module, meaning each module can both send as well as receive data. They operate in the frequency of 2.4GHz, which falls under the ISM band and hence it is legal to use in almost all countries for engineering applications. The modules when operated efficiently can cover a distance of 100 meters (200 feet) which makes it a great choice for all wireless remote controlled projects.

The module operates at 3.3V hence can be easily used with 3.2V systems or 5V systems. Each module has an address range of 125 and each module can communicate with 6 other modules hence it is possible to have multiple wireless units communicating with each other in a particular area. Hence mesh networks or other types of networks are possible using this module.
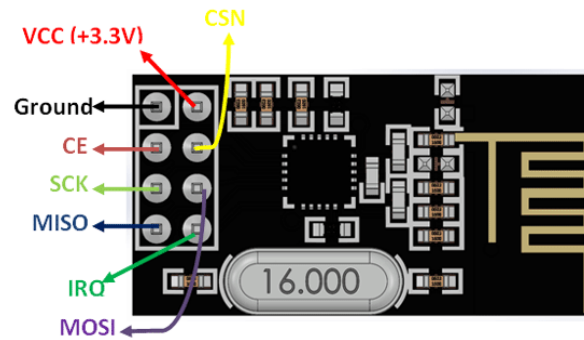

Figur: 6.wifi module

3.7 IP Camera

An Internet Protocol camera, or IP camera, is a type of digital video camera that receives control data and sends image data via the Internet. They are commonly used for surveillance. Unlike analog closed-circuit television (CCTV) cameras, they require no local recording device, but only a local area network. Most IP cameras are webcams, but the term *IP camera* or netcam usually applies only to those used for surveillance that can be directly accessed over a network connection.

Figure: 7. IP Camera

4. Conclusion

The objective of this project is to surveillance smarter and faster, our project can helps to monitoring public places, highways and laboratories to be smarter. In an existing system can only monitoring, they cannot any intimation to another. Our proposed system can be overcome the surveillance method. our project can be monitoring as well as intimation to police station, ambulance, fire station and nearer security guard. Our project can be identifying the abnormal activities and intimate message through GSM within the fraction of second and it can be helpful to deaf and dumb peoples. The IP camera has been capturing clear resolution video. They any access in any of the device using Internet. Our project can be reduce accident due to over speed of vehicle, the ultrasonic sensor can used to detect the over speed of the vehicle and intimate message to police station in fraction of second. our project can be save the life of the people due to any of the accident.

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