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LOC with Wireless Secured Communication & Tracking Devices

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ABSTRACT

This Project is a IR & camera based security system for protected areas & borders, which senses the Intruders, trespassers and transfer video to other end. For confirmation .In this Project, we are going to have an IR Sensor which senses any intruders / trespassers and will activate the alarm as well as switch on the guns in that particular place.In this project we will shoot the intruder when he cross the border, the bullet is equipped with a gps facility if the intruder escapes the we can track him with the help of ARM 11 devices or smartphone.It will also activate the Camera, which will start capture the live video and transmit the same to the receiver end, the smart phone.In the same time it will start gives alarm and the data will transferred through the RF Transmitter & Receiver to the mobile device .

Keywords: Mines Detection, Harmful gas Detection, Target tracking, etc

1. INTRODUCTION

The Kargil War also known as the Kargil conflict, was an armed conflict between India and Pakistan that took place between May and July 1999 in the Kargil district of Kashmir and elsewhere along the Line of Control (LOC). The conflict is also referred to as Operation Vijay (Victory in Hindi) which was the name of the Indian operation to clear the Kargil sector. The cause of the war was the infiltration of Pakistani soldiers and Kashmiri militants into positions on the Indian side of the LOC, which serves as the *de facto* border between the two states. During the initial stages of the war, Pakistan blamed the fighting entirely on independent Kashmiri insurgents, but documents left behind by casualties and later statements by Pakistan's Prime Minister and Chief of Army Staff showed involvement of Pakistani paramilitary forces, led by General Ashraf Rashid. The Indian Army, later on supported by the Indian Air Force, recaptured a majority of the positions on the Indian side of the LOC infiltrated by the Pakistani troops and militants. With international diplomatic opposition, the Pakistani forces with drew from the remaining Indian positions along the LOC.The war is one of the most recent examples of high altitude warfare in mountainous terrain, which posed significant logistical problems for the combating sides. INDIAN government had to face huge loss because of this war. Human loss, machine loss, aircrafts, tankers. Indian economy decreased by 38%,

2. RELATED WORK

The continuous evolution in wireless sensor network technology make it possible to implement the wireless sensor network (WSNs) in a variety of scenarios. WSNs consist of thousands of tiny sensor nodes deployed in a physical environment for observation of an event of interest.The sensors in the vicinity of an event must be able to monitor it and report back to the sink. A sink sensor node has capability to communicate with outside world such as laptop, base station.Sensor nodes have been deployed to play significant roles in traffic control, battlefield, habitat monitoring and intruder tracking in recent years. The traditional target tracking methods for Wireless Sensor Networks make use of a centralized approach. As the number of sensors rise in the network, more messages are passed on towards the sink and will consume additional bandwidth. Thus this approach is not fault tolerant as there is single point of failure and lacks scalability. Moreover in traditional target tracking methods, sensing task is usually performed by one node at a time resulting in less accuracy and heavy computation burden on that node. In WSNs each node has very limited power; consequently traditional tracking methods based on complex signal processing algorithms are not useful.Lately, several cases regarding gas leakage incidents are reported in Malaysia.

Two such cases in Malaysia were reported in May and Sept 2011. It concerned a luxury condominium and mall where victims were cut and burnt, and the properties were damage owing to explosion and fire. A gas valve was found to have been switched on at the condominium and a faulty pipeline had caused a LPG to be accidentally unleashed to the mall. The explosion had additionally destructed property that was few kilometers far from wherever the incident passed off. Hence, preventive live i.e. Early detection of leakage and to forestall from fateful events is important. Gas tragedies owing to gas pipeline area unit attributed to corrosion that eventually caused the pipeline to rupture. Because the pipeline unsound, gas leaks to the atmosphere. This incident is fateful as in time explosion could occur that caused fatalities like the incident in Ghislenghien, European country (2004), Canvey Island, UK (2008) and Pennsylvania, USA (2011). This has prompted the concept to develop an automatic gas sensing microprocessor system that additionally has the motion capability as gas area unit usually transport employing a pipeline from one location

area unit usually transport employing a pipeline from one location to a different. A robot has been utilized in exchange of human for handling numerous tasks in an exceedingly unsafe and dangerous geographical point wherever human life is in danger. In our study to develop mobile gas sensing mechanism, two sorts of device are used for the gas detection and leakage location data because the actual location of the leakage is very important for maintenance purpose. As pipeline leakage cannot be anticipated, therefore, our robot will be able to incessantly monitor and examine the pipeline.

3. PROPOSED SYSTEM

A robot can be controlled in two methods by hardwired control or wireless control. The wireless control provides additional benefits including increased flexibility and reduced installation cost. In latest the internet technology is used for movement control and all other purposes like image or videos captured by the robot and shared via internet. In proposed system a single camera is installed on a robot and the robot can move in all directions to take photos in different angles. This system is very flexible to monitor any living object with the help of the PIR sensor and it is more suitable for surveillance systems. This project can be implemented in the border regions to identify the trespass and intruders. This model detects the hazardous gases during the surgical attacks, This model has an IR sensor which sense the harmful gases and identifies the range of the gases and sends the information to the other end. The gas detecting robot is new generation robots which provides an answer to the problems and provide an ease to the militant operations in war fields. The gas detecting robot has many uses, such as, it can detect hazardous gas as well as mines in the war fields. The wirelessly controlled robotic vehicle is attached with sensors and a camera which helps in capturing the detailed video of the surroundings to a system. The robot is implemented with the help of Bluetooth which helps in sending the details of the system surroundings. This kind of robot is controlled by a remote controller which helps in the movement of robot in terrains. This model is integrated with a shooting facility which shoots the intruder when he crosses the border, if the intruder escapes then we can locate him with the help of smartphone**.** This model also has obstacle and direction sensing facilities.

4.SYSTEM MODEL AND DESIGN GOALS

4.1 System Model

As illustrated in Fig. 1, the system model consist of different entities: the microcontroller, a group of sensor, relay, drivers, motors.

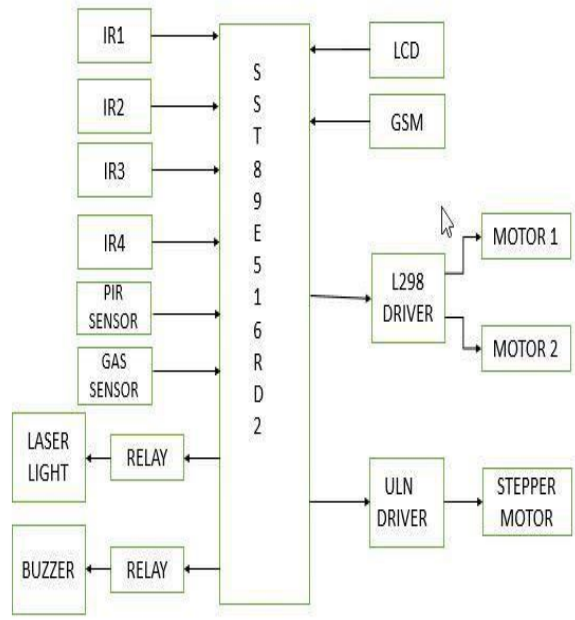
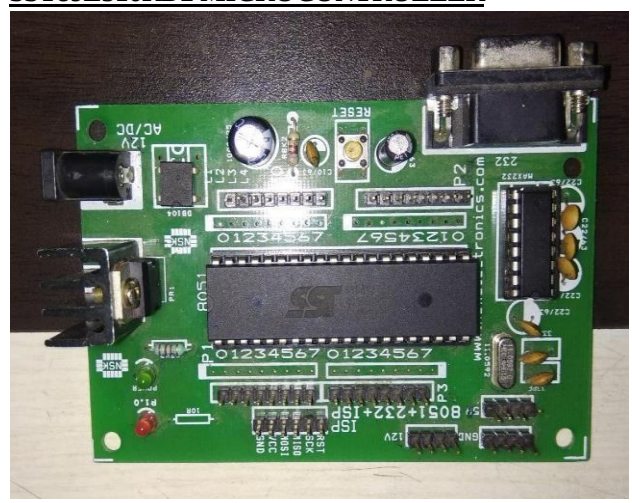


Fig. 1. System model

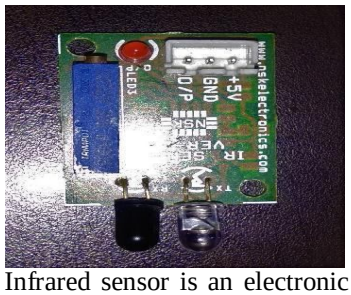
4.2. Component Description

SST89E516RD2 MICROCONTROLLER



It has a 5V operating voltage from 0 to 40 MHz.64 kB of on-chip flash user code memory with ISP and IAP.SPI and enhanced UART. Four 8-bit I/O ports with three high-current port 1 pins. Three 16-bit timers/counters. Programmable watchdog timer. Eight interrupt sources with four priority levels. Second DPTR register Low EMI mode (ALE inhibit) TTL- and CMOS-compatible logic levels.

Infrared Sensor



Infrared sensor is an electronic device, which emits and sense some aspects of surroundings. IR sensor also detects the motion and measure the heat of an object. In the infrared spectrum, all objects are radiate in the form of thermal radiations. These kind of radiations are invisible to our eyes, which is detected by an infrared sensor. The emitter is same as that of an IR LED (Light Emitting Diode) and the detector is same as that of IR photodiode. When IR light falls on the photodiode, output voltage and resistance change in the proportion to the magnitude of the IR light received.

PIR Sensor

A Passive Infrared sensor **(**PIR sensor**)** is an electronic device that measures infrared (IR) light radiating from objects in its field of view. PIR sensors are often used in the construction of PIR-based motion detectors. Apparent motion is detected when an infrared source with one temperature, such as a human, passes in front of an infrared source with another temperature, such as a wall. All objects emit what is known as black body radiation. It is usually infrared radiation that is invisible to the human eye but can be detected by electronic devices designed for such a purpose. The term *passive* in this instance means that the PIR device does not emit an infrared beam but merely passively accepts incoming infrared radiation.

LCD (Liquid Crystal Display)

LCD screen is nothing but an electronic display module and it is used for various applications. A LCD display is a 16x2 basic module. Basically this is used in various devices. In Liquid Crystal Displays (LCDs) operating voltage is 4.7V-5.3V.It is an alphanumeric LCD display module can display alphabets and numbers. It consist of 2 rows and each row can print 16 characters. Each character is built by a 5 X 8 pixel box. It can work both on 4 bit and 8 bit mode

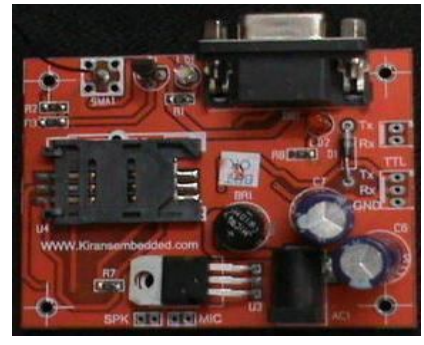
DC Motor

NR-DC-ECO is high quality low cost DC geared motor. It contains Brass gears and steel pinions to ensure longer life and better wear and tear properties. The gears are fixed on hardened steel spindles polished to a mirror finish. These spindles rotate between bronze plates which ensures silent running. The output shaft rotates in a sintered bushing. The whole assembly is covered with a plastic ring. All the bearings are permanently lubricated and therefore require no maintenance. The motor is screwed to the gear box from inside.

GSM (Global System for Mobile Communications)

Global System for Mobile Communications system is the most popular standard for mobile telephony systems in the global. The GSM is one the wireless networks which has low power and low cost communication device. The GSM Association, its support industry trade organization of mobile phone carriers and manufacturers, estimates that 80% of the global mobile market uses the standard. GSM is used by over 1.5 billion people in world across more than 212 countries. A GSM modem is a specialized type of modem which is provided slot for SIM card, and it operate just like a mobile phone. When a GSM modem is connected to a microprocessor kit it allows the microprocessor communicate with mobile network for sending message to the programming set mobile number.

Power Supply



The whole electronic system is depending on the power supply for providing the required power for their operational circuit. An AC to DC adaptor has been used to get DC input for the mother board. In mother board, we have developed a 5V regulator circuit, which is needed for microcontroller as supply voltage. IR transmitters are also connected to 5V supply, so that they always transmit high signal.

5 .FLOWCHART

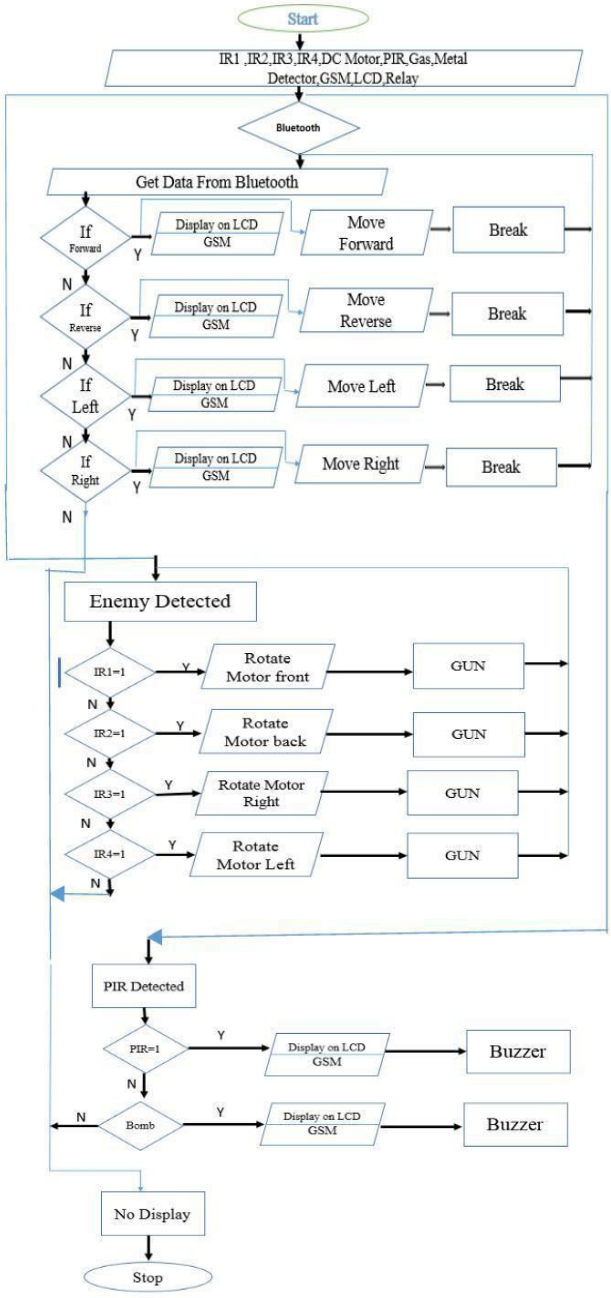


Fig 2. Proposed Flowchart

6. MODULE DESCRIPTION

6.1 Hazardous Gas & Mine Detecting:

The mine detecting robot detects the mines and poisonous gases with the help of sensors. The movement is controlled with the help of a remote which interacts with the robot through wireless communication in the form of Bluetooth. The aim of the robot is monitoring and detecting the variations in gas and obstacles . Not only detecting, tracing on to a screen can be easily done by wireless camera attached on the robot. The visualization of all details is done by using the wireless LCD connected to the robot, so that all details of the environment can trace easily.

6.1.1Gas And Mines Detecting Algorithm

Step 1:Start
Step 2:Robot Moves Forward
Step 3:if Distance=End?
Backward Motion
else if Gas or Mine Detected
Stop Motion go to step 5
else
go to step 2
end if
end if
Step 4: if distance= start?
goto step 2
else if Gas or Mine detected?
stop motion goto step 5
else
backward motion
end if
end if
Step 5: Alarm activated
Step 6: Determine the location
Step 7: Transmits data and turn on alarm
Step 8: End

6.2.Target Tracking in Wireless Sensor Networks

The continuous evolution in wireless sensor network technology make it possible to implement the wireless sensor network (WSNs) in a variety of scenarios. WSNs consist of thousands of tiny sensor nodes deployed in a physical environment for observation of an event of interest. In a target tracking application, the sensor nodes which can sense the target at a particular time are kept in active mode while the remaining nodes are to be retained in inactive mode so as to conserve energy until the target approaches them.

6.2.1 Target detecting Algorithm:

Step 1:Start
Step 2:Initialize
IR1=0,IR2=0,
IR3=0,IR4=0 Step 3:if IR1=1
Target found Front
else
if IR2=1
Target found back
else

```
    if IR3=1
      Target found Right
   else
      if IR4=1
      Target found Left
   else
      goto step 4
          end if
        end if
   end if
     end if
Step 4: Stop
```

7. RESULT & CONCLUSION

In this paper, we have presented the IR sensor based target tracking, harmful gas and mines detection along with GPS technology. The main advantages of this system Wirelessly send audio/video information.Work in hazardous dangerous environment .Streaming of Video without visible light.Work efficiently for long distance. Moveable Camera.This can be implemented in large scale in order to have long run to facilitate better safety and provide effective testing infrastructure for achieving better results in the future.

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