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# IoT Based Multifarious Detective Robot Inquisitor Using GSM and GPRS

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## ABSTRACT

The main motto of this work is to introduce a Wireless Multifunctional Defense Robot that can be operated by gsm and using WIFI Module with locomotion and navigates around the areas vulnerable to danger and attempts to locate the intruders. Robots are typically miniature in size so they are adequately capable of accessing caves, mines and small building holes and have the ability to live for a long time in harsh and challenging climatic environments without causing any harm. Combat robots have been operating over the last few decades. It working module has built in with temperature sensor and IR sensor for obstacle detection and Proximity metal sensor for detecting metal and gas sensor for harmful gas detection and it consist of L293D driver for controlling 4 wheel DC motors for robot. The data base will be stored in Amazon cloud from GPRS technology, for which GSM is used where an sim card with an internet connection will be transferring our data from the robot to the cloud storage which is the Amazon web service.The objectives of our project are to Save the lives of people during rescue operations. To minimize unauthorized access in sensitive places. Detect hazardous and harmful materials. To build a system this is possible to do all the things with high reliability and low cost.

Keywords: Audiono UNO, IoT, Temperature sensor, IR sensor, GSM Module and AWS.

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## I. INTRODUCTION

Home Many embedded related systems have dramatically multi designs based on their usages and capabilities. Robotics are being advance level of manufacture from past centuries. As robots have its peripheral components which are becoming more flexible, reliable and miniaturized, these systems mostly utilizing for multi applications such as entertainment, military, and surveillance things. A remote controlled surveillance robot defined as robot controlled remotely to snap the videos for speculated reasons. In military environment, if any systems or robot runs then it has to valid some criteria's and restrictions. Mostly in military applications all autonomous and remote controlled robots could be prefer. This project explains how to implement an Wireless multifunctional Defense Robot it can be

controlled via GSM and using GPRS Module and identifies multi hazards and also monitoring the battle fields to protect army people from intruders. Surveillance is major activity that too if we want to protect some precious things from robbing and there is not possible to monitor continuously using humankind it would be very complex task. This robot is constantly watching and sending a live stream of it to an approved person. Because of the tracking, the job will be very simple and technology will make it precise. The implementation of this project is to provide the machine based monitoring system in vivid areas in mind of human safety. Robot are comfortable to go anywhere and anyplace such as mining, blocked tunnels and restricted caves over hazardous environment which includes toxic gases and hazardous things. Military robots systems are designed from over many decades. This system shall provide multiple facilities to enhance identifying different kind of sensing activities to provide multi featured robot. It includes one camera to snapping the video to show the operators. It has built in with temperature sensor and IR sensor for obstacle detection and metal detector sensor for sensing metal items and gas sensor for identifying toxic gas detection and it consist of L293D driver for controlling four-wheel DC motors for robot.

The data base will be stored in amazon cloud from GPRS technology, for which GSM is used where an sim card with an internet connection will be transferring our data from the robot to the cloud storage which is the Amazon web service.

## II. LITERATURE REVIEW

We are not at all concentrating over unbelieved machine artifacts outbreak humankind in new domains. There are multiple features with this system when compare to human mankind abilities. One of the most vital thing on these robots shall have the capacity to act missions remotely in the field, without any real danger to surviving lives. This influences great trouble military robots.

These robots are more durable than human and more able to withstand damage. Thus, in risky conditions, they offer greater chances of success. Any time a robot is shut down the army literally rolling out of new one. The military robot is just like an autonomous machine robot consisting of a wireless camera which can be obstructed by humans as a raw agent through a computer. Full autonomous robot is still under development and can perform different tasks. Research worldwide therefore works towards designing and creating such a robot, in order to simplify our work in different fields. We have studied numerous papers that may perform different technologies to handle these bots lets considering the best course of action on our multifurious military robot. Let 's speak widely about some of them. Dr. S. Bhargavi has been developing an autonomous battle based robot specially built for the field of war. Enemies offered protection. Each time enemies appear in front of the robot, the laser gun will be fired. User sitting at one place provides this remote operation. A wireless camera shall mount on the robot. A real time streaming functionality may prevents the risk of taking with enemies war and protecting themselves early by having anticipated tasks to do then user can shoot enemy by laser gun, which operates remotely.

Dhiraj Patel Singh has created a article which represents a mobile-operated robot. It has a camera that spies the enemy's every movement, and is mobile control. It is therefore mainly suits to the military field, and are prefer for cop work as well. The DTMF (Multi Frequency Dual Tone) technology is used. By this technology the robot is mobile controlled but the contact range is limitless. To this end the mobile network should be successful. In this paperwork another mobile is handled by a smartphone connected to the robot and the customer. The robot is controlled entirely with smartphone.

Initially, smartphone users make a call to another device, which is connected with robot, for processing. If a key pressed a tone, which corresponds to the key pressed task to do at the other end known as DUAL TONE MULTIPLE FREQUENCY (DTMF).Then the robot receives tone with the aid of the phone stacked in the device. Microcontroller handles the tone in another way by using DTMF decoder. This sends a signal to motor driver IC, which then drives the robot.

Ankita patel invents a touch screen based paper that controls multifunctional spy robot. ZigBee network is used in the fields of long distance communication. This work system includes microcontroller for collecting data from different locations and therefore moving robot operated in robot direction. This paper is composed of geared motors with two wheels attached to it. The motor starts with the help of a relay and a touch-screen control. The signal sent from the touch screen at the receiver section and executed by the microcontroller. It comprises components such as gripper, microphone, video screen, and sensors. This paper's methodology was divided up into two sections. Implementation of hardware, and software. Using various components such as touch screen sensor, ZigBee, LCD, intelligent robot, for hardware development. Microcontroller is preferred for implementation in software. A microcontroller has the ability to use large quantities of memories like RAM , ROM, and it also has its own ports, i.e. Port I / O, timepiece. All of these components are embedded on one chip. Touchscreen in hardware section, tuner card, antenna, ZigBee technology are used. Analog to digital convert programming and LCD character module programming are preferred at the programming section USART communication. All programming done preferably in C Programming Language.

## III.PROJECT DESCRIPTION

This chapter deals with working of “Implementation and recent progress in smart home automation”. It can be simply understood by its block diagram

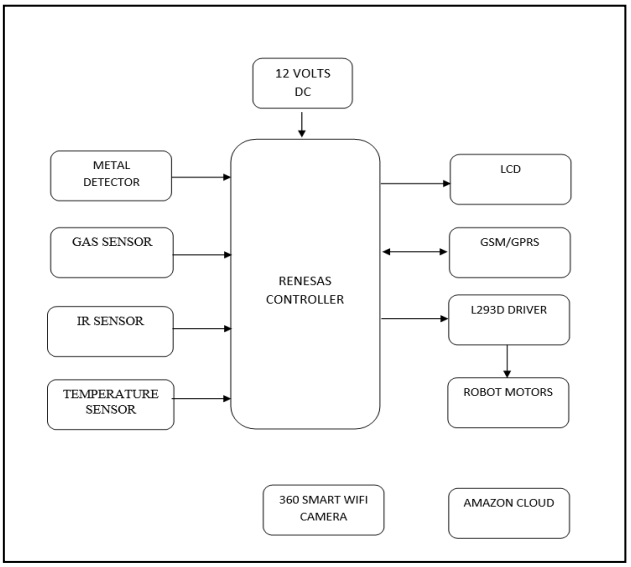



Fig 3.1: Block diagram

### Description:

This block diagram explains about the data base will be stored in amazon cloud from GPRS technology, for which GSM used where an sim card with an internet connection will be transferring our data from the robot to the cloud storage which is the Amazon web service.

Here the robot shall enters into field with some of the features inbuilt. While moving over ground it detects the metal related obstacles, and one IR sensor which detects the obstacle anything is available in front of robot and it detects the smoke measurements along with finding the environmental temperature values. Based on these feature robot can share details to cloud for user understanding the robot existing environment. In addition, the robot can operate forward, backward, Right and Leftwards directions

based on the user command via GSM communication using physical sim card. For sending, the data to cloud from robot sim card should have internet pack availability to share the details to cloud. On top, camera mounts on robot for online streaming the existing environment through internet with that user can watch the robot field and calculates data to share cloud. Similar robot can utilizes for military purposes or any isolated forest areas.

## IV. WORKING PRINCIPLE

We have proposed a robotic used to analyze the area in hostage situation and provide accurate data to the operator to take preventive actions to avoid loss of life or object. The robot has different sensors: metal sensor and IR sensor. The IR sensor senses the motion in the area as well as obstacle detection. The metal sensor determines the metal content of illegal things. A GSM network that gives the processor instruction in which direction to move the vehicle like FORWARD direction, BACKWARD direction, LEFT direction and RIGHT direction and STOP control the Robot. To execute this project, R5F100LEA microcontroller from the Renesas RL78 series, which is also 16-bit microcontroller. Microcontroller, which controls the entire device, serves as the key function in the current project. It includes Flash ROM 64 KB, RAM 4 KB and Data Flash 4 KB, high speed on-chip oscillator, self-programmable under software control, 58 GPIO's, 3 UART's, Simplified I2C, 10-bit ADC resolution, 28 Interrupt Sources, ISP programming help, etc. Simultaneously it finds and sends data about smoke or metal detection in terms of 0 or 1 along with temperature data using individual sensors connected to robot.

This scenario may happens continuously until the system gets off. One camera mounted. The complete model will become the ROBOT unit in this project temperature sensor is used to check the human body sustainable to that environment or not and toxic gas available in that environment for human protection. Gas sensor used to detect the fire or harmful gas surrounded area. IR sensor used to detect the obstacle if any obstacle detected then moving of robot will stop. It used internally a sensor, which is metal detector, which used for finding if any metal contents illegal things like bomb detected then metal sensor will sense and give the information and store into server. By using GSM we can control the robot by sending some commands from user mobile to microcontroller GPRS technology is using for communication multiple devise such as internet of things which is mainly used to store the all the information into Amazon cloud server. Here L293D driver mainly used to control the robot. In addition, all the data will be displaying through LCD.

## V. EXPERIMENTAL RESULT

In this project, a robotic used to analyze the area in hostage situation and provide accurate data to the operator to take preventive actions to avoid loss of life or object. The robot has different sensors like smoke, metal, IR and temperature sensors to update amazon cloud using GPRS. The IR sensor senses the motion in the area as well as obstacle detection. The metal sensor determines the metal content of illegal and hazardous things. A GSM network that gives the processor instruction in which direction to move the vehicle based on commands like FF forward direction, BB backward direction, LL left direction and RR right direction to control the Robot. The updated data can observe using mentioned IP address 54.218.25.195.

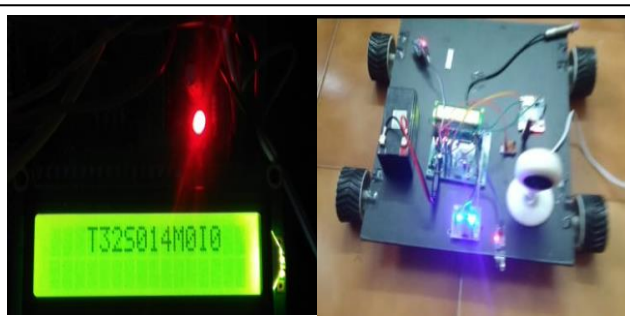
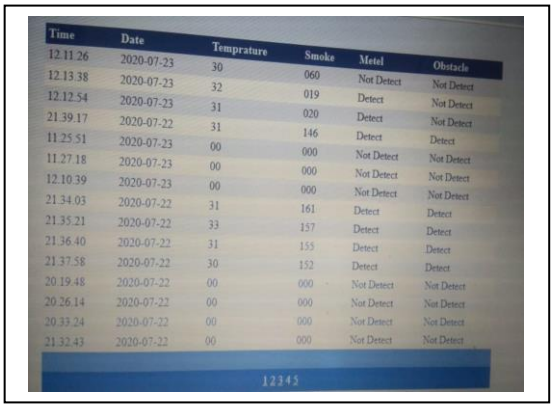


Fig 5.1: Implementation of kit showing the Robot and its LCD info

Output Images:

To connect the amazon server for getting the data as shown below:

http://54.218.25.195/project/login.aspx



| Time | Date | Temprature | Smoke | Metel | Obstacle |
|---|---|---|---|---|---|
| 12.11.26 | 2020-07-23 | 30 | 060 | Not Detect | Not Detect |
| 12.13.38 | 2020-07-23 | 32 | 019 | Detect | Not Detect |
| 12.12.54 | 2020-07-23 | 31 | 020 | Detect | Not Detect |
| 21.39.17 | 2020-07-22 | 31 | 146 | Detect | Detect |
| 11.25.51 | 2020-07-23 | 00 | 000 | Not Detect | Not Detect |
| 11.27.18 | 2020-07-23 | 00 | 000 | Not Detect | Not Detect |
| 12.10.39 | 2020-07-23 | 00 | 000 | Not Detect | Not Detect |
| 21.34.03 | 2020-07-22 | 31 | 161 | Detect | Detect |
| 21.35.21 | 2020-07-22 | 33 | 157 | Detect | Detect |
| 21.36.40 | 2020-07-22 | 31 | 155 | Detect | Detect |
| 21.37.58 | 2020-07-22 | 30 | 152 | Detect | Detect |
| 20.19.48 | 2020-07-22 | 00 | 000 | Not Detect | Not Detect |
| 20.26.14 | 2020-07-22 | 00 | 000 | Not Detect | Not Detect |
| 20.33.24 | 2020-07-22 | 00 | 000 | Not Detect | Not Detect |
| 21.32.43 | 2020-07-22 | 00 | 000 | Not Detect | Not Detect |

12345

Fig 5.2: Server updated output image

Advantages & Applications

**Advantages:**

- It just saves time
- Manual specific operation has been reduced to major extent.
- Less rated man power required.
- Efficiently distribution system.
- Easy to utilize.
- Efficient and reliability applies.
- Easy way to send mobile users to online content.
- Can travel in any direction.
- Full duplex communication between controller & robotic module.

**APPLICATIONS:**

- Used in military applications.
- Isolated Areas
- Mining Environments
- Forest Monitoring

## VII. CONCLUSION

The project is formulated using systematic modelling and can produce the desired results. This could be effectively implement as a Real Time device with some changes. Science is discovering or creating major breakthroughs in different fields and therefore technology continues to change from time to time. Furthermore, most units can manufactured together with a microcontroller on a single unit, making the system compact and Making the system already in place more efficient. In order to make the device available for real-time purposes, larger-range modules need to introduce.

The type of communication technique expands its range of operations where the user can control robot movement from any part of the world by providing live feedback from the surroundings compared to earlier robots operating on local networks. This robot with various sub modules can be widely used for security purposes and emergency rescue operations as a surveillance robot. In the proposed system the interfacing of sensors, camera module, Motor control and GSM/GPRS is done with Renesas microcontroller for better processing control which provides better surveillance implementation. In this system we obtain information about the area with by use of remote control, sensors and camera feed through wireless medium.

## VIII. FUTURE SCOPE

In an endless process there is always a chance of improving any system as a research & development. To this phenomenon our system is no exception. Can do the following developments for this project. We have developed a prototype module for project demo concern. This project may be taken up to product level in the future. We need to make this project compact and cost-effective to make it user-friendly and durable. Furthermore, most of the units are embedded on a single board with technology change

along with the controller, thereby reducing the system size.

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