

An Intelligent Robot For Security In Borders

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Abstract : Most of the military organization now takes the help of robots to carry out many risky jobs that cannot be done by the soldier. These robots used in military are usually employed with the integrated system, including video screens, sensors, gripper and cameras. The military robots also have different shapes according to the purposes of each robot. Here the new system is proposed with the help of low power IOT wireless sensor network to trace out the intruders (unknown persons) and the robot will take the necessary action automatically. Thus the proposed system, an Intelligent Unmanned Robot (IUR) using IOT saves human life and reduces manual error in defense side. This is specially designed robotic system to save human life and protect the country from enemies.

Robots are specially design for human to make our life easier. Robots are design for various purposes like military purpose, industry, for home based application. At border different tanks, missile, guns etc are used by enemy. This cause problem and harm our force or soldiers. For this a robot is design and developed for military purpose application to protect our army. robots used to detect its obstacle which is found in its path. If it found any obstacle in its path then using gun mechanism it will able to shoot that obstacle. For making it multifunctional robot all the actions perform by user same actions perform by robot using stretch sensor. All these mechanisms are embedded on the propeller.

IndexTerms - Military robot, IOT Wireless network, Intelligent Unmanned Robot (IUR).

I. 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 withdrew 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 the war. Human loss, machine loss, aircrafts, tankers. Indian economy decreased by 38%, cost of all commodities increased, taxes increased all together country had to face tremendous loss. The proposed system is based on IOT. The system uses an IR and camera based security system for protected areas and borders, which senses intruders, trespassers and transfer video to other end.

II. LITERATURE SURVEY

Bhawana D. Parate, Jagruti J. Shah – “Design and Development of multifunctional Robot for Military purpose Applications”

Robots are specially design for human to make our life easier. Robots are design for various purposes like military purpose, industry, for home based application. At border different types of tanks, missiles and guns are used by the enemy. This causes problems and will harm our force or soldiers. To address the above problem a robot is designed and developed for military purpose application to protect our army. The method involves a biped walking robot using parallel leg mechanism i.e. PLM which includes different functions like capturing real world data using digital image processing used to detect its obstacle which is found in its path. The limitations in the system is that it can move only on plain surfaces, but coming to the system fails to perform the operation effectively.

Alwin Hoffmann, Andreas Angerer, Andreas Schierl, Michael Visteinand Wolfgang Reif – “Towards Object-Oriented Software Development for Industrial Robots”

Industrial robotics is characterized by sophisticated mechanical components and highly-developed control algorithms. However, the efficient use of robotic systems—with regard to flexibility, reusability and extensibility is very much limited by existing programming methods. As a consequence, software development for industrial robots is a complex and time-consuming task which generates considerable costs. This work performs an analysis of the current software development

for robotics systems and identifies short comings from a software engineering point of view. Based on that, it outlines an architectural approach that addresses the identified problems and allows efficient software development for industrial robotic systems.

Sweeta Deshmukh, Priyadarshini, Mamta, Madhura Deshmukh, Dr. Md Bakhar- " IOT based Surveillance Robot"

The proposed security solution hinges on our novel integration of camera on Raspberry Pi. Raspberry Pi operates and controls video camera for surveillance and records video for future playback. The other major advantage is that it is a simple circuit where particular operating system has to be installed so that the image can be displayed. Raspberry Pi consumes more power when compared to a PC using INTEL Pentium 2 processor. The Raspberry Pi's memory is also limited which is been overcome in the current proposed system which uses External EEPROM memory AT24C02/4/8/16/32A having high flexibility in volume. Raspberry Pi uses L293D Driver chip. The disadvantage of this is, it has a 1.5 voltage drop within the chip. Also, using Raspberry Pi the performance decreases significantly, it also has less Graphical capabilities and can only be programmed on limited number of languages.

III. EXISTING SYSTEM

- It is not directly compatible with current robot controller and even requires a new generation of robot control software.
- There is no autonomous navigation.
- It had to face challenges such as state regulation, design issues. Safety/reliability, collision prevention.
- Video transaction of incident is must which is not there.

IV. PROPOSED SYSTEM

This project paper is a IR & camera based security system for protected areas & borders, which senses the Intruders, trespassers and transfer video to other end. For confirmation, 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. We will shoot the intruder when he cross the border, the bullet is equipped with a GPS facility if the intruder escapes then we can track him with the help of our smart phone. 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.

Fig 1 describe the system architecture. This unit consists of a metal sensor which can be used for the detection of mine/ metals. The system consist the solution for surgical strikes. 360 degree surveillance around the boundary is available. It consists of live human detection that is by sensing the movement of human. It tracks the location of the incident. Video transaction of the incident is available. It consist of gas sensor which can detect harmful gases. The system overcomes horrible climatic challenges. Temperature problem is resolved. The robot will also activate the Camera, which will start capture the live video and transmit the same to the receiver end, that is the smart phone.

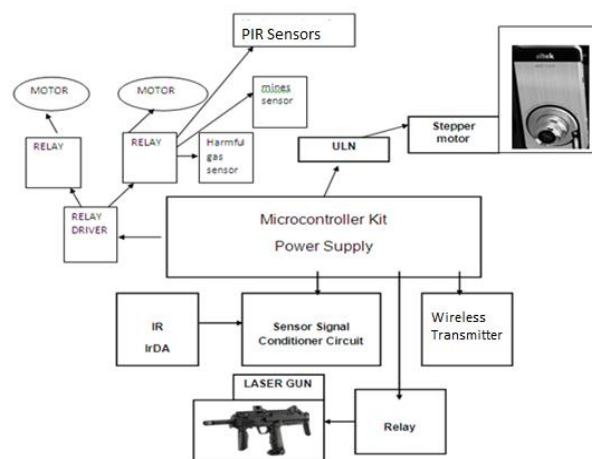


Fig 1. System Architecture.

V. MODULES

The modules described here as follows:

A. Hardware module

- 1) Functionality: - It provides the wireless connection across different sensors and devices connected.

- 2) Input: - Establish connection between the robot and the host device.
- 3) Output: - Connects various devices through wireless network.

B. Software module

- 1) Functionality: - The android app is built using java programming language used to control the activities of the hardware.
- 2) Input: - User commands are the input.
- 3) Output: - Movement of the robot according to the user inputs.

C. Network module

- 1) Functionality: - It provides the wireless connection across different sensors and devices connected.
- 2) Input: - Establish connection between the robot and the host device.
- 3) Output: - Connects various devices through wireless network.

D. Metal Sensor

- 1) Functionality: - Sensing the mines/metal.
- 2) Input: - Mines, metal.
- 3) Output: - Alert to the android app through messages and buzzer.

E. Harmful Gas Sensor

- 1) Functionality: - Sensing the harmful gas which may be present in environment or the one attacked by enemies.
- 2) Input: - Harmful Gas.
- 3) Output: - Alert to the android app through messages and LED display.

F. IR Sensor

- 1) Functionality: - Sensing the movement so that to identify the intruder or attacker.
- 2) Input: - Obstacle in 360 degree.
- 3) Output: - Alert to the android app through messages and LED display.

G. PIR Sensor

- 1) Functionality: - Sensing the movement so that to identify the live human being.
- 2) Input: - Movement in human being.
- 3) Output: - Alert to the android app through messages and LED display.

IV. RESULT

The ROBOT is a basic tool for automation and will be of great use to perform repetitive tasks of picking and placing in an industrial production line. Its use can be extended and exploited by few modifications to do difficult and hazardous tasks for nuclear applications. It can be used to do work effectively due to its great-added accuracy which will results the quality improvement in the work.

Internet of things (IoT) is the network of physical devices, vehicles, home appliances and other items embedded with electronics, software, sensors, actuators, and network connectivity which enables these objects to connect and exchange data. Each thing is uniquely identifiable through its embedded computing system but is able to inter-operate within the existing Internet infrastructure.

This Paper 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 Paper, we are going to have an IR Sensor which senses any intruders / trespassers and will activate the alarm as well as switch on the lasers/guns can be used in that particular place which will shoot the intruder when they cross the border.

It will also activate the Camera, which will start capture the live video and transmit the same to the receiver end, the smart phone at the same time it will start gives alarm and the data will transferred through the RF Transmitter & Receiver to the mobile device.

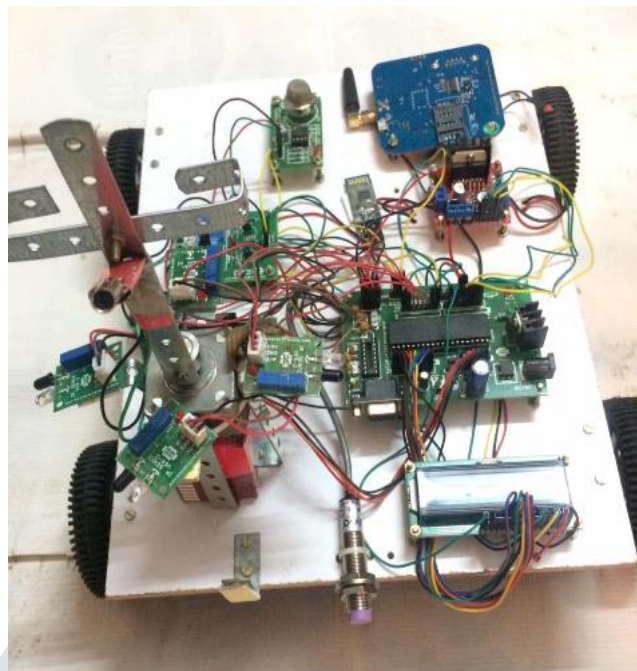


Fig 2. Mine detecting robot.



Fig 3. Smartphone SW Interface

IV. CONCLUSION AND FUTURE SCOPE

Security is the current area of research where lots of scope exists. Currently this particular security technique is required by several countries. One such enhancement we are trying to do in this paper.

The type of communication technique enhance operation, where the user can control the robot by getting live video feedback, compared to earlier robots work like wifi with constraints have limited, iot and s video camera makes it cost effectives combat robot. This robotic vehicle with different widely be used as surveillance robot for sec emergency rescue operations where human and user will be able to alert prior to intruder

The proposed system gives an exposure to design a multifunctional defense robot. This robot has a widespread industrial, defense applications. The laser gun attached to the robot is an excellent substitute for the weapons carried by the soldiers. The laser gun can be triggered with the help of wireless camera. It can be used in a hostage situation to pinpoint the exact location of

terrorists with the help of wireless camera, saving many lives during rescue mission. Another application is border security system to sense movement of intruder through pir sensor. The current range of operations is limited and can be made more sophisticated. Laser gun found to be very accurate in pointing to the target.

We can use this system for military applications installing suitable sensors. Just by changing the robotic unit design we can use it in hospitals for patient monitoring. Using some chemical sensors we can detect harmful gas leakage in the chamber the time delay which occurs in the execution of commands can be reduced and thus we can have more real time access to the robot. With reduced time delay we can have faster operation and quick response to any illegal activities in the monitored area. Also it can be used as a spy robot. The robot is very economical.

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