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ANDROID BASED INTELLIGENT ROBOT FOR BORDER SECURITY

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Abstract - *For automatically detecting trespassers in borders, an autonomous intelligent Robot can be used. Our borders extend thousands of miles and therefore our soldiers will not be able to provide complete security. Illegal immigration, smuggling and trafficking in drugs and arms can be prevented if the borders are secured. Every government gives more priority for border security. As technology increases new threats and risks arise towards national security. To improve the border security, sensor technology and computer processing power can be used. In our project an autonomous intelligent robot is used which is enhanced with a video surveillance camera for detecting the trespasser, inform nearby control unit and to check whether an intruder is detected and fire if necessary. PIR motion sensor is used for detecting the trespassers.*

Key Words: **Autonomous Robot, PIR motion sensor, Android device, Laser gun , Bluetooth technology**

1. INTRODUCTION

Security is the degree of protection, which separates the assets and potential threats. Security can be classified into different types; they are information technology security, physical security, potential security, monitory security etc. The design and development of robots now a day's focuses on unstructured and natural environments rather than for industrial environment. Robots are used for rescue security and surveillance. The skill of robot can be utilized were a human is not capable for doing it. For monitoring remote areas an intelligent robot can be designed with reliable economic communication. This paper introduces an Autonomous intelligent robot for border security. A cost effective autonomous solution is used to overcome the limitations of the existing physical solutions. The number of soldiers who are recruited in the borders can be reduced. Here the robot can identify trespassers using video surveillance, which provides a 24-hour surveillance. Intruder detection is performed with a PIR sensor module attached to the robot. There are mainly three sections, namely software section, hardware section and Robotic action. Here a remote control mode is used, in which the user navigates the robot to the target section. It has the capability to automatically detect the trespassers in borders and to inform nearby control unit [1]. Here the robot identifies the trespasser using ultrasound sensor and captures image using camera. This enables effective identification of intruder and fire if necessary.

Android Based Autonomous Intelligent Robot for Border Security, which identifies trespassers using PIR motion sensor, alerts security personnel by SMS using GSM and captures image of trespassers using camera in android device and mail this image to corresponding email ID using android based application[2]. It enables security personnel to detect effectively and at low cost to identify an intruder. Design and Development of Robot Car for Border security. The work presents a multipurpose smart robot car using wireless camera for detecting humans, fire, metals, obstacles at main areas and the information is send to main location. The system uses machine intelligence to provide immediate response from sensors [3].

2. PROPOSED MODEL

The block diagram of the proposed system consists of PIR sensor, android phone and dc motors. Here the microcontroller we are using is pic16f877a Transmission of ultrasonic signal being enabled by microcontroller and monitors the reflected signal from the intruder.

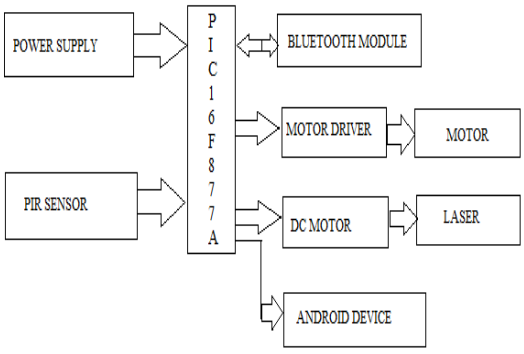

FIGURE -1: Block diagram of proposed system

PIC16F877A : It the heart of the project. It is an 8-bit controller. The important activities of the robot are controlled by the microcontroller. It has 256 bytes EEPROM data memory. . It is self-programming and has 37 instructions. It is a RISC (Reduced Instruction Set Computer)

design. Its code is extremely efficient .it is low cost and high clock speed.

DC MOTOR: It is an electromechanical device that converts electrical energy into mechanical energy. It can be used to do many useful works.

BLUETOOTH TECHNOLOY

It is a wireless technology for exchanging data over short distances. It can connect several devices at a time. The development in computing and communications has paved way for Bluetooth technology. This technology dominates both home and business market

PIR SENSOR

It is an electronic sensor that measures infrared light radiating from objects. It is used to sense movement of people or animals. PIR sensor do not generate or radiate energy, do not detect or measure heat instead they detect the IR radiation emitted from an object.

L293D: It is a motor driver integrated circuit. It is used to drive DC motors rotating in either direction. It is a 16 pin IC. It works on the concept of typical H Bridge. There are two H bridge circuits, which can rotate 2 DC motors independently.

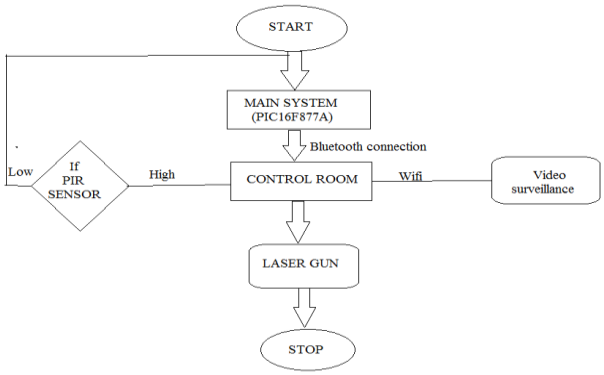

Chart -1: **Flowchart showing the working.**

2.1 WORKING DESCRIPTION

Basic principle of the system is waiting for the reflected signal from the intruder. To rotate the motor and laser gun DC motor is used. The movement of robot is enabled by our mobile phone. Two-geared DC motor is used for the movement of robot.

Here we are using two mobile phones, one is for controlling the movement of robot and the other is for providing video surveillance. Then a PIR sensor is used for detecting the trespasser. The sensor is activated 40secs after the activation of the device, as it wants to cope up with the surroundings. If an intruder is detected, the output of PIR sensor is being send to the microcontroller, then the Bluetooth module in the microcontroller sends an information signal to the control room.

If an intruder is detected a laser gun is provided for further purposes. The movement of laser can be controlled as per the directions given by the control room. If necessary, laser gun can be used for shooting or firing the intruder.

2.2 SOFTWARE DESCRIPTION

MIKROC: It is used for code development .It is a powerful, feature-rich development tool for microcontrollers. It is used for developing applications for embedded systems.

PROTEUS: It is used for developing various designs with electronics and microcontroller. It is used as a tool to test programs and embedded designs. It can stimulate the programming of microcontroller in proteus 8 stimulation software.

ROBOTIC ACTION: Movement of the robot is controlled by using 2 DC motors .For forward motion of the robot the motors are rotated in clockwise direction. Backward movement is obtained by rotating the motors anti-clockwise direction. For left and right movements one motor is rotated keeping the other intact.

2.3 FUTURE SCOPE

A coherent system is needed which combines various technologies to create a more accurate and efficient systems. Border security is an important factor concerned for many nations. It controls illegal crimes in the country. By implementing a large number of robots the security levels can be increased. A single robot could only monitor a local area but more robots could detect intruders in a global area. More number of sensors can be included for more safety. Large number of sensors is used to detect more intruders. Metal detectives and other technologies can be established to further increase security levels. A less expensive and complex system can be introduced for increasing the border security.

3. CONCLUSION

There are no present security methods to safeguard our borders therefore implementation of android-based robot for border security could be more helpful. It reduces human

involvement in the borders. This method reduces the risk in the lives of our soldiers. PIR sensor is used to track motion of intruder and camera for video surveillance. Alert message is being send to the control room, and the provision for firing is passed on. This system provides more security and reducing the risk of soldiers.

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