ADVANCE BORDER SECURITY USING ANDROID APPLICATION

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ABSTRACT:

These system offers a complete robot action which design to keep the enemy out of reach from line of control. that is what it saves the most worthy human life. Now a days our soldiers continuously observe the border of country though it is a normal day or during a war. and they observes any of d terror moment on the actual line of control. but unfortunately the system is not safe for soldiers life and there are chances of mistake and dangers. the proposed system is mainly design to provide remote accessibility using wireless technology for land soldiers on battle field.

Keywords: *Remote access technology, Portable camera, Android application.*

1.INTRODUCTION:

The android operated machine gun is non portability so by providing transportation capability system will be more powerful and it gives more controlling and operational flexibility to the user. Some features we are trying to add in the system are servo motor for horizontal and vertical motion of machine gun, wireless camera and LASER beam to point the target, wireless connectivity between control room and robot unit using Bluetooth technology and system software which is operated by user which provides full system monitoring functionality at the control room. System will be controlled using wireless signal. The wireless and embedded technology will be used for the design and development of this system.

Fig-1: Manual Technique

So the proposed system is the novel idea to build wireless android operated machine gun which operate as per defined by user. Proposed system will be a combination of android operated machine gun and the control room. This system will provide security on border and protect soldier life. This system is mainly designed to provide real time operation by continuous monitoring using camera. System will be controlled using wireless signal. We need to build a remote signal transfer platform. This remote signal transfer platform will be used for wireless network. The wireless and embedded technology will be used for the design and development of this system. This system can be very useful in ground level combat and save most worthy human life. So the proposed system is the novel idea to build wireless self defensive machine gun which operate as per defined by the user. Proposed system will be a combination of remote operated machine gun and the control room.

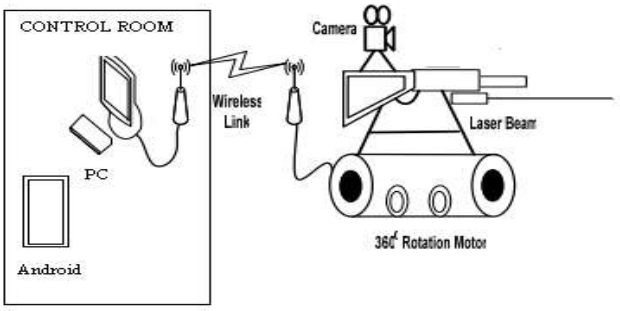

Fig -2: System organization

2. SYSTEM DEVELOPMENT:

The main objective of the system is to detect the target using the PIR sensor and camera. The microcontroller is used for processing and instructing. There are two units one is the control unit and the second is the robot unit. Here android is used for the navigating the machine gun. And machine gun is used for firing and destroying the target. Metal detector sensor is used for detecting metal under ground below 7 cm. which will help us to find out hidden weapon under ground camera is used for the surveillance of enemy side. It also consist of the Bluetooth module.

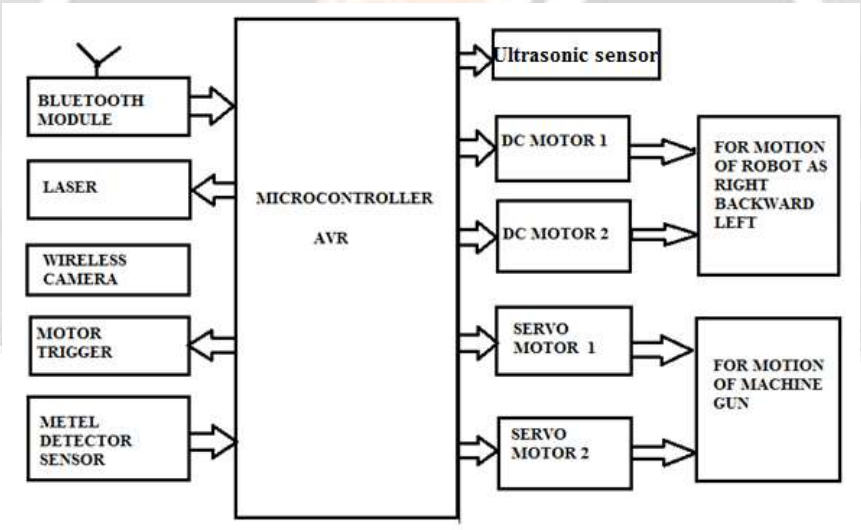

Fig-3: Block diagram of Robot Unit

2.1 Micro controller(AVR):

The microcontroller is used for processing and instructing .In this system we use ATMEL AVR(AT32UC3C) 28 pin microcontroller. The Atmega328 is a very popular microcontroller chip produced by Atmel. It is an 8-bit microcontroller that has 32K of flash memory, 1K of EEPROM, and 2K of internal SRAM.

The Atmega328 is one of the microcontroller chips that are used with the popular Arduino Duemilanove boards. The Arduino Duemilanove board comes with either 1 of 2 microcontroller chips, the Atmega168 or the Atmega328. Of these 2, the Atmega328 is the upgraded, more advanced chip. Unlike the Atmega168 which has 16K of flash program memory and 512 bytes of internal SRAM, the Atmega328 has 32K of flash program memory and 2K of Internal SRAM. The Atmega328 has 28 pins.

It has 14 digital I/O pins, of which 6 can be used as PWM outputs and 6 analog input pins. These I/O pin account for 20 of the pins.

2.2. Bluetooth module:

Bluetooth is a wireless technology standard for exchanging data over a short distance in a very efficient and lucid way. It is a technology standard for exchanging data over short distances (using short wavelength radio transmissions in the ISM band from(2400-2480MHz) from fixed and mobile devices, creating personal area network (PANs) with high levels of security.

Wireless control Bluetooth operates at frequencies between 2402 and 2480 MHz, or 2400 and 2483.5 MHz including guard bands 2 MHz wide at the bottom end and 3.5 MHz wide at the top. This is in the globally unlicensed (but not unregulated) Industrial, Scientific and Medical (ISM) 2.4 GHz short-range radio frequency band. Bluetooth uses a radio technology called frequency- hopping spread spectrum. Bluetooth divides transmitted data into packets, and transmits each packet on one of 79 designated Bluetooth channels. Each channel has a bandwidth of 1 MHz. It usually performs 800 hops per second, with Adaptive Frequency Hopping (AFH) enabled. Bluetooth low energy uses 2 MHz spacing, which accommodates 40 channels.

Here we use Bluetooth Device as a wireless connection between Android phones as receiver and Bluetooth device on moving robot at transmitter side. in this by using serial communication communication held in between two devices.

2.3 Metal detector:

Metal detector sensor is mainly used for the detection of the metal detector is used for detecting mine under ground below 7 cm. So that any weapon hidden under the ground is detected.

A **metal detector** is an electronic instrument which detects the presence of metal nearby. Metal detectors are useful for finding metal inclusions hidden within objects, or metal objects buried underground. They often consist of a handheld unit with a sensor probe which can be swept over the ground or other objects. If the sensor comes near a piece of metal this is indicated by a changing tone in earphones, or a needle moving on an indicator. Usually the device gives some indication of distance; the closer the metal is, the higher the tone in the earphone or the higher the needle goes. Another common type are stationary "walk through" metal detectors used for security screening at access points in prisons, courthouses, and airports to detect concealed metal weapons on a person's body.

The simplest form of a metal detector consists of an oscillator producing an alternating current that passes through a coil producing an alternating magnetic field. If a piece of electrically conductive metal is close to the coil, eddy currents will be induced in the metal, and this produces a magnetic field of its own. If another coil is used to measure the magnetic field (acting as a magnetometer), the change in the magnetic field due to the metallic object can be detected.

Fig-4: Metal detector working

Metal detector detects under ground miles and any harmful devices like bombs can be easily detected. it also measures a distance from robot to substance under ground.

2.4 Camera:

Here system will continuously capture video frames using wireless camera.

Fig-5: Camera

Here we use wireless camera rear view kit with 700 resolution having a scan frequency 50 Hz. this system shows the moving video of border at control room. so that target will easily detect and we can fire at that direction automatically. there is no need of manual military so that it can saves human life.

2.5 Wireless Camera Receiver

Fig-6: wireless camera receiver.

Wireless video transmitters and video receivers make wireless video easy and reliable. Whether it is using highly reliable FM wireless video or 2.4 GHz to 5.8 GHz Wi-Fi, wireless video transmitters and wireless video receivers are the perfect solution when it is difficult or impossible to run cables. A wireless transmitter and receiver can easily be used in conjunction with hidden video cameras. Wireless video surveillance receivers are ideal for receiving video over long distances and save you time and frustration.

2.6 Servo Motor

The servo motors are specially used for the motion of machine gun in 3600 angle.The rotation of Gun is done by two Servo motors. One in horizontal direction & other in vertical direction, so that user can target or see at any direction by rotating gun using remote input device.

Fig-7: Servo motor

A servo is a mechanical motorized device that can be instructed to move the output shaft attached to a servo wheel or arm to a specified position. Inside the servo box is a DC motor mechanically linked to a position feedback potentiometer, gearbox, electronic feedback control loop circuitry and motor drive electronic circuit.

2.7 DC motor:

The DC motors are mainly used for the motion of the robot.The DC motors are mainly used for the motion of the robot. A simple DC motor has a stationary set of magnets in the stator and an armature with one or more windings of insulated wire wrapped around a soft iron core that concentrates the magnetic field. The windings

usually have multiple turns around the core, and in large motors there can be several parallel current paths. The ends of the wire winding are connected to a commutator. The commutator allows each armature coil to be energized in turn and connects the rotating coils with the external power supply through brushes.

A DC motor like we all know is a device that deals in the conversion of electrical energy to mechanical energy and this is essentially brought about by two major parts required for the construction of dc motor, namely.

1) Stator- The static part that houses the field windings and receives the supply.

2) The rotating part that brings about the mechanical rotations.

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Fig-8: DC Motor

2.8 Laser:

For accurate target at the aim user can use this LASER. It is light emitting diode which generate long distance red laser beam. It is attached with machine gun so that it will move at machine gun's direction.

In our project LASER is used for to point the accurate target. All sensor require some laser light to return to them from the target surface in order to function. The amount of light needed is a measure of the sensitivity of the device. In general, the most sensitive devices are the most costly, and accurate measurement at high sample rates require stronger reflection than for lower sample rates. For diffuse targrts, the higher the reflectance of the target, the better a sensor's performance.

2.9 Ultrasonic sensor:

Ultrasonic sensor is used at robot side. Ultrasonic transmitter continuously transmit ultrasonic rays and receiver receives the rays when wave strike on obstacle and reflect back. Ultrasonic sensor will fitted in front of robot. Robot will move automatically, when any obstacle come in between robot path, it will automatically change it's path. If any obstacle is detected then robot unit send alert signal to transmitter side through Bluetooth module.

Fig-9: Ultrasonic Sensor

Ultrasonic sensor will fitted in front of robot. Robot will move automatically, when any obstacle come in between robot path, it will automatically change it's path. If any obstacle is detected then robot unit send alert signal to transmitter side through Bluetooth module.

2.10 Power supply unit: Lithium polymer Rechargable Battery:

Fig-10: battery

We use here a lithium polymer battery as a power supply, it is rechargeable. it is a great way to power any potable project. this is an excellent choice for anything that requires a small battery with lot of punch. the voltage is low enough not to tax your regulating circuits, and the discharge rate is high enugh to accommodate a lot of electronics and a few small motors.

The battery has three cells and outputs 11.1V storing 1500mA of charge. because this is a triple cell battery pack, a special charger is needed. this battery is not compatible with single cell chargers.

2.11 Android Mobile

By using such type of android mobile we can operate machine gun with the help of mobile apps

The purpose of this project is to cover the basics of setting up a connection between Arduino Uno and an Android phone via Bluetooth. Smart phones pack a ton of cool features (camera, accelerators, speakers, microphone, a nice screen to show data from your sensors, Wi-Fi adaptor) that will make an excellent addition to a robot, or any other Arduino project.

3. FLOW CHART:

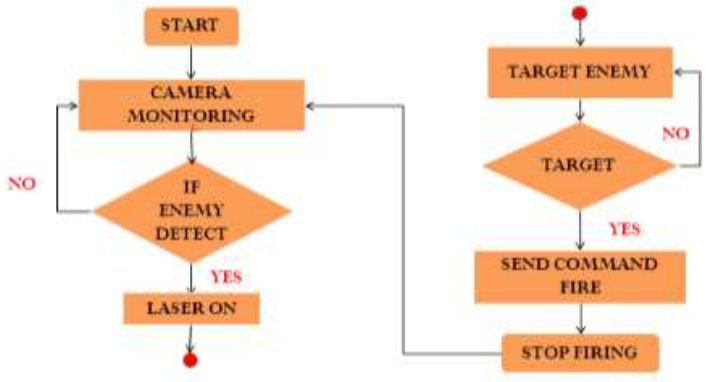

Fig-11: Flow chart of system

Once the vigilance person who is at the control room finds any unauthorized entry of adjacent country terrorist or militant he can activate a gun which is located at the border side from the room itself which is done by using the joysticks which is nothing but a input from control unit to the remote unit. In the similar way the laser is used to target the enemy and the gun is triggered remotely from the control unit. All these transmission are taken over by a RF transmitter and a receiver which are placed at both the ends. The RF unit is a 433MHZ transmitter receiver units.

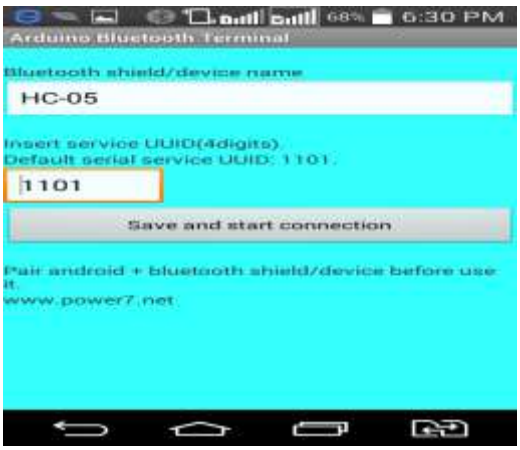

Fig-12: Pairing of Bluetooth of android with robot unit

Fig-13: Sending command of initialization of gun to the robot unit

Fig- 14: Firing Robot After Enemy Found

4. RESULT:

When Enemy is detected This Information is provided to microcontroller and Bluetooth module wirelessly and we operate robot and machine gun with the help of our android mobile by observing video on PC and enemy is destroyed in this way we have successfully operated our machine gun.

Where we have plaed robot at the border side when any person tries to eater in the coverage area of the robot unit. Here we have plcae the robot with machine gun it is in motion as per theuser command. When it is moving on the boundry side the camera which is put on it will continously providing the live video at the control room. When there is any hidden weapon at the border side the meral detector sensor will sense it and send commandar the control room with the help of microcontroller and Bluetooth module.

In this project we have used ultrasonic sensor which continuosly transmits the ultrasonic wave when any enemy is come at the border side it will sonic it and send infromation at the control room on the android. When we get the information we operate the robot and machine gun by watching video an the PC and eneny is targeted with the help of of laser beam and destroyed by giving command from the android.

In this way we have protected solders life by keeping him out of boundery amd also emeny is destroyed.

Fig- 15: Project Overview

5. CONCLUSION:

Enormous amount of work has been done wireless controlling of machine gun. In this project various methodologies have been analyzed and reviewed.

Thus it can be concluded that features like user friendly interface light weight and probability of android is based Smartphone has over taken the sophistication of technologies making this system absolute. In this way in less manpower and less time we have save the border.

Thus we have going to develop **"Android operated Machine Gun for Defence system"** systems for protecting our border. The remote controlling improves its efficiency, security and accuracy.

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