National E-Conference on "Communication, Computation, Control and Automation" (CCCA-2020)

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RESEARCH ARTICLE OPEN ACCESS

WIRELESS MULTIFUNCTIONAL ROBOT FOR MILITARY APPLICATIONS

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Abstract:

This project work describes the carrying-out of robotic observation and control system for area which a man cannot go like forests etc. This robot can be used to provide the surveillance in border. Multisensory capability has to disclose human beings, poisonous gases, temperature and explosion of fire at areas where a normal person cannot go. The robot uses GPS to find the exact location of the robot vehicle. The robot vehicle iscontainedwithGPSReceiverandGSMModem,theGPSreceivergetsthelocationcoordinateswhichcanbe decoded and it sends to control room using GSM modem. IR sensor detects human presence and it delivers activemessagestothecontrolroom.Sensorinformation,GPScoordinateswhicharelatitudeandlongitude,and is continuously sent to control room. At the control room the GPS information is mainly used to show the real time position of the robot using Google maps, also the sensors information from the location can be seen on a webpage and it can be accessible fromanywhere.

Keywords — Surveillance, Humans, Gases, Fire, Humidity, IR Sensor, GPS, GSM.

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I. INTRODUCTION

Thismultifunctionalrobotismainlyusedtodesignfor military application in. This robot is electro-mechanical system which can be composed by C++ program.Itwasmadetoreplacehumanbeingsinsome dangerous places where humans cannot go. To reduce the difficulty of wired communication, here we introduce latest wireless radio frequencytechnology system. The transmitted signalis sent to receiver andis attached to device that is operated by user. Military application robots are used to expose landmines, humans, poisonous gas and explosion of fireetc.inthewarzones.Robotvehiclecanworkinall types of environments like highly polluted areas, nuclear as well aschemical.

The global positioning system (GPS), has capability to navigate any device around the world.

GPS plays a key role in all the military applications.A GPS receiver on the robot vehicle along with GSM Modem sends this information to a server which can be located at the controlroom.

A. ExistingSystem

Most popular surveillance systems use RF based communication for data transmission and DTMF for autonomous operation. Use of RF hinders the rangeof operation as RF has very low communication rangeas compared to other available communication methods. Line of sight operation makes it not totally apt for use in areas with obstacles or in areas like forests. Use of DTMF for controlling movement of the robot make it semi-autonomous as human intervention is always needed for robots to move. Robotic systems as proposed in use mobile phone on systems for data collectiontodatatransmission,whichincreasescostof system as a good quality mobile device costs highand such systems are not feasiblepractically.

B. ProposedSystem

The Multifunctional robot is divided into modules, each with their own functionality and centrally controlled by a controlling system. The system can be controlled by RF Transmitter. The prototype is more useful which contains GPS and GSM. The robot can able to detect the landmines, harmful gases, human beings and fire and it sends the sensors information to the control room. In this we are controlling the robot by using RF transmitter control. By using a laser gun we can shoot the intruder by receiving the message from control station. At the robot, sensors continuously sense and provide data to the controller, which sends the same data to the control room using GPS and sends the alert message to the control room by using GSM module. A GPS Receiver continuously gets latitude and longitude data to the controller.

II. LITERATURESURVEY

We are no need to surprise when a machine performs as a human beings in improving technology. Many useful ways is still exist when compared to alive solider. One important thing about military robot vehicles are, it has ability to handle tasks in the warzone,withzerocasualty.Thereforetheygivegood number of possibility of success in hazardous places. When the robot vehicle is crashed, military can easily design anothervehicle.

From literature, it is seen that an intelligence fighting robot was designed especially for warzone. Security has given from intruders. Whenever the intruders come across the robot vehicle it is able shoot withthelasergun.Thistypeofprocedureisdonewith the help of the controller at the control room. And a wireless cam is placed on the robot vehicle. And then a huge quality of video to be shared to controller computer and whenever the intruders come across the robotvehicleandcontrollershoottheintruderbyusing lasergunwhichistobecontrolledatcontrollerstation.

Recent studies show that a robot vehicle can be controlled by handheld device. The camera in the vehicle records the videos of the intruder which is controlledbyahandhelddevice.It isveryusefulinthe military applications. And the technology used here is dual tone multi frequency. With this, the vehicle is operated by using handheld device and the range is also more. But the signals must be good. A handled device is tied with the robot vehicle and another handheld device is operated by the controller. This vehicle is absolutely controlled with the handheld device only. And the procedure to operate is, first the

controllerhavetomakeaphonecallwithhisdeviceto anotherhandhelddevicewhichisontherobotvehicle. Andthevehiclegetsthetonefromthehandhelddevice that is tied to the vehicle. This tone is controlled by MC with help of dual tone multi frequency decoder. And then sends a message to the motor and the robot vehiclemoves.

III. BLOCKDIAGRAM

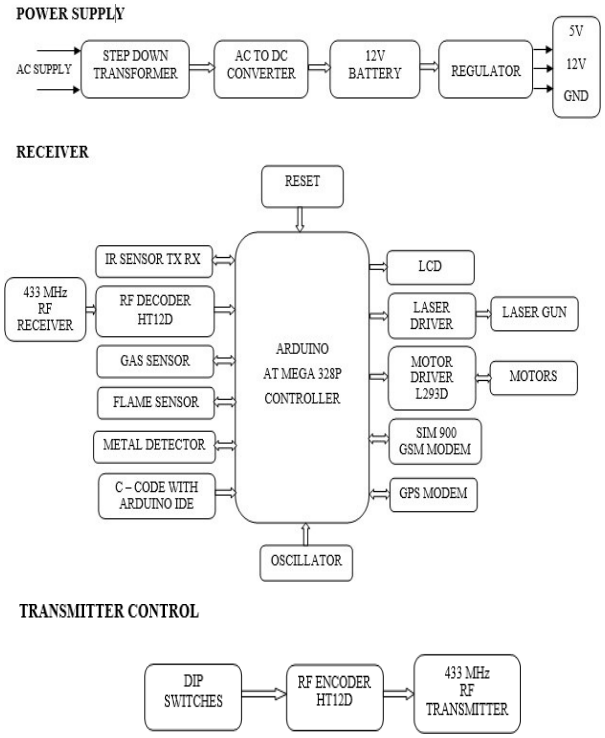

Fig 1: Block Diagram

Power Supply:

Power Supply should be a main block requirement for entire robot. We cannot run robot vehicle without this power supply. The total required direct current supply for whichthe base unit and also for the recharge one is to be defined from the mainsline.

Arduino Mega:

Arduino Mega board is a MC chip which is under the ATmega2560. It is heart of the entire project. This board contains fifty four digital input and output pins and also 16 analog input pins.

GPS:

Global Positioning System (GPS) is used todetermine the exact location of the particular place of the robot vehicle.

GSM:

A GSM modem is a chip that will be used to generate communication between a handheld device or a computing machine and a GSM system.

Gas Sensor:

It is mainly used to expose the poisonous gases like alcohol, smoke, methane, hydrogen, NH3, Propane, Benzene etc.

Metal Detector:

Itisusedtodetectallthemetals.Landmine isalsoone typeofmetal.So,ithasabilitytodetectthelandmines. This sensor is used only for landminedetection.

Flame Sensor:

Flame sensor is a kind of detector which is used to designed for detecting as well as responding to the presence of a fire or flame.

Laser Gun:

Laser Gun is used to the shoot intruder by receiving the message from control station.

Motor Driver:

Motor is like an output device, its speed should be varied according to the speed which is to be set by the

DIP switches. The speed can be varied by varying the voltagegiventothepulsewidthmodulationconverter.

LCD:

Liquid Crystal Display is mainly used to display the status of the robot.

IV. RESULT &DISCUSSION

This project describes that the robot vehicle is developed to run by the message through the transmitter. This prototype is developed because ithas ability to run anywhere and it has ability to know the data of exact location using GPS and GSM. And ifthe robot will find any landmines, or if any harmful gases oranyfireatremoteareasthenitdetectsbyusingmulti sensor capability. And then it sends the alert message tothecontrolstationbyusingGSMmodem.Andithas ability to detect the obstacles by using IR sensor. And if the robot will find any intruder, it can shoot the intruder by using the laser gun which is mounted on the top of the robot vehicle. And it sends an alert message to a registered subscriber identity module with the help of global system for mobile communicationmodule.Theperformanceofthisrobot vehicle is very good at highly polluted areas and nuclear as well aschemical.

V. CONCLUSION

The main aim of this project is to reduce the death rate of our soldiers and also to reduce the casualty. It has ability to detect metals like landmines by using a sensorcalledmetaldetector.It hasabilitytodetectthe humans and fire by using IR and fire sensors. The robotvehicleisoperatedcontrolledatthecontrolroom with the help of a controller. Not only in military but also these type of robots can be used in many applications. So, this robot is perfect for military to save the many lives of oursoldiers.

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