Soldier Robot with Dark Eye

Ujwala G. Meshram, Shubhangi Borkar

M.E Student, Department of Embeded System and Computing Science, Nagpur Institute of Technology, Nagpur, M.S, India

Asst. Professor, Department of Computer Science, Nagpur Institute of Technology, Nagpur, M.S. India

ABSTRACT: The motive of this paper is to replacement of human soldier to robot. Human life is priceless. In danzareous sector like war field, boarder area and human casualties in terrorist attack there is highly risk on human life. to tackle this type of environment or gather information about there surrounding we design a robot who monitor the every position of enemy also detect hazardous gas, metal ,temperature and send feedback to user on real time basis. A camera are mount on the robot to capture real time video. the camera has unique quality that it provide night vision. So that in total dark area we can see clearly scenario. In this paper robot act as an vehicle that can be operated remotely. For remote operation RF technology is used.

KEYWORDS: IR camera, RF module, IR sensor, robot.

I. INTRODUCTION

A robot is an automatic machine that performs various complex tasks. A robot can act itself by using mechanical system like motors, pulleys, gears, accelerometer and many other systems. also it work with some display , LED, sensor to gather information and send via remotely to alert user what to do next. The robot makes efficient locomotion by means of software in which programming are dump into robot. So that robot sense data from environment with the help of sensors.

The working principle of this paper is divided in to two section.

- Transmitter
- Receiver

At the transmitter section commands are send via PC to control the movement of robot. The movements of robot are

- Start
- Forward
- Reverse
- Left
- Right
- Stop
- Read data
- Auto mode

All this commands are control by PC . So that robot is travel by wirelessly. For remote operation RF module are used which execute at adequate distance upto 200meters.

At receiver section the transmitted data are received by antenna. In this section two motors are interfaced with microcontroller atmega8 where they are used for locomotion of robot. A wireless camera is mounted on the robotic body to keep eye continuously on enemy even in complete dark area. There are LCD display to display temperature, amount of gas, illumination of light etc. there are following sensors they are

- Gas sensor
- Metal detector
- Motion sensor
- Temperature sensor

- LDR

II. RELATED WORK

We aim to develop a model which will be efficiently used to minimize terrorist causality. Being able to achieve reliable long distance communication with user-friendly robot control is an Important open area of research to robotics. Author[6] Swetha N invent a paper of "Design and Implementation of Accelerometer based Robot Motion and Speed Control With Obstacle Detection": this paper propose a model of a robot based on "Human Machine Interfacing Device" utilizing hand gestures to communicate with embedded systems for tracking of enemies. The 3-axis accelerometer is selected to be the input device of this system, capturing the human arms behaviors. Author[8] design a paper on signal and image processing. This paper presents the design, development and validation of vision based autonomous robotic system for military applications. Sum of Absolute Difference (SAD) algorithm is used for the implementation of the proposed image processing algorithm . author[9] Kallyanee N. Kapandnis design a paper to reduce human victims in terrorist attack such as 26/11. So this problem can be overcome by designing the spy robot which involves wireless camera. so that from this we can examine rivals when it required. This robot can quietly enter into enemy area and sends the information via wireless camera.

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We have propose methodology of the paper which can be divided in two ways
1) Hardware Implementation
2) Software Implementation

Hardware implementation consist design and development of the sensor like gas sensor, metal detector, IR sensor, temperature and LDR, RF module, LCD Display and also used intelligent soldier robot while at another end ,in Software Implementation we focuses on program of the microcontroller using MATLAB and C language.

A. *Hardware Implementation*

Microcontroller is a heart of this wireless robot. It is a programmable device. it has a CPU in addition to a fixed amount of RAM ,ROM, I/O ports and a Timer embedded On a single chip . Microcontroller having large amounts of memory and I/O ports so we never need external peripheral devices. Because of on chip ROM/RAM, I/O ports microcontroller makes them ideal in every application sector. Here we are using ATmega 8(L). the Atmega8 is low power CMOS 8-bit microcontroller based on the AVR RISC architecture. By executing powerful instruction in a single clock cycle, the Atmega8 achieves throughputs approaching 1 MIPS per MHz, allowing the system designer to optimize power consumption versus processing speed.

the working principle of this work system is divided in to two ways
a)Transmitter
b)Receiver

At the transmitter section commands are send to the receiver by wirelessly. The microcontroller at the receiver section act as a slave. following figure shows the transmitter section. At transmitter section RF module is used for remote operation. IC max 232 is used for serial programming. The max232 is the IC which in one package contains the necessary driver and receivers. It just need +5V supply voltage and generates the necessary RS-232 voltage level (approx -10V to +10V) internally. Because of this feature it greatly simplified the design of circuitry. AC supply is connected to the transmitter circuit which is in 230V. and IC MAX232 needs only +5V supply so that we are using here voltage regulator i,e IC 7805 to provide stable 5V supply to the MAX232. As shown in figure the pin no.11 and 12 Of MAX IC are connected to the receiver and transmitter of microcontroller. While pin no. 14 and 13 are connected to the PC COM Port. Because of this connectivity PC and transmitter section are interfaced with each other. So that whatever commands we are giving from PC this are transmitted through this COM port to the microcontroller and this master microcontroller send signal wirelessly to the receiver.
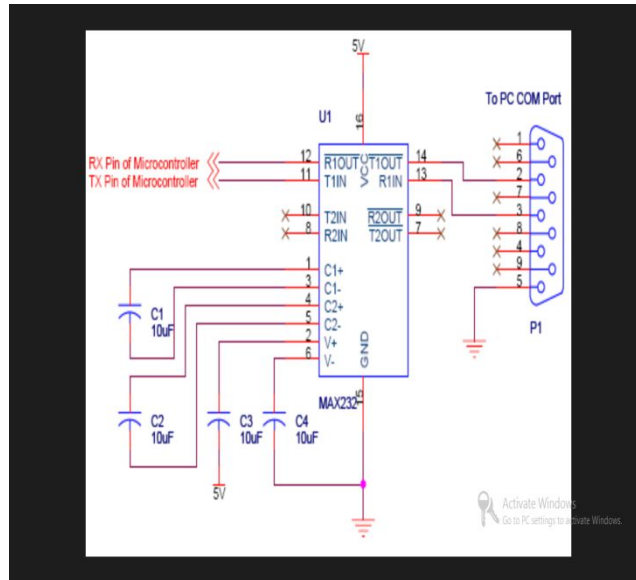
Figure: 1 ckt diagram of MAX232 IC

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b) Receiver

At the receiver section two motors are interf0aced with microcontroller where they are used for movements of robot. A IR camera are mount on the robotic body for spying purpose. Here we are using two motors for locomotion of robot. For their proper operation it requires 138 to 200 mA but our microcontroller is not capable to provide that much current. So that we are using here motor driver IC. In which it takes small amount of current from microcontroller and supply large amount of current to the motors for its movement. Following figure shows the block diagram of receiver section.
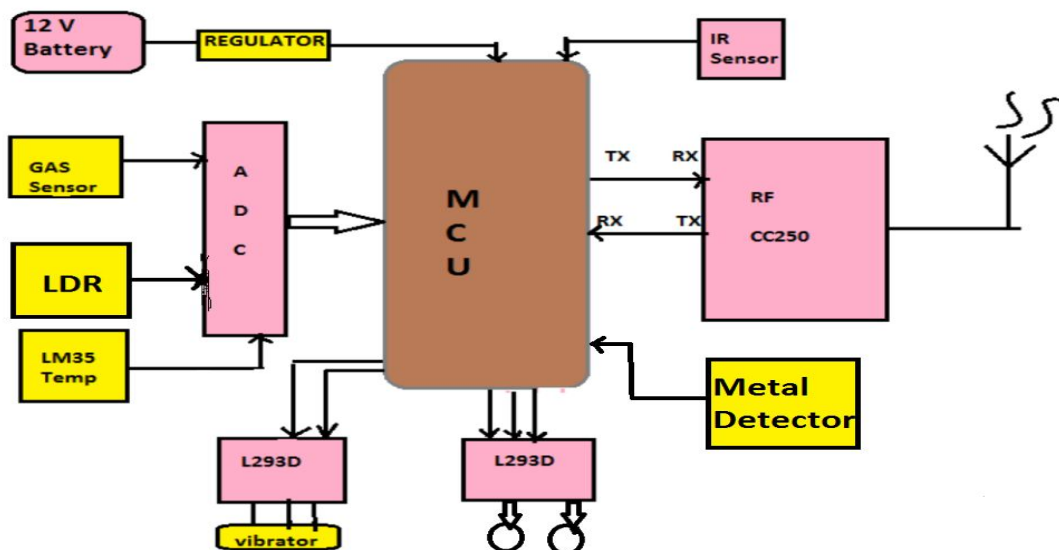

Figure 2: Receiver section

As shown in block diagram the commands from transmitter are receive by RF antenna. the RF module is interfaced with microcontroller. At the transmitter end 12V battery is provide to supply all over ICs. Voltage regulator

is used to prevent variations in voltages. As shown in diagram there are five sensors used to sense data from environment in the form of voltages. Gas sensor is used to measure carbon dioxide from environment. also temperature sensor used to sense temperature from surrounding scenario. LDR are used to detect illumination of light. All this sensor are generates output in the form of voltages. at microcontroller we cannot provide directly voltages so we have to convert this analog value (voltages) to digital value so we use analog to digital convertor to provide binary digit which interfaced with microcontroller. Whatever data are sensed by sensors this data are shown on LCD display. So we get exact data from LCD display. Here we are connecting IR sensor that going to detect any obstacle come in front of it. For that purpose it consist two IR LED that continues transmit signal and if there any obstacle then it reflect back so in this way obstacle is detected. On the robot there is a vibrator. If anybody try to touch robot then it vibrate and make alertness sound so that operator can alert what to do next.

We provide a design in which control of robotic unit is from remote end and also we are able to get the videos from the robot end for the purpose of spying. At the user PC, we will have videos and also we are able to control the robotic movement. Two motors are connected with motor driver IC which provides sufficient current to revolve motor. These motor drivers IC are interfaced with microcontroller. For remote operation we are using here RF technology that has adequate range upto 200 meters. the images captured by the camera should be processed very fast to provide real time visualization of environment to the user. This IR camera is visualize in total dark area so provide night vision capability.

B. *Software implementation*

For coding purpose we are using MATLAB software The software is used to operate robot in two modes, they are as follows

- Auto mode

Once the controller gives the auto mode command to the robot , the robot uses IR obstacle detector sensor to identify any obstacle in its path and then it move back and turn left after that it move forward direction. We can brief this mode as in figure.
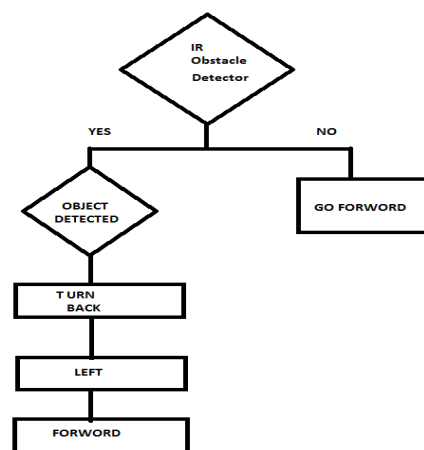

Figure 3: Auto mode

- Manual Mode

In manual mode robot are move due to human interference. the PC user define the direction of robot like move forward ,reverse, left ,right ,start and stop and collect data from environment.

IV .RESULT

For coding purpose of robot mode we use MATLAB software. We define all sensors to ports of microcontroller. When we run program then a gui file window is open that guide user how to use direction of robot i,e start, forword,reverse, left, right and stop.
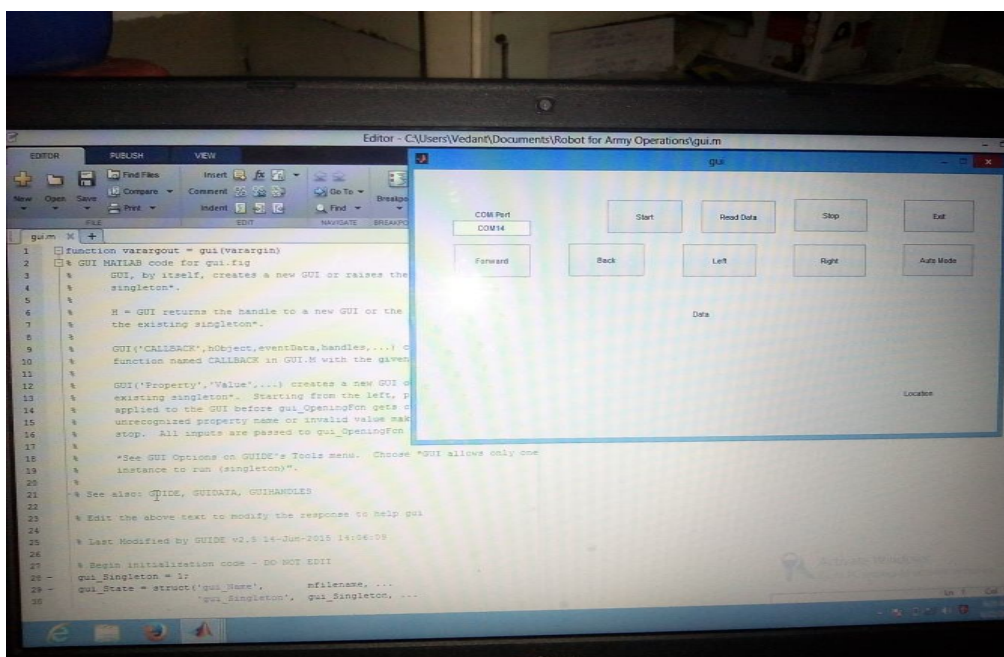

Figure 4.MATLAB software

When we start the robot then it gather information by using sensors and on LCD display we can read data i,e value about sensors. we can view on this diagram.

Figure 5. LCD display

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V. CONCLUSION AND FUTURE SCOPE

As we all known , these days our nation is sick of massive terror attack and bomb explosion. So to avoid such harmful disaster technological power must exceed human requirement. Human life and time are priceless. So in this paper we design a model of a robot that can be control wirelessly and monitor every position of enemy and collect data from unknown environment. This data can be wirelessly send through RF technology to the user PC. So from one location we can collect data from unknown environment and take a decision what to do next. Camera provide night vision . so we can use this robot in various sector like at war field, at boarder area for spying purpose. At shopping mall, jewellery shop and at wild field also we can use.

In future we can modify this design module by adding security system like LASER GUN so that no one cant destroy it.

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BIOGRAPHY

Ujwala G.Meshram: appearing in master of Engineering in Embeded System and Computing, college of Nagpur Institute of Technology. She has received degree in Electronics and Telecommunication from SGBAU University. She has interest in research of robotics, Electronics and communication.

Author **Ms. Shubhangi Borkar** presently working as Asst. Professor at college of Nagpur Institute of Technology, Nagpur.