

Android Phone Controlled Spy Robot

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Abstract:- This research paper is based on Spying Robot. It describes the development of the spy robot. In this the spy robot is controlled by an android application wirelessly. Android based spy robot basically communicates by using RF technology by transmitting and receiving data by using an android application. This spy robot along with wireless camera and mic can transmit real-time audio-video wirelessly and will give confidential information regarding opposite parties. An microcontroller named arduino mega is used for the desired operation. We are developing the remote buttons in the android application where the motion of the robot can be controlled. RF is used to transmit the confidential data. The Bluetooth module is used to control the movement of the robot to move forward, backward and left or right. Tracing and attacking enemies at different areas are very much difficult for the soldiers. Hence spy robots are created.

Keywords:- Micro-controller, RF Module, Wireless camera, Bluetooth HC-05 module.

I. INTRODUCTION

Nowadays fields in which robots are popularly used are industries, academic, research and development, militaries and others. There is always a chance for losing lives of the soldiers during wars and emergency situations. We are implementing a solution where the soldiers are replaced with a robot where it is controlled wirelessly. This paper defines the robot, the project on intelligent spy robot. The aim is to develop a project to build an intelligent spy robot that has capability to display the movement live on PC.

II. MICROCONTROLLER (ATMEGA2560)

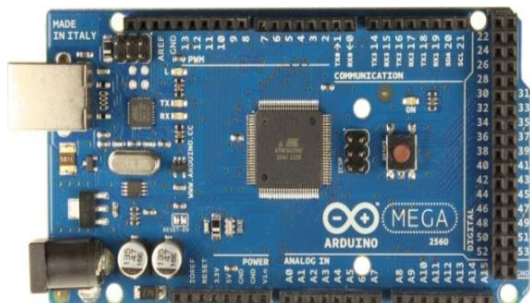


Fig 1:- Arduino Mega2560

A microcontroller consists of a processor, memory and input/output peripherals on a single chip. We can also define a microcontroller as a compact integrated circuit designed to govern a specific operation in an embedded system. Microcontroller is considered as the brain of this spying robot.

It handles each and every input/output data. The movement of the robot will be controlled by the microcontroller based on the input given by user or sensors. The microcontroller used in this project is Arduino Mega 2560 which is based on ATmega2560. Arduino Mega 2560 contains everything needed to support the microcontroller. Arduino Mega 2560 is a 16 bit microcontroller which contains flash memory of 256k bytes, SRAM of 8k bytes and EEPROM of 4k bytes along with this it has 54 input/output digital pins, 4 UARTs, 16 analog inputs, an ICSP header, a USB connection, a reset button, and a power jack.

III. R F MODULE

RF stands for radio frequency signal. Its range is roughly from 20kHz to 300GHz. It is used for wireless electromagnetic communication. It is used for real time audio video transmission from robot to base station. The RF module consists of both RF transmitter and receiver. The data transmitted by RF transmitter is received by an RF receiver operating at same frequency.



Fig 2:- RC832 Pin Diagram



Fig 3:- TS835 Pin Diagram

The transmitter used in this project is TS835 and receiver used is RC832. Transmitter and Receiver both operates at an high frequency of 5.8GHz.

TS835 transmitter has 48 channels choice to get the best transmitting quality. It is of very small size and lighter weight. Input voltage and current of the transmitter is 7-28 v and 220mA. Maximum range of the transmitter is 5-8 KM and its transmitting power is 600mW.

RC832 receiver also has 48 channels choice to get the best transmitting quality. Input voltage and current of the receiver is 12 v and 220mA. It supports NTSC/PAL auto video formats.

RF signal has various advantages with respect to IR signal. RF signal is suitable for long distance applications as it can travel through large distance. Specific frequency is used for RF communication. It can also travel through walls or it there is any obstruction between transmitter or receiver.

A. Rf Block Diagram

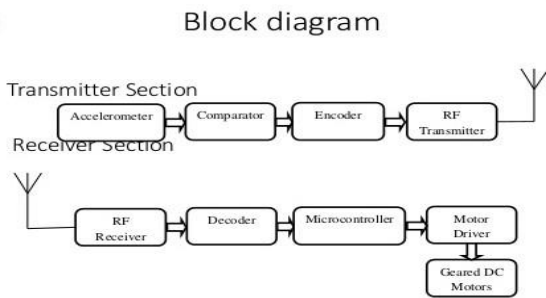


Fig 4:- Block Diagram

The transmitter is present on the robot. The receiver is present on the users side to receive information. The receiver is connected through the application and whatever data is transmitted is being viewed on the screen. In the transmission section, the transmitter transmits real time audio video data to the receiver through the data received from the camera and audio from the mic attached to the Bot.. The audio/video received from the source is encoded and is passed to the microcontroller. The microcontroller decodes the information and its then sent to the receiver side. In this way live streaming is achieved.

IV. BLUETOOTH HC-05 MODULE



Fig 5:- HC-05 Module

Bluetooth HC-05 module is used in the robot for interfacing To make the robot work wirelessly the Bluetooth module acts as an interface Between the arduino and the android phone. It establishes a connection between the arduino and the mobile phone so that when commands are given accordingly transmission and receiving and movement of the robot is possible. The Bluetooth module HC-05 is a master/slave module. By default it acts as slave. The bluetooth module works in two modes i.e. AT COMMAND mode and CONNECTIVITY mode. In the AT COMMAND mode we get information and status of the arduino whether it is connected or not about the password resetting the password as well as we also get the name of it. Next mode is CONNECTIVITY mode in this the Bluetooth is connected to the android application then further processing is done.

V. WIRELESS CAMERAS



Fig 6:- Wireless camera

The camera system consists of a camera, a transmitter, a receiver and PC with a control program and a user interface. The video signal is transmitted using wireless camera and transmitter to a wireless receiver that is connected to your PC. This camera system is used for live video transmission of a remote area wirelessly. This camera system will help us to identify any unwanted activity in a remote location.

The range of a wireless camera is between 250 to 500 feet in an open environment and in close environment it will be in between 100 to 165 feet.

VI. MOTOR DRIVER

Cytron MDD10A can drive two motors. It automates the motors in clockwise and anticlockwise direction. The reason behind this is it is a dual H bridge motor driver. The operating voltage of cytron MDD10A is 46V and total DC current upto 10Amp, It also has an over temperature protection. . Cytron MDD10A has multiple inputs and outputs pins so that it can drive 2 DC motors. This is the dual channel version which is designed to drive 2 brushed DC motor

VII. INTERFACING

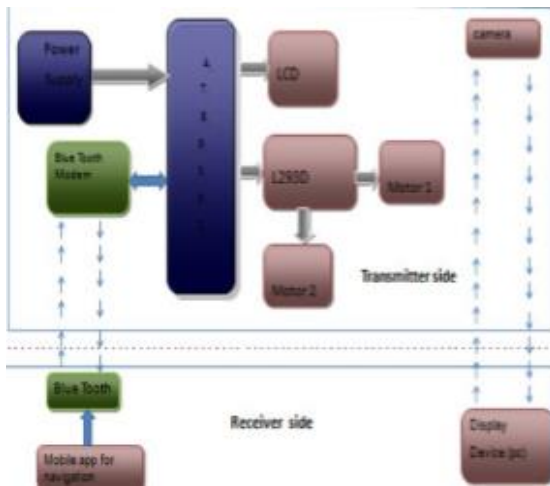


Fig 7:- Interfacing

There are two sections in this interfacing receiver and the transmitter section. The external power supply such as battery is attached to the arduino. It can take only 5V power from the external devices. So upto 12V power supply can be supplied to the arduino from the external battery. The arduino is then connected to the motor drivers. Motor drivers are connected to the voltage regulator. Arduino is connected to the Bluetooth. On the receiver side the robot is wirelessly connected to the through the bluetooth to the mobile application. The transmitter is present at the robot and then the transmitter and receiver are connected. The audio/video is decoded at the receiver side. Finally through the bluetooth the android phone is connected.

VIII. APPLICATION

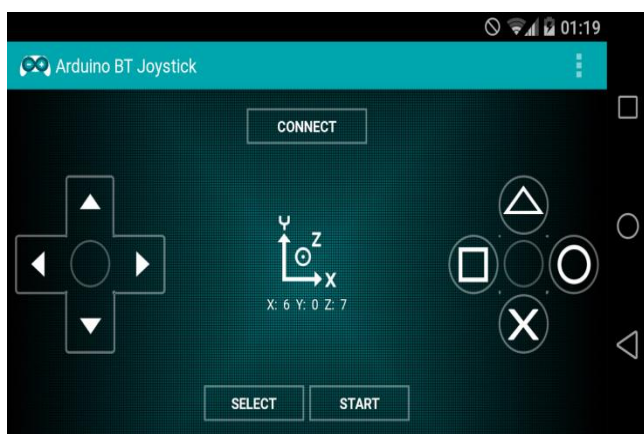


Fig 8:- Bluetooth Application

An application is developed to control the robot one of the example is given above. The robot is controlled through the application that is developed. To control the robot the buttons are created and it is coded in such a way if the specific button is pressed the robot will move in the given direction. For example if we press suppose button “A” and button “A” is coded to move in the forward direction the robot moves in the forward direction. In this way by pressing the buttons which is been coded for directions we control the robot accordingly. If

we press the select button the voice input which is given depending upon that the robot can be controlled by using other application. These two methods are applied in this paper. To make the robot stop working a button is coded in the application so that when we press the button the robot stops moving.

IX. FUTURE SCOPE

- It can be developed further to work as a humanoid.[1]
- It can be used in the fields like in industries such as colleges, medical, military, companies. [1]
- It can be used in wars to spy the enemy. [1]
- It can be improved in terms of decision making capabilities by applying varied types of sensors and can be used in Big industries in different applications.[1]

X. FUTURE ENHANCEMENT

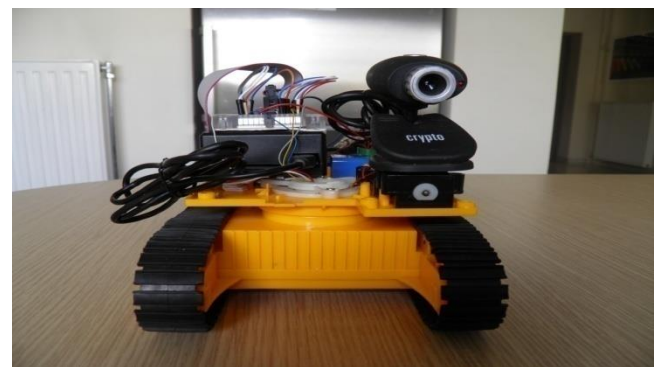


Fig 9:- Spy Robot

This system can be connected to the internet by using zigBee internet model with Wi-Fi. Internet controls the system through remote location. We can also operate it through joystick. It works smoothly with joystick along with wireless connection. For the vision of the robots Halogen Lights can Be used. Also along with spying the system can be a voice recognition system. Commands are given to the robot to control the robot effectively. We can also make use of AI where the robot will work autonomously without any human intervention.

XI. CONCLUSION

Accuracy would be the main aim of this paper. While developing the robot design of the robot did not cause any hindrance. The robot moves depending on the inputs given to the microcontroller by the user through mobile application. It display the current operation such as if we have to move left we will press the given button and the robot will move accordingly. The camera, sensors and the mic gives the surrounding informations that takes place in the area surrounded by the robot. We can also manipulate the movement of the robot either by using sensors or through wireless connection. In this paper we have implemented the robots movement by connecting it through bluetooth to the android phone. RF module is used for audio video transmission. Since the range of RF module

is in between 5 to 8 kms hence the spy robot is used for long distance applications.

XII. RESULTS

- Bluetooth connection established between the robot and the the android phone through the Bluetooth device.
- It was observed that RF module transmitted the information received from the robot on to the display screen of the phone which was visible through the ULED application.
- The sensors placed were able to detect the parameters .

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