

Unmanned Ground Vehicle Remote Controlled Robot for Security Applications

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Abstract: This paper describe the android smart phone to control the unmanned ground vehicle. The unmanned ground vehicle mainly used in secured places. Today android system is very popular. The controller can run the software and touch the screen on the smart phone to drive the vehicle. The vehicle is connected via Bluetooth with help of smart phone application software. When a person or motor enters a monitored area, camera capture the image which is continuously send to the control room. Camera connected to microcontroller keeps on capturing at the secured places and view all information of the secured section images by PC or TV. Voice communication also enable by using mike.

I. INTRODUCTION

An unmanned ground vehicle is a vehicle that operates while in contact with the ground and without an onboard human presence. Unmanned ground vehicle is actively being developed for both civilian and military purpose. Generally, the vehicle will have a set of sensors to observe the environment and will either autonomously make decisions about its behavior or pass the information to a human operator at a different location who will control the vehicle through tele operation. Unmanned ground vehicle (UGV) is one of typical solution for army application. This project describes the design and implementation of a prototype teleported unmanned ground vehicle (UGV) for security applications which is remote controlled using high speed secure wireless connectivity. This connection is enabled by Bluetooth and using smart phone communication is given to vehicle. The vehicle is provided with video cameras which will be recorded and

transmitted to the operator for further action by the robot. This vehicle can be operate in multiple terrains and then vehicle can be moved in all directions.

II. EXISTING METHOD

More and more mobile robots are working around us and they will help us a lot in daily lives. Normally, unmanned ground vehicle is used in war field and give the feedback to the control room. The communication between device and vehicle is established by ZIGBEE technology and the robot is controlled by PC (or) Computer. This robot can be used in any of the terrain.

III. PROPOSED SYSTEM

In this modern environment everybody uses smart phones which are a part of their day-to-day life. They use all their daily uses like newspaper reading, daily updates, social networking, and all the apps like home automation control, human body anatomy, health maintenance, etc. has been designed in the form of applications which can be easily installed in their hand held smart phones. This project approached a robotic movement control through the smart phones. Hence a dedicated application is created to control an embedded robotic hardware.

The application controls the movement of the robot. The embedded hardware is developed on 8052 microcontroller and to be controlled by Smartphone on the basis of Android platform. 8052 controller is to receive the AT commands from the Smartphone and takes the data and controls the motors of the robot by the motor driver L293D. The robot can able to move forward, reverse, left and right movements. The Smartphone is been interfaced to the device by using Bluetooth. A

Bluetooth device HC-05 module is going to be added to 8052 microcontroller to receive commands from Smart phone. A wireless Camera is mounted on the robot body for security purpose even in complete darkness by using infrared lighting.

IV. BLUETOOTH

Bluetooth is a wireless technology in a short range communications system that aims to replace cables connecting portable. Bluetooth has many features like robustness, low power, and low cost. Bluetooth technology was designed firstly to support simple wireless networking devices, including cell phones, wireless headset, wireless mice and PDA's. It is worth to mention that Bluetooth cover short distances. Bluetooth devices generally communicate at less than 1Mbps. Bluetooth requires a low cost transceiver chip to be included in devices. The maximum range for Bluetooth is 10meters.

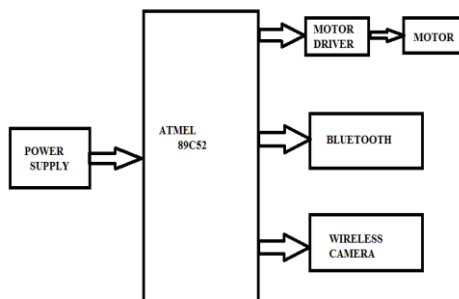


Fig 4.1 Block diagram of proposed system

V. ANDROID APPLICATION

Today Android is a very familiar word in the world today. Millions of devices are running the Google Android OS and millions are being developed daily .Google has made the android development platform open to everyone around the world, so there are millions of developers. Although some developers just focus on building the apps or games for the android devices, there are numerous possibilities as well.

VI. OPERATION OF THE SYSTEM

The project is designed to control a robotic vehicle using an android application. Bluetooth device is interfaced the control unit on the robot for

sensing the signals transmitted by the android application. An Atmel89C52 microcontroller is used in this project as control device.

Remote operation is achieved by any Smart phone with Android OS, upon a GUI(Graphical User Interface) based touch screen operation. Transmitting end uses an android application device remote through which commands are transmitted. At the receiver end, these commands are used for controlling the robot in all directions such as forward, backward and left or right and captures the video and transmits to TV through RF signal at the receiving end the movement is achieved by two motors that are interfaced to the microcontroller. Serial communication data sent from the android application is received by a Bluetooth receiver interfaced to the microcontroller. The program on the microcontroller refers to the serial data to generate respective output based on the input data to operate the motors through a motor driver IC. The motors are interfaced to the control unit through motor driver IC.

VII. MICROCONTROLLER

Smart phone communication require the Atmel 8052 microcontroller which has high performance and low power consumption. The 8052 is member of the 8051 family. The 8052 has 256 bytes of RAM and 3 timers. It also has 8K bytes of flash memory.The Atmel AT89S52 is a powerful microcontroller which provides a highly-flexible and cost-effective solution to many embedded control applications

VIII. CONCLUSION

In this project, we achieved control both wireless communication between the mobile Robot Android GUI applications. The main task of this project make a security robot which can be control by emerging android technology. It gives versatile operation of robot controller which need not modify the hardware.

This system can further be developed by enhancing the performance and by adding more features.

Further development of this system depends on the application we are using in an area of work. The system can be added features like gas sensor, thermal image sensing, connecting robotic arms and can be used in pick and place purposes etc...can be done. The development of this system has wide area of applications such as in Law enforcement, Industrial and in Disaster management and so on.

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