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Wireless surveillance robot

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ABSTRACT

We propose a cost-effective four-wheel surveillance robot using raspberry pi, micro-controller which employ servomotor, DC motor controlling. Surveillance robot typically consists of a video camera, servomotor, DC motor, raspberry pi, blue tooth module, ultrasonic distance sensor & Laser gun.

Designing of the robot in such a way which can be controlled using blue tooth app from the android mobile. We had developed the suitable switches on the app through which we can control the motion of it. Here, Bluetooth act as an interface between the controller and android app. According to the command received from the user, the robot motion can be controlled. Although camera used for the video capturing is wireless too. So, both the video as well as navigation of the camera can happen simultaneously from the same mobile.

Keywords: *Android smartphone, Bluetooth module, Robot, Microcontroller, Wireless camera, Ultrasonic sensor.*

1. INTRODUCTION

Nowadays, smartphone is becoming so much popular with high speed & more powerful processors, larger storage capacities & rapid response.

Basically, Bluetooth is used for the exchanging of data from sender to receiver. A Bluetooth device can communicate up to seven Bluetooth modules through a single link consequently. In last years, an android has provided us an open platform for our smartphones. Android is a software package which consists of an operating system, interface layer, and software applications. Different from other, it provides software

development kits (SDK), which is an important tool in using a Bluetooth app as “Brain of the Robot”.

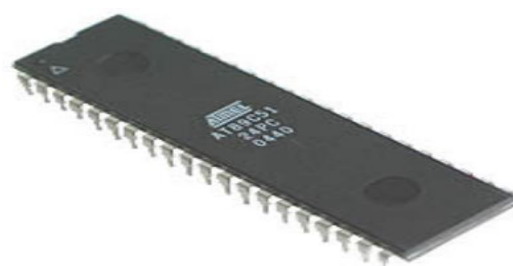
In this paper, we present a review of the robots controlled by mobile app i.e., via Bluetooth. In our work, the robot moves forward, backward, left, right side, 180° vertical rotation and 360° horizontal rotation of camera are done via Bluetooth. This can be used at borders in place of our soldiers but soldiers should be present for the controlling of this robot through the control room. This is mainly military application based robot. This article is organised as follow: Section II – Describe the purpose of work, Section III –Our Experimental Setup, Section IV –Its application and Section V – Our Conclusion.

2. PURPOSE

The main idea of our research is to provide simple robot's architecture but with powerful computational platforms so the designer can focus on their research. The simpler architecture can also be useful for educational purpose. Though this, students can get an idea and they can build their own robots at low cost.

The following list shows typical robot control architectures:-

AT89S52 Controller:-



The AT89S52 is a high performance, low power consuming CMOS 8 bit microcontroller. This is manufactured using ATMEL's non-volatile & high density memory technology. Highly flexible in operation. The ATMEL AT89S52 have the following features:- 8K bytes of Flash, 256 Bytes of RAM, 32 I/O Lines, Watchdog timer, two data pointers,

HC SERIAL BLUETOOTH: -

HC Serial Bluetooth product comprise of Bluetooth serial interface module and Bluetooth adapter. The main function of Bluetooth device is to transfer the information from the sender end to the receiver end through wireless system. This module has two modes: - Master and Slave Device.



WIRELESS CAMERA:- Analog wireless camera is used for the transmission of audio as well as video signals using radio frequencies. Typically, analog wireless has a transmission range/distance of approx. 300 feet (91 meters) in open space.



RASPBERRY PI: -

Raspberry Pi is a credit-card sized mini-computer, low cost. It is programmed using either by Scratch and Python language. Raspberry Pi 2 V1.1 consist of a quad-core Cortex-A7 CPU which run at 900 MHz and having 1 GB RAM. This is about 4-6 times more powerful and faster than its predecessor. According to parallelized benchmarks, the Raspberry Pi 2 V1.1 is 14 times faster than a Raspberry Pi 1.



ULTRA SONIC SENSOR: - The main operations of Ultrasonic sensor are done by Transmitter and Receiver. Transmitter continuously transmits ultrasonic rays and receiver receives the rays when wave strike on an obstacle and reflect back. Ultrasonic sensor will fit in front of the robot. The robot will provide a command signal to the user when any obstacle come in between robot path.



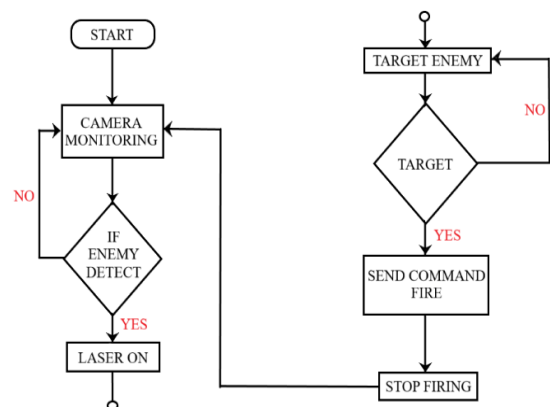
SERVOMOTOR: -

A servo motor rotates an object with accurate and great precision. It is just a simple motor which runs on servomechanism principle. It can either run on DC or AC supply. A very high torque servo motor in a small and lightweight package is commonly used in robotics.



3. BLOCK DIAGRAM & PROJECT SNAPSHOT

The block diagram of a operation of the robot is describe below:-

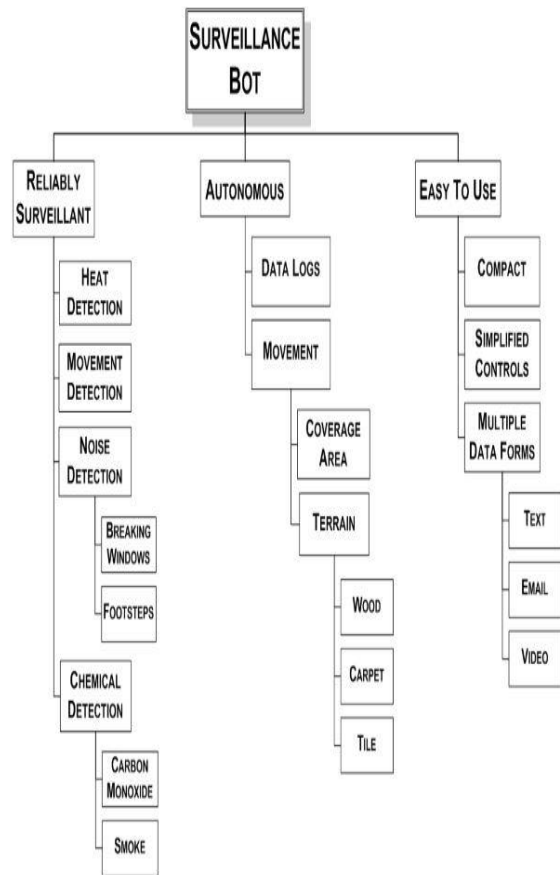
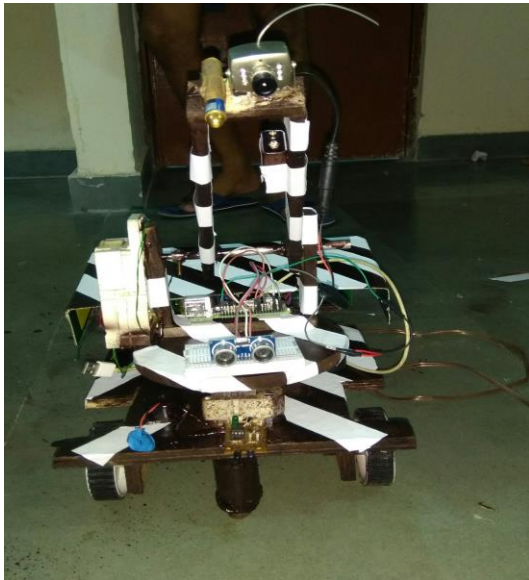


LASER: - For an accurate target at our main aim, we can use this LASER. It is light emitting diode which produces a long-distance red laser beam. It is attached along with machine gun so that it will move in machine gun's direction.

Here, it is simple to control the robot using Bluetooth module HC – 06 and AT89S52 Microcontroller. The controlling device of the whole system are a microcontroller, Bluetooth

module, DC motor, Raspberry – pi & Servo motor. All this device interfaced to the microcontroller.

The data is transmitted from the user to the controller with the help of Bluetooth module. The DC and Servo motor operates according to the command received by the controller. If the command is to move the robot then DC motor will operate otherwise servomotor will operate for the camera and laser gun application.



PROJECT SNAPSHOT

4. APPLICATION INSTRUCTION

First make sure the Bluetooth module is correctly paired with your mobile. The default password for pairing is “1234” or “0000”. Check the manual of Bluetooth module.

Command	Function
Press 0	Laser Gun ON/OFF
Press 1	Forward Direction
Press 2	Backward Direction
Press 3	Right Direction
Press 4	Left Direction
Press 5	Camera (Clockwise Direction)
Press 6	Camera (Anticlockwise Direction)

5. CONCLUSION

According to the current scenario, the world is starting moving towards technology and internet. Each and every small thing are connected to the Internet. The information which is present on the internet can be accessed by anyone on the planet at any time if he or she has valid credentials. It made it easy for the person to monitor any machine, hardware or almost anything remotely. This is the main advantage of Internet technology. IOT based robotics as we can use it in our project in near future. Lower Cost, Better Function, less space, simplified wiring, Automated Adjustment, Preventative maintenance etc. are some of the advantages of IOT based robot.

6. REFERENCE

[1] Pavan.C, Dr. B. Sivakumar “Wi-Fi Robot for video Monitoring & Surveillance System” International Journal of Scientific & Engineering Research Volume 3, Issue 8, August-2012.

[2] A.Sivasoundari, S.Kalaimani, M.Balamurugan “Wireless Surveillance Robot with motion detection and live video transmission” International Journal of Emerging Science and Engineering (IJESE) ISSN: 2319-6378, Volume-I, Issue-6 April 2013.

[3] Phey Sia Kwek, Zhan Wei Siew, Chen How Wong, Bih Lii Chua and Kenneth Tze Kin Teo “Development of a Wireless Device Control Based Mobile Robot Navigation System” 2012 IEEE Global High Tech Congress on Electronics.

[4] Hou-Tsan Lee, Wei-Chuan Lin, Ching-Hsiang Huang, Yu-Jhih Huang, “Wireless indoor surveillance robot”, in 2011 Proceedings of SICE Annual Conference (SICE), 2011.

[5] Piyare, R. and Tazil, M. (2011) “Bluetooth based home automation system using Android phones”. IEEE 15TH International symposium on consumer electronics (ISCE), 14-17 June 2011, Singapore.

[6] Fundamentals of Power Electronics 2nd Edition by Robert W. Erickson.