

Advanced Military Spy Robot and Bomb Disposal

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Abstract

This paper presents the wireless bomb disposal robot which will help to improve defense of our nation from terrorist, suicide bombers and other such activities. The bomb detectors and disposal system works only with the presence of experts. But this way of analyzing takes more time and make risk to life of experts. The Wireless Bomb Disposal Robot uses a control application, at the user end to control the robot remotely using Wireless technology. The bomb technician controls the robot using this application at control site. Input from the user is transmitted over Bluetooth to the Receiver, where it is received, identified and given to the appropriate module (Robot) to act. The Robot consists of a Base, a robotic Arm and a wireless camera on it. We have used DC motors for the elbow and the gripper of the robotic arm. As we are not risking the life of a bomb expert or any other commando. Hence introducing the safest way for disposing the explosive to save life of common people.

Keywords: Arm, Camera, Sensor, Detector

I. INTRODUCTION

Here we are going to construct a Robot which is used for bomb disposal purpose. Use wireless camera for video feedback so operator can operate more efficiently. The operation of robot is control by using wireless module so it can provide more range of operation. Also construct a basic bomb diffusing robot which can handle simple tasks like cutting wires, flip on switches, lift light objects, etc. and a simple autonomous robot to help in the transit of the bomb. Also gives video feedback to us so effective handling of robot can be possible. Here we use robotic arm. We are going to use servo motor as actuator, Robot base will rotate 180 degree, elbow, shoulder and gripper also will move according to their directions the input to the system is from the user. This input is first processed at the control application, serially transmitted over a Radio Link. This input is then received at the robot and processed again. The output of the system is the processed signal to the appropriate module. This module can be a motor of the base of the robot or the robotic armor robot provides an extra layer of protection to the bomb disposal squad by allowing them to check and analyze a suspicious packet before actually approaching it for disposal. Mobile robots reduce or eliminate a bomb technician's time-on-target. A robot takes risk out of potentially deadly scenarios and lets the bomb technician focus on what to do to an explosive device rather than on the immediate danger to life and limb. Even if a robot cannot reach an item for disruption, it can still be used to relay information to aid in tool and procedure selection to moving downrange. In addition, events recorded by a robot's camera can provide evidence for further analysis.

II. SYSTEM DESIGN:

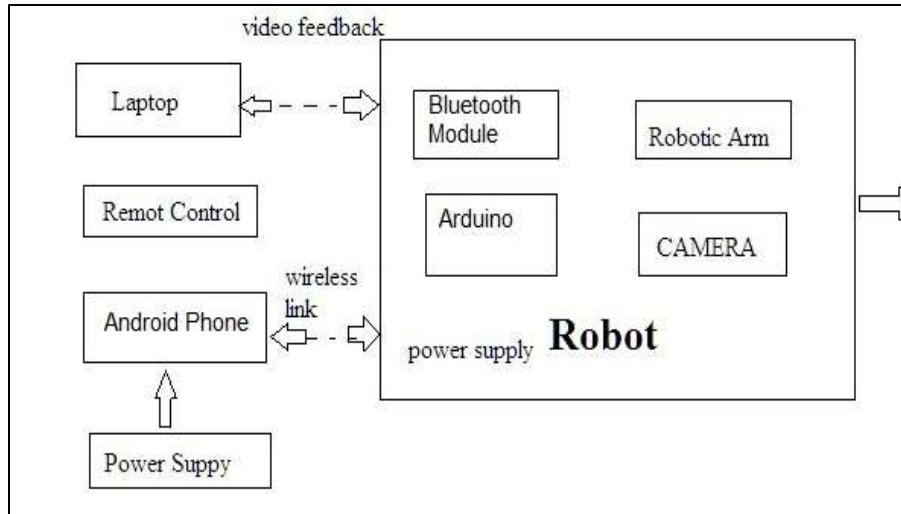


Fig. 1: Block diagram of Project

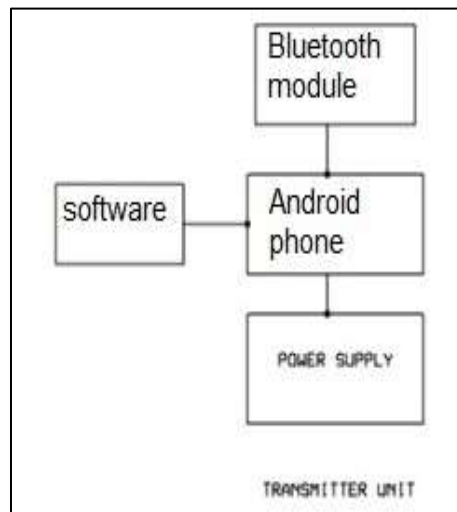


Fig. 2: Block diagram of Transmitter

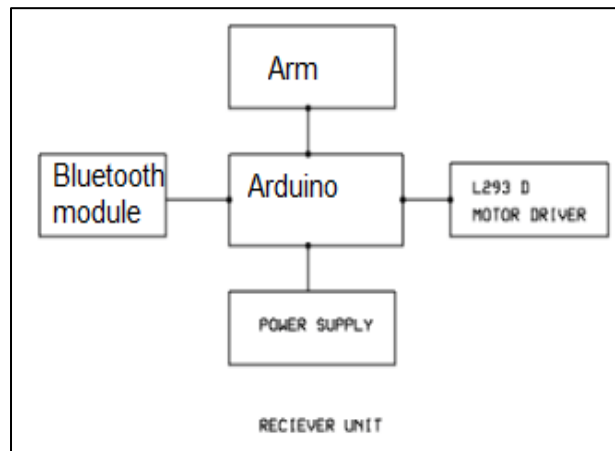


Fig. 3: Block diagram of Receiver

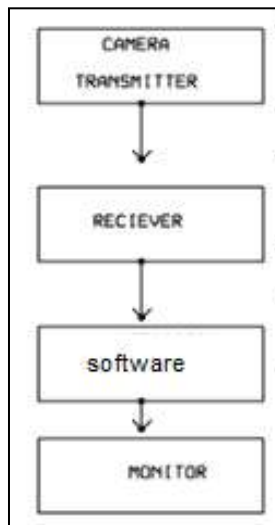


Fig. 4: Block diagram of Camera

As per the discussion, system consists of mainly following parts

A. Transmitter (Control Site)

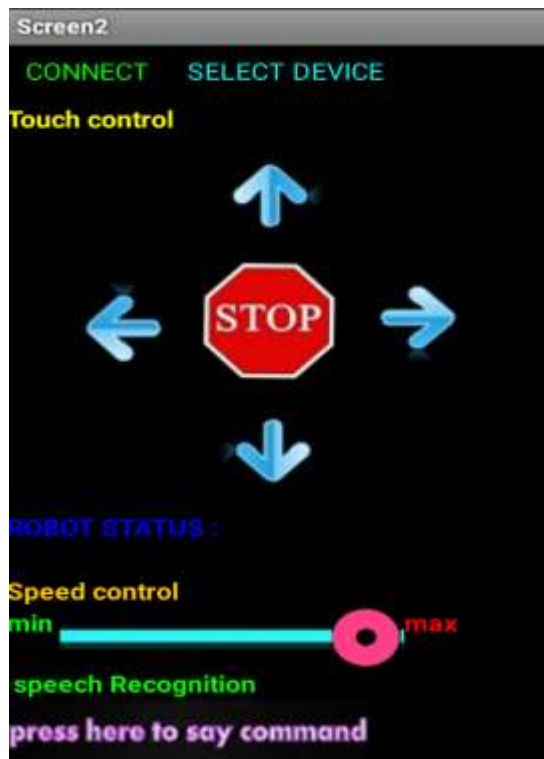


Fig. 5: Transmitter (Control Site)

B. Android Mobile App

1) Receiver (bomb site)

a) Motor shield:

It has 4 high torque DC motors and servo motor for driving the robot. L293D Motor driver is interfaced with microcontroller to control the robot.

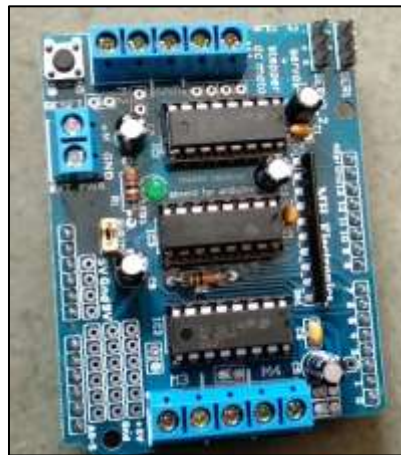


Fig. 6: Motor shield

2) Wireless Camera Unit:

It consists of an IP camera with WiFi hotspot connectivity. It may consist of a camera with WiFi router whose IP address is known to us. Also it can be an android smartphone running WiFIlivestream software.



Fig. 7: Wireless Camera Unit

3) ArduinoUno:

The ArduinoUno is a microcontroller board based on the ATmega 328. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller, simply connection a computer with a USB cable or power it with a AC to DC adapter or battery to get started. The Uno board is the first in a series of USB Arduino boards, and therefore a reference model for the Arduino platform.

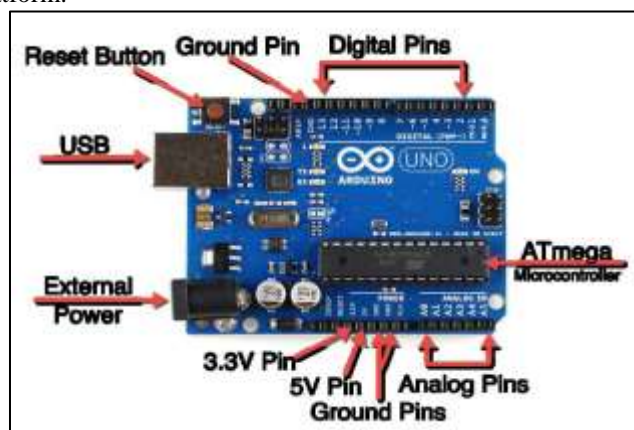


Fig. 8: ArduinoUno

4) Bluetooth Module:

HC-05 module is an easy to use Bluetooth SPP (Serial Port Protocol) module, designed for transparent wireless serial connection setup. The HC-05 Bluetooth Module can be used in a Master or Slave configuration, making it a great solution for wireless communication.

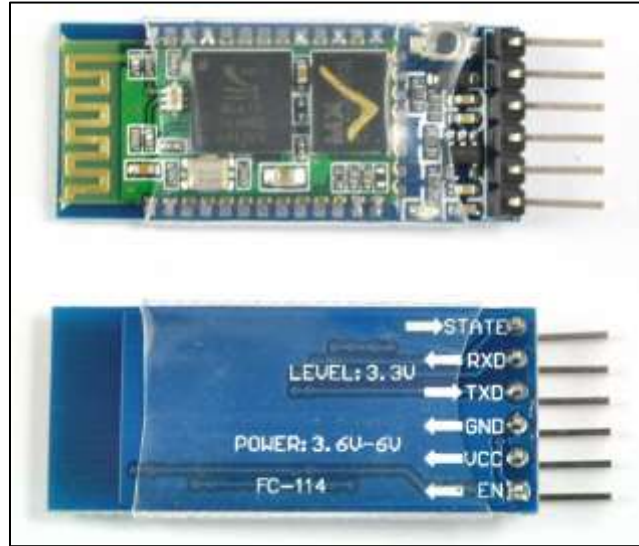


Fig. 9: Bluetooth Module

5) Servo Motor based Robotic Arm:



Fig. 10: Servo Motor based Robotic Arm

6) Circuit Diagram:

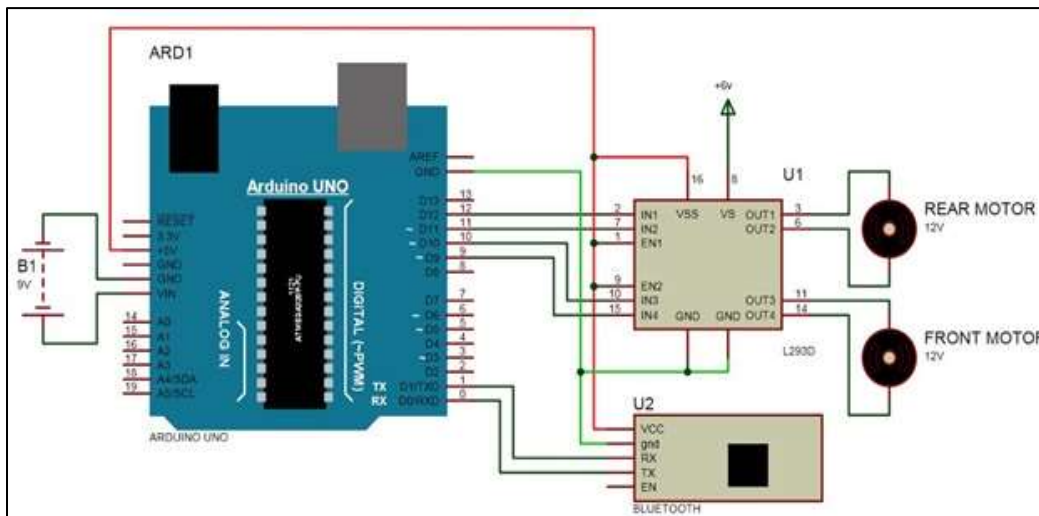


Fig. 11: Robot movement

Port9=pin15
Port10=pin10
Port11=pin7
Port12=pin2
Vcc=5volt
Port0=TX
Port1=RX

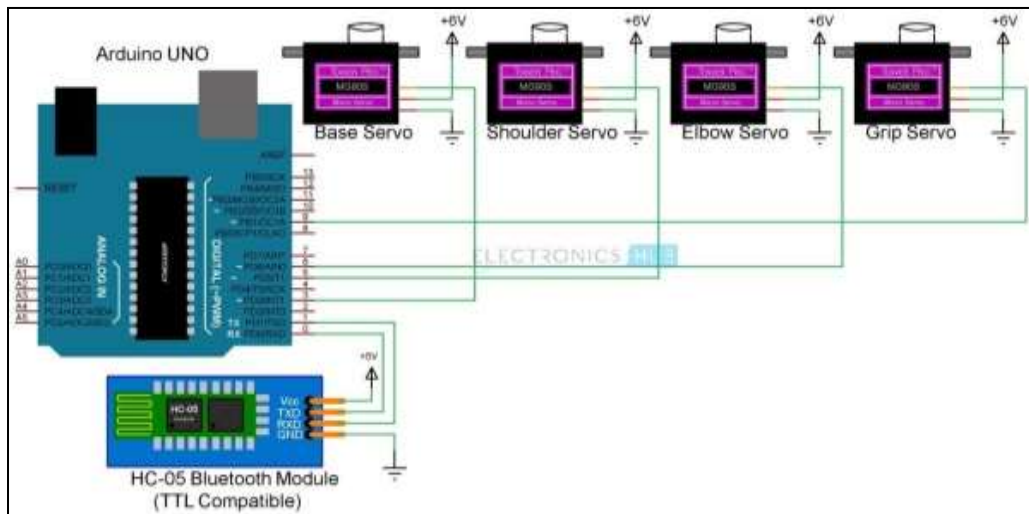


Fig. 12: Arm movement

Port3=base servo
Port5=shoulder servo
Port6=elbow servo
Port9=grip servo
Port0=TX
Port1=RX
Vcc=5volt

III. APPLICATION

- We have designed it as an assistant robot to the bomb disposal squad but there are a number of other applications of this robot. It can be used by: Police: In hostage situations.
- Military: For reconnaissance missions.
- Fire: To provide video feedback of the site for analysis.

IV. CONCLUSION

It detects the signal which is transmitted and according to that control robot in forward, backward, left turn, right turn movements. Metal/Bomb detector can detect the metals and alert with LED to notify the Metal/Bomb. The camera detects the exact location of the robot. In this manner our project plays a crucial role in Military as well as in our police department.

REFERENCE

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- [2] Wireless Bomb Disposal Robot 1 ShindePushpa.D., 2 Davane Rahul D., 3 PatilPoonam B. 1,2,3Department of Electronics and telecommunication AnnasahebDange College of Engineering and Technology, Ashta
- [3] Wireless Bomb Defusing Robot with camera interfacing Prof. Vaibhavjoshi, SonaliKatore, Yogini Bhandare, AmolKanade. #Department of Electronics and Telecommunication SITRC, Nasik, SPPU