Arduino based Spy Robot Surveillance using nRF401

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Abstract- **A nRF401 Controlled Spy Robot is an Arduino Uno based robot that can be monitored and controlled by a remote using a single-chip radio transceiver. The Wireless Network Camera mounted on the robot can also be displayed on any other Android device for monitoring. In this project simple materials are used like plastic wood for the chassis, cycle spokes for the wheel axle, L293D motor driver and two 600 rpm DC motors for propulsion in four directions namely front, reverse, left and right. nRF401 module is used to receive commands in the form of strings from the robot. The robot is covered with camouflage texture so that it does not alert surroundings. It is made up of simple materials rather than preassembled kits because the materials are readily and cheaply available, the robot becomes very lightweight and it can be formed into any desired size.**

Index Terms- Android, Arduino, Camera, Robot, Robotics, Spy.

I. INTRODUCTION

A robot is an electromechanical machine that is controlled by computer program to perform various operations. Industrial robots have designed to reduce human effort and time to improve productivity and to reduce manufacturing cost. Today human-machine interaction is moving away from mouse and pen and becoming much more pervasive and much more compatible with the physical world. Remote can control the robot motion from a long distance using nRF401 to interface controller and robot. ARDUINO UNO can be interfaced to the nRF401 module though simple 3-wire interface and code is written in embedded C language. As per the commands received from nRF401 transmitter the robot motion can be controlled. The output motion of a robotic vehicle is accurate and repeatable. Pick and Place robots can be reprogrammable and tool can be interchanged to provide for multiple applications. The purpose of this work is to design and implement nRF401 Controlled Spy Robot which is used for Surveillance, home automation, wheelchairs, military and hostages Rescue applications.

II. SYSTEM DESIGN

Arduino Uno R3 This is the brain of robot loaded by a program written in embedded c language to do the required functioning and is interfaced with Bluetooth module. The motor drivers are used to make the system work as required.
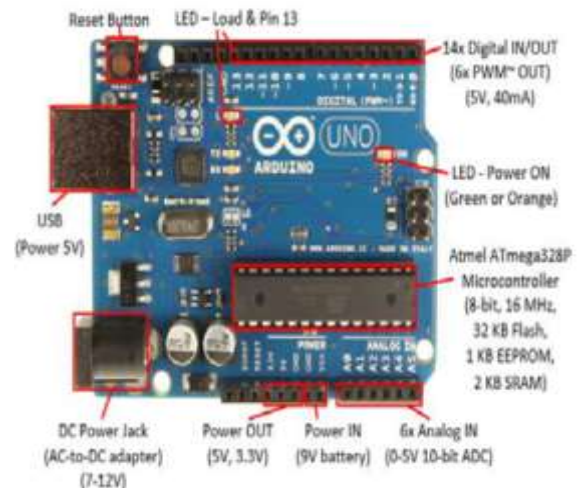

Fig.1 Arduino Uno Board

D.C. motor is controlled by DC voltages and moves in forward, backward, left and right, direction according to the polarity of voltage applied. Mostly all mechanical movement which robot performs is accomplished by an electric motor. Electric machines are means of converting energy into mechanical energy. Electric motor is used to power devices. An example of small motor applications such as motors used in automobiles, robot, hand power tools and food blenders. Micro-machines are electric machines with parts the size of red blood cells and find many applications in medicine.
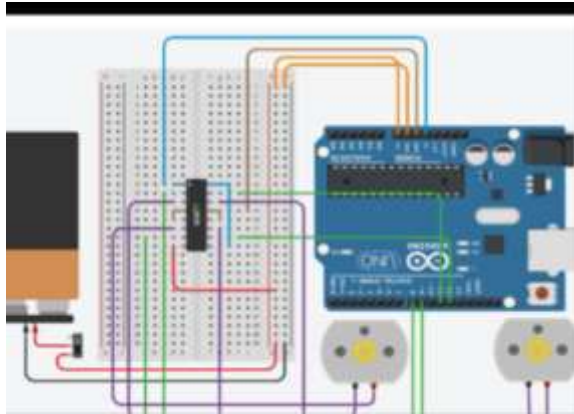
Fig.2 Motor driver circuitused in the project

The L293D is a typical Motor driver IC which allows the DC motor to be driven in either direction according to the way it is coded. It is a 16 pin IC which can control two DC motors simultaneously in any directions with the help of the code. The IC uses an input of 5 volt at pin 8 and16 as well as pin 1and 9 which is enable, the other pins 4,5,12 and 13 are grounded. The inputs to the IC's pin no 2 and 7 are for the first motor connected at pin 3 and 6. The inputs to pin 10 and 15 are for the second motor which is connected at pin no 11 and 14 as shown in figure 2. The inputs are logic 0 or logic 1 given from digital pins 8, 9, 11 and 12 of the Arduino Uno [9].

Fig.3 Wireless Camera

The Wireless Network Camera, also known as Wi-Fi IP Camera, is used in this system to stream videos live to any mobile device, including Android and iOS devices, using Wi-Fi network. It can also capture photos and videos which can then be shared across other devices and cloud services. It also has infrared supported night vision and an integrated microphone speaker for audio transmission between itself and the mobile device. Furthermore, it can also rotate

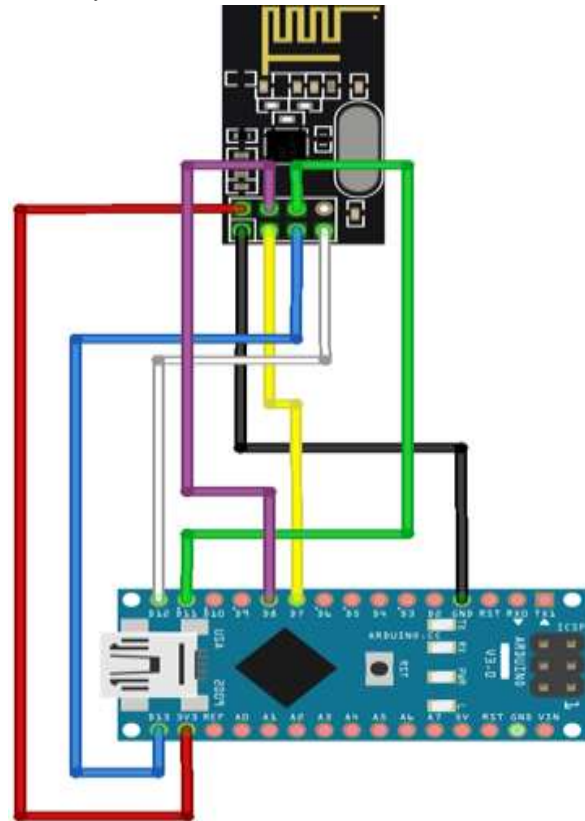approximately 360 degrees both horizontally and vertically [1].

Fig. 4 nRF401 interfacing with Arduino

III. HARDWARE AND SOFTWARE REQUIREMENT

- Arduino Uno R3
- L293D Motor Driver
- Two 600 rpm DC motors
- Breadboard
- Lithium Polymer Battery
- nRF401 Module
- Slide Switch
- Wheels
- Jumper Wire Set
- Plastic Wood
- Paper
- Cycle Spoke
- One remote or transmitter for controlling robot
- Android 4.0 or up
- Arduino IDE

IV. CONCLUSION

The proposed project makes it easier for people, especially the law enforcing agencies, to monitor persons and places. Secret Bot is created very simply and easily so mass production of this robot takes very little time, therefore if one Bot is attacked then another one can be deployed when needed. This way, human lives can be saved in critical situations. As smart mobile devices are readily available to almost everyone, and the Bot can be made smaller, and audio transmission between the Bot and mobile device is possible, the Bot is useful also in many other applications like home surveillance, getting news information from, for example, trapped humans under rubble and in similar conditions. In the future, we plan to improve the proposed system by consolidating the two interfaces in 3.2.2 and 3.2.3into one dedicated software application which will also incorporate face recognition, and also make the Bot to defuse bombs and armored in order to withstand blasts. To allow Secret Bot to move around on all terrains, continuous track plates are also intended to be added to the Bot's wheels.

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