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Wi-Fi Controlled Human Detection Robot Using Arduino

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ABSTRACT: This project reason to give a practical design to build the first and simplified version of a defense robot which has to be active within havoc areas like collapsed buildings where rescue teams cannot operate due to a lot of technical difficulties. Human detection for defense purpose is normally carried out by humans in such conditions, but when there is a risk of collapse or nasty environment it will better to utilize some high tech equipment to achieve that mission rapidly and effectively.

KEYWORDS: AT 328, L293D, PIR Sensor, WI-FI module, DC Motor.

I. INTRODUCTION

A unique passive Infrared sensor is used in our design that emits infrared rays to detect humans. As a human body emits thermal radiation. Will be received and manipulated by the PIR (Passive infrared sensor). Once a human target is located manipulated by the PIR (Passive infrared sensor). Once a human target is located the system has to be give and alert which may be held to localized the victim location as soon as possible. The main design of the robot consists of a 'Human Detection Module' carried by a mobile robot platform sufficiently small enough to wander around the area and carry out its search activity. The robot will be also equipped with a camera to transmit live video, of the disaster location, to the rescue team so that false alerts may be omitted and a visual contact with the victim would be executed. The human detection module utilizes also an infrared LED lighting to show off the robot's surrounding under low or no light conditions. Can be carried to any place in the world and can be assembled in some few hours for fast search and defense operations. The design is simple with the cheapest budget.

II. OBJECTIVE

- To detect human in the range of PIR sensor
- Provides audio indications.
- For safety use reduces the efforts of human labor.

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III. BLOCK DIAGRAM

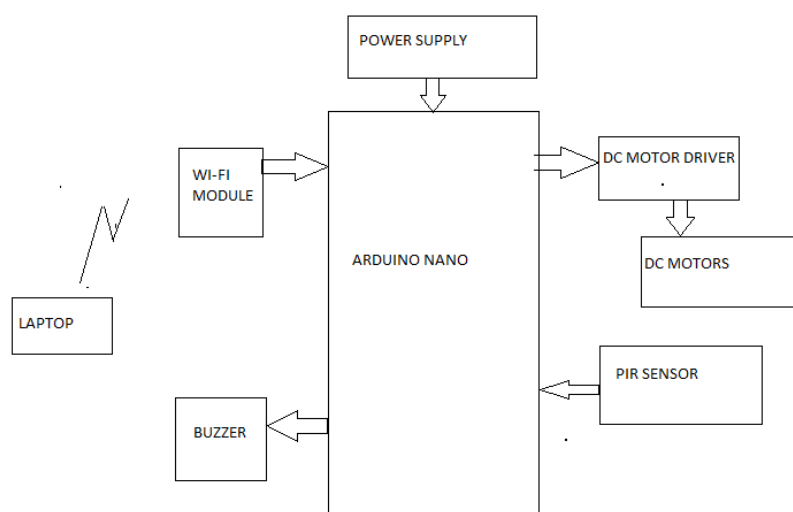


Figure 1: Block Diagram of Wi-Fi Controlled By Human Detection Robotic Vehicle Using Arduino

- A. Arduino nano:** The Arduino Nano can be powered via the Mini-B USB connection, 6-20V unregulated external power supply (pin 30), or 5V regulated external power supply (pin 27). The power source is automatically Selected to the highest voltage source. The ATmega 328 has 32KB,(also with 2 KB used for the boot loader).
- B. Power Supply :** A power supply is an electronic device that supplies electrical energy to an electrical load. Here arduino nano, sensor, buzzer operates with DC 5V, motor driver circuit operates with DC 12V supply and this supply is provided by 12V battery.
- C. PIR Sensor:** PIR sensor detects a human being moving around within approximately 10m from the sensor. This is an average value, as the actual detection range is between 5m and 12m. PIR are fundamentally made of a pyro electric sensor, which can detect levels of infrared radiation..
- D. Buzzer :** A buzzer is an electrical device that is used to make a buzzing sound for example, to attract someone's attention. Piezo buzzer use the inverse piezoelectric principle to create movement of a ceramic disc to produce sound waves. The buzzer includes a built-in oscillating circuit. Piezo buzzers operate over a wide temperature range and create noises ranging from soft and gentle to loud and aggressive.
- E. Motor Driver (L293D):** This is a motor driver IC that can drive two motor simultaneously. L293D IC is a dual H- bridge motor driver IC. One H-bridge is capable to drive a dc motor in bidirectional. L293D IC is a current enhancing IC as the output from the sensor is not able to drive motors itself so L293D is used for this purpose. L293D is a 16 pin IC having two enables pins which should always be remain high to enable both the H-bridges.
- F. DC Motor:** It is an electric motor that converts electrical energy into mechanical energy and it is called a DC Motor because it works on direct current. 12V DC power supply is required for the DC Motor for its operation. In this project DC motor is used to operate wheels of the vehicle.
- G. WI-FI Module:** The ESP8266 is a WiFi module that costs less than 5 USD. This makes putting your sensors on the net actually feasible. These seems to be three ways of using this module, in order of increasing complexity:
 1. Sending it AT commands from a computer via an USB to serial adapter. This is mostly useful for testing and setup.
 2. Interfacing with an arduino or any other microcontroller and using this board as a peripheral.
 3. Programming the module directly and use its GPIO pins to talk to your sensors, eliminating the need for a second controller.



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H. Laptop : By using laptop we give the command to the robot through WI-FI. So that robot is moving either forward, backward depending upon the instruction which we give to them and it is stop when human is available get audio indication through buzzer.

IV. WORKING

The robot has two sides receiver receiver side & transmitter side. The transmitter side consist of AT 328 micro controller (Arduino nano) the inputs to the microcontroller are PIR Sensor. The outputs are Wi-Fi module and L239 D motors drives module to which dc motor is connected.

The DC motors is used to more the robot in left, Right, toward, backward direction L239D motor driver module controls the dc motor to more in the direction. Human can be detected using PIR Sensor. A PIR Sensor is a sensor that produces passive Infrared signal this signal can detect heat human being produce 9-10 microns of heat. The distance up to of which PIR sensor can detect is restricted within 12ft. If the sensor detect the human it send the sig to the Wi-Fi Module & produced hotspot for transmitter side.

Once the signal from the transmitter is received by the Wi-Fi module is notified the arduino in turn sends a signal to buzzer. Which triggers the buzzer to produce continuous beam. This continuous beep indicates that there is a presence of human to the users.

V. RESULT

Human detection Robot is to provide more security for the users to protect their belongings from robbers. It is also used in chemical industries for the security purpose.



VI. FUTURE SCOPE

The Robot can be modified further by attaching visual Camera where the image of the intruder can be notified. We can also implement diff type of Sensor.

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