

SECURITY PATROLLING ROBOT

Astha Srivastava, Nidhi Gupta, Ankita Mishra

UG Student, Department of ECE, BBDNIIT LUCKNOW, INDIA

Assistant Professor – Department of ECE BBDNIIT LUCKNOW, INDIA

INTRODUCTION:

We projected Security Patrolling robot for the easy management of any problems detect on the absence of an owner in his house or in an any domestic areas. In this project, Arduino Board is used as the brain of the robot. In this we are using the several electronics components to achieve the modules and purpose.

A robot when moves in its specified path with the camera mounted on its robot hardware a user can access the robot motion. Here a robot can control manually with the help of Wi-Fi module controller. Wi-Fi module controller works by uploading the coding done on sensor based for robot to give its action.

Literature review:

Robot is knowledgeable device designed to execute any work automatically with speed and accuracy. It has its own brain filled with computer logic so that it can do the job according to the set algorithm. Autonomous vehicle movement is guided by the prototype logic. Robots play a prime role in every field of lifespan. It is used in industries, in households and in institutes.

- The brain of the robot is microcontroller in which program is uploaded and components are attached as input and output to it. Sensors are important component for all robots; there are different types of sensors available as per convenience. Sensor primarily consists of transducers, amplifiers. Transducer transform physical signal into electrical signal. As the electrical signal present in small range, hence an amplifier is used that provides high gain and raise the signal to volt range. Primarily used sensors are distance measuring sensor, sound sensor, pressure detector, touch sensor, heat sensor, and pitch sensor.

-

- The robots are as smart as human now days. Some advantages of robot are: -

- Productivity: - Robot performs more accurate and high-quality work. They can perform the work with more repeatability than humans.

- Safety: - Robots protect workers from performing hazardous tasks. Robot prevents accidents since

humans are not performing any dangerous jobs.

- Saving: - Robots save time and also reduce the amount of wasted material used due to accuracy.

PROPOSED SYSTEM

We projected Security Patrolling robot for the easy management of any problems detect on the absence of an owner in his house or in an any domestic areas. In this project, Arduino Board is used as the brain of the robot.

In this we are using the several electronics components to achieve the modules and purpose.

A robot when moves in its specified path with the camera mounted on its robot hardware a user can access the robot motion. Here a robot can control manually with the help of Wi-Fi module controller. Wi-Fi module controller works by uploading the coding done on sensor based for robot to give its action.

Through this coding when it gets uploaded on an Arduino uno board then the Wi-Fi module get access by commanding on the following buttons.

As follows,

Left: #L

Right: #R

Forward: F

Backward: #D

Stop: #S

After giving command to the robot, it moves in a forward or backward as a command is given from a manually holder user. An ultrasonic sensor LED is mounted on a hardware to know that the robot gone with the touch of any obstacles a user changes its direction if he she does not find the situation reliable.

In this we are using Two DC motor, one ultrasonic sensor, an Arduino UNO R3, one motor driver, robot chassis, camera, power wheels, ESP8266 IOT module, Plastic wheels, and power supply.

Motor driver for drive the motor, ultrasonic sensor for obstacles avoidance, Camera to access the surrounding and capture the images, robot chassis and a plastic wheels as a hardware requirement.

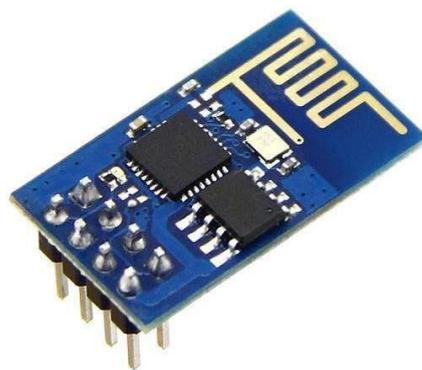
a-Arduino Uno - Arduino Uno is a microcontroller board called Arduino Uno, which is based on the ATmega328 series of controllers. It provides developers and programmers with an integrated development environment in which various operations such as writing, compiling and downloading codes can be easily performed. Arduino Uno is an open-source prototyping platform based on user- friendly hardware and

software. It has 14 digital input and output pins and 6 analog inputs for communication with sensors, switches, motors and other electronic components. It has a 16 MHz ceramic resonator, a USB connection, an external power connection and an in-circuit serial programmer (ICSP) connection, a reset button, GND pin as ground and a 5V pin to provide 5 voltages. The voltage is 5 V, and the input voltage is 7 to 12 V.



Fig 1- Arduino Board

ESP8266 Wi-Fi Module



Introduction

ESP8266 is Wi-Fi enabled system on chip (SoC) module developed by Espressif system. It is mostly used for development of IoT (Internet of Things) embedded applications.

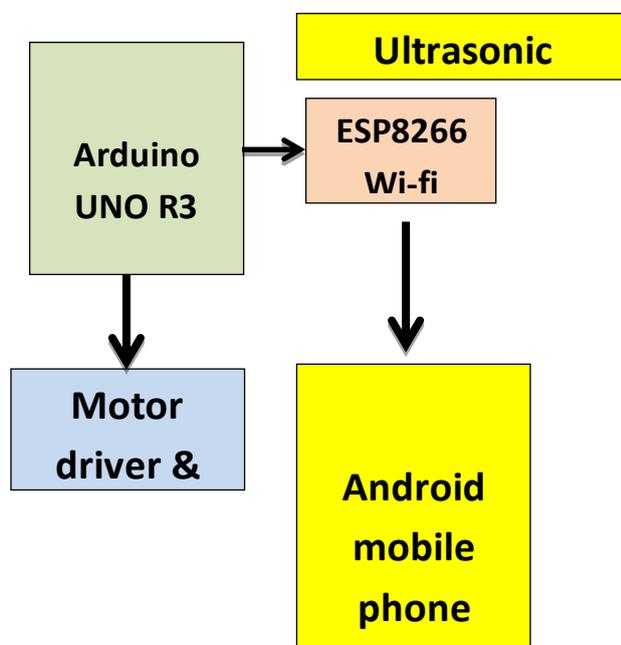


Fig 2- Block Diagram

Working:

The connection between Arduino board and motor shield driver is bi directional. Since we are using four gear motors it is easy and comfortable to use the motor shield in control speed of the motors.

Ultrasonic sensor acts as a input to Arduino. That signal helps in determining the status of the robot with respect to the specified path and Arduino uno gives the essential commands to the motor driver IC to adjust the gear motors speeds. This process continuous unless any obstacles was detected. The ultra-sonic sensor detects obstacles and will send the data to Arduino based on the information the Arduino Uno calculates the distance between the obstacles and patrolling robot.

In this robot, ultrasonic sensor are the input devices, motor driver acts as output devices and user display act

as both output and input. We are using the 12volt battery for power supply to that bot.

Ultrasonic sensor act as input sensor and directly connected to Arduino it is use for detecting the specified path on ground.

Ultrasonic sensor is also directly connected to Arduino and it is use for detecting the obstacles on the ground in this we are using only one sensor. User display acts as both input and output component for the Arduino Uno and it is use for displaying the audio and video of the situation on the display. The motion of the robot can be updated through the program and we are using only one Arduino boards in this project.

If found any problem, notification or alert is send on users' phone as we are using the IOT module to send the notification from the patrolling robot to the head user in this we are using the one SIM card and message send to the mobile it is also connected directly to Arduino and it is act as output component.

We are using one motor driver to drive the two DC motor which is directly connected to motor driver IC and motor driver is directly connected to Arduino UNO. DC motor has capability to move forward and backward direction.

For power we used 12volt.

If we are talking about the Arduino uno in this project we used Arduino uno for a sensor and IOT module. Power supply given directly from the 12volt battery.

The robotics technology takes the place of manual work. Around premises and domestic areas, one can witness a lot of problems. The patrolling robot is a revolution and concept can be used for patrolling automation in various areas. The robot works as a specified path following robot for which one sensor and a motion coding are used.

We designed a patrolling robot that follow a specified path and avoids the obstacle which arises in its path this

REFERENCES:

- T. Kurfess, "Robotics and automation handbook.in" CRC. Press LLC, Boca Raton London New York Washington, D.C, 2005.
- P. Liang, Ch. Yang, N. Wang, Z. Li and R. Li, "Mechatronic design of a human robot coupling interface for teaching by demonstration", IFAC-Papers Online 49.21, 2016.
- F. M. Proctora, G. Hoornb, and Robert Lipmana, "Automating robot planning using product and

manufacturing information,” Published by Elsevier B.V, Procedia CIRP, 43, 2016.

- F. Shakhathreh, “The basics of robotics”, Mechatronics thesis, Lahti University of Applied Sciences Machine- and production technology, Autumn 2011.
- M.S. Essersa, T.H.J. Vanekera, “Developing concepts for improved efficiency of robot work preparation”, Published by Elsevier B.V., Procedia CIRP 7,2013.
- J. B. Martinez, and F.M. –Perez, “Robotic control based on the human nervous system,” International Journal of Artificial Intelligence & Applications (IJAIA), Vol.2, No.4, October 2011.
- M. A. Omair, H. Rakib, Md. A. Khan, R. T. Mahmud, “An autonomous robot for waiter service in restaurants,” BRAC University, Dhaka, Bangladesh, SPRING 2015.
- R. Saple, K. Deshmukh, K. Zunjarrao, S. Patil, K. Deshmukh, “Robotic Waiter,” IJIRST – International Journal for Innovative Research in Science & Technology, Volume 1,2015. 9. M. Asif, M. Sabeel, Mujeeb-ur-Rahman, Z. H. Khan,” Waiter robot-solution to restaurant automation,” research conference, MDSRC - 2015 Proceeding, Wah/Pakistan, November 2015 .
- N. Malik, A.Singh, N. Rani, Pratibha, Poonam, “Serving robot: New generation electronic waiter,” International Journal of Engineering Science and Computing, Research Article, Volume 6 Issue No. 4, ISSN 2321 3361, April 2016.
- Cheong, M. Lau, E. Foo, J. Hedley, and J. Wen Bo,” Development of a robotic waiter system,” IFAC (International Federation of Automatic Control) Hosting by Elsevier Ltd,Papers OnLine 4921,2016.
- U. Shah, F. Ali, S. Sohail, H. Khan, “Intelligent Robotic Waiter With Menu Ordering System,” in IEP Centre, International Electrical Engineering Congress (IEEC 2016), May2016.