

A Robot Using Arduino Uno to Follow a Person

Sanjay Sengar, Nahid Nasir

*Department of Electronics and Communication Engineering, IIMT College of Engineering,
Greater Noida, Uttar Pradesh, India*

***Corresponding Author**

E-Mail Id: sanjaysengar2002@gmail.com

ABSTRACT

A robot which can assist us in many fields with preferring conveying things, work with more exactness in lesser time in each sort of works. A robot that can assist us in a clinic or getting clinical things any crisis with packaging will be more useful for a specialist in crisis cases. This kind of robot having such countless advantages and it will be useful later on. This sort of robot can be near people is a lot of conceivable. This valuable venture is made to endeavours to follow the right human or obstruction. In this robot, Infrared sensors are utilized to move the robot in both the heading and ultrasonic sensor for both the forward and turn around bearing. We utilized the Arduino Uno microcontroller as the cerebrum of this undertaking. This robot is driven with four Dc engines and it is constrained by an engine driver safeguard with Atmega L293d. The primary goal of planning this helpful venture is to improve our life and sumptuous. In this undertaking mechanical vehicle sense the human by IR sensor consequently and follow the human and deterrents. This sort of robot will be more valuable and it will be a pattern from here on out.

Keywords: *Arduino, DC gear engine, infrared sensor, microcontroller, ultrasonic sensor, robot*

INTRODUCTION

In this high innovation, a robot should have the option to identify and follow people. A robot that can distinguish and follow human or deterrent inside a particular reach is called 'Human Following Robot'. Robots are utilized to completely change people and make individuals' life extravagant.

A robot that can use in shopping time which conveys things, and follow human with practically no distant more useful. A robot that can use in the clinic to carrying medication with more exactness and quick.

The human following robot has many works like work as trolley, structure in clinic, and a little container with a vehicle, etc. Presently in this impacting world, individuals are begun to lives with robot-

like people following robots for their extravagant life. This task named called human following robot since it can follow people with the assistance of IR sensors and can coincide with people and help people in any sort of work with additional precision and in lesser time.

The human following robot can use in the guard area likewise to convey weapons for the fighters. This sort of robot can detect obstructions and people naturally and it can use later on in our vehicles. A human following robot can be changed in the future with additional created parts and can make it more development.

This robot can be upgraded by structure by adding more parts like camera, GPS beacon and make it more lovely and

functional. This robot will be more pattern in our future.[1-3]

METHODOLOGY

A human following robot has two construction stages: hardware and programming. Hardware First, we really want to develop an edge or casing as per the essential by and by arrange the part in chasis as per the circuit frame.

As of now partner trigger pin to A2 number pin in Arduino, by and by partner Resonation pin to A1 of the Arduino. Additionally left IR sensor is related with the A3 pin of the Arduino board, the servo motor is related with PIN10 of Arduino.

Additionally, the motor driver (L293D) has 16 pins, starting, 1,8,9 and 16 pins of the motor driver are related with +5 volt pin and 4,5,10 and 11 pins of the motor driver are related with the ground pin. Similarly, PIN 2 of the motor driver is related with the PIN 4 of Arduino, and PIN 7 of Arduino is related with PIN 10 of the motor driver, and by and by PIN 8 of

Arduino is related with the PIN 15 of the motor driver pin. Comparably in motor, motor1 is related with the 1 and 2 pins of the motor drive shield.

In addition, as of now, moreover motor2 is related with 3 and 4 pins of the motor driver shield, and by and by motor3 connects with 5 and 6 pins of the motor driver. Likewise, last one motor4 connect with 7 and 8 of the motor driver pins.[4-6]

SOFTWARE

To make the hardware parts work or run, it should be programmed through the required software like Arduino IDE. Since

the microcontroller at first will not be having any program, if we also build up the hard ware it will not have the capability to work or run due to lack of instructions which is provided by a program.

Therefore, we need a software to upload the program on any microcontroller. To implement the task all three section are taking and giving information.

Sensor module parts it sense data and provide it to the microcontroller chip. Microcontroller part software take all data from the all sensor and saving to the corrected path.

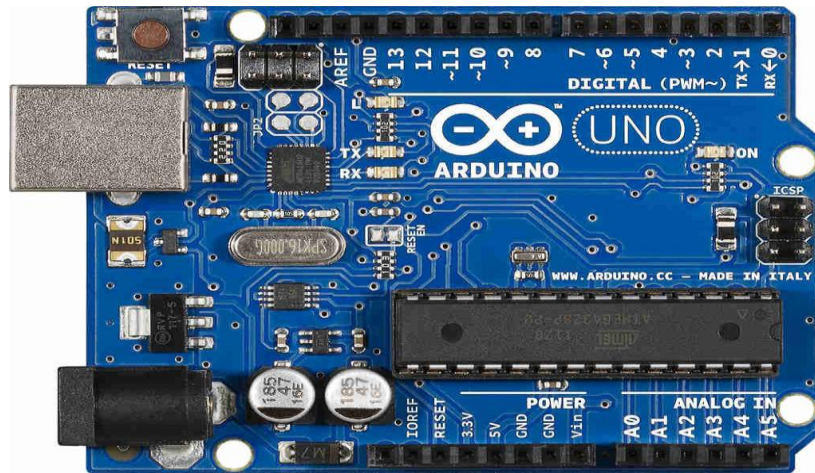
According to the data input the microcontroller parts giving the necessary input for the motor control section to guiding and run the motor for working. Since we are using Arduino Microcontroller we have to use Arduino IDE software to write and upload program in microcontroller.

MODELING AND ANALYSIS COMPONENTS

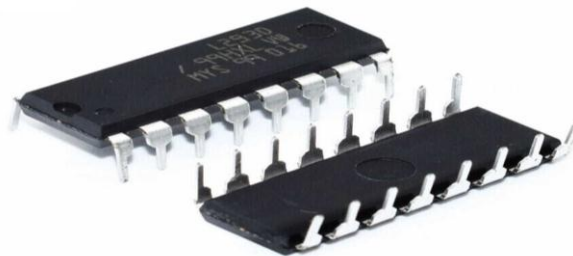
The human following robot has the following main components are:

- Arduino Uno
- L293D Motor driver
- Infrared Sensors
- Ultrasonic Sensor
- Servo Motor
- Four DC Geared Motors
- Four wheels
- Robot Chasis
- Jumper wires
- 18650 batteries
- Switch

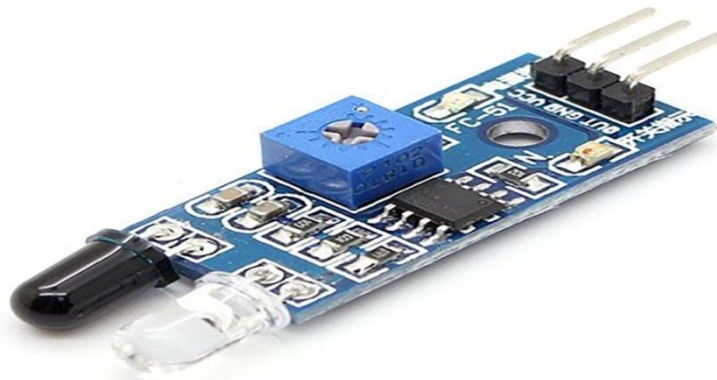
Arduino Uno



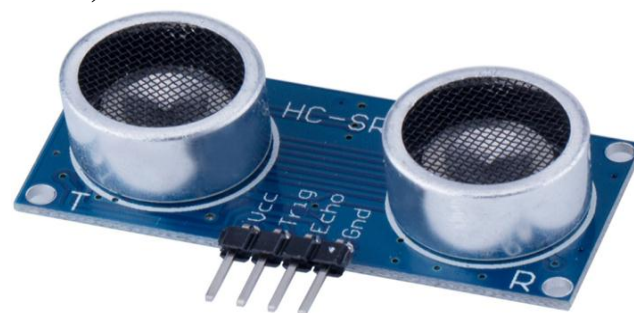
IC L293D Motor Driver



Infrared Sensor



Ultrasonic Sensor (HC-SR04)



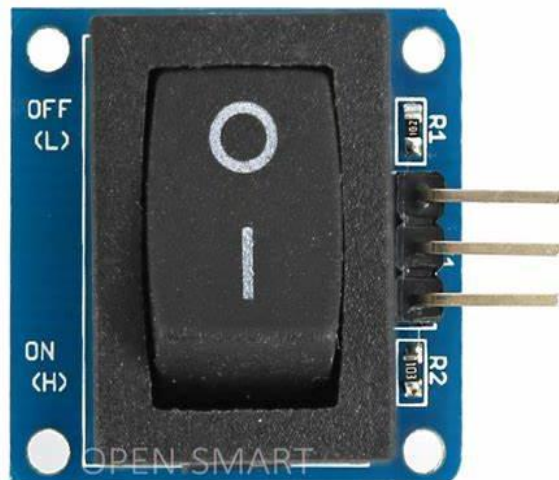
DC Gear Motor



Wheel



Switch



TOOLS NEEDED

Some tools names are given below:

- Soldering Iron
- Glue gun
- Cutter
- Knife
- Screwdriver
- Tweezer
- Wire Strippers
- Needle nose Pliers

RESULTS

We have effectively made the human following robot which is utilized to follow objects as well as people. This robot utilizes ultrasonic reach sensors and Infrared sensors. The test was performed on the both ultrasonic sensor and infrared sensor that the sensor was working precisely inside the scope of 10 cm. An ultrasonic sensor is utilized to push the robot ahead and in reverse. Infrared sensors are utilized to likewise move the

robot in the left or right bearing. Then we test the sequential correspondence of Arduino, engine safeguard, and different engines.

This robot required some investment to finish this undertaking. We were dealt with heaps of issues in regards to the program code, as there was enormous quantities of mistake in the code which was further and finally it works. Engines drivers associations got exchanged which was corrected and our robot turns out totally great. At last, after the heaps of exertion and time our goal was accomplished which was to carry out a decent Human-Robot connection.

CONCLUSION

Provide us with the area of the robot, or we can add remote controllers to our robot to fill in as a distant regulator or to on the planet the advanced mechanics age is coming. In this Item Following Robot, we can add a GSM module that will function as a programmed object following the robot.

My task can be use in numerous areas like medical clinics for additional exactness and quick work in any crisis cases, in shipping shopping centres to convey things, we can append different sensors and cameras to get more elements. This task provoked the gathering to co-work, impart, and extend comprehension of gadgets, mechanical frameworks, and mix with programming. Along these lines, we finished this task by accept that our venture will be useful in future and it will help human to do any sort of works and thus my motivation will find success.

ACKNOWLEDGEMENTS

No volume of words is sufficient to offer our thanks towards our aide sir Mr. Pankaj Jha, Sr. teacher in the Division of Electronics and communication Department who has been exceptionally

concerned and directed for every one of the thoughts and settle quires in the readiness of this undertaking. They have been extremely agreeable and earnest us through to see our diligent effort become productive.

We are particularly grateful to the proprietors of Electronics for giving the necessary parts at extremely low cost and for giving each detail and working of parts and parts.

We additionally need to communicate our gratitude to our folks for giving us the time for this undertaking. Lastly, I might want to offer my thanks towards my colleagues for giving their 100 percent exertion and their diligent effort to make our venture succeed, without them and their help finishing this project was unrealistic.

REFERENCES

1. Morioka, K., Lee, J. H., & Hashimoto, H. (2004). Human-following mobile robot in a distributed intelligent sensor network. *IEEE Transactions on industrial electronics*, 51(1), 229-237.
2. Matsumoto, Y., & Zelinsky, A. (1999, October). Real-time face tracking system for human-robot interaction. In *IEEE SMC'99 Conference Proceedings. 1999 IEEE International Conference on Systems, Man, and Cybernetics* (Cat. No. 99CH37028) (Vol. 2, pp. 830-835). IEEE.
3. Takemura, H., Zentaro, N., & Mizoguchi, H. (2009, December). Development of vision based person following module for mobile robots in/out door environment. In *2009 IEEE International Conference on Robotics and Biomimetics (ROBIO)* (pp. 1675-1680). IEEE.
4. Bellotto, N., & Hu, H. (2005). Multisensor integration for human-robot interaction. *The IEEE Journal of Intelligent Cybernetic Systems*, 1, 2.

5. Mahesh, M. R., Pallavi, H. R., Saniya Taranam, P. B., Supriya, A. V., & Thanushree, M. Arduino Based Human Following Robot.
6. Sharma, A. K., Pandey, A., Khan, M. A., Tripathi, A., Saxena, A., & Yadav, P. K. (2021, March). Human following robot. In *2021 International Conference on Advance Computing and Innovative Technologies in Engineering (ICACITE)* (pp. 440-446). IEEE.