



MINI SMART ROBOT

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Abstract: Smart Vehicle and Robots are seeking great attention of today's so called 'smart' population as it makes life 'task' easy with no human interaction. However, some industries have not adopted smart gadget because of some limitation like Controllability, Running Cost, and Flexibility. To overcome those limitation various sensors are used for better Controllability and Flexibility, and Electric Motor for low Running Cost

I. INTRODUCTION

Robotic field is a mixture of various other fields like Mechanical Engineering, Electrical Engineering, Electronics Engineering, Computer Engineering, Artificial intelligence and Data Science Engineering, etc. A smart robot can perform various task depending upon which type of robot is used. Robots are design to make task easier which a human may not able to perform or it's difficult to perform. A robot can be designed to perform a single task effectively and efficiently or to perform various task at a time. Some industries have not accepted smart robots because of some restriction like Controllability, Running Cost, and Flexibility. To overcome those limitation several sensors are used for improved Controllability and Flexibility, and Electric Motor for low Running Cost

II. MATERIALS AND METHODOLOGY

The main components and design consideration to develop the planned mini smart vehicle as well as the coordination of its numerous components are defined below.

2.1. ARDUINO

Arduino is an open-source stage used for developing electronics projects. Arduino consists of both physical programmable circuit board (often mentioned as a microcontroller) and a part of software, or IDE (Integrated Development Environment) that runs on your computer, used to write and upload computer code to the physical circuit board.

2.2. L 298 MOTOR DRIVER

L298N Module is a high voltage, high current dual full-bridge motor driver module for controlling DC motor and Stepper motor. It can control both the speed and rotation direction of motors. This module contains of an L298 dual-channel H-bridge motor driver IC.

2.3. HC SR04 ULTRASONIC SENSOR

As the term suggest it is an ultrasonic sensor which uses ultrasonic wave to measure distance by sensing obstacle. Now a days we see blind stick, automatic doors, which uses the similar or better version of ultrasonic sensor which helps to execute the task. We are using the basic one which is easily available in market. And full fill the requirement of our research.

2.4. HC-05 BLUETHOOTH MODULE

HC-05 is a Bluetooth module which can connect in two ways. Which means, it is a full duplex. We can use it with utmost microcontrollers. As it operates Serial Port Protocol (SSP). The module communicates with the help of USART at the band rate of 9600. And it too supports another band rate. So, we can interface this module with any microcontroller which supports USART. The HC-05 can operates in two modes. One is Data mode and other is AT command mode. When the enable pin is 'LOW' the HC-05 is in Data mode. If pin is set 'HIGH' the module is in AT command mode. At this point we operate this module in Data mode.

2.5. IR SENSOR

IR technology is used in day-to-day life also similarly in industries used for different purposes. For example, Television use an IR sensor to recognize the signals which are transmitted from a remote controller. The key benefits of IR sensors are low power requirement, their modest design & their appropriate features. IR signals are non-noticeable by the human sense.

2.6. Servo Motor

A servomotor is a rotatory actuator that permits for accurate control of angular position, acceleration and velocity. It needs a comparatively sophisticated controller, every so often a dedicated module designed exactly for use by means of servo motors. Here in this work, three types of servo motors were used having different torque and operational speed.

2.7. DC Motor / Gear Motor

Direct Current (DC) motor is a rotating electric device that changes direct current, of electrical energy, to mechanical energy. An Inductor (coil) in the DC motor generates a magnetic field that makes rotating motion as DC voltage is applied to its terminal. Inside the motor is an iron shaft, covered in a coil of wire. This shaft contains two fixed, North and South, magnet on both sides which causes both a repulsive and attractive force, in turn, creating torque.

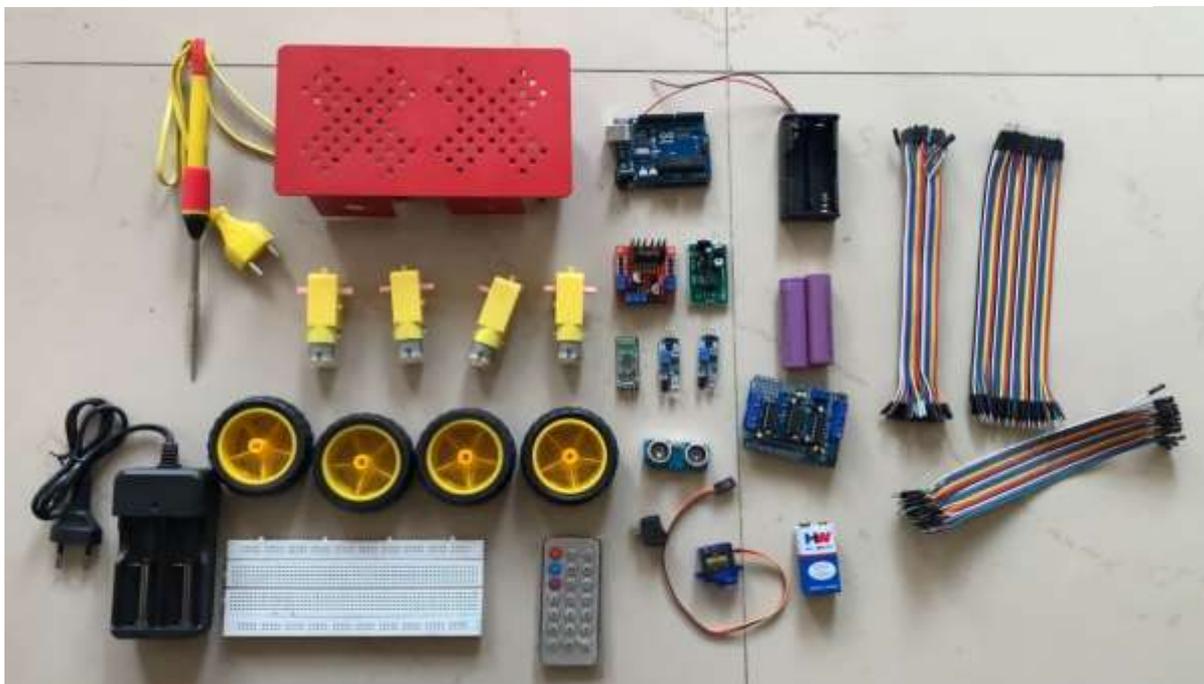
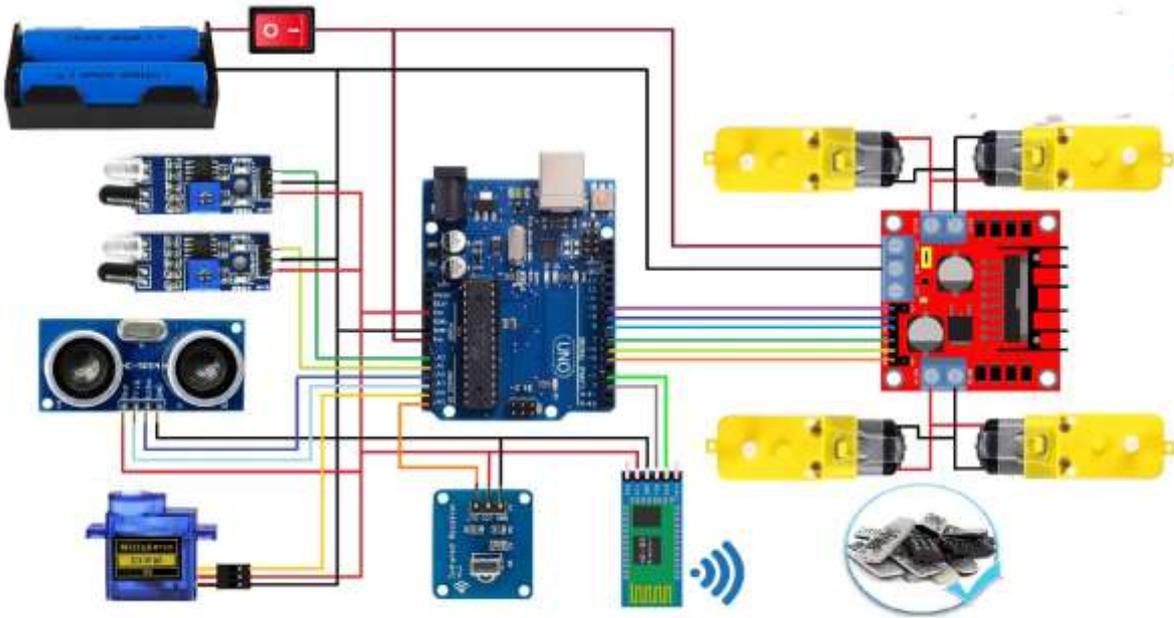
2.7. PROGRAMMING LANGUAGE

1) C language is used for programming Arduino.

2.8. SOFTWARE REQUIREMENT

1) ARDUINO IDE.

2.9. DIAGRAM REPRESENTATION



III. FEATURES OF THIS ROBOT

- 1) OBSTACLE AVOIDANCE
- 2) LINE FOLLOWER
- 3) REMOTE CONTROLLED
- 4) APPLICATION CONTROLLED

5) VOICE CONTROLLED

3.1. APPLICATIONS

Note: - This is a miniature version. It can be built in different sizes according to the application.

- 1) HEALTHCARE INDUSTRIES.
- 2) FOOD INDUSTRIES.
- 3) IT CAN BE USED IN HOTELS, RESORTS AND AIRPORTS FOR CARRYING LUGGAGE.
- 4) IT CAN BE USED IN WAREHOUSE TO TRANSPORT GOODS FROM ONE LOCATION TO ANOTHER.

3.2. ADVANTAGES

- 1) Obstacle avoidance robot is design to allow robot to navigate in unknown environment by avoiding collisions.
- 2) Obstacle avoiding robot senses obstacles in the path, avoids it and resume its running.
- 3) Line following robot can be used to transport items from the point of production to the point of utilization.

Example: - Line following robot can be useful for transporting food items made by the cook to the customer table in the restaurants.

3.3. FUTURE SCOPE

- 1) We can interface sensors to this robot so that it can monitor some parameters.
- 2) We can add wireless camera to this robot.
- 3) It can be use in various industries to reduce in human efforts.

IV. RESULT AND CONCLUSION

In this project we have studied and implemented smart robot using an Arduino. The programming and interfacing of Arduino has been mastered during the implementation. It will help to reduce human effort in many industries. In a country like India, where the population is humongous and the resources are scarce, it becomes highly difficult to set up such extensive projects in every location. So, what this system provides is an alternate to the existing system with robotic machinery, which can handle tasks with lower per capital cost and better accuracy.

V. REFERENCES

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