

Multi-Function Robo Car Controlled By Bluetooth

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Abstract- *Arduino is based on easy-to-use hardware and software having an open source prototyping platform. The robotics and automation industry are widely used because of its simplicity and ability to change according to our needs. The undertaking is intended to build up an automated vehicle utilizing Arduino for remote activity for observing reason. In this paper, we design and implement an embedded system based on the ATmega328 microcontroller and use it for constructing a mobile robot. By interfacing a Bluetooth module into the proposed inserted framework, it can give a control framework that utilizes Bluetooth as a standard innovation for associating (send/get information to/from) remote gadgets. The control circuit of the proposed framework is structured in a manner with the end goal that a client can interface any sort of attractive fringe. Besides, the versatile robot is furnished with a sensor to gauge the separation between the robot and any hindrance in its way and making the correct move to abstain from slamming. Utilizing diverse programming dialects, we demonstrate the working of the framework as a versatile robot. The proposed system can be reprogrammed easily to support a variety of applications. The robot can transmit real time information with the help of Arduino board connected to computer or any smart device This project can be made in a bigger scale for real time vehicles. This paper proposes a multipurpose Robotic car that senses for example fire, harmful gases and detects human using fire sensor, PIR sensor which can be controlled by Arduino dependent on IoT. Each gadget is extraordinarily recognizable by the controlling programming which is the center idea of IoT*

Keywords- Arduino nano board, bluetooth module hc-06, l298n motor driver, dc motors, ir sensors, light sensor, ultrasonic sensor

I. INTRODUCTION

The Web of Things is the inter-networking of physical gadgets, vehicles, structures, and different things implanted with hardware, programming, sensors, actuators, and system availability that empower these items to gather. The IoT allows objects to be sense and/or controlled remotely across existing network infrastructure, creating opportunities, for more direct integration of the physical world into computer-based systems. Robots are the future . This robot was mainly built from Arduino and combining various projects of Arduino to form a Multi-Featured Arduino Robot.

The robot acts as a smart car which is capable of understanding , controlling as an RC car and even avoiding obstacles while moving. The concepts which are in creation in reality are somewhat costly in nature. This project features the use of automated safety and remote access securely using a cheap alternative. Also we can use it in a normal car without much addition of parts and weight. Luxury and Safety are one of the important features we see in this project. This car features characteristics which are needed by people to reduce accidents percentage per day. We've projected this work to provide simpler hardware architecture, but with powerful and concise computational platforms required to build the Robot.

1.1 Arduino

A microcontroller is a finished microchip framework based on a solitary IC. Microcontrollers were created to address an issue for microchips to be placed into minimal effort items. Building a total microchip framework on a solitary chip generously diminishes the expense of structure straightforward items, which utilize the microchip's capacity to actualize their capacity, on the grounds that the chip .This implies utilizing a chip for minimal effort items comes up frequently. Today microcontrollers are regularly utilized in wide assortment of astute items. For instance, most PCs console and actualized with a microcontroller.

Arduino is an open-source stage utilized for structure hardware ventures. Arduino comprises of both a physical programmable circuit board (regularly alluded to as a microcontroller) and a bit of programming, or IDE (Incorporated Improvement Condition) that keeps running on computer, used to transfer the computer code to the physical board. The Arduino stage has turned out to be very prevalent with individuals simply beginning with gadgets, and in light of current circumstances. programmable circuit sheets, the Arduino needn't bother with a different bit of equipment (called a software engineer) so as to stack new code onto the board – you can just utilize a USB link. Moreover, the Arduino IDE utilizes a rearranged adaptation of C++, making it simpler to figure out how to program

II. LITERATURE REVIEW

2.1 Conventional Wireless Robotics:

A robot is a mechanical or virtual artificial agent, usually an electro-mechanical machine that is guided by a computer program or electronic circuitry in conventional robotics, the controlling and operation of robots is typically done by using Radio Frequency circuits

2.2 Bluetooth:

Bluetooth is a remote innovation standard for trading information over short good ways from fixed and cell phones, and building individual territory systems. Bluetooth innovation was made by Ericsson in 1994 and is utilized to supplant the links in the workplace, in research facilities or at home as in. Bluetooth is worked in the scope of 10 meters

2.3 DC Motor :

A DC engine is any of a class of rotational electrical machines that changes over direct flow electrical vitality into mechanical vitality. The most widely recognized sorts depend on the powers delivered by attractive fields. Almost a wide range of DC engines have some inward component, either electromechanical or electronic, to occasionally alter the course of current stream in part of the engine.

2.4 HC -05 BLUETOOTH

The HC-05 Bluetooth Module has 6 pins – Vcc, GND, TX, RX, Key, and LED. It comes pre-customized as a slave, so there is no compelling reason to interface the key pin, unless you need it change it to ace mode the major difference between master and slave modes is that, slave mode the Bluetooth module cannot initiate a connection, it can however accept incoming connections. After the connection is established the Bluetooth module can transmit and receive data regardless of the mode it is running in. If you are using upon to connect to the Bluetooth module, you can simply use it in the slave mode. The default data transmission rate is 9600 kbps. The range of Bluetooth communication is from 30m or less. The module has a factory set pin off "1234" which is used on pairing the module to a phone.

2.5 Sensors

Sensors are utilized in ordinary articles, for example, contact touchy lift catches (material sensor) and lights which diminish or light up by contacting the base. Applications incorporate autos, machines, aviation, medication, assembling and mechanical autonomy.

III. PROPOSED SYSTEM

Power Supply: A power supply is an electronic gadget that provisions electric vitality to an electrical burden. The essential capacity of a power supply is to change over one type of electrical vitality to another and, accordingly, control supplies are now and then alluded to as electric

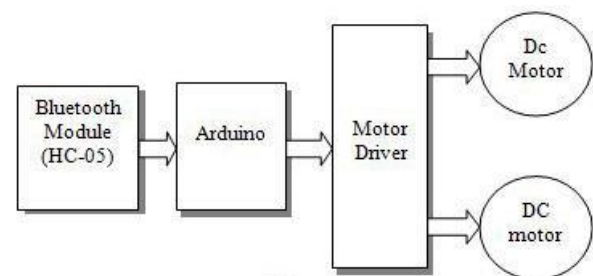
Bluetooth module: It is little remote sequential correspondence module that can be associated with a Miniaturized scale Controller to get and send information when associated with other Bluetooth gadgets.

Arduino-UNO: Arduino is an open-source prototyping platform based on easy-to-use hardware and software. Arduino consists of both a physical programmable circuit board and a piece of software, or IDE (Integrated Development Environment) that runs on your computer, used to write and upload computer code to

Motor driver: It is a small circuit that hoists the motor driving IC, and can control two motors at the same time. It controls the motor speed by pulse width modulation (PWM)

IV. BLOCK DIAGRAM

The Block Diagram of our system consists of a Bluetooth module, an Arduino kit and a couple of motors for driving the car



Bluetooth module is interfaced to the control unit on the robot for sensing the signals transmitted by the android application. This data is sent to the control unit which moves the robot. Commands are used for controlling the robot in all directions at receiver end. Movements of two motors that are interfaced to the microcontroller. Android application is sent data serially and received by a Bluetooth receiver interfaced with controller. The program on the microcontroller interfaced to the serial data to generate respective output based on the input data to operate the motors through motor driver integrated circuits. The motors connected to control unit through motor driver

V. ARCHITECTURE

5.1 Bluetooth Control Theory-

Bluetooth controlled car is controlled using Android mobile phone instead of any other method. Very easy to use as only needs to touch button in android phone to control the car in forward, backward, left and right directions. So here android phone is used as transmitting device and Bluetooth module placed in car issued as receiver. Android phone will transmit command using its in-built Bluetooth to car so that it can move in the required direction like moving forward, reverse, turning left, turning right and stop. Move the car forward for motor movement or back side while for the direction motor or front side, the positive polarity cable will move the wheels left. You can build the circuit on a trial basis using a small breadboard first to confirm all connections as it is essential to connect the State pin of HC-06A big RC car will require more power and therefore you should use L298 module board as L293D motor driver can only give max 0.5A per channel and is While L298 module board is bigger L293D that can give 1A per channel and also has the code for this project is embedded using Code

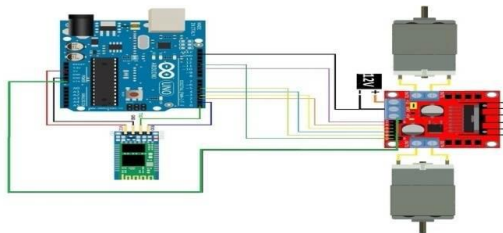


fig 2:circuit diagram of Bluetooth control

5.2 Obstacle Avoidance Theory-

The obstacle detection is essential necessity of this autonomous robot. The robot gets the information from surrounding area through sensors mounted on the robot car. Some sensing devices is used for obstacle detection like bump sensor, infrared sensor, ultrasonic sensor etc. Ultrasonic sensor is most suitable for obstacle detection and is of low cost and has high going capacity. It's ability to operate autonomously is based on the bot's ultrasonic sensor. The ultrasonic sensor emits high-frequency sound waves (these waves can't be detected by human ears because then HIGH. It waits for at least 10 μ s, and then writes it LOW again. When the sound emitted by the sensor reflects off of an object and returns to the sensor, the sensor sends a digital signal to the Arduino. This digital signal indicates the ultrasonic signal's round-trip travel time. They are too high), and waits for those sound waves to reflect off of an object, and calculates how long it takes for the sound to return to the sensor. The sensor I used

comes with send and receive pins labelled "trigger" and "echo," respectively. These pins do most of the work for us. You can find additional details about interfacing to the sensor module if you look through the code. To do this, we need to send the sensor module a logic HIGH signal that's at least 10 μ s wide to the trigger pin.

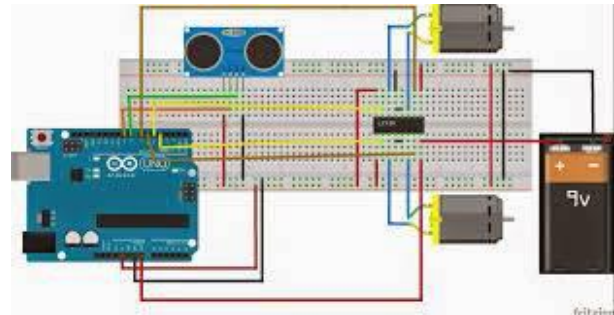








fig 3: circuit diagram of Obstacle avoidance theory

5.3. Programming Highlights

Arduino Ide

The Arduino Facilitated Headway Condition - or Arduino Programming (IDE) - contains a substance supervisor for making code, a message area, a book comfort, a toolbar with gets for ordinary limits and a movement of menus. It interfaces with the Arduino and Genuine hardware to move programs and talk with them. Programs created using Arduino Programming (IDE) are called depicts. These depictions are written in the substance director and are saved with the record extension. No. The chief has features for cutting/sticking and for looking/overriding substance. The message zone gives input while saving and conveying and besides shows bungles. The console shows substance yield by the Arduino Programming (IDE), including complete error messages and other information. The base right-hand corner of the window demonstrates the orchestrated board and consecutive port. The toolbar gets empower you to affirm and move programs, make, open, and extra depicts, and open the successive screen.

	Verify Checks your code for errors compiling it.
	Upload Compiles your code and uploads it to the configured board. See uploading below for details. Note: If you are using an external programmer with your board, you can hold down the "shift" key on your computer when using this icon. The text will change to "Upload using Programmer"
	New Creates a new sketch.
	Open Presents a menu of all the sketches in your sketchbook. Clicking one will open it within the current window overwriting its content. Note: due to a bug in Java, this menu doesn't scroll; if you need to open a sketch late in the list, use the File Sketchbook menu instead.
	Save Saves your sketch.
	Serial Monitor Opens the serial monitor .

VI. CONCLUSION

This paper has built up an ARDUINO framework for a Bluetooth controlled versatile robot dependent on the ATmega328 Microcontroller, where the Bluetooth module (Blue Connection) is effectively interfaced onto the proposed framework for giving a control framework that utilizes highlights of Bluetooth innovation for remote interchanges. Tests did on the sequential correspondence channel between the versatile robot and PC cell phone demonstrate that the framework and the remote controlling through the scope of Bluetooth Furthermore, the sensor is working appropriately for making the best possible move if the robot faces any snags in its way... The created framework is ease and adaptable than backings assortment of uses with least changes to its center. Likeness 40% An Implanted Framework for a Bluetooth this paper has built up an implanted framework for a bluetooth controlled portable robot dependent on the atmega8535 microcontroller, where the bluetooth module (blue connection) is effectively interfaced onto the proposed framework for giving a control framework that utilizes highlights of bluetooth innovation...

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