



INTERNATIONAL JOURNAL OF ADVANCE RESEARCH, IDEAS AND INNOVATIONS IN TECHNOLOGY

ISSN: 2454-132X

Impact factor: 4.295

(Volume 5, Issue 1)

Available online at: www.ijariit.com

Sensoid Robot using Android

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ABSTRACT

Sensoid Robot which infers recognizing robot that can distinguish certain things, this robot is introduced with sensors like light, temperature, humidity and gas sensor all of these sensors convey diverse yields. The robot is created using Arduino microcontroller, which is contained diverse features like controlling the improvements and following the estimations of the sensors using an android application camera is embedded in the robot for better discernment, robots like this can be used for military and perception missions. In this proposed work, we have used Arduino microcontroller, light, stickiness, gas sensors, Bluetooth module, OLED demonstrate the customer can see the readings of the sensor and can take a firm decision by following the robot and its advancements through the android application. Gadgets used are Arduino IDE, MIT App Inventor, and Tiny DB database is used in order to achieve the general working arrangement of this endeavour. The essential arrangement of working up this endeavour is that robots like this can be used and sent on various missions where individuals can't reach, by separating the data which is given by the robot we would then have the capacity to touch base at a particular goal and avoid any risk that is required.

Keywords— Sensors, Micro-Controller, Ultra-Sonic, Temperature and Humidity, LDR, Gas Sensor

1. INTRODUCTION

The target of the task is to build up a robot that will move as indicated by the code doled out however locate a free space, exploring from any impediment on its way. Avoiding impediments as well as the robot can be controlled through Bluetooth utilizing an advanced cell There are different sensors that are utilized in robot, for example, ultrasonic, gas, temperature and moistness sensor, LDR sensor every one of these sensors perform remarkable tasks and readings can be observed through versatile application this sort of robot is exceptionally helpful in military and observation missions where computerized supervision is required, for instance, in spots where it may be dangerous for people to be. The camera is implanted in the robot for better perception and will make it a keen robot this may encourage people if necessary. For instance, it may not generally be conceivable to go to each place yet we can send this robot which will be there making its own way and

send diverse data. The venture gives a rule to the understudies who are new in the realm of Arduino and help them to comprehend about the installed framework, sensors, microcontroller and how to make a robot utilizing Arduino.

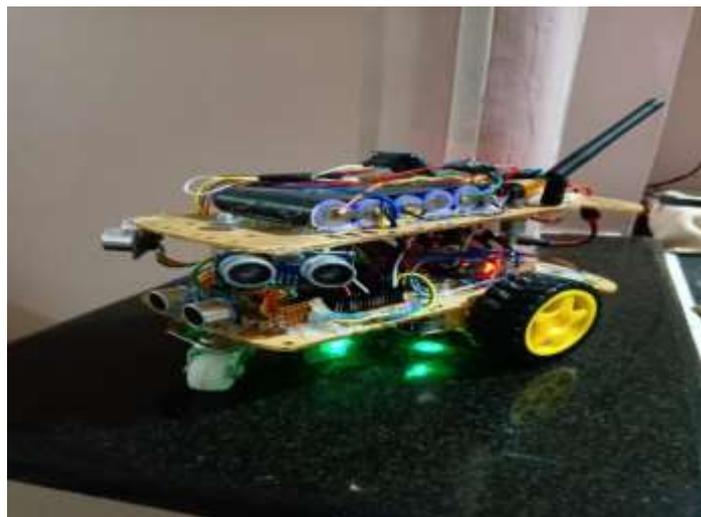


Fig. 1: Sensoid Robot

2. LITERATURE SURVEY

The microchip-based framework is worked for controlling a capacity or scope of capacities and isn't intended to be customized by the end client similarly a PC is characterized as an implant framework. An implanted framework is intended to perform one specific errand yet with various decisions and alternatives.

Inserted frameworks contain preparing centres that are either microcontrollers or advanced flag processors. Microcontrollers for the most part known as "chip", which may itself be bundled with different microcontrollers in a half breed arrangement of Application-Specific Integrated Circuit (ASIC). When all is said in done, input dependably originates from a locator or sensors in progressively explicit word and in the interim the yield goes to the activator which may begin or stop the task of the machine or the working framework.

An installed framework is a mix of both equipment and programming. Each implanted framework is interesting and the

equipment is exceedingly spent significant time in the application area. The equipment comprises processors, microcontroller, IR sensors and so on. Then again, Software is much the same as a mind of the entire inserted framework as this comprises of the programming dialects utilized which make equipment work. Thus, implanted frameworks programming can be a broadly shifting background [1].

The motivation behind the postulation is a basic, PC-controlled robot controlled which moves around identifying the hindrances on its way and consequently advancing through the free space keeping away from every one of the deterrents it experiences and furthermore controlling the robot utilizing the android application. After the finishing of the robot, the robot would now be able to perform different undertakings and different developments of the robot can be controlled utilizing a straightforward versatile application associated by means of Bluetooth and a Smartphone (Bluetooth Enabled) and the Ultra Sonic Sensor will distinguish get the separations impediments if there are any. On the off chance that there are any deterrents and Ultra Sonic Sensor slams into them, cerebrum of the robot (miniaturized scale controller) will figure the separation [1].

The robot is made initiated after the switch on the movement board is turned on. In the event that there appears to have any snag without their set to it, it will move to the other way of the deterrent recognized. That is, if the correct sensor distinguishes the item on its way, it will turn left and begin moving straight again and whenever the left sensor recognizes an obstruction, it will turn right and keep moving. Also, if there is by all accounts deterrent all around the robot inside the recognition separate, the robot will continue turning 360° [1].

Arduino UNO R3 is an open-source microcontroller board dependent on the Microchip ATmega328P microcontroller and created by Arduino.cc. The board is furnished with sets of advanced and simple information/yield (I/O) sticks that might be interfaced to different development sheets (shields) and different circuits. The board has 14 Digital pins, 6 Analog pins, and programmable with the Arduino IDE (Integrated Development Environment) by means of a sort B USB link. It very well may be fuelled by a USB link or by an outside 9-volt battery, however, it acknowledges voltages somewhere in the range of 7 and 20 volts [1].

The programming condition Processing [2] and the microcontroller Arduino [2] have been two vital apparatuses in framework plan improvement including installed frameworks. Handling is a Java-based programming dialect including a simple to-utilize IDE with a spotlight on visual programming. Arduino is a framework comprising of a microcontroller with USB or Bluetooth associations, and a programming domain focused on originators and specialists who need to manufacture intuitive artefacts. Handling and Arduino depend on the open source though, not just in the manner in which they have been and still are being created, yet additionally inside their locale of clients. Handling, for instance, has an element which permits distribution of a venture in the type of a site, including an applet and the source code. Due to this component, numerous ventures worked with Processing are being distributed with the source code, which permits other individuals, particularly tenderfoots, to gain from existing tasks. They share an introduction towards originators and craftsmen as clients.

The instruments' functionalities, work process, and dialect are centred on the exercises of portraying: Without any underlying setup, clients can begin testing quickly, and straightforwardly

encounter the outcomes. Related to Arduino and other electronic prototyping units, clients go through a breadboard and wire their circuits physically. This turns out to be good with self-trained experimentation reorder approach. It likewise empowers the seeing-drawing seeing cycle, where the structure is investigated in a tight emphasis of alteration pursued by testing the experience [2].

Also, a standard electronic interface dependent on the "shield" idea makes working with complex equipment a straightforward matter of connecting the discretionary sheets. Each one of those highlights of open source stages bolsters the framework thinking instructing and developing a trial set. Alongside Arduino, Frit Zing [3] turns into an incredible better approach to consider planning gadgets and equipment since it enables the clients to engage themselves by structuring equipment that was once only in reach of trained electrical engineers. This paper explores the world of Arduino, Frit Zing and sensors through multiple versions of existing ideas. We integrate ongoing feedback into the learning process and identify the strength and weakness of designed systems.

3. METHODOLOGY

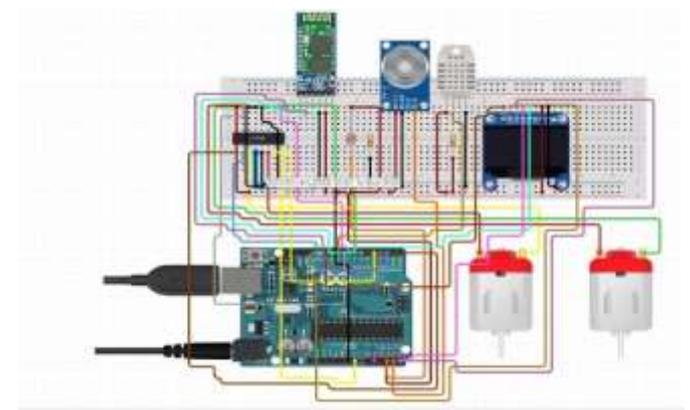


Fig. 2: Circuit Diagram

Mechanical Components Used

- (a) OLED Display
- (b) Bread Board
- (c) Dc Motors
- (d) Bluetooth Module
- (e) Arduino Micro Controller
- (f) Gas Sensor
- (g) Temperature and Humidity Sensor
- (h) Motor Driver
- (i) Smart Phone (Bluetooth Enabled)
- (j) Light Sensor
- (k) Capacitors, Resistors& Wires
- (l) Relay Switch

3.1 Gas Sensor

The obstruction of the sensor is diverse relying upon the kind of gas. The smoke sensor has a worked in potentiometer that enables you to alter the sensor affectability as indicated by how exact you need to identify gas.



Fig. 3: Gas Sensor

3.2 Temperature & Humidity Sensor

The DHT-22 (likewise named as AM2302) is an advanced yield, relative mugginess, and temperature sensor. It utilizes a

capacitive mugginess sensor and an indoor regulator to quantify the encompassing air and sends an advanced flag on the information stick. The Temperature Sensor DHT-22 arrangement is exactness coordinated circuit temperature gadgets with a yield voltage straightly relative to the Centigrade temperature.



Fig. 4: DHT-22 Sensor

3.3 LDR (Light Dependent Resistor)

An LDR is a segment that has a (variable) obstruction that changes with the light power that falls upon it. This enables them to be utilized in light detecting circuits.



Fig. 5: LDR Sensor

3.4 Ultra-Sonic Sensor

As the name shows, ultrasonic sensors measure separate by utilizing ultrasonic waves. The sensor head discharges an ultrasonic wave and gets the wave reflected over from the objective. Ultrasonic Sensors measure the separation to the objective by estimating the time between the discharge and gathering.



Fig. 6: Ultra Sonic

3.5 Arduino UNO R3

The Arduino UNO R3 is an open-source microcontroller board dependent on the Microchip ATmega328P microcontroller and created by Arduino.cc. The board is furnished with sets of advanced and simple information/yield (I/O) sticks that might be interfaced to different extension sheets (shields) and different circuits. The board has 14 Digital pins, 6 Analog pins, and programmable with the Arduino IDE (Integrated Development Environment) by means of a sort B USB link. It very well may be controlled by a USB link or by an outer 9-volt battery, however, it acknowledges voltages somewhere in the range of 7 and 20 volts.

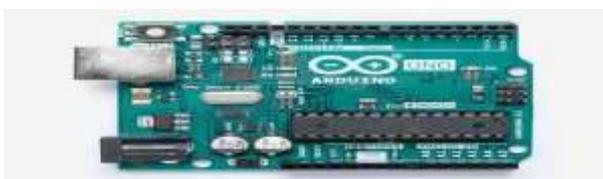


Fig. 7: Arduino Uno

3.6 Bluetooth Module (HC-05)

HC-05 module is a simple to utilize Bluetooth SPP (Serial Port Protocol) module, intended for straightforward remote sequential association setup. The HC-05 Bluetooth Module can be utilized in a Master or Slave arrangement, making it an incredible answer for remote correspondence. This sequential port Bluetooth module is completely qualified Bluetooth V2.0+EDR (Enhanced Data Rate) 3Mbps Modulation with complete 2.4GHz radio handset and baseband. It utilizes CSR Blue centre 04- External single-chip Bluetooth framework with CMOS innovation and with AFH (Adaptive Frequency Hopping Feature).



Fig. 8: HC05

3.7 Smart Phone (Bluetooth Enabled): the Cell phone is a class of multi-reason portable registering gadget. They are recognized from highlight telephones by their more grounded equipment abilities and broad versatile working frameworks, which encourage more extensive programming, web (counting web perusing over portable broadband), and mixed media usefulness (counting music, Bluetooth, video, cameras, and gaming), close by centre telephone capacities, for example, voice calls and content informing.



Fig. 9: Smartphone

3.8 Motor Driver L293D (IC)

L293D is a double H-connect engine driver incorporated circuit (IC). Engine drivers go about as flow intensifiers since they take a low-ebb and flow control flag and give a higher-ebb and flow flag. This higher current flag is utilized to drive the engines.

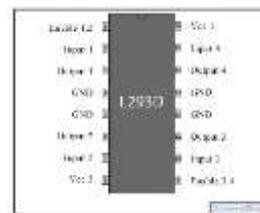


Fig. 10: Motor Driver IC

4. IMPLEMENTATION

4.1 Code

```
#include<SimpleDHT.h> //Temperature and Humidity Library
#include "U8glib.h" //Oled Display Library
U8GLIB_SSD1306_128X64 u8g(5, 4, A5, 6, 3);
int pinDHT11 = 2; //Define Temperature & Humidity Sensor
Digital pin 2
SimpleDHT11 dht11; //Define DHT sensor

#define light (A1) //Define pin A1 Light Sensor
#define gas (A0) //Define pin A0 Gas Sensor

int lvl;
int sensorgasValue ;
int izqA = 8;
int izqB = 9;
int derA = 10;
int derB = 11;
int vel = 255;
int estado = 'c';
int pecho = 12;
int ptrig = 13;
int duration, distance;

void setup() {
  Serial.begin(115200);
  pinMode(derA, OUTPUT);
```

```

pinMode(derB, OUTPUT);
pinMode(izqA, OUTPUT);
pinMode(izqB, OUTPUT);
pinMode(pecho, INPUT);
pinMode(ptrig,OUTPUT);
pinMode(13,OUTPUT);

u8g.firstPage();
int i = 0;
do {
draw();
} while( u8g.nextPage() );
delay(1000);
}

void draw() { //Oled Display Title

u8g.setFont(u8g_font_osb21);
u8g.drawStr( 30, 22, "RO-1");
u8g.setFont(u8g_font_unifont);
u8g.drawStr( 55, 37, "by");
u8g.setFont(u8g_font_unifont);
u8g.drawStr( 35, 52, "RoDuInO");
}

void loop(){
if(Serial.available(>0)
{
estado = Serial.read();
}

if(estado=='f'){
analogWrite(derB, 0);
analogWrite(izqB, 0);
analogWrite(derA, vel);
analogWrite(izqA, vel);
}

if(estado=='l') {
analogWrite(derB, 0);
analogWrite(izqB, 0);
analogWrite(derA, 0);
analogWrite(izqA, vel);
}

if(estado=='s'){
analogWrite(derB, 0);
analogWrite(izqB, 0);
analogWrite(derA, 0);
analogWrite(izqA, 0);
}

if(estado=='r'){
analogWrite(derB, 0);
analogWrite(izqB, 0);
analogWrite(izqA, 0);
analogWrite(derA, vel);
}

if(estado=='B'){
analogWrite(derA, 0);
analogWrite(izqA, 0);
}

analogWrite(derB, vel);
analogWrite(izqB, vel);
}

if(estado == 't') //Temperature, Humidity and Gas Sensor
{
byte temperature = 0;
byte humidity = 0;

if (dht11.read(pinDHT11, &temperature, &humidity,
NULL))
{
return;
}
lv1 = analogRead(light);
sensorgasValue = analogRead(gas);
Serial.print((int)temperature);
Serial.print("C");
Serial.print("|");
Serial.print((int)humidity);
Serial.print("%");
Serial.print("|");
Serial.println(lv1);
Serial.print("|");
Serial.println(sensorgasValue); //gas sensor//
Serial.print("|");
delay(5000);
}

if (estado == 'a'){
digitalWrite(ptrig, HIGH);
delay(0.01);
digitalWrite(ptrig, LOW);
duracion = pulseIn(pecho, HIGH);
distance = (duration/2) / 29;
delay(10);
if (distance <= 15 && distance >=2) //Ultrasonic Sensor
{
digitalWrite(13,HIGH);
analogWrite(derB, 0);
analogWrite(izqB, 0);
analogWrite(derA, 0);
analogWrite(izqA, 0);
delay (200);
analogWrite(derB, vel);
analogWrite(izqB, vel);
delay(500);
analogWrite(derB, 0);
analogWrite(izqB, 0);
analogWrite(derA, 0);
analogWrite(izqA, vel);
delay(600);
digitalWrite(13,LOW);
}
else
{
analogWrite(derB, 0);
analogWrite(izqB, 0);
analogWrite(derA, vel);
analogWrite(izqA, vel);
}
}
}

```

4.2 Mobile Application

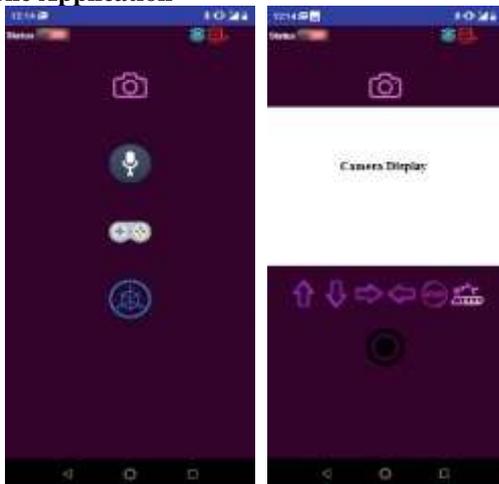


Fig. 11: Controls

5. CONCLUSION

Today we are in the realm of mechanical autonomy. Purposely or unconsciously, we have been utilizing distinctive kinds of robots in our everyday life. The point of the postulation is to assess what understudies can find out about the fields of building, mechatronics, and programming advancement as they configuration, develop and program an independent robot. This will to give a rule to the understudies who are new in the realm of Arduino and help them to comprehend about the installed framework, IR sensors, microcontroller and how to make a robot utilizing Arduino. This task had the objective of controlling diverse parts of the robot to influence it to respond as indicated by our craving. The general end objective was to influence the

robot to pursue a dark track just by programming it to utilize the sensors joined to it. The point of the postulation is to give straightforward rules to the new understudies and tenderfoots who are keen on this kind of venture.

6. REFERENCES

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