

ARMED CAR

Introduction: This project is basically a robotic car which has an arm and ultrasonic sensor. The whole project is developed by using hardware chassis and software tools relevant to this course. The main thing at this project is that the whole control is maintained by the smart phone using manually developed app.

Objectives: The purpose or objective of the device is to hold and pick any object of some certain limit of weight. The arm of the car has 3 joints that is it can move at 3 dimensional also the ultrasonic sensor that we have used will send signal about the object in front of the car and automatically stop the rotation of dc motor before 6 cm of confliction.

Equipment:

Hardware:

1. Arduino Uno: collaborate with the hardware and software.
2. L298n Motor Module: It controls the motors used for the wheels of the car.
3. Bluetooth Module HC-05 : Controls the device by using smart phone Bluetooth service.
4. DC Gear Motor (2 pcs) : To run the wheels of the car.
5. Servo Motor (3pcs) : For controlling the different movements of the arm.
6. Battery for power supply (3.87v and 10000amp)
7. Robotic Car Chassis Kit and wires as required
8. Android phone (as remote controller device)

Software:

1. Circuit.IO
2. MIT app inventor.
3. Arduino IDE.

Features:

1. Controlled by android smart phone. (For controlling the car and arm a CUSTOM APP has been build
2. The Car is able to move forward, backward, left and right. So every possible 2 dimensional point can be reached.
3. The Arm can move up and down, left and right direction.
4. To pick and place functioning the arm will have finger like two clips. These clips will move left and right, both in opposite direction top pick and place.
5. The ultrasonic sensor sense signal but the present about the presence of any object in front of the car and stop the rotation of the wheel's motor

Circuit Diagram:

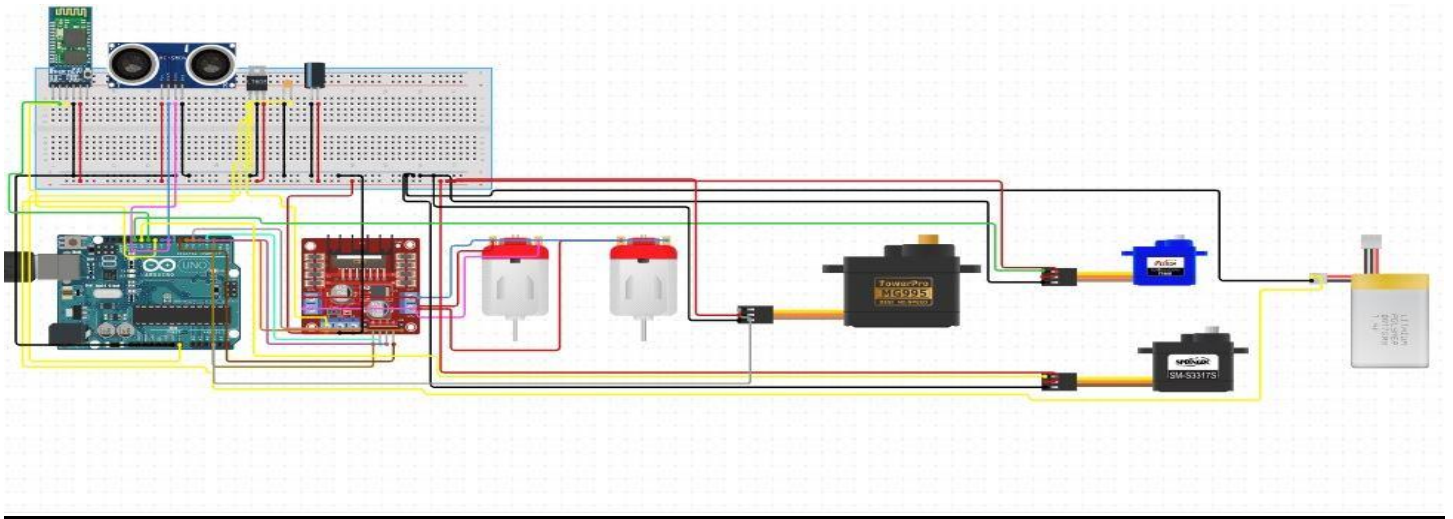
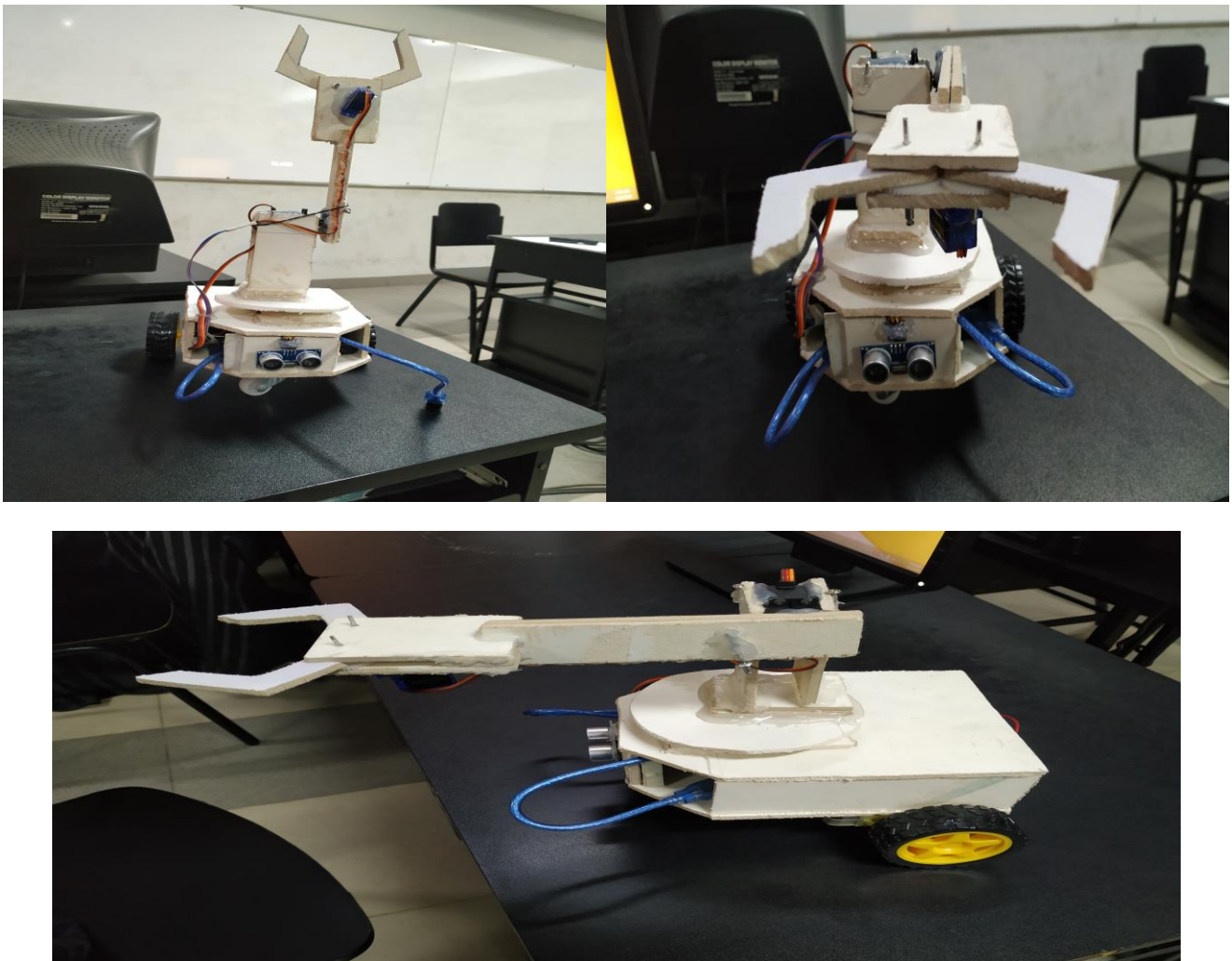


Figure of the project:



Working Principle:

As the power on we can drive the movement of the car to reach some particular object by using our manually developed RAC (Robot Armed Car) App which was designed and materialized by using MIT APP INVENTOR. As we reach the nearest of the object we can control of the arm in 3 dimensional way using the same app and pick that object. Afterward following the same procedure the object can be dropped anywhere on the surface. The ultrasonic sensor's working method is embedded into the device.

Constraints:

AS we used ultrasonic sensor to detect object infront of the car. There arises a problem; basically ultrasonic sensor produces huge noise by generate. For this issue sometimes the car stops running as it was instructed to stop the functioning of the wheels when any object detected. So the noise sometimes work as a trap.

Dos and Don'ts:

We have implemented all the features as we proposed in our project proposal. Initially using ultrasonic sensor and functioning of it was not included in our proposal. But as our teacher said to use it we have also included the feature successfully.

Conclusion:

We have contributed our best effort to make this project successfully done. Although we have faced some obstacles but hopefully the project was done well.

Appendix:

#include <Servo.h>	Servo servo03;	Serial.flush();
const int trigPin = 2;		pinMode(trigPin, OUTPUT);
const int echoPin = 3;	int servo1Pos, servo2Pos,	pinMode(echoPin, INPUT);
long duration;	servo3Pos;	servo01.attach(12);
int distance;	int servo1PPos, servo2PPos,	servo02.attach(13);
int motorLpin1=4;	servo3PPos;	servo03.attach(11)
int motorLpin2=5;	int speedDelay = 20;	servo1PPos = 0;
int motorRpin1=6;	int index = 0	servo01.write(servo1PPos);
int motorRpin2=7;	int motorSpeed=255;	servo2PPos = 0;
int motorLpwm=10;	String input;	servo02.write(servo2PPos);
int motorRpwm=9;		servo3PPos = 90
Servo servo01;	void setup() {	servo03.write(servo3PPos);
Servo servo02;	Serial.begin(9600);	pinMode(motorLpin1,OUTPUT);

pinMode(motorLpin2,OUTPUT);	if(input=="B"){	digitalWrite(motorRpin1,1);
	Serial.println(input)	digitalWrite(motorRpin2,0);
pinMode(motorRpin1,OUTPUT)	analogWrite(motorLpwm,moto	}
;	rSpeed);	
		if(input=="R"){
pinMode(motorRpin2,OUTPUT)	analogWrite(motorRpwm,moto	Serial.println(input);
;	rSpeed);	
	digitalWrite(motorLpin1,0);	analogWrite(motorLpwm,moto
pinMode(motorLpwm,OUTPUT)	digitalWrite(motorLpin2,1);	rSpeed);
;	digitalWrite(motorRpin1,0);	
	digitalWrite(motorRpin2,1);	analogWrite(motorRpwm,moto
pinMode(motorRpwm,OUTPUT	}	rSpeed);
);		digitalWrite(motorLpin1,1);
}	if(input=="F"){	digitalWrite(motorLpin2,0);
	Serial.println(input);	digitalWrite(motorRpin1,0);
void loop() {	analogWrite(motorLpwm,moto	digitalWrite(motorRpin2,1);
digitalWrite(trigPin, LOW);	rSpeed);	}
delayMicroseconds(2);	analogWrite(motorRpwm,moto	if(input=="S" (distance>1
digitalWrite(trigPin, HIGH);	rSpeed);	&& distance<6)){
delayMicroseconds(10);	digitalWrite(motorLpin1,1);	Serial.println(input)
digitalWrite(trigPin, LOW);	digitalWrite(motorLpin2,0);	analogWrite(motorLpwm,0);
duration = pulseIn(echoPin,	digitalWrite(motorRpin1,1);	analogWrite(motorRpwm,0);
HIGH):	digitalWrite(motorRpin2,0);	digitalWrite(motorLpin1,1);
distance= duration*0.034/2;	}	digitalWrite(motorLpin2,1);
Serial.print("Distance: ");	if(input=="L"){	digitalWrite(motorRpin1,1);
Serial.println(distance);	Serial.println(input);	digitalWrite(motorRpin2,1);
//delay(1000);		}
input="";		
while(Serial.available()){	analogWrite(motorLpwm,moto	//Servo
input+=(char)Serial.read();	rSpeed);	
delay(5);	analogWrite(motorRpwm,moto	if (input.startsWith("G")) {
}	rSpeed);	Serial.println(input);
//Motor	digitalWrite(motorLpin1,0);	String dataInS =
	digitalWrite(motorLpin2,1);	input.substring(1,

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input.length());
    }

    servo1Pos = dataInS.toInt();

    Serial.println(servo1Pos);

    if (servo1PPos > servo1Pos) {
        for ( int j = servo1PPos; j >=
servo1Pos; j--) {

            servo01.write(j);

            delay(20);

        }

    }

    if (servo1PPos < servo1Pos) {
        for ( int j = servo1PPos; j <=
servo1Pos; j++) {

            servo01.write(j);

            delay(20);

        }
    }

    servo1PPos = servo1Pos;

    if (input.startsWith("E")) {

        Serial.println(input);

        String      dataInS      =
input.substring(1,
input.length());

        servo2Pos = dataInS.toInt();

        Serial.println(servo2Pos);

        if (servo2PPos > servo2Pos) {

            for ( int j = servo2PPos; j >=
servo2Pos; j--) {

                servo02.write(j);

                delay(20);

            }

        }

        if (servo2PPos < servo2Pos) {

            for ( int j = servo2PPos; j <=
servo2Pos; j++) {

                servo02.write(j);

                delay(20);

            }

        }

        servo2PPos = servo2Pos;

        if (input.startsWith("W"))
        {

            Serial.println(input);

            String      dataInS      =
input.substring(1,
input.length());

            servo3Pos = dataInS.toInt();

            Serial.println(servo3Pos);

            if (servo3PPos > servo3Pos) {

                for ( int j = servo3PPos; j >=
servo3Pos; j--) {

                    servo03.write(j);

                    delay(20);

                }

            }

            if (servo3PPos < servo3Pos) {

                for ( int j = servo3PPos; j <=
servo3Pos; j++) {

                    servo03.write(j);

                    delay(20);

                }

            }

            servo3PPos = servo3Pos;

        }

    }

}

```