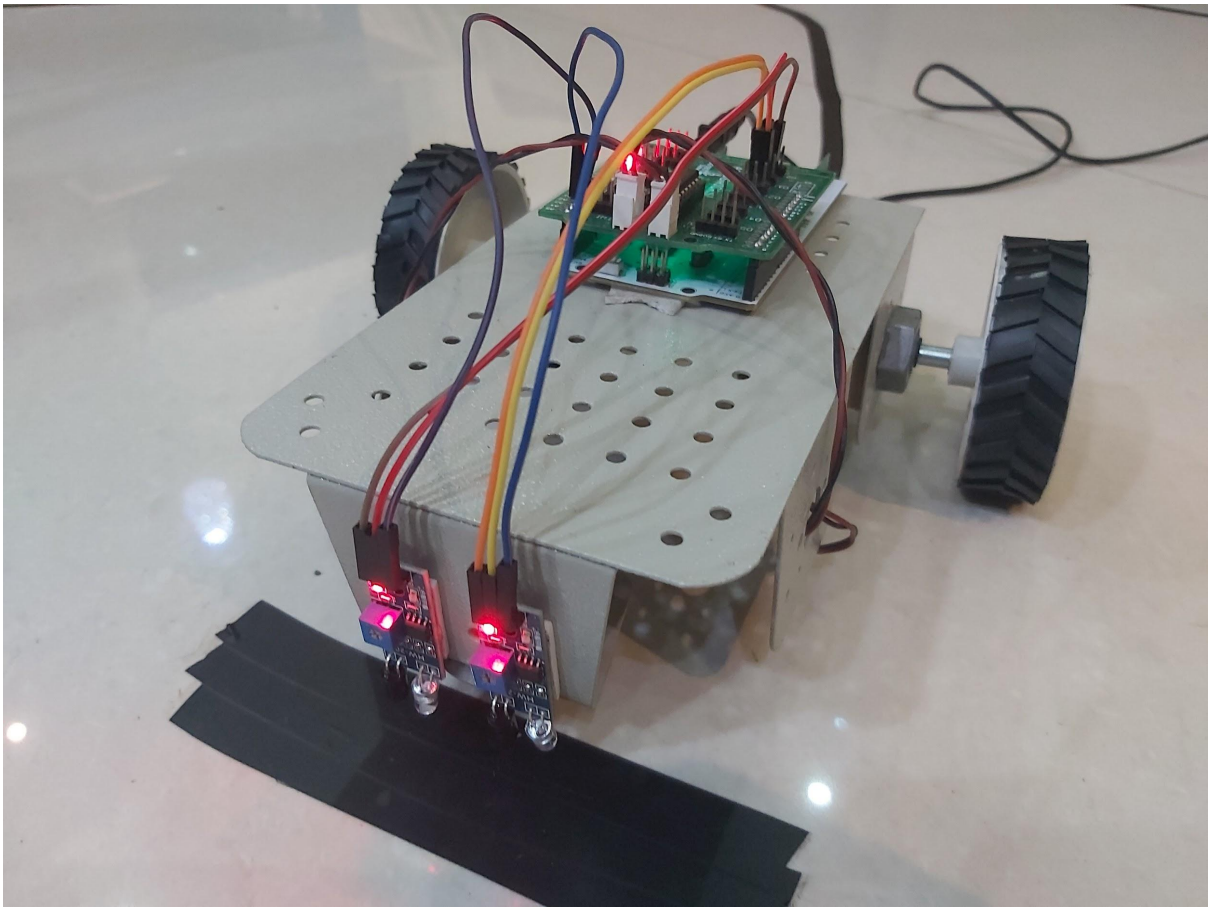
Line Follower Robot



The line follower robot, as the name implies, is an autonomous vehicle that follows a visible line imprinted in the surface. This visual line represents the path that the line follower robot will take. It usually uses a black line on a white background, but you can change it to a white line on a black background.

Giant line follower robots are employed in industries to assist in the automated production process. They're also employed in military applications, humanitarian aid, and delivery services, among other things.

THINGS USED IN THE PROJECT

HARDWARE

- Boltduino (Arduino)
- IR sensor x2
- Motor driver shield
- Motors x2
- Chassis
- Standard wheels x2
- Caster wheel

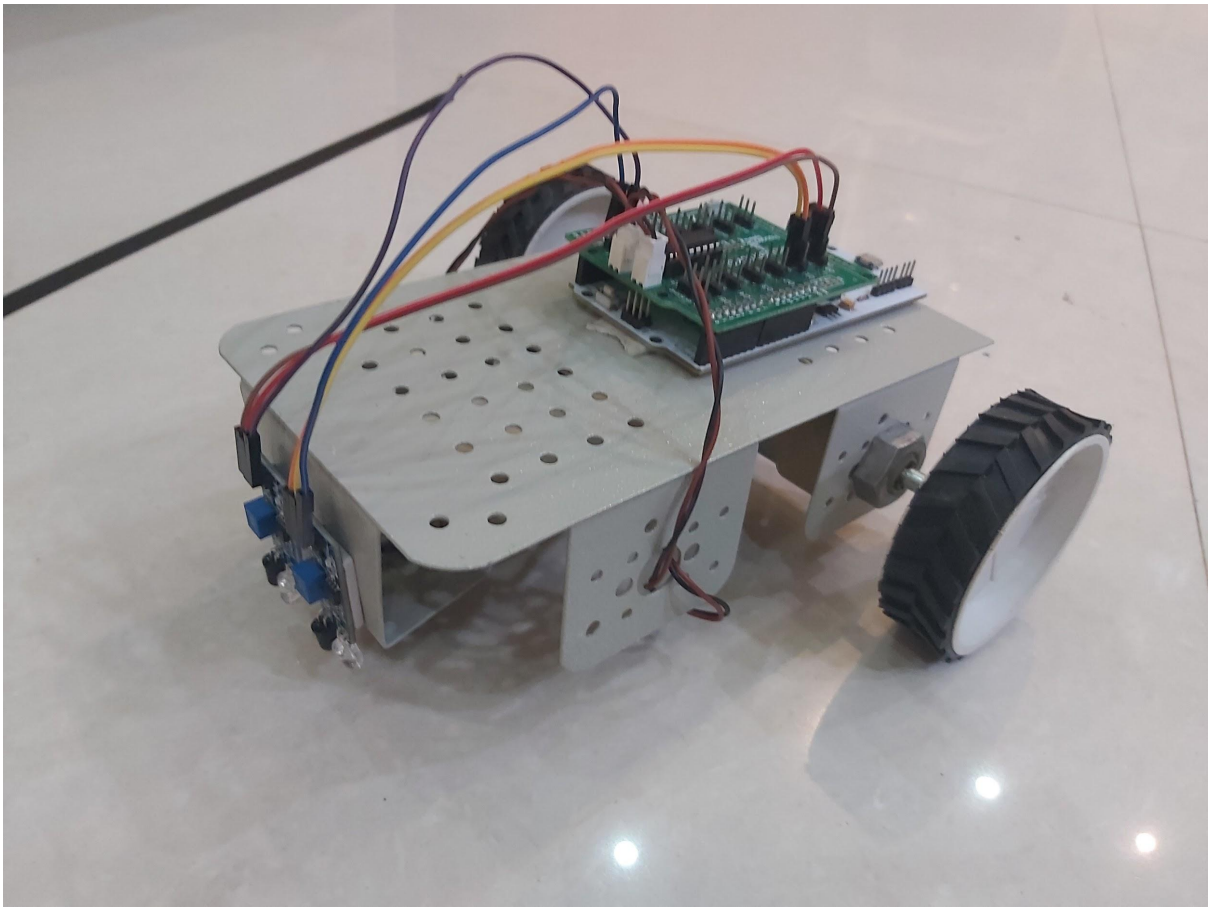
- 12V power adapter
- Few screws & nuts
- USB cable
- A spanner
- A screwdriver
- Double sided tape
- Standard electrical black tape

SOFTWARE/ APP / ONLINE SERVICES

- Arduino IDE

HARDWARE SETUP

1) Fit caster wheel to chassis with screws and nuts using screwdriver
2) Take 2 motors and lose its nut with spanner and fix those motors in a place of wheels from inside of chassis
3) Take out the wires of the right motor from the front right side(front wheel side) of the chassis. Similarly, Take out the wires of the left motor from the front left side(front wheel side) of the chassis.
4) Lose the screw of both the standard wheels and mount it on the motors.
5) Take the motor driver shield and mount it on the Boltduino such that all pins of the motor driver shield are connected to the Boltduino.
6) With a double sided tape stick the Boltduino to the top side of the chassis. Such that the USB port is on the edge of the chassis and Boltduino is in the centre of the Chassis.
7) Take the wire of the right motor and left motor and connect it to the right and left given pin on the motor driver shield.
8) With double sided tape, stick 2 IR sensors in such a way that is 1 inch above from ground in front of the robot. And the parallel distance between each IR sensor should be more than the size of black line used in a robot environment.
9) Connect the OUT pin of IR1 & IR2 sensors to A0, A1 analog pins of Arduino respectively, and VCC to 5V and GND to ground pin (GND) of Arduino.
10) Draw a line around the robot environment with black electrical tape on white background.
11) Our robot is ready to code.



SOFTWARE SETUP

1) Open Arduino IDE and select Board as Arduino UNO and Port as per your hardware configuration.

SOFTWARE PROGRAMMING/ CODE

1) Open a new sketch, name it as **Line_Follower_Robot** and Code as shown below.
2) Write simple if else conditions for the line following algorithm. Shown below.

```
void setup() {
  // put your setup code here, to run once:
pinMode(A0, INPUT);
pinMode(A1, INPUT);
pinMode(5, OUTPUT);
pinMode(6, OUTPUT);
pinMode(4, OUTPUT);
pinMode(12, OUTPUT);
pinMode(7, OUTPUT);
pinMode(8, OUTPUT);
digitalWrite(5, HIGH);
digitalWrite(6, HIGH);
}

void loop() {
```

```
  // put your main code here, to run repeatedly:
int a = analogRead(A0);
int b = analogRead(A1);

// Forward
if(a<100 && b<100){
  Forward();
}
// Right
if(a>100 && b<100){
  Right();
}
// Left
if(a<100 && b>100){
  Left();
}
// Stop
if(a>100 && b>100){
  Stop();
}
}

void Forward(){
  digitalWrite(4, HIGH);
  digitalWrite(7, LOW);
  digitalWrite(12, HIGH);
  digitalWrite(8, LOW);
}

void Right(){
  digitalWrite(4, LOW);
  digitalWrite(7, HIGH);
  digitalWrite(12, HIGH);
  digitalWrite(8, LOW);
}

void Left(){
  digitalWrite(4, HIGH);
  digitalWrite(7, LOW);
  digitalWrite(12, LOW);
  digitalWrite(8, HIGH);
}

void Stop(){
  digitalWrite(4, LOW);
  digitalWrite(7, LOW);
  digitalWrite(12, LOW);
  digitalWrite(8, LOW);
```

}

3) Verify the code and check for any errors.
4) Connect the USB cable to the Boltduino (Arduino) and Laptop to Upload the code.
5) Click on the upload button in Arduino IDE.
6) The Boltduino will blink lights and motors will start moving the wheels.
7) Place the robot in front of the black line which was drawn.

OUTPUT/ VIDEO

https://youtu.be/rHL7clrbKFg