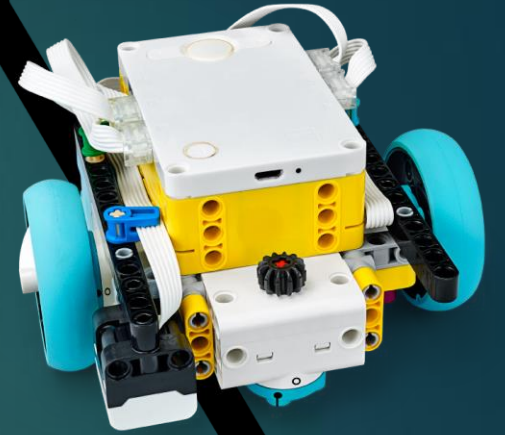


DIY GROUP PROJECT

**MULTI
IMPLEMENTATION
LINE FOLLOWER**



GROUP 16

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➤ ACKNOWLEDGEMENT:

We are very much thankful to prof. Dr. Korak Sarkar for guiding us to make this DIY project. We learned many technical concepts and work accordingly to build this project.

➤ INTRODUCTION:

A ROBOT IS ANY MACHINE WHICH IS COMPLETELY AUTOMATIC, I.E. IT STARTS ON ITS OWN, DECIDES ITS OWN WAY OF WORK AND STOPS ON ITS OWN. IT IS ACTUALLY A REPLICA OF HUMAN BEING, WHICH HAS BEEN DESIGNED TO EASE HUMAN BURDEN. IT CAN BE CONTROLLED PNEUMATICALLY OR USING HYDRAULIC WAYS OR USING THE SIMPLE ELECTRONIC CONTROL WAYS. THE FIRST INDUSTRIAL ROBOT WAS UNIMATES BUILT BY GEORGE DEVOL AND JOE ENGELBERGER IN THE LATE 50'S AND EARLY 60'S.

WORK DISTRIBUTION



MINGMA RINZING
LEPCHA



Video editing ,
presentation
preparation ,
components
research



BHUNESHWAR
NETAM



Cad 3D model,
Purchasing
components
Physical
assembly



BIJOY TIMUNG



Tinker Cad circuit ,
Final assembly

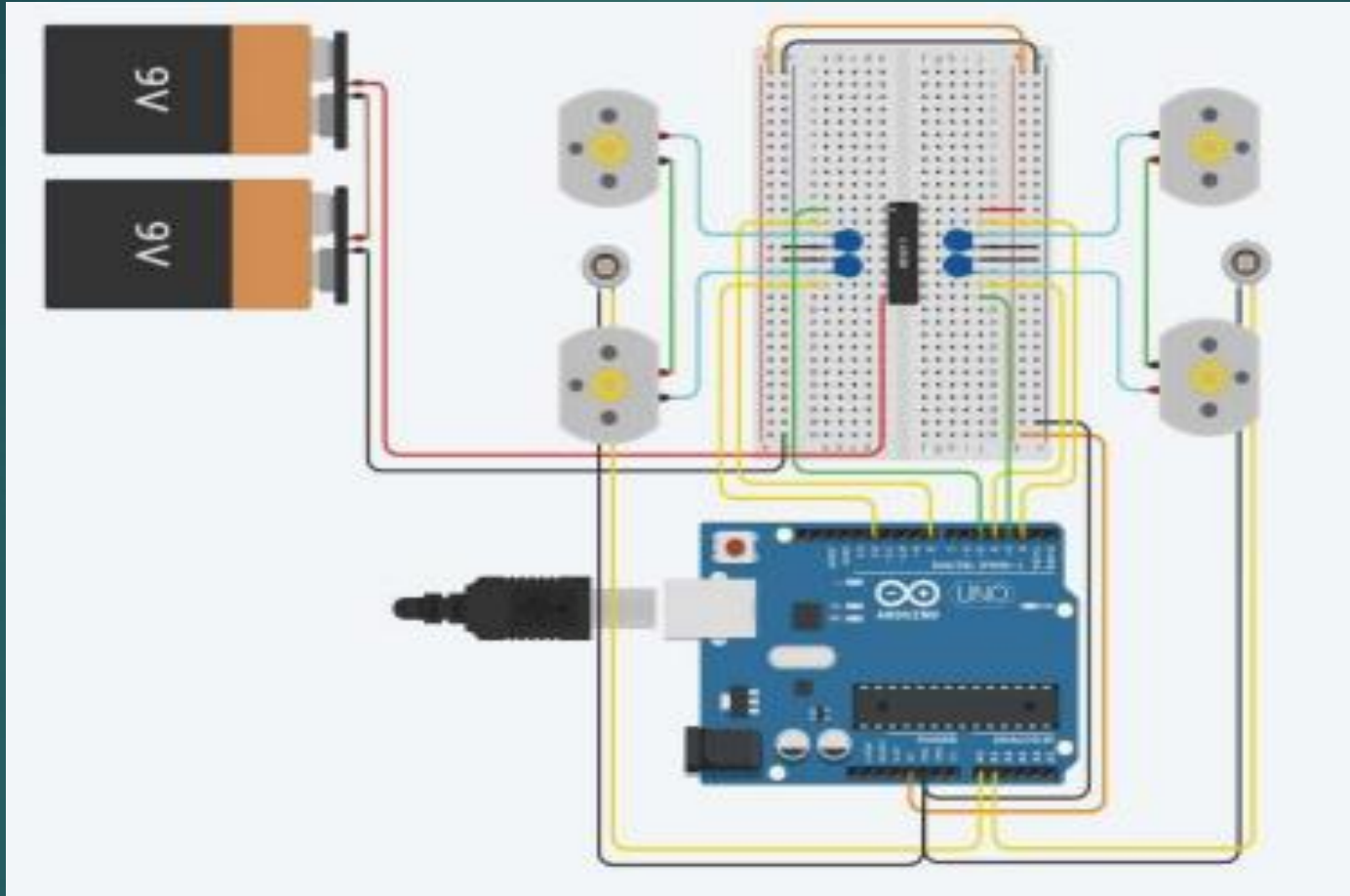


RUHUL AMIN



Tinker Cad
circuit coding
and Analysis

DESIGN IN TINKERCAD



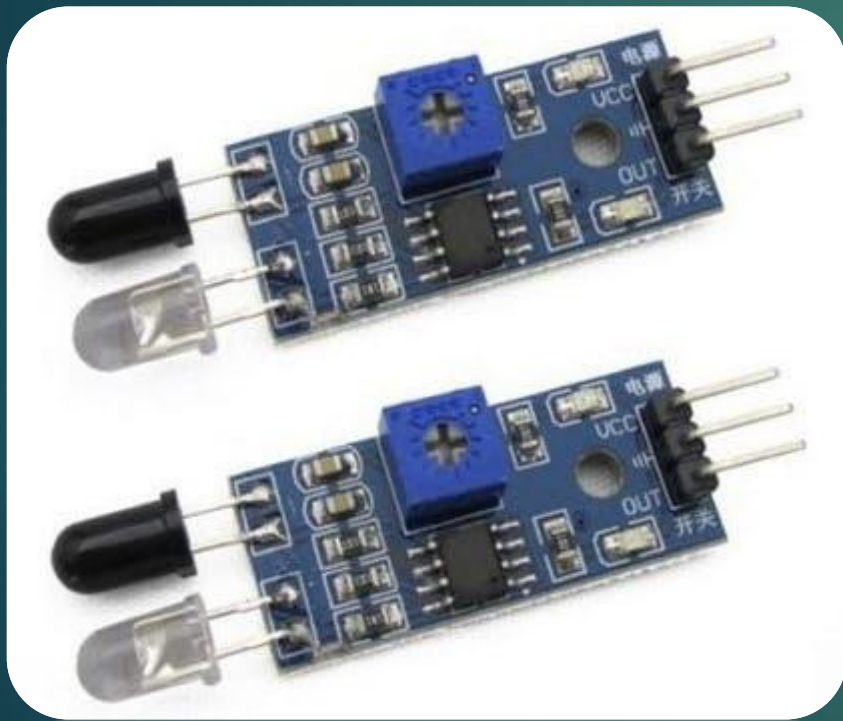
CIRCUITAL LAYOUT

Components used :-

1. Arduino UNO
2. L293D MOTOR DRIVER SHIELD
3. 4 WHEELS
4. 4 DC MOTORS
5. JUMPER WIRES
6. 2 IR SENSORS
7. Batteries

IMPORTANT COMPONENT

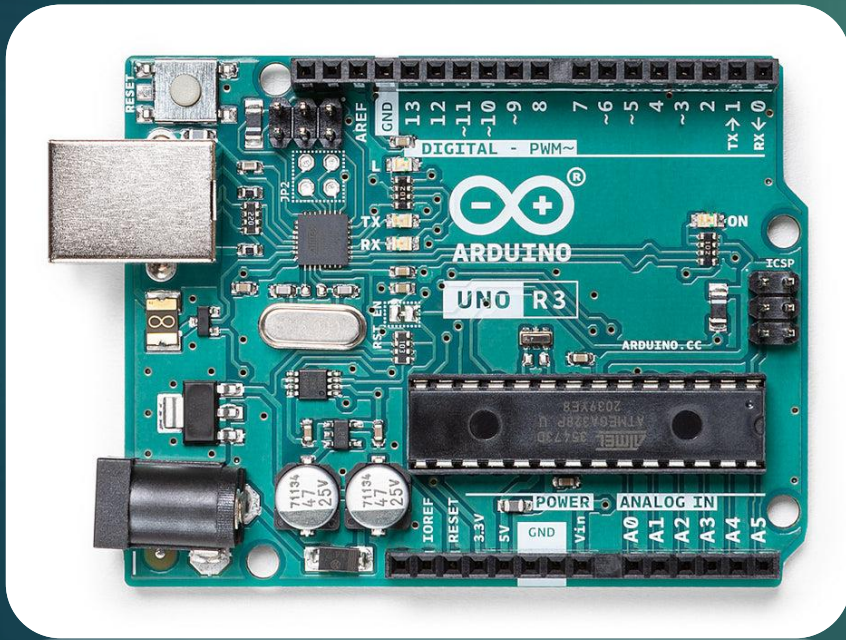
COMPONENT 1: THE IR PROXIMITY SENSORS



The concept of working of a line follower robot is based on the phenomenon of light. We know that white colour reflects almost all of the light that falls on it, whereas black colour absorbs most of the light. In case of a line follower robot we use IR transmitters and receivers also called photodiodes. They are used for sending and receiving light. IR transmits infrared lights. When infrared rays falls on white surface, it's reflected back and caught by photodiodes which generates some voltage changes. When IR light falls on a black surface, light is absorb by the black surface and no rays are reflected back, thus photo diode does not receive any light or rays.

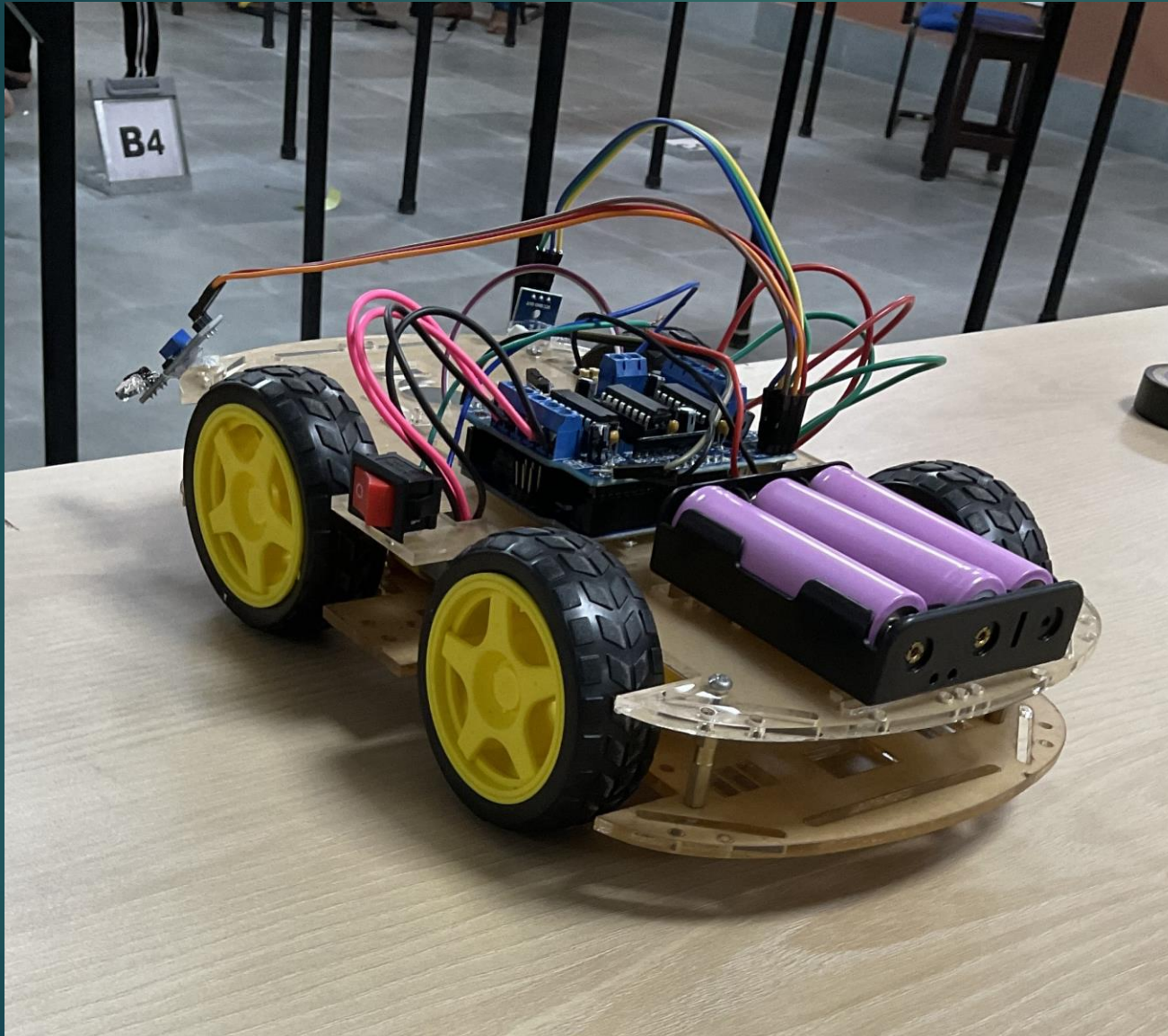
Here in this Arduino line follower robot when sensor senses white surface then Arduino gets 1, ie, HIGH as input and when senses black line arduino gets 0, ie, LOW as input.

Component 3: Arduino Uno



- ▶ **Arduino Uno** is a microcontroller board based on the ATmega328P ([datasheet](#)). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator (CSTCE16M0V53-R0), a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.. You can tinker with your Uno without worrying too much about doing something wrong, worst case scenario you can replace the chip for a few dollars and start over again.

THE working model



Code Used

```
#include <AFMotor.h>

#define left A0
#define right A1

AF_DCMotor motor1(1, MOTOR12_1KHZ);
AF_DCMotor motor2(2, MOTOR12_1KHZ);
AF_DCMotor motor3(3, MOTOR34_1KHZ);
AF_DCMotor motor4(4, MOTOR34_1KHZ);

void setup() {
    //declaring pin types
    pinMode(left, INPUT);
    pinMode(right, INPUT);
    //begin serial communication
    Serial.begin(9600);
}

void loop() {

    //line detected by both
    if(digitalRead(left)==0 && digitalRead(right)==0) {
        //Forward
        motor1.run(FORWARD);
        motor1.setSpeed(150);
```

Done compiling.


```
void loop() {  
  
  //line detected by both  
  if(digitalRead(left)==0 && digitalRead(right)==0) {  
    //Forward  
    motor1.run(FORWARD);  
    motor1.setSpeed(150);  
    motor2.run(FORWARD);  
    motor2.setSpeed(150);  
    motor3.run(FORWARD);  
    motor3.setSpeed(150);  
    motor4.run(FORWARD);  
    motor4.setSpeed(150);  
  }  
  // by left sensor  
  else if(digitalRead(left)==0 && !analogRead(right)==0) {  
    //turn left  
    motor1.run(FORWARD);  
    motor1.setSpeed(200);  
    motor2.run(FORWARD);  
    motor2.setSpeed(200);  
    motor3.run(BACKWARD);  
    motor3.setSpeed(200);  
    motor4.run(BACKWARD);  
    motor4.setSpeed(200);  
  
  }  
  // by right sensor
```

Done compiling.

```
}  
// by right sensor  
else if(!digitalRead(left)==0 && digitalRead(right)==0){  
    //turn right  
    motor1.run(BACKWARD);  
    motor1.setSpeed(200);  
    motor2.run(BACKWARD);  
    motor2.setSpeed(200);  
    motor3.run(FORWARD);  
    motor3.setSpeed(200);  
    motor4.run(FORWARD);  
    motor4.setSpeed(200);  
  
}  
//by none  
else if(!digitalRead(left)==0 && !digitalRead(right)==0){  
    motor1.run(RELEASE);  
    motor1.setSpeed(0);  
    motor2.run(RELEASE);  
    motor2.setSpeed(0);  
    motor3.run(RELEASE);  
    motor3.setSpeed(0);  
    motor4.run(RELEASE);  
    motor4.setSpeed(0);  
  
}
```

Application in real life



Automatic Public Transport



Robotic Waiters in Restaurants



Radioactive Waste Disposal



Security Agents for Patrolling



SOFTWARES USED

- ▶ MS POWER POINT
- ▶ TINKERCAD
- ▶ GOOGLE SLIDES
- ▶ PHOTOSHOP
- ▶ Arduino Editor

Conclusion:

We had a very innovative and fun time making the project.

We enjoyed the project , even enjoyed the problems we faced.

Teamed up together to solve the problems and learned to work in a team

And different aspects of Arduino and electronics.

➤ OUR FINAL PROJECT VIDEO:

LINK : <https://youtu.be/DLFFWo1bHuk>

THANK YOU !