Team Robochamps

Line follower Bot with Pick and Drop

Team Members :

-> Parth Gupta (21IE10028)

-> Tamim Ahmed (21GG10042)

-> Rajdip Pramanik (21IM10022)

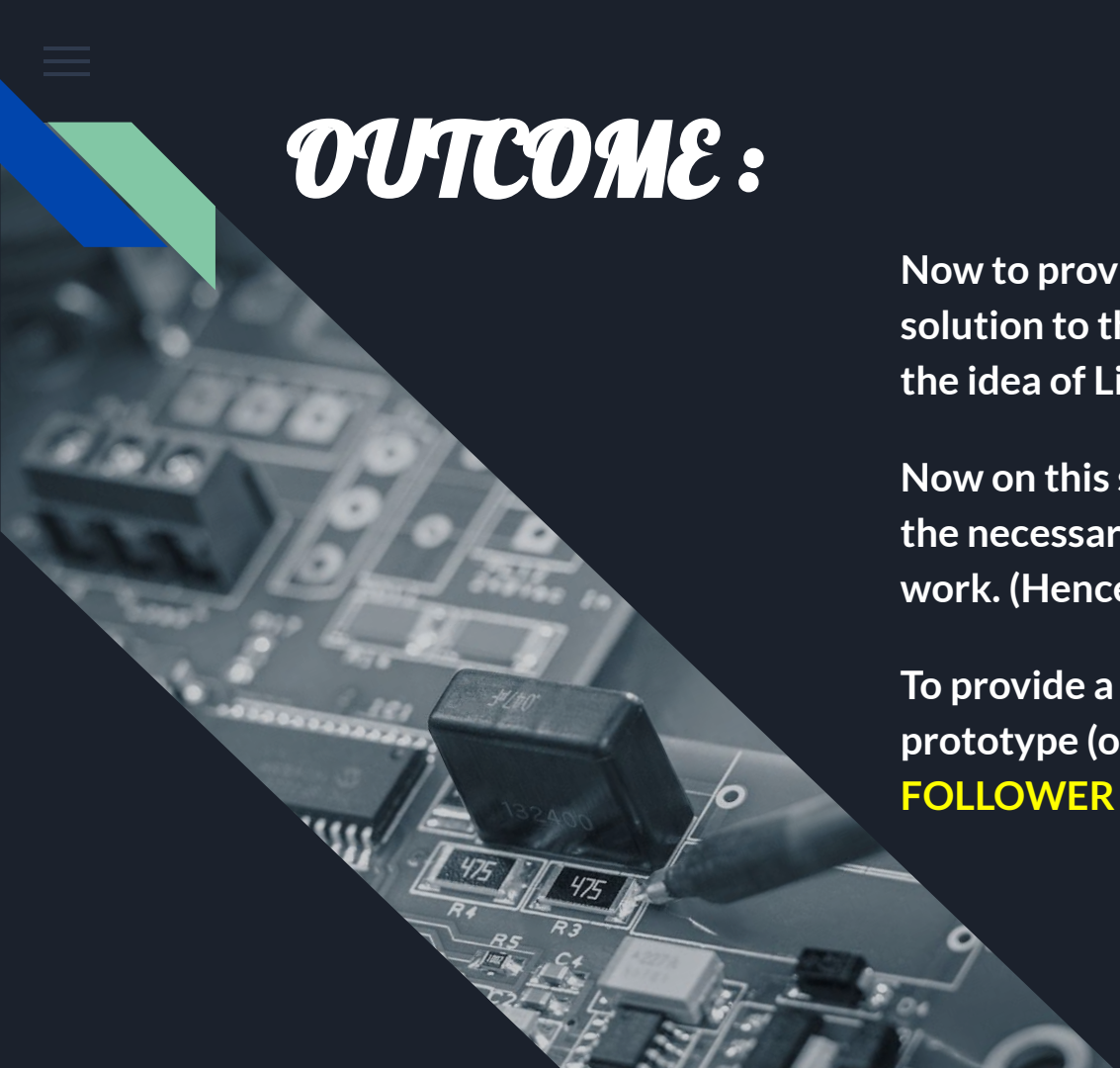
AIM and Motivation :

To make a robot which can work autonomously and help perform various industrial , domestic and social applications such as carrying goods , floor cleaning , delivery services and transportation within a confined space.

These tasks which are to be done repeatedly on a daily basis can become a hectic job for humans to do

To ease human efforts and increase productivity the use of technology must be promoted.

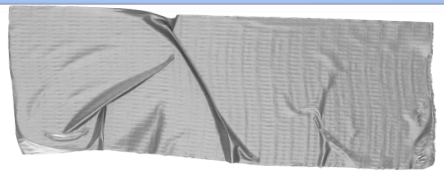
OUTCOME :



Now to provide a affordable , productive solution to the mentioned problem we came with the idea of Line Follower Bot.

Now on this simple machine one can mount all the necessary tools which one needs for there work. (Hence making it highly customisable)

To provide a demo for this we created a prototype (on a much smaller scale) of **A LINE FOLLOWER BOT WITH PICK DROP FUNCTION.**



Work Distribution

We choose to divide our work between our three members :

- **Parth Gupta**
  To arrange for the parts ,check circuitry, assemble the bot and perform the tests.

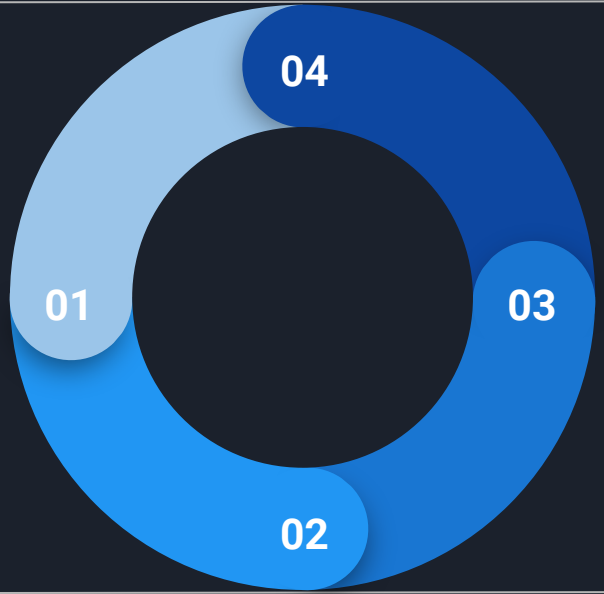
- **Tamim Ahmed**
  Will do the coding part for the Arduino of the bot.

- **Rajdip Pramanik**
  Will take care of the circuit part of the bot.

PLAN

Prototype on TinkerCAD

Procuring Parts



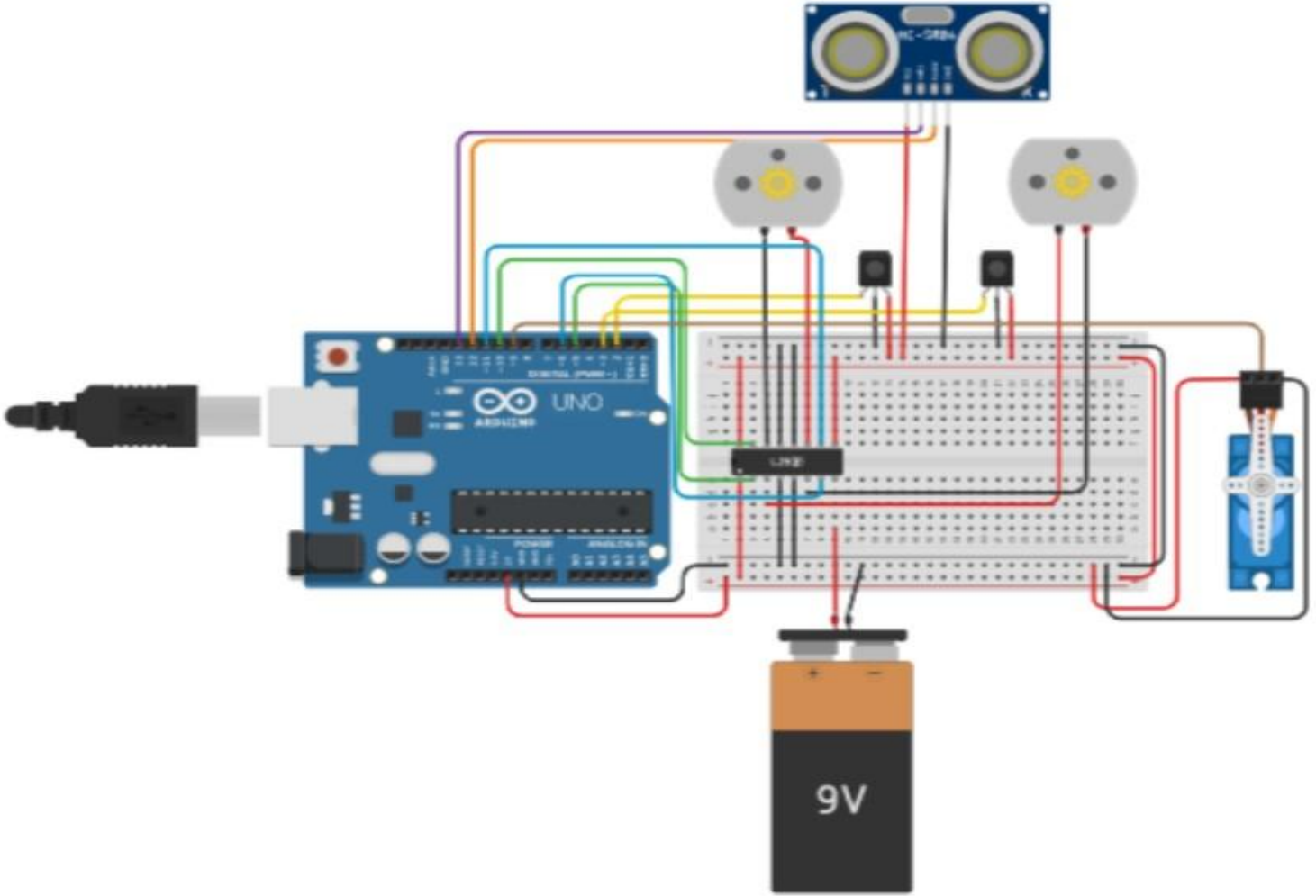
Debugging the Formed Bot

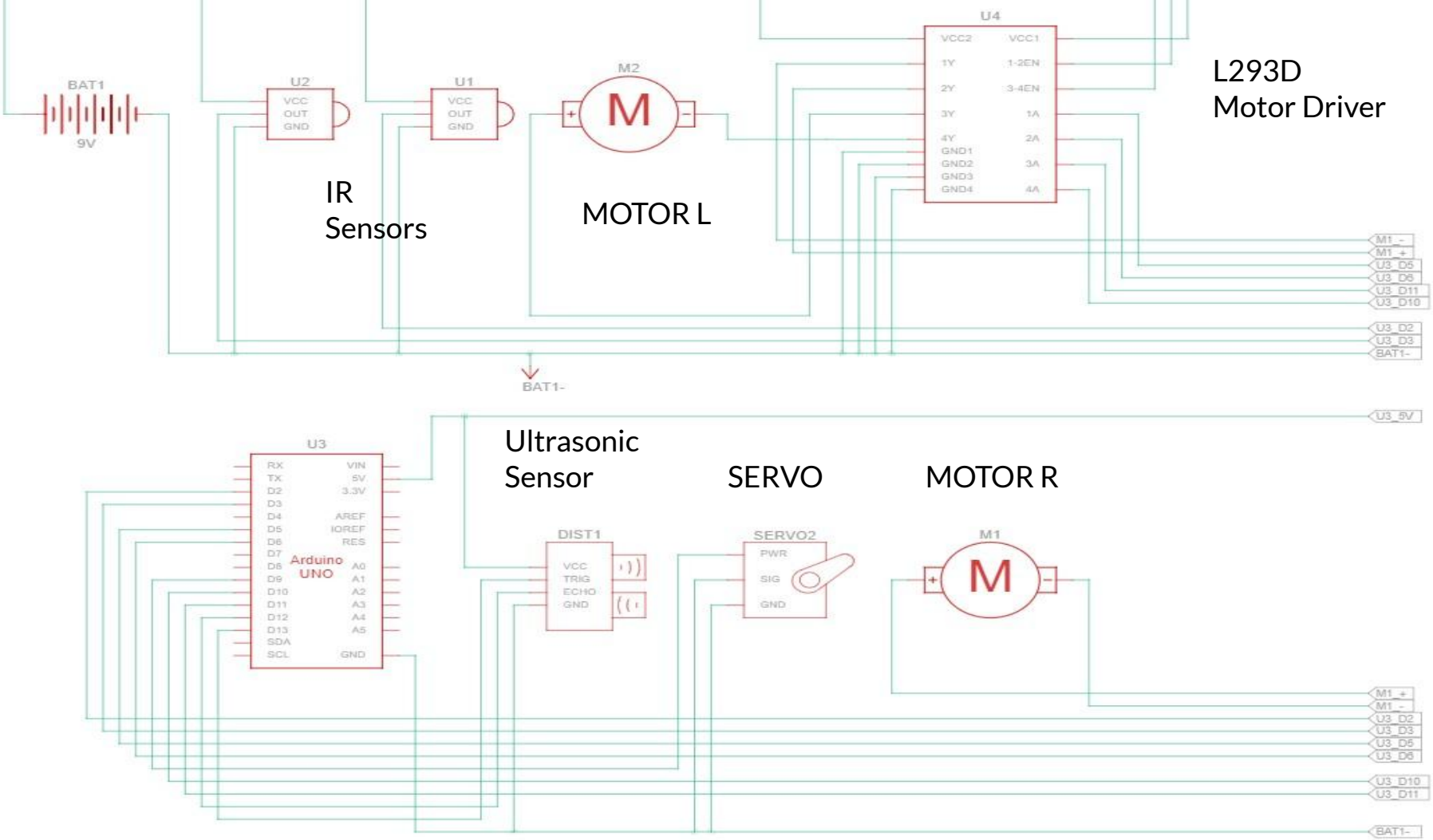
Assembling Parts

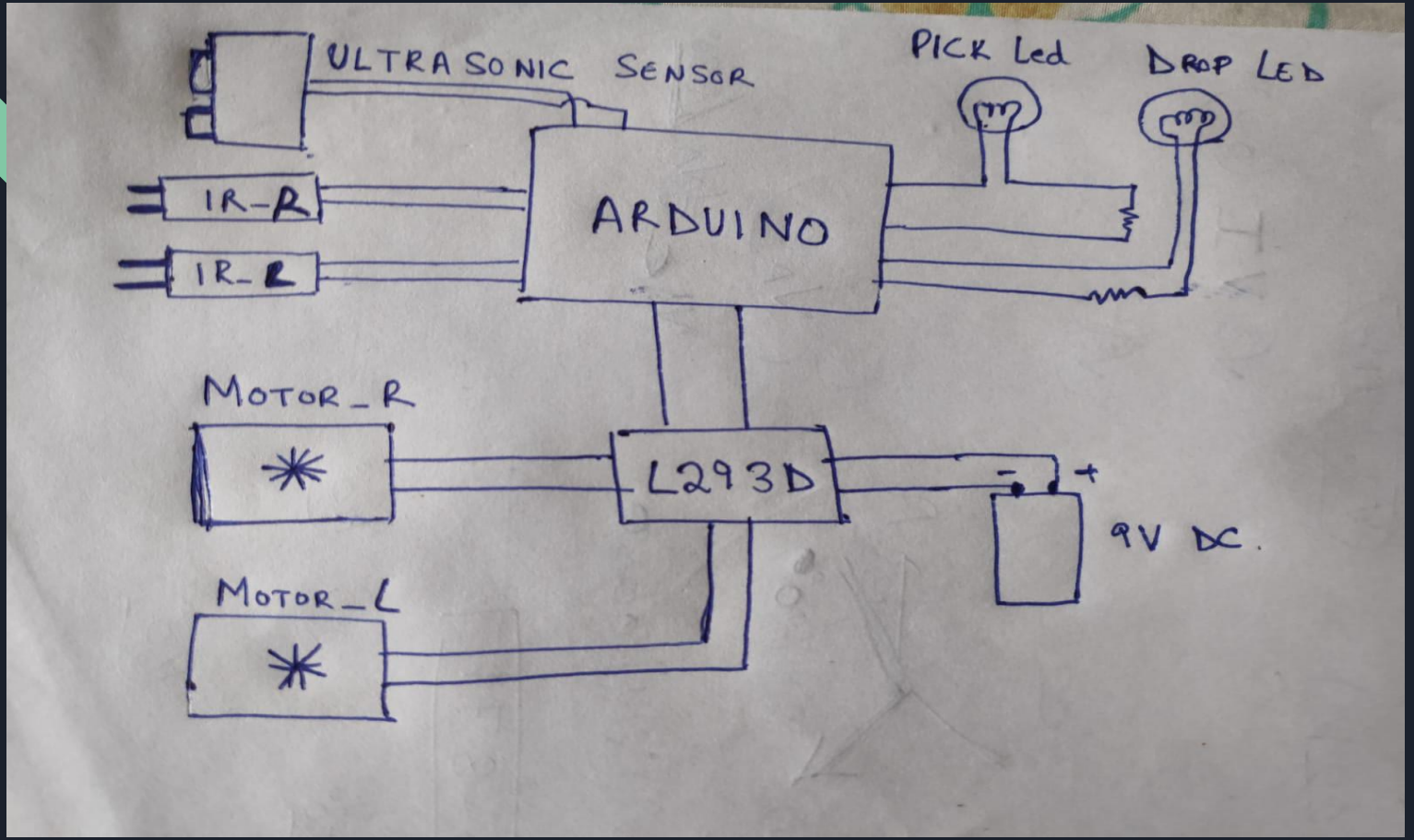
Hardware Parts Used

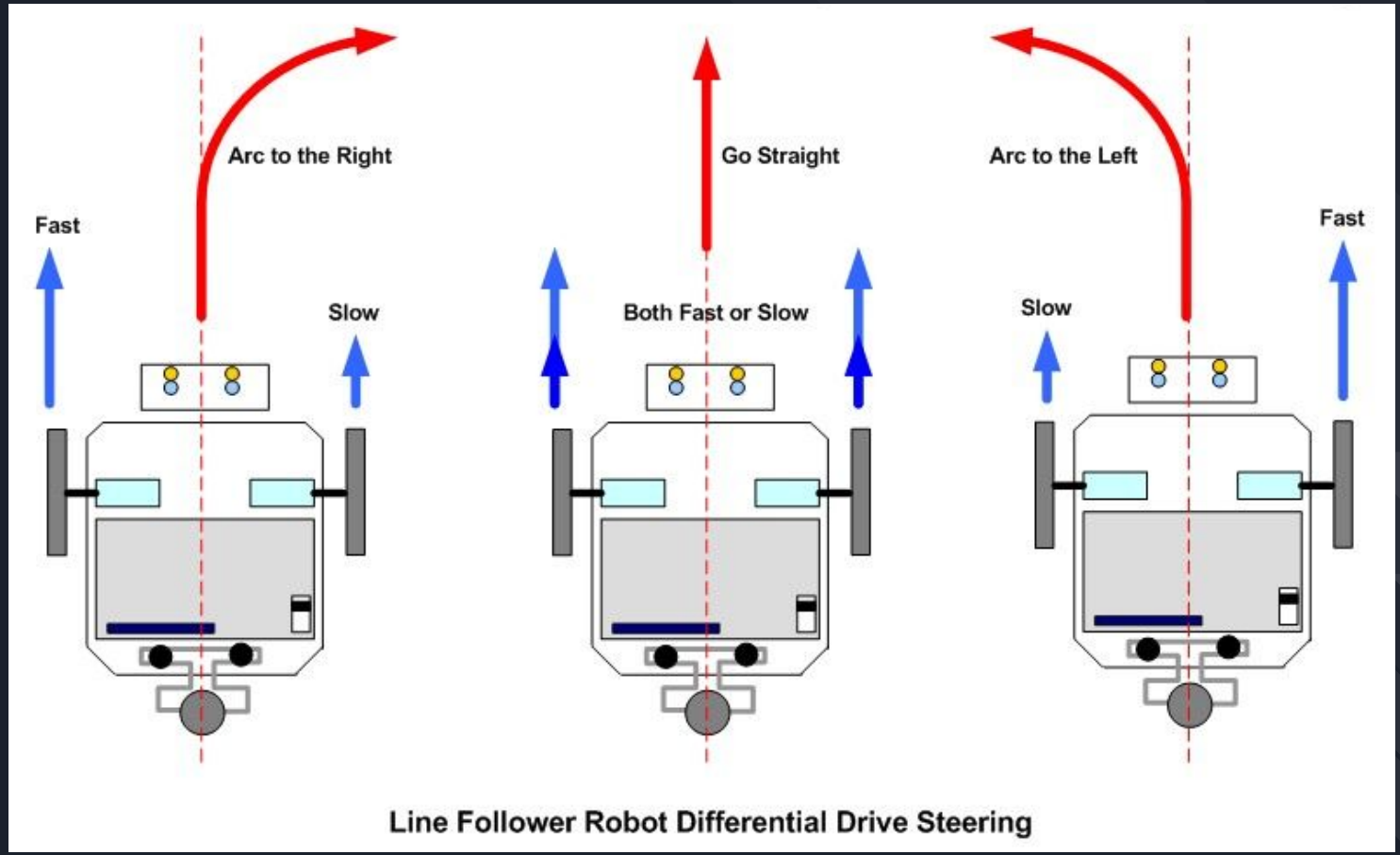
1. Arduino Uno Board
2. Small Breadboard
3. 9 volt Battery
4. Jumper wires
5. DC Motors x 2
6. IR Sensor x 2
7. Ultrasonic Distance Sensor(HC-SR04)
8. A Chassis
9. Wheels x 2
10. Castor Wheel
11. L293D Motor Driver
12. Servo Motor

Schematics


UNO
ARDUINO
9V


BAT1
9V
U2
VCC
OUT
GND
U1
VCC
OUT
GND
M2
M
IR
Sensors
MOTOR L
U4
VCC2
VCC1
1Y
1-2EN
2Y
3-4EN
3Y
1A
4Y
2A
GND1
GND2
3A
GND3
GND4
4A
L293D
Motor Driver
M1 -
M1 +
U3_D5
U3_D6
U3_D11
U3_D10
U3_D2
U3_D3
BAT1-
BAT1-
U3_5V
U3
RX
TX
D2
D3
D4
D5
D6
D7
D8
D9
D10
D11
D12
D13
SDA
SCL
VIN
5V
3.3V
AREF
IOREF
RES
A0
A1
A2
A3
A4
A5
GND
Arduino
UNO
Ultrasonic
Sensor
SERVO
MOTOR R
DIST1
VCC
TRIG
ECHO
GND
SERVO2
PWR
SIG
GND
M1
M
M1_+
M1_-
U3_D2
U3_D3
U3_D5
U3_D6
U3_D10
U3_D11
BAT1-

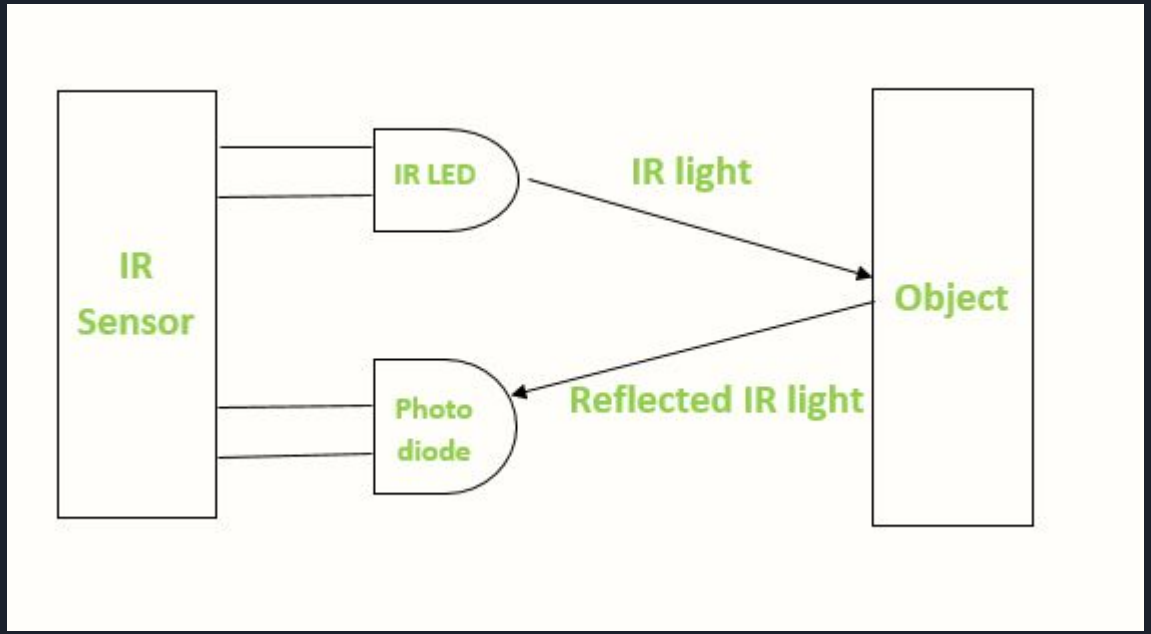

ULTRASONIC SENSOR
PICK Led
DROP LED
IR-R
IR-L
ARDUINO
MOTOR_R
L293D
9V DC.
MOTOR_L



Line Follower Robot Differential Drive Steering

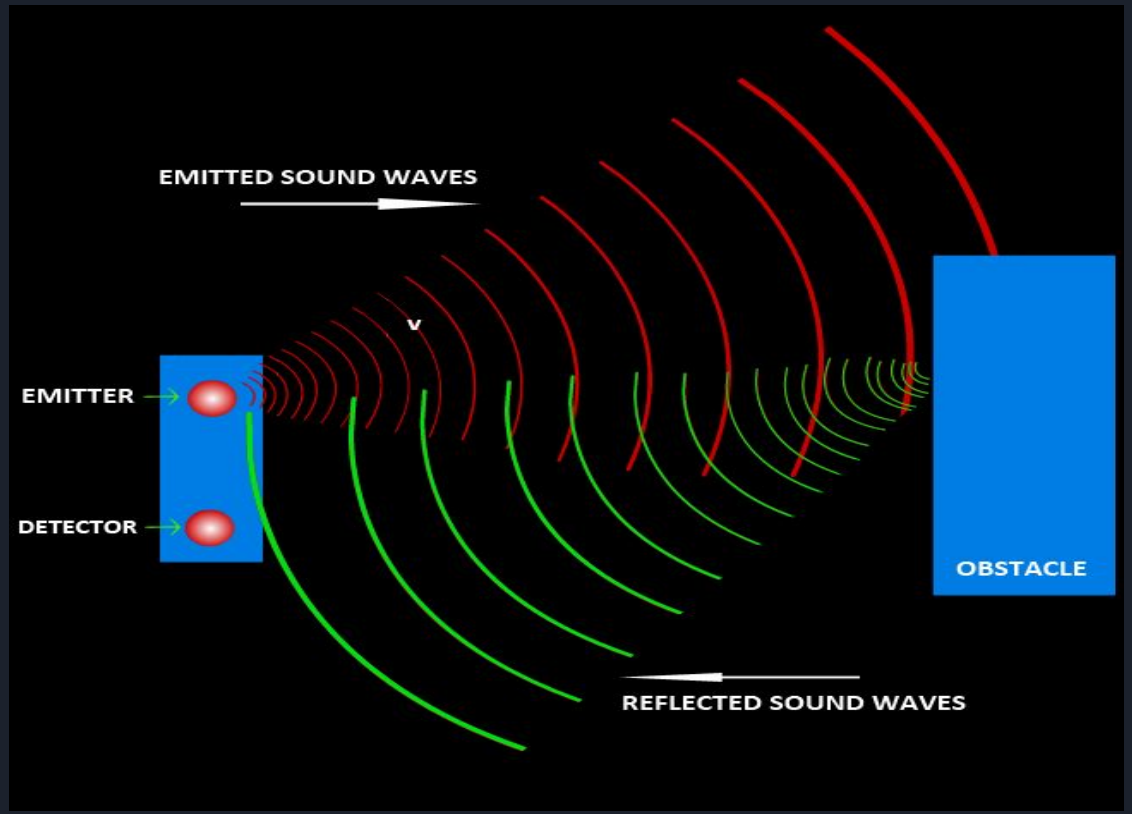
Description of Parts

01 IR SENSOR

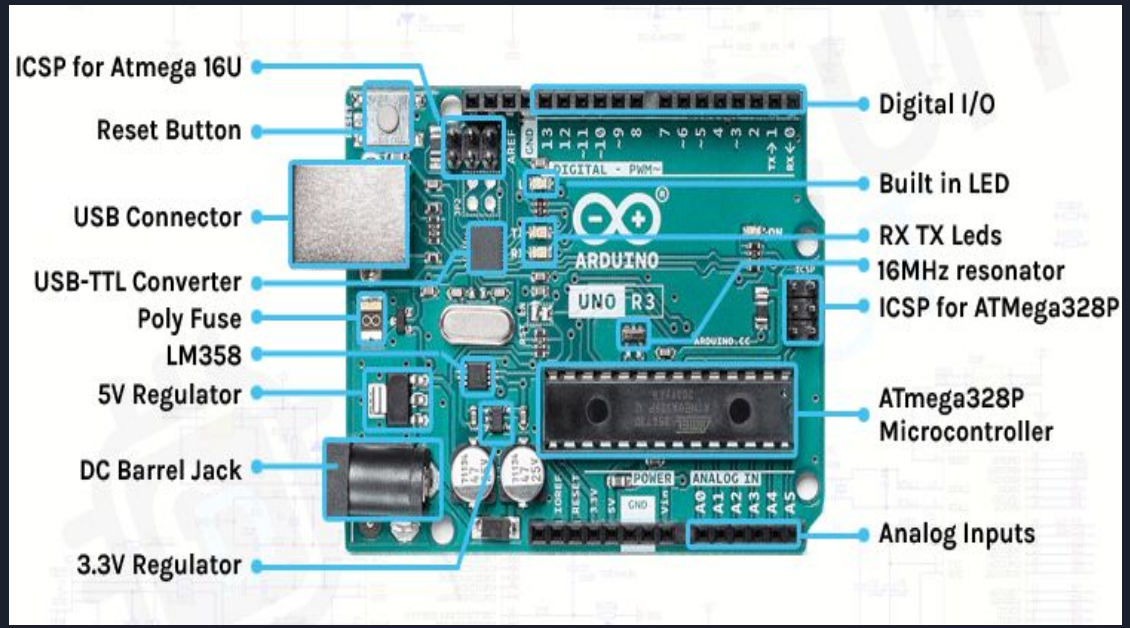


02

Ultrasonic Sensor



ARDUINO UNO BOARD



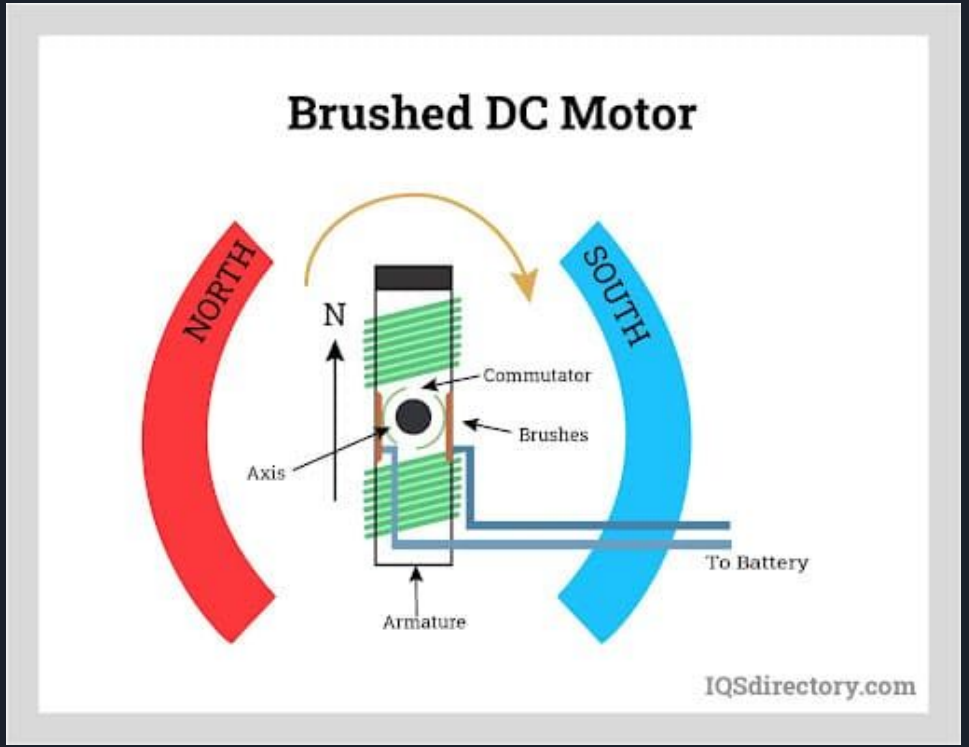
Inexpensive

Cross-platform

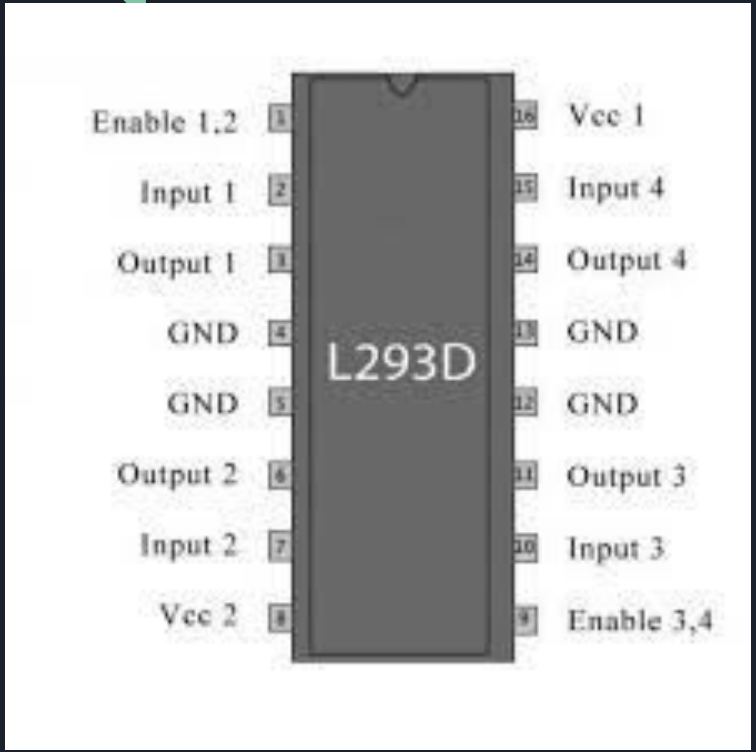
Open source and extensible software

Small but Powerful enough to control various things with ease and provide required outputs.

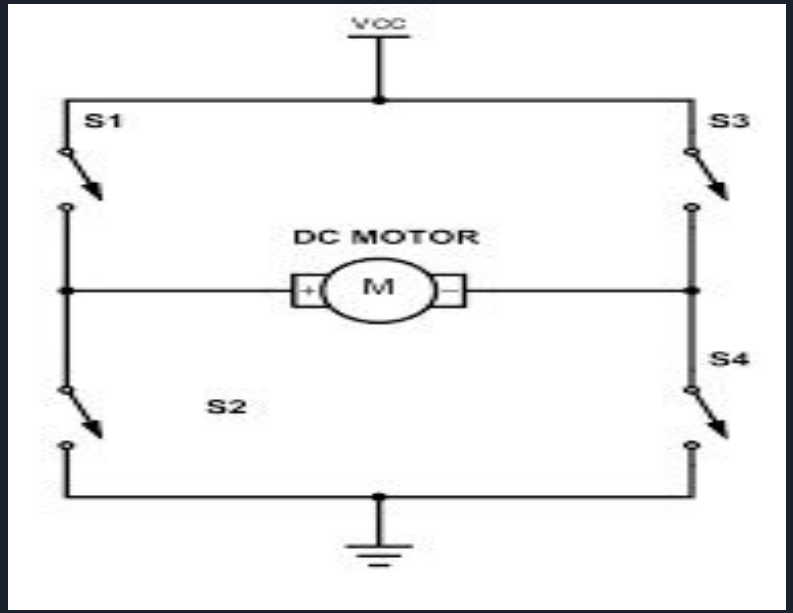
DC MOTORS


Brushed DC Motor
NORTH
SOUTH
N
Commutator
Brushes
Axis
To Battery
Armature
IQSdirectory.com

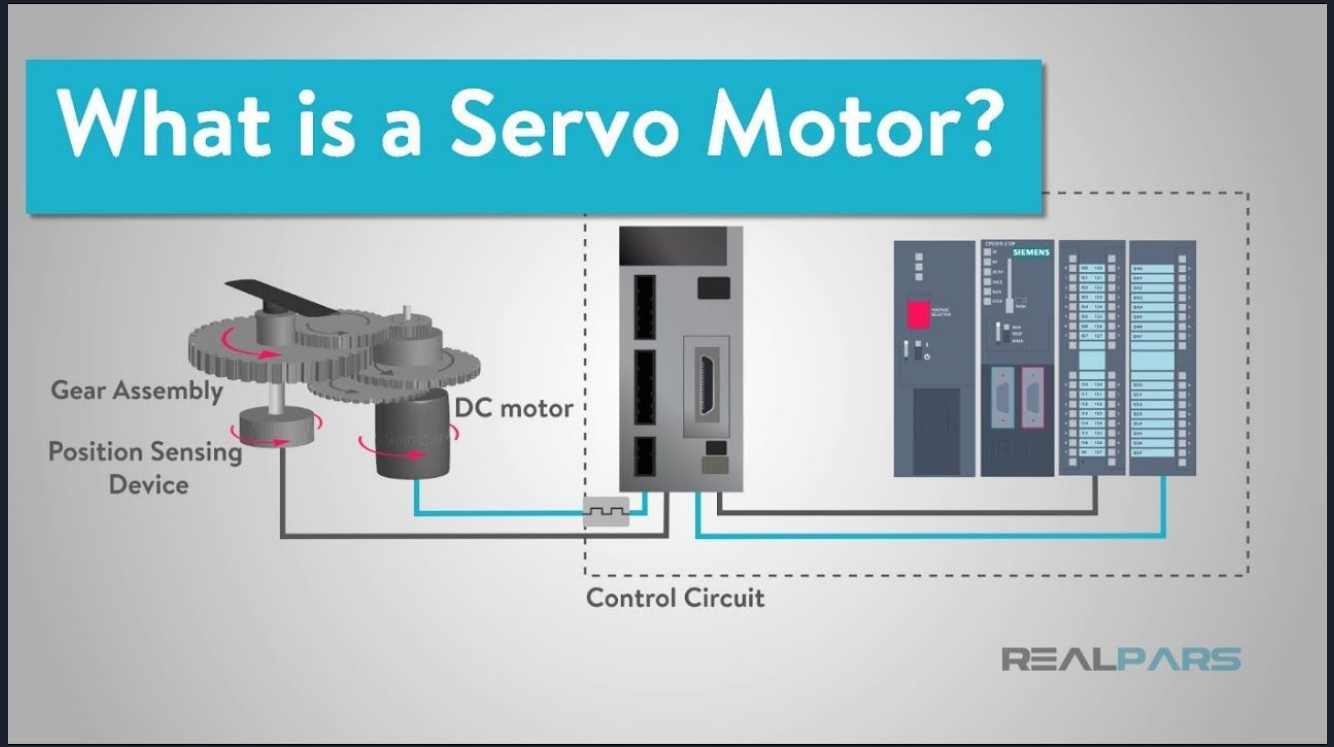
L293D Motor Driver



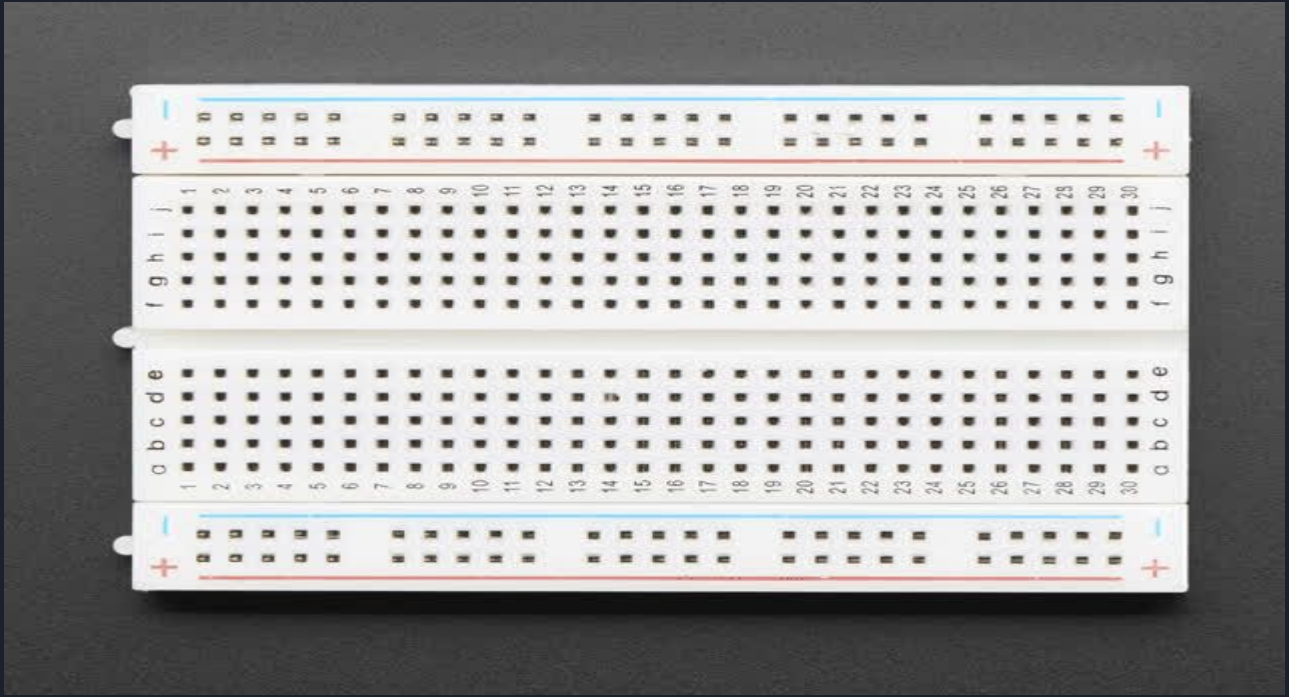
The L293D IC **receives signals from the microprocessor and transmits the relative signal to the motors**.



Servo Motor


What is a Servo Motor?
Gear Assembly
Position Sensing Device
DC motor
Control Circuit
REALPARS

Breadboard



Challenges Faced while making the Bot :

01 The prototyping was far more easy than physically making the bot and to tackle unforeseen problems thrown at us by the physical environment.

02 The debugging part was the most difficult to do as sometimes only one motor would work and at other times the motor would run so fast that the sensors won't be able to stop it in time.

03 The servo being used in the pick drop part was causing trouble , the arduino has 3 timers , 1 is being used to control the two motors , one of them cannot be accessed and the other is used with ultrasonic sensor.

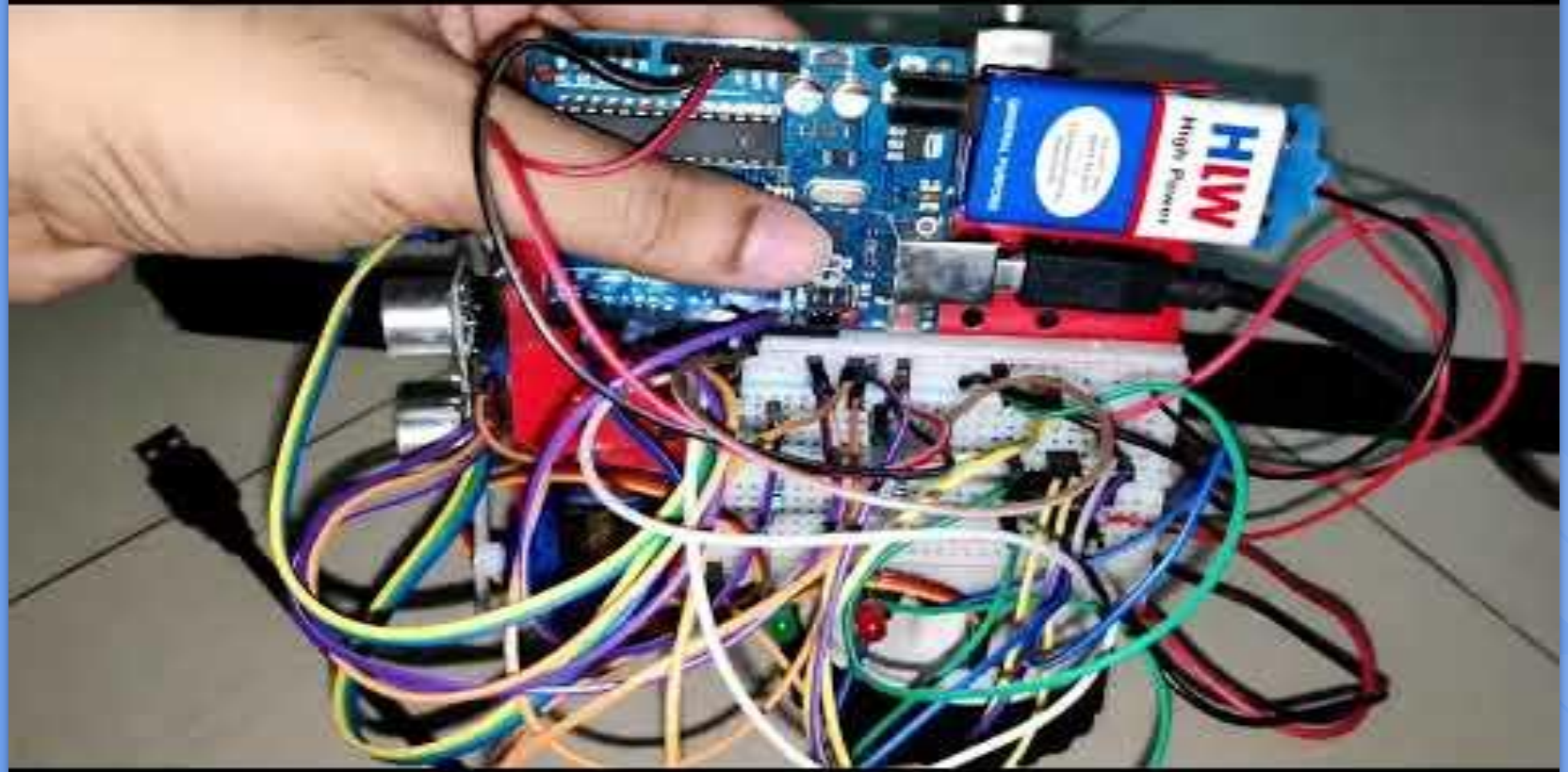
Things that could be achieved but Left Out :

We had initially thought of making a much better pick and drop platform.

When the parts arrived the servo would cause problems as discussed in previous slide.

In the tinkercad model there was no such problem so no one expected it and the solution to this was ordering a new Arduino Mega which was not possible due to time and money constraints.

Another problem was of delay function.


HW
High Power

Thank you!