



DIY PROJECT

# Obstacle Avoiding Bluetooth Controlled Car

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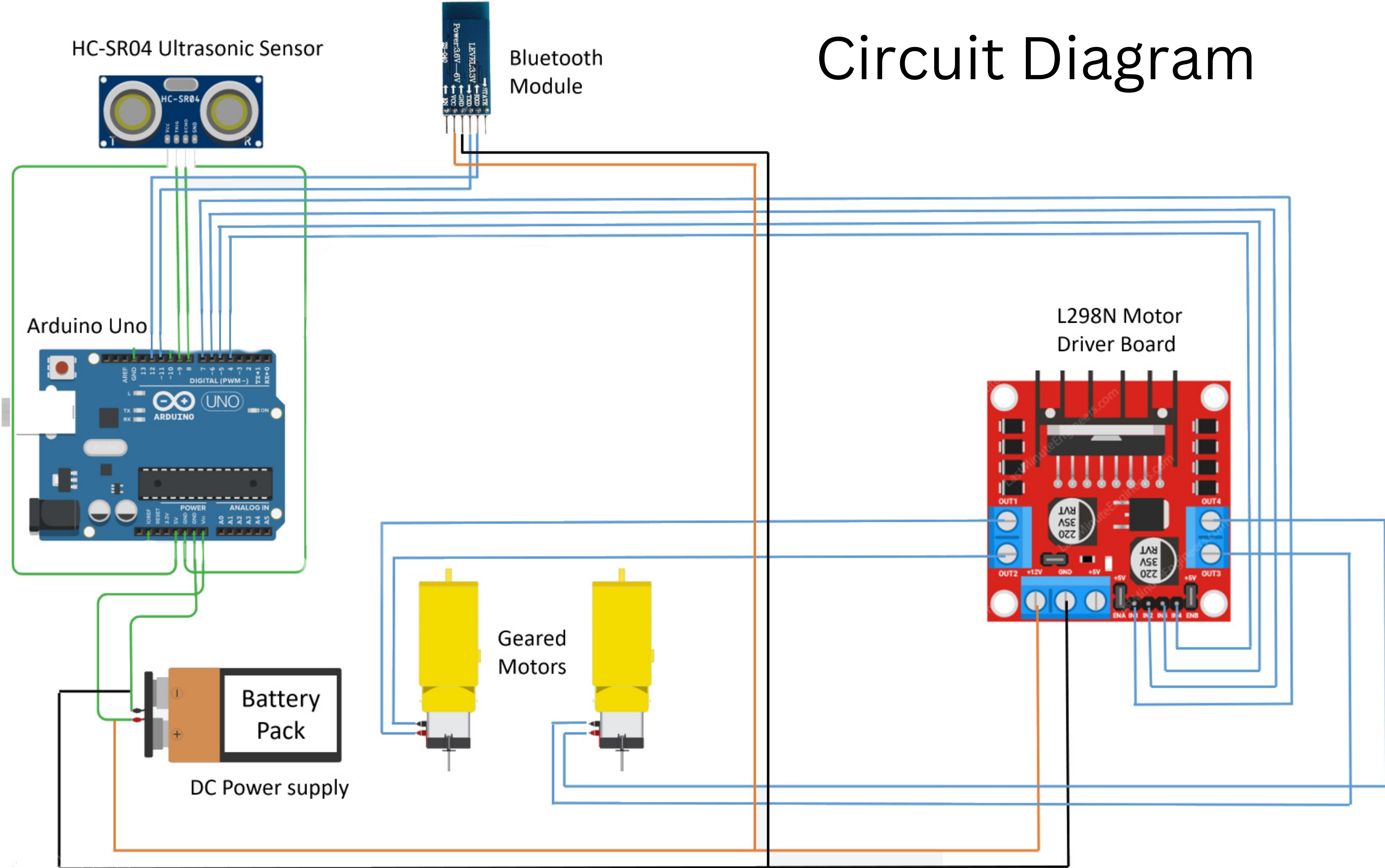
# Problem Statement

- The need of an automated power driven electric mode of transport for traveling small distances like inside IIT Kharagpur campus. This would reduce human efforts and hence, the driver travelling through it would only need to control the directions and our device would itself control the braking.
- This system could be also utilized as an additional safety feature of automatic braking in all other modes of road transport to reduce accidents due to human error.
- All the existing automatic electric vehicles out there in the market are very expensive so this prototype of ours provides affordability by only providing automatic braking and giving manual handling.

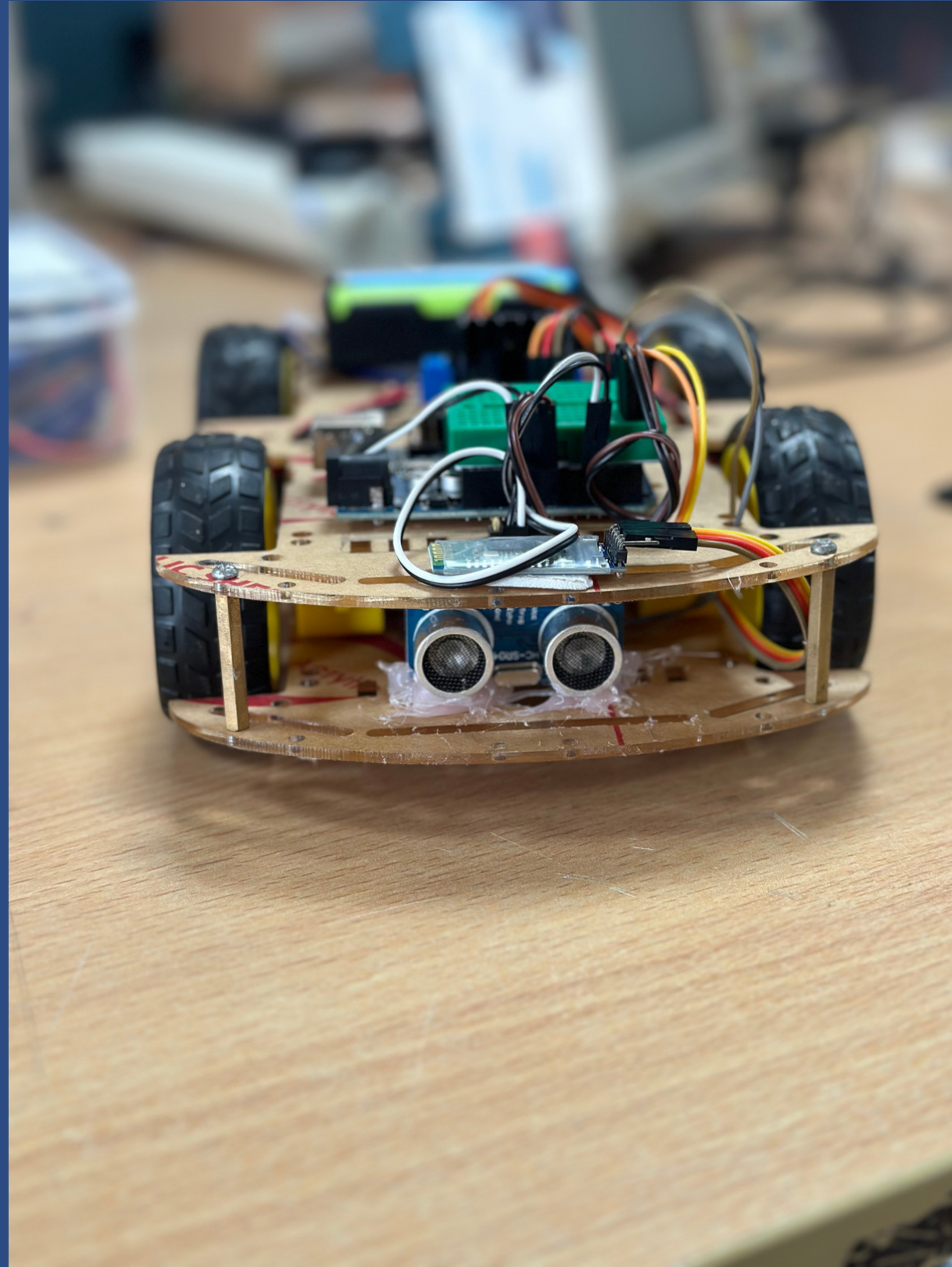
# Components

- Arduino UNOR3
- L298N Motor Driver
- HC-SR04 Ultrasonic Sensor
- HC-05 Bluetooth
- TT Gear Motor
- 18650 Battery
- 18650 Battery Holder
- 65MM Wheels for TT Motors
- Jumper Wires

# Circuit Diagram







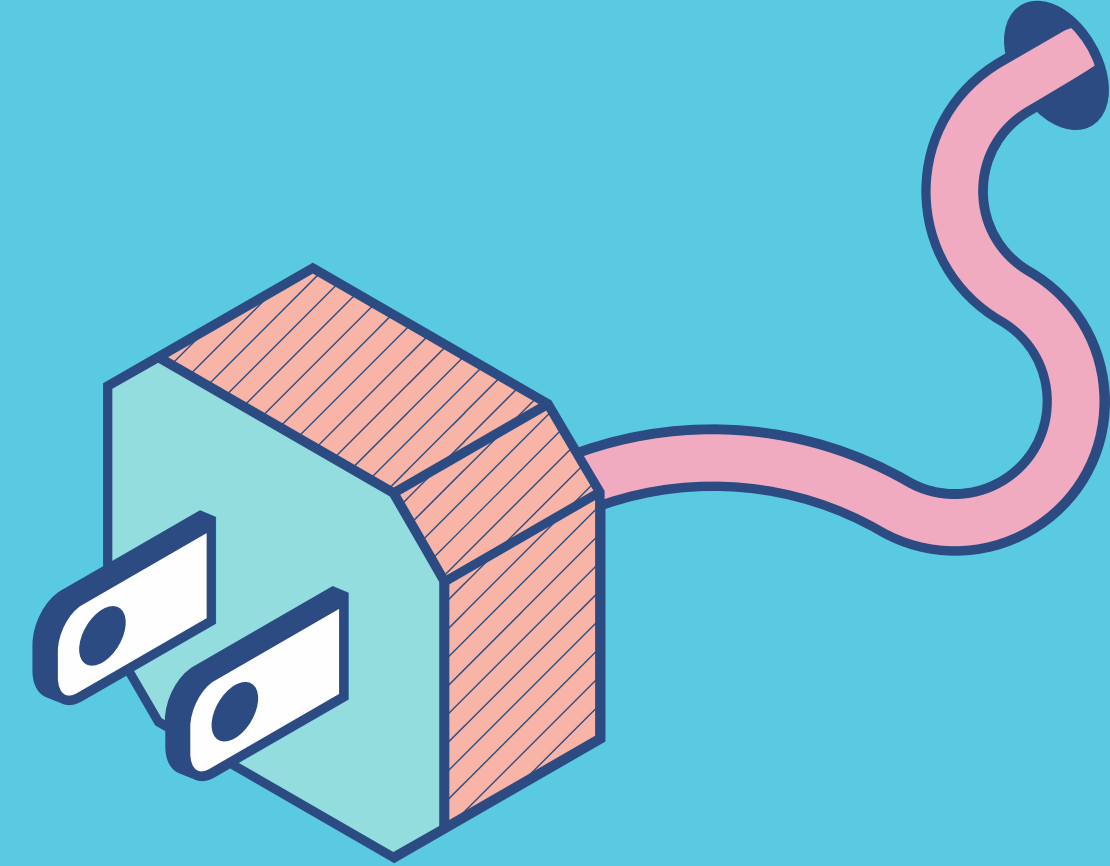


Demonstration :)



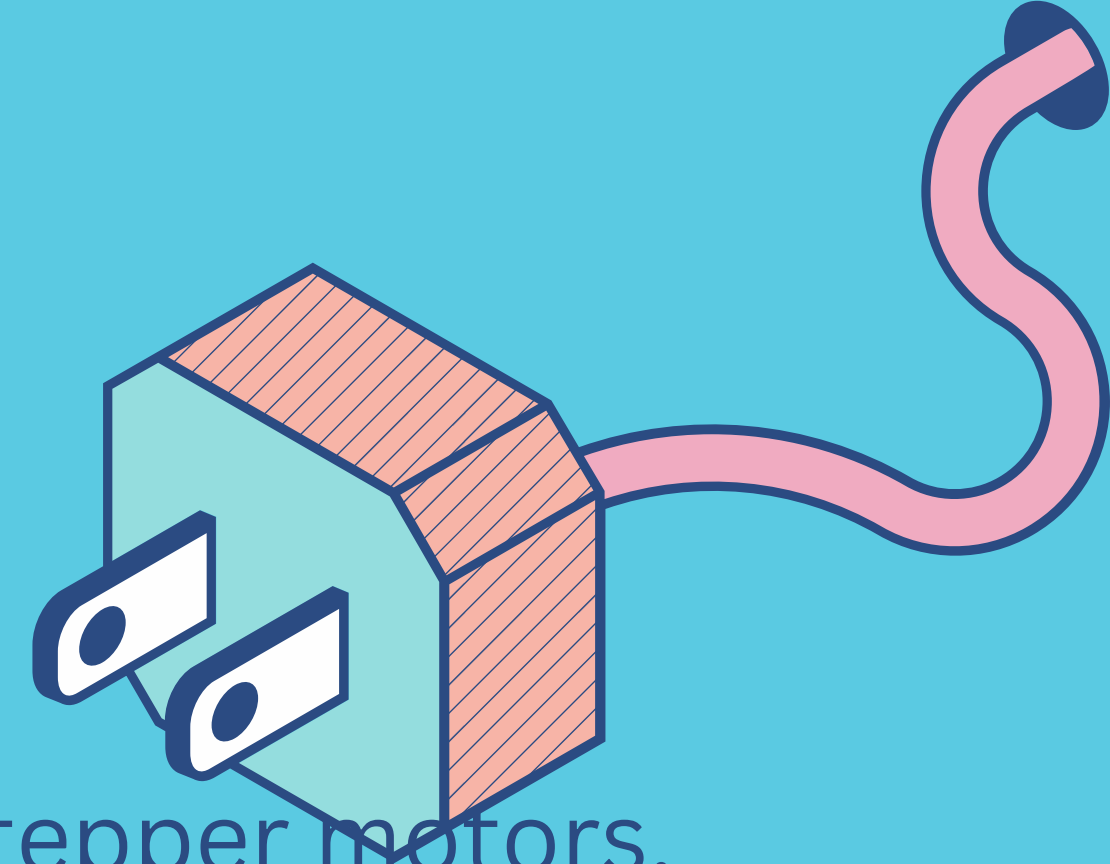
# Arduino Uno R3

Arduino Uno R3 is a popular microcontroller board designed for beginners and hobbyists in electronics and programming. It is based on the ATmega328P microcontroller and features digital and analog input/output pins, USB connectivity, a power jack, and a reset button. Uno R3 is widely used for prototyping and creating various projects such as robotics, home automation, and wearable technology. It can be programmed using the Arduino Integrated Development Environment (IDE), which supports a simplified version of C++ programming language.



# L298 Motor Driver

The L298N Motor Driver is a popular dual H-bridge motor driver module used to control DC motors and stepper motors. The module has two H-bridges, which allow bi-directional control of two motors or control of a single stepper motor. It can be controlled via input signals from a microcontroller such as Arduino, Raspberry Pi, or similar platforms. The L298N module typically has input pins for controlling motor direction and speed, making it suitable for various robotics and automation projects.

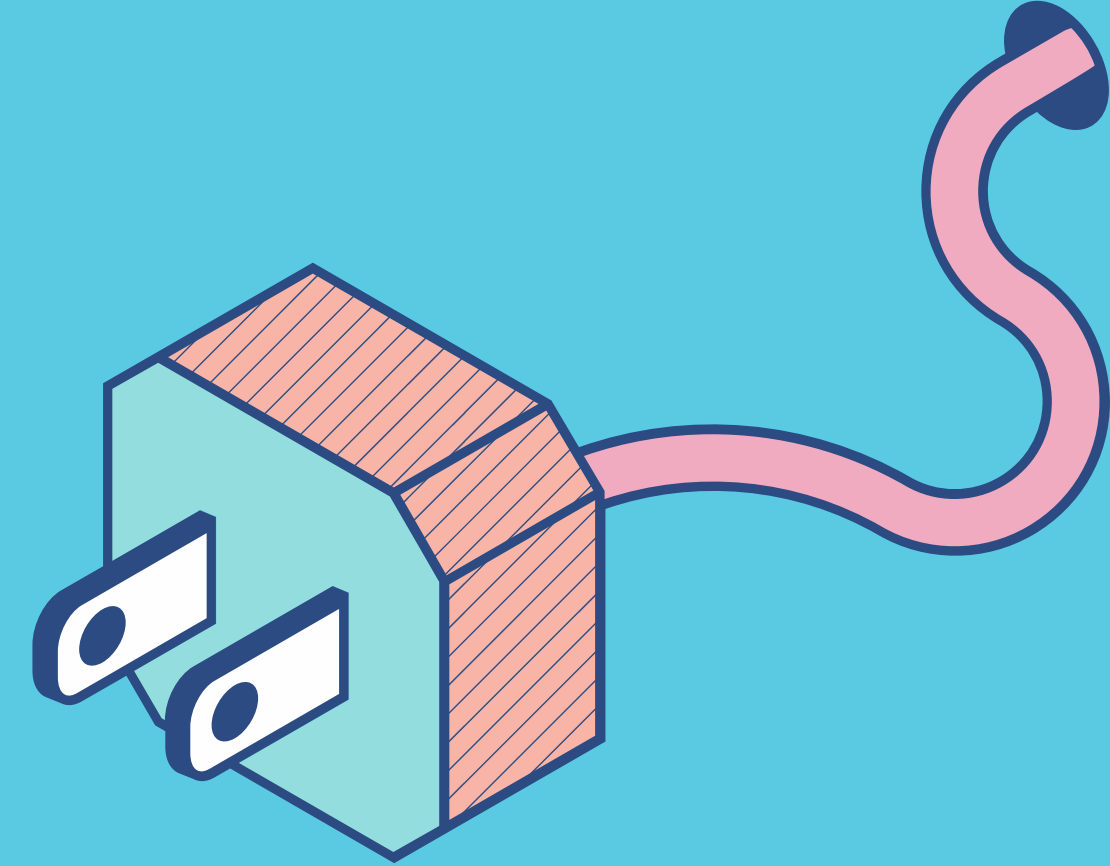




# HC-05 Module

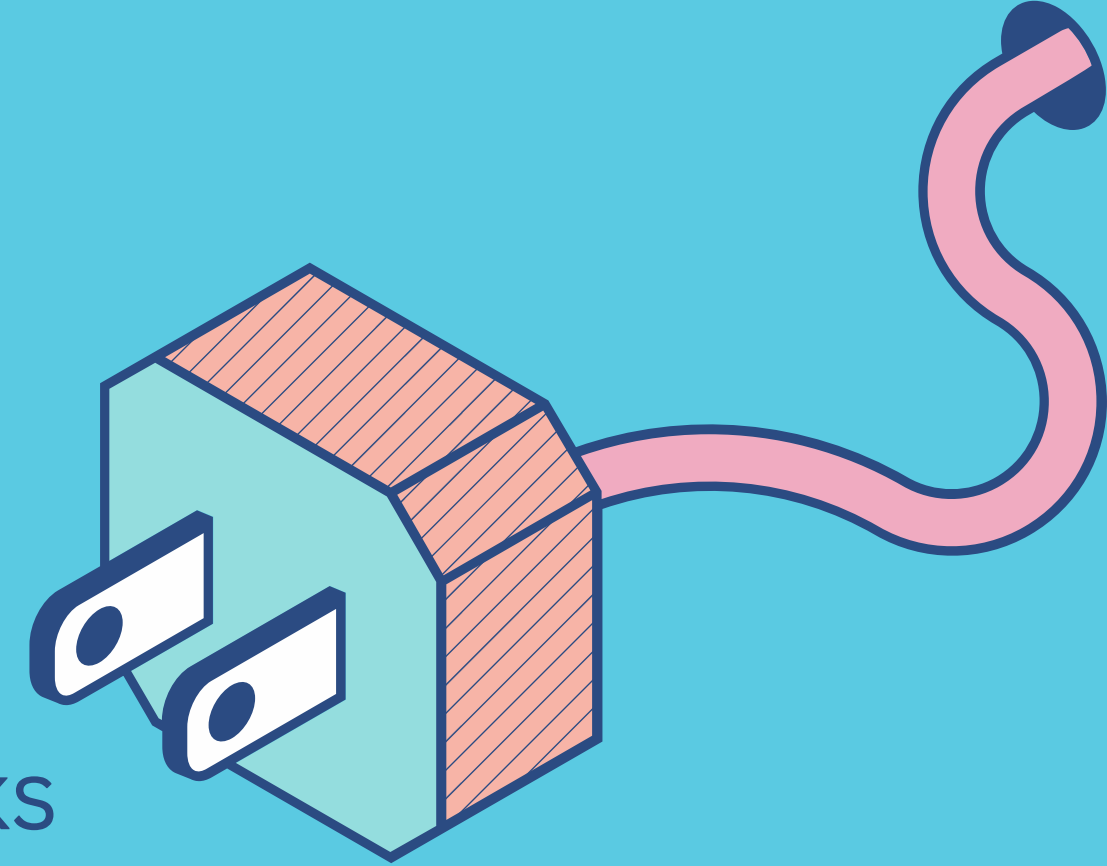
The HC-05 Bluetooth module is a popular wireless communication module used in electronics projects.

It allows devices to communicate wirelessly over short distances using Bluetooth technology. The HC-05 module supports Bluetooth 2.0 and provides a range of up to 10 meters. Overall, the HC-05 Bluetooth module is versatile, affordable, and widely used in applications such as robotics, home automation, and remote control systems.



# HC-SR04 UltraSonic Sensor

The HC-SR04 ultrasonic sensor is a popular distance measuring module used in electronics projects. It works by emitting ultrasonic waves and then measuring the time it takes for the waves to bounce back after hitting an object. Based on this time measurement, it can calculate the distance between the sensor and the object. The HC-SR04 module typically consists of a transmitter, a receiver, and a control circuit. It has a range of approximately 2 to 400 cm. The sensor is easy to use and can be interfaced with microcontrollers like Arduino for various applications such as obstacle detection, distance measurement, and robotics.



# Challenges Faced

- In the very Beginning we faced a problem where we weren't able to connect the Bluetooth Module to the Smartphone.
- Initially our project was to make a model which could be used by a real human but due to its high cost we had to switch to a small scale model of the same.
- Ultrasonic Sensor was not measuring distance and printing in Serial Monitor. Later we had errors in the code, so we had to modify the code.
- We made a huge mistake during the preparation of the project, when we were connecting the battery, accidentally positive terminal and negative terminal of battery were connected and short circuit happened, we quickly removed the batteries from it.





# How we Solved!

- We Learn a lot of things through searching and digging Google every time we faced a Problem.
- Sometimes there was a Fault in a component, Sometimes we were lacking the important logic in the code.
- We changed our Code multiple times to try multiple Solutions to the Problem Statement and We Finally arrived at our Final Conclusion!
- We watched Multiple Arduino Tutorials and read a dozen of articles to get working with Arduino.

## Teamwork

This project allowed us to appreciate the essence of teamwork as while working on the project, we worked together while distributing the tasks amongst ourselves and depending on others' work as well as ours

## Arduino

Arduino is a very essential software which none of us was familiar with at the start of the semester. Working on this project allowed us to delve deeper into its nuances and learn how to use it most efficiently.

## Electronic Components

During this project, we worked with various electronic components. This allowed us to get used to the practicalities of theirs and we learnt how to best utilize them in our project.