

Internet of Things (IOT) Projects using Python

End-Term Project Synopsis

Group No.	Group Members Name (Regd. No.)	Project Title
3	Ashwini Kumar Behera (1941012390)	<i>Omni-Directional Bluetooth Controlled Car</i>
	Ratikanta Sahoo (1941012547)	
	Amitosh Mohapatra (1941012578)	
	Sushovan Kar (1941012580)	

1. Introduction:

- It is a vehicle used to move in all directions. Our project aims at designing a Omni directional robot equipped with four Omni wheels, mounted at 90 degree apart. These wheels are mounted on DC motors which will be driven by L298N motor drivers.
- Application control vehicle is a high-tech product based on Bluetooth control, which is a new product combining electronic technology, information technology and vehicle control technology. The vehicle digital control technology is to make full use of the characteristics of digital technology, such as accuracy, speed and easy to transmit. It can change the driver's intention and vehicle operation status information into code through intelligent detection device, and convert and process these codes through computer, and finally complete the vehicle control through the Executive device. Key technical issues include vehicle automatic operation technology, remote transmission technology, motor drive technology, etc.
- The development of this project is a Mecanum Wheel based car that can be controlled by Bluetooth, which is convenient to explore some places that are not convenient for people to enter. At the same time, the adaptability of this Bluetooth controlled car to the road is better than that of the general four-wheel car. The sports platform can be equipped with wireless camera, manipulator and other modules to complete more complex functions.

2. Problem identification and Problem Formulation:

- The design is based on 51 series single-chip microcomputer control. The tracked vehicle has two modes of Bluetooth remote control and autonomous driving. In the remote control mode, the control signal is sent out through the Bluetooth module controller. The Bluetooth module on the car decodes the received information, feeds back the information to the single-chip microcomputer, which processes the obtained

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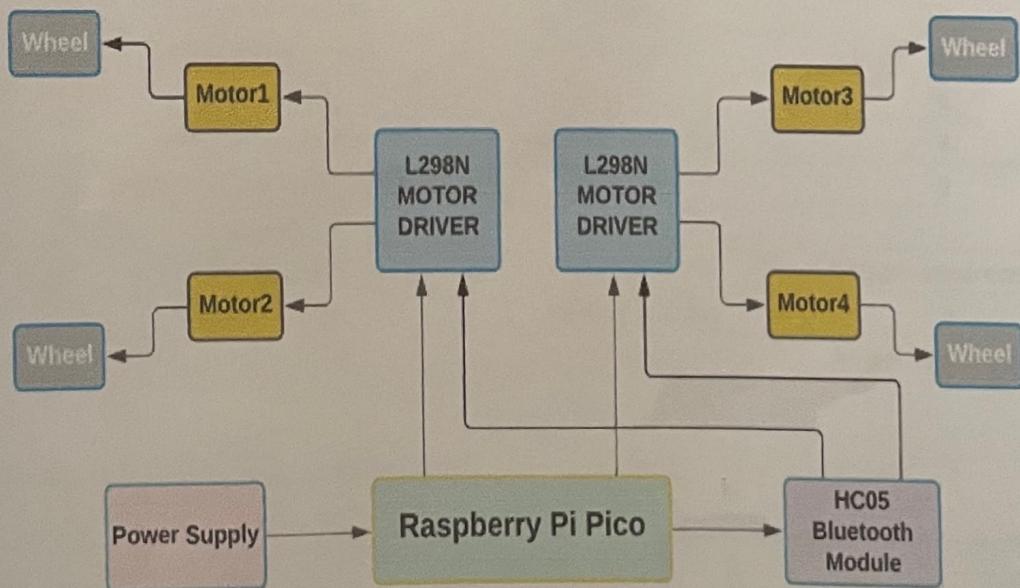
information, and then uses the DC motor driver to control the start and stop of the direct-current motor and the speed adjustment through PWM. In the autonomous motion mode, the tracked vehicle can use its own infrared sensor to complete the autonomous scanning of the area. This design mainly from the mecanum wheel based body design, mobile application control, PWM speed control and other aspects of the design and development.

- Turn on the car switch, select the Bluetooth signal emitted by the corresponding key of the remote control in the remote control mode, and the infrared receiving module receives the Bluetooth signal. The single chip microcomputer analyzes the received Bluetooth signal to determine whether it is the manual mode or the automatic mode. When entering the manual mode, press the command button on the mobile application to send out the corresponding Bluetooth signal.

3. Objective of the Project:

- In this project, we will learn how to make a Bluetooth control car with a Raspberry Pico board. For that, I used the Bluetooth module and a mobile application to control the car. But, you have to use HC-05 module. After that only we can control the car using any mobile application. Also, I used four gear motors, and the two L298N motor driver and three DC 7-12V battery was used to power up these motors.
- You can use a car chassis for this project. But I built this car with a low budget. Therefore, I have used a piece of Sun board for this car.

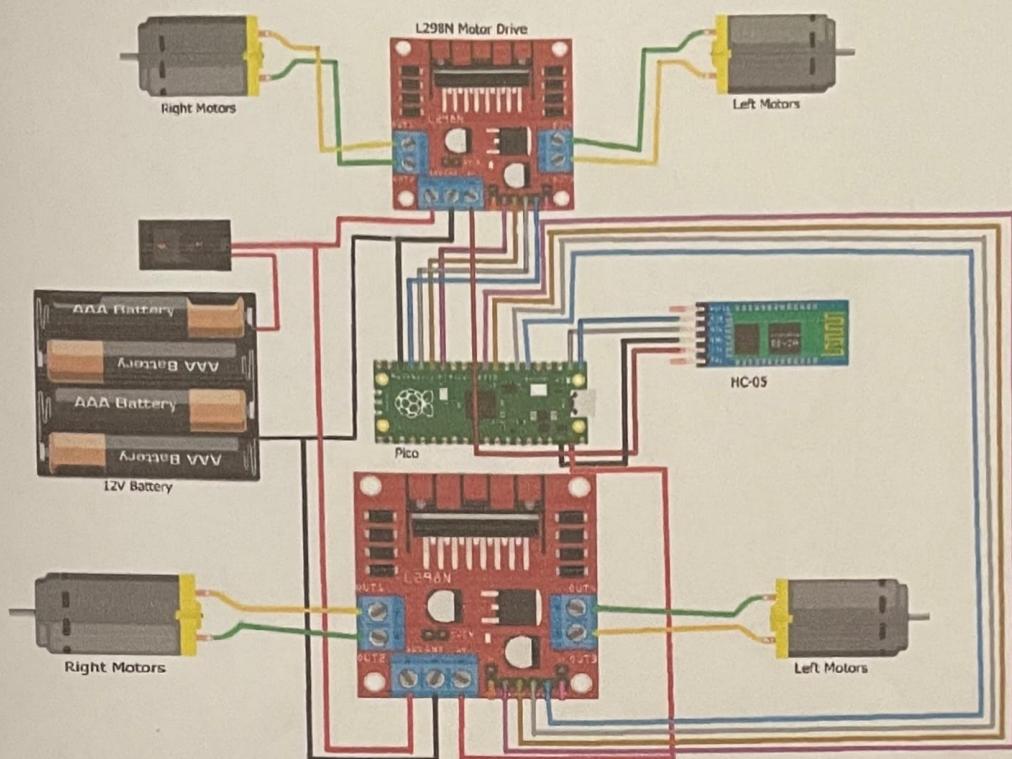
4. Block Diagram of the Project:



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5. Circuit Diagram of the project:



6. Components/Items Required:

Sl. No.	Name of the Components	Specification	Quantity
1	Raspberry Pi Pico	125 MHz	1
2	Bluetooth module	HC05	1
3	L298N motor drive	-----	2
4	Gear motor	-----	4
5	Mecanum wheel	Omni-Directional	4
6	Li-Ion battery with holder	7V-12V	3
7	Switch	-----	1
8	Sun board	-----	As per requirement
9	Breadboard	840 Tie points	1
10	Jumper wires	-----	As per requirement

Full Signature of Group members:

1. Ashwini Kumar Behera
2. Ratikanta Sahoo
3. Amitosh Mohapatra
4. Sushovan Karc

23/12/2022. S. Sahu
23/12/22

Signature of Corresponding Faculty