IMPLEMENTATION OF UGV THROUGH BLUETOOTH VOICE COMMAND AND WIFI BASED WEB CONTROL

K. Azmathulla and K. Vinod
Future Wireless Communication (FWC)
ASSIGNMENT

July 18, 2025

Abstract

This project implements a voice-controlled Unmanned Ground Vehicle (UGV) using an ESP32 microcontroller.Voice commands are captured via a mobile app and sent to the ESP32 over Bluetooth.The ESP32 interprets these commands to control motor movements like forward, backward, left, and right.A secondary control option is provided via a Wi-Fi-based web interface.The system enables hands-free, wireless control suitable for smart robotics and automation tasks.

1. Components

Component	Qty
ESP32 Board	1
L298N Motor control	1
UGV Car Kit	1
USB Cable (Type C)	1
Jumper Wires (F-F)	8
Android Mobile with RoboBoy App	1
Batteries(1.5v)	4

Table 1: List of components used

2. Setup and Connections

1. Assemble the toy car according to the instructions in manual.
2. Make the connections according to the Schematic diagram.
3. Make sure connect the Vin pin of ESP32 board to Vms terminal of L298N.
4. If we want to control via Bluetooth through RoboBoy App, we need to create a project inside the app to meet our requirements like giving audio for commands like "forward", "backward","left","right","stop".

3. Steps for Implementation

1. Open tools in arduino ide select ESP32Devmodule in "Boards", select port "devttyUSB0".
2. Also in tools select Partition Scheme: "Minimal SPIFFS (1.9MB APP with OTA/190KB SPIFFS)" otherwise we may face problem while uploading.
3. Compile and upload the code into ESP32 board via USB cable .
4. After uploading remove the cable and connect the vehicle either with bluetooth using RoboBoy app or with wifi.

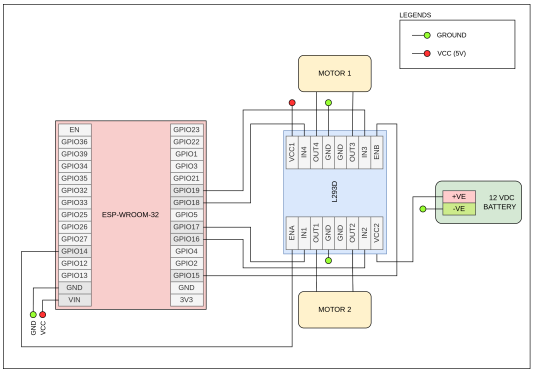

Figure 1: This is the Schematic Diagram.