UGV - Toycar

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CONTENTS

***Abstract*—Controlling a toycar (UGV) via Bluetooth and Speech.**

I. HARDWARE SETUP

I.1 Assemble the chassis, fix the motors and mount the wheels to build the toycar.

I.2 Fix the breadboard on the base of the toycar.

I.3 Take an ESP32 module for communication purposes.

I.4 Plug the **L293D** motor driver IC in Fig. I.4 on the breadboard.

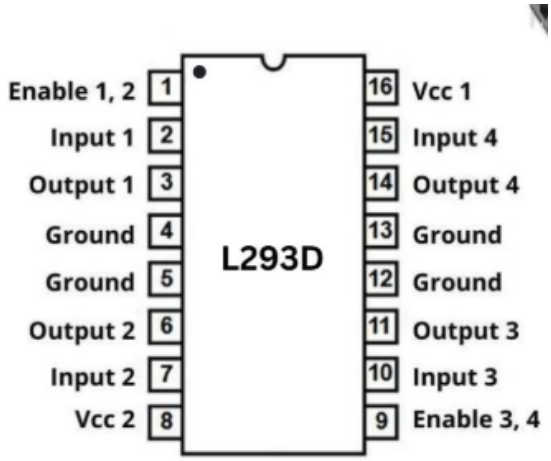

Fig. I.4. L293D Motor Driver IC

I.5 The connections between the L293D output pins and the motors (M_1, M_2) are according to Table I.5

L293D IC	3	6	11	14
Motors	M_1 (+)	M_1 (-)	M_2 (+)	M_2 (-)

TABLE I.5
L293D & MOTORS CONNECTIONS

I.6 Connect any 4 GPIO pins (**Ex**: 25, 26, 33 & 32) of ESP32 in Fig. I.6 to L293D inputs

I.7 The connections between the ESP32 and the L293D input pins are according to Table I.7

I.8 Connect the ground pins of the L293D IC and the ESP32 to a common ground on the breadboard.

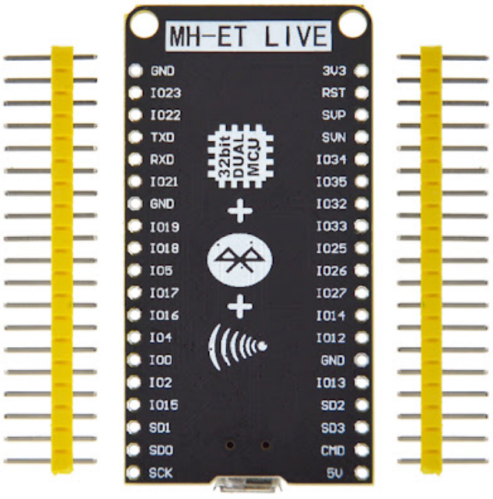

Fig. I.6. ESP 32

ESP32	32	33	25	26
L293D IC	3	6	11	14

TABLE I.7
L293D & ESP32 CONNECTIONS

I.9 Connect the 5V pin of the ESP32 to the VCC 1 pin of the L293D IC.

II. IMPLEMENTATION

A. Dabble

II.1 Install **Dabble** app using Google Playstore in an Android mobile.

II.2 Upload the following code to the ESP32 using any IDE.

```
wget https://github.com/Satyanarayana-123456/UGV_toycar/blob/main/codes/dabble_gamepad.cpp
```

II.3 After uploading the above code, plug the ESP32 to a power bank via a micro-USB cable.

II.4 Open the Dabble app and connect to the ESP32 via bluetooth. The app interface looks like Fig. II.4

II.5 Now use the **Gamepad** of the app in Fig. II.5 to control the toycar.

II.6 Operate the left-side control buttons labeled *Forward, Back, Left & Right* to give the respective commands.

B. Arduino Bluetooth Controller

II.7 Install **Arduino Bluetooth Controller** app using Google Playstore in an Android mobile.

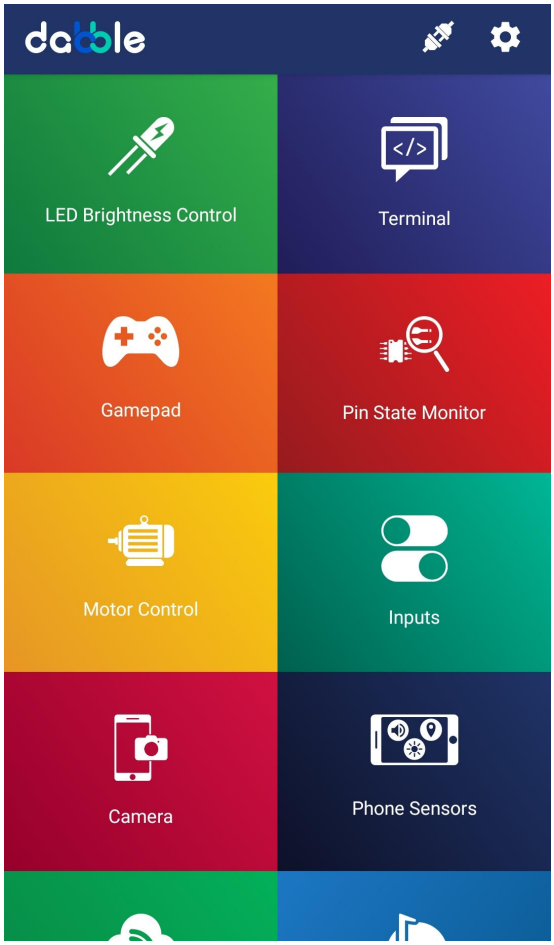

Fig. II.4. Dabble Interface

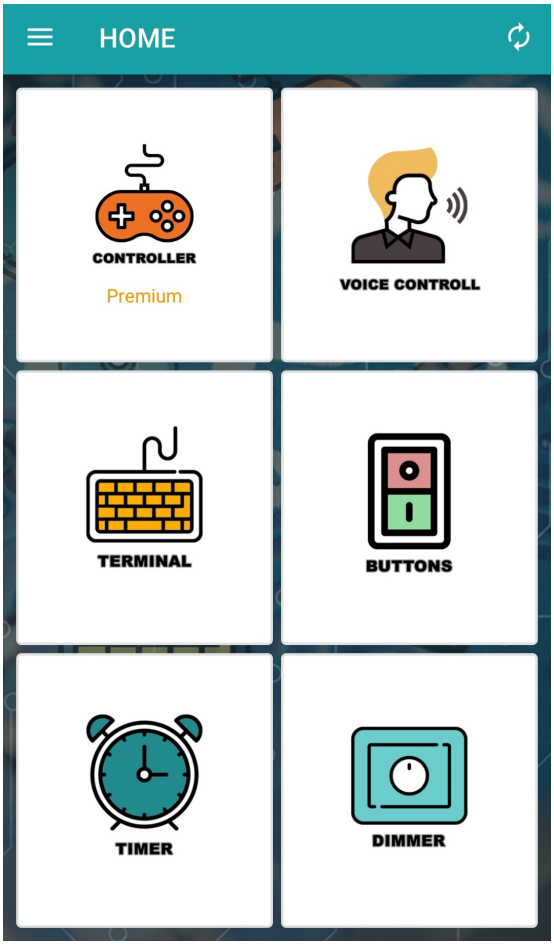

Fig. II.10. Arduino Bueetoth Controller Interface

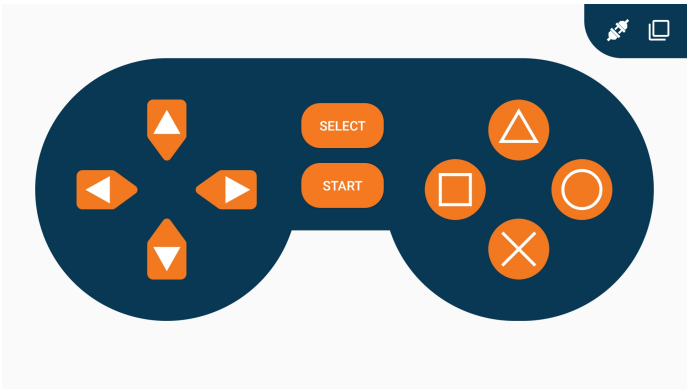

Fig. II.5. Gamepad in Dabble App

II.8 Upload the following code to the ESP32 using any IDE.

```
wget https://github.com/Satyanarayana-123456/UGV_toycar/blob/main/codes/ABC_voice.cpp
```

II.9 After uploading the above code, plug the ESP32 to a power bank via a micro-USB cable.

II.10 Open the Arduino Bluetoth Controller app and connect to the ESP32 via bluetooth. The app interface looks like Fig. II.10

II.11 Now use the **Voice Control** section of the app to control the toycar.

II.12 The commands which the voice control takes are *Left, Right, Forward, Back & Stop*.