Preliminary

1 Hardware

1.1 Raspberry Pi 4 B

As a Microntroller, we'll be using a Raspberry Pi 4 model B of 2GB of ram memory, as illustrated in the Figure 1.

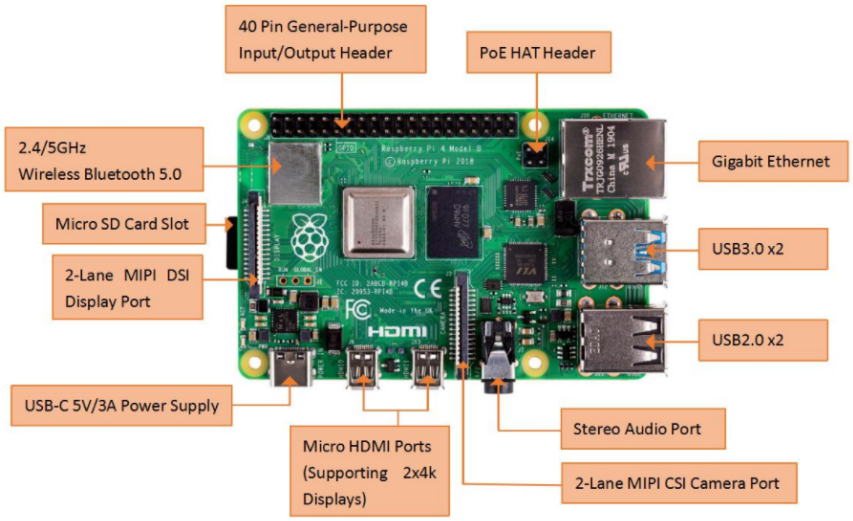

Figure 1: *Raspberry Pi 4 model B interfaces and GPIO.*

As we can see, we can interact with the raspi in different ways, in particular:

- **USB-C Power Supply** of 5V/3A. For, we'll first use a AC Adapter as the one in Figure 2 with an ON/OFF switch.

Figure 2: *AC Adapter for Power Supply of 5V/3A*

Consequenly a stand alone battery will be used in order to make the car more autonomous.

- **Micro HDMI Port** in order to connect the raspi to a screen thanks to a Micro HDMI-to-VGA adapter as in Figure 3 (NOTE: this may change according to the screen, for instance mine has a VGA port) . Connecting the raspi on the screen will be usefull for the desktop configuration.

Figure 3: *Micro HDMI to VGA Adapter.*

- **2-Lane MIPI CSI Camera Port** in order to connect the camera.
- **Micro SD card slot** where we connect our 32 GB micro SD card flashed with the Operating System for the raspi (we'll see in Section 2 how to configure this).
- **GPIO**, i.e. the General-Purpose Input/Outputs in order to interact with the different signals.

1.2 4WD Smart Car Kit

The 4 Wheel-Drive Smart Car kit from Freenove includes the following components:

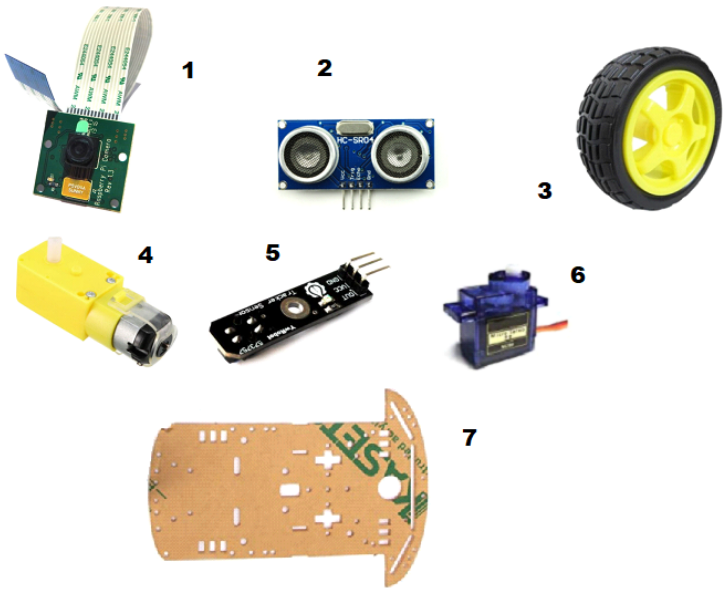

Figure 4: *Smart car kit components.*

1. **Car Chassis**
2. **4 Tire Wheels**
3. **4 DC Gear motors**
4. **2 Micro Servo motors 9g SG90**

5. **Raspberry Pi Camera Rev 1.3 module**
6. **Line Tracking Sensor**
7. **Ultrasonic Ranging module HC-SR04**

2 Raspberry Pi Configuration

3 Assembling