This document explains how to build the Poppy Humanoid head modified by Generation Robots in order to integrate a screen and more powerful speakers.

Material:
- 1* 3D piece of the modified back head *(new)*
- 1* 3D piece of the screen support *(new)*
- 1* 3D piece of the face head
- 1* Raspberry Pi 3 *(new)*
- 1* 4" WaveShare screen *(new)*
- 1* USB hub *(new)*
- 2* USB2Dynamixel
- 1* Xmini me speaker *(new)*
- 1* mini USB 5V power supply *(new)*
- 1* preflashed microSD card *(new)*
- 3* Robotis S2 screws
- 3* 2mm nuts
- 4* M2.5*10 screws *(new)*
- 4* 2.5mm nuts

1. Initial assembly

Follow the assembly of the official head for:
- The neck, the backhead and the AX motors
- The insertion of the 3 2mm nuts in the head face
- The insertion of the 4 2.5mm nuts in the head face

Pass the cables of the motors and the power supply cable through the back head orifice, like in the official assembly.

2. Assembly of the modified head

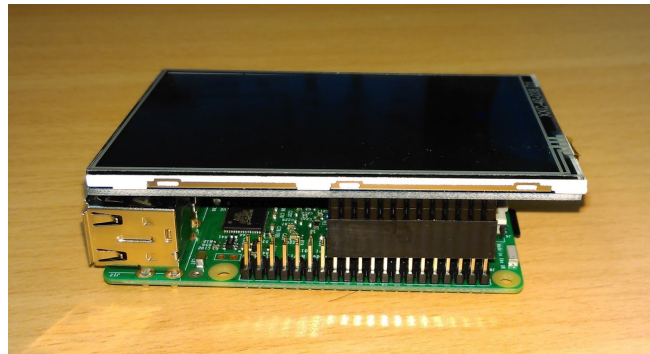### a. Configuration of the Raspberry Pi 3

- Insert the preflashed miniSD card into the Raspberry Pi 3.
- Plug a USB keyboard into the Raspberry Pi 3.
- Plug the WaveShare screen onto the Raspberry Pi directly on its GPIO, as seen in the following picture.
- Connect the 5V power supply on the mini-USB port of the Raspberry Pi 3.

Once the Raspberry is powered on, you must see the screen switching on and booting on the desktop. The wifi must be configured. If there is no wifi, the network can be shared by a phone.

To configure the wifi, on the touchscreen:
- Click on wifi icon on the top.
- Choose your wifi network and type your password thanks to the keyboard.

The Raspberry Pi is now configured. You can reboot the system and unplug the keyboard. The Raspberry Pi must automatically connect to the configured wifi network.

b. <u>Assembly of the head electronics</u>

First unplug the screen from the Raspberry Pi.

Switch on the speaker and follow the next steps in order to correspond to the following picture:
- Connect the USB hub to the USB port in the middle, on the back side.
- Connect the 2 USB2AX on the USB hub, on the side where there are 3 ports.
- Connect the USB of the speaker on the other side of the USB hub.
- Connect the jack of the speaker on the Raspberry Pi.
- Connect the micro-USB power supply of the Raspberry Pi (without connecting to the wall socket).
- Flatten the USB hub against the back of the Raspberry Pi 3, and place behind the speaker, then place all of these in the back head, as on the picture.
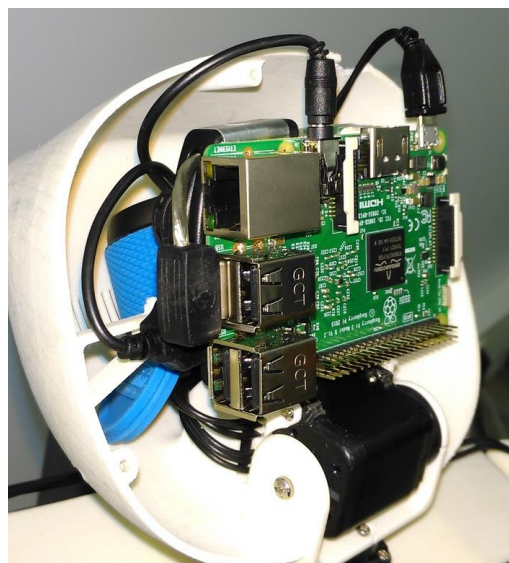
c. Assembly of the head face

- Take the support of the screen piece and place double-sided tape where the screen will be laid on, as on the picture.

- Place the screen on the support, paying attention to put it straight.

- Insert the support and the screen into the head face, and screw the 4 M2.5*10 screws.

d. Assembly of the head

- Place the head face so that the pins of the screen are just in front of the GPIO of the Raspberry Pi, as on the following picture, and without forgetting to place the hub and the speaker as described before.
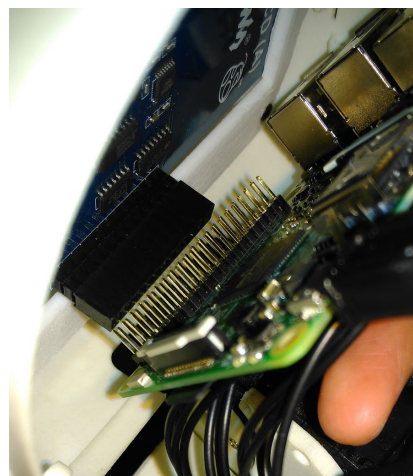
- Close the head face on the back head.
- Screw the 3 robotis screws to fix the head face to the back head.

The head is now assembled. You can now power supply the head by connecting the 5V power supply. You can now add some eyes to your robot like on this picture!