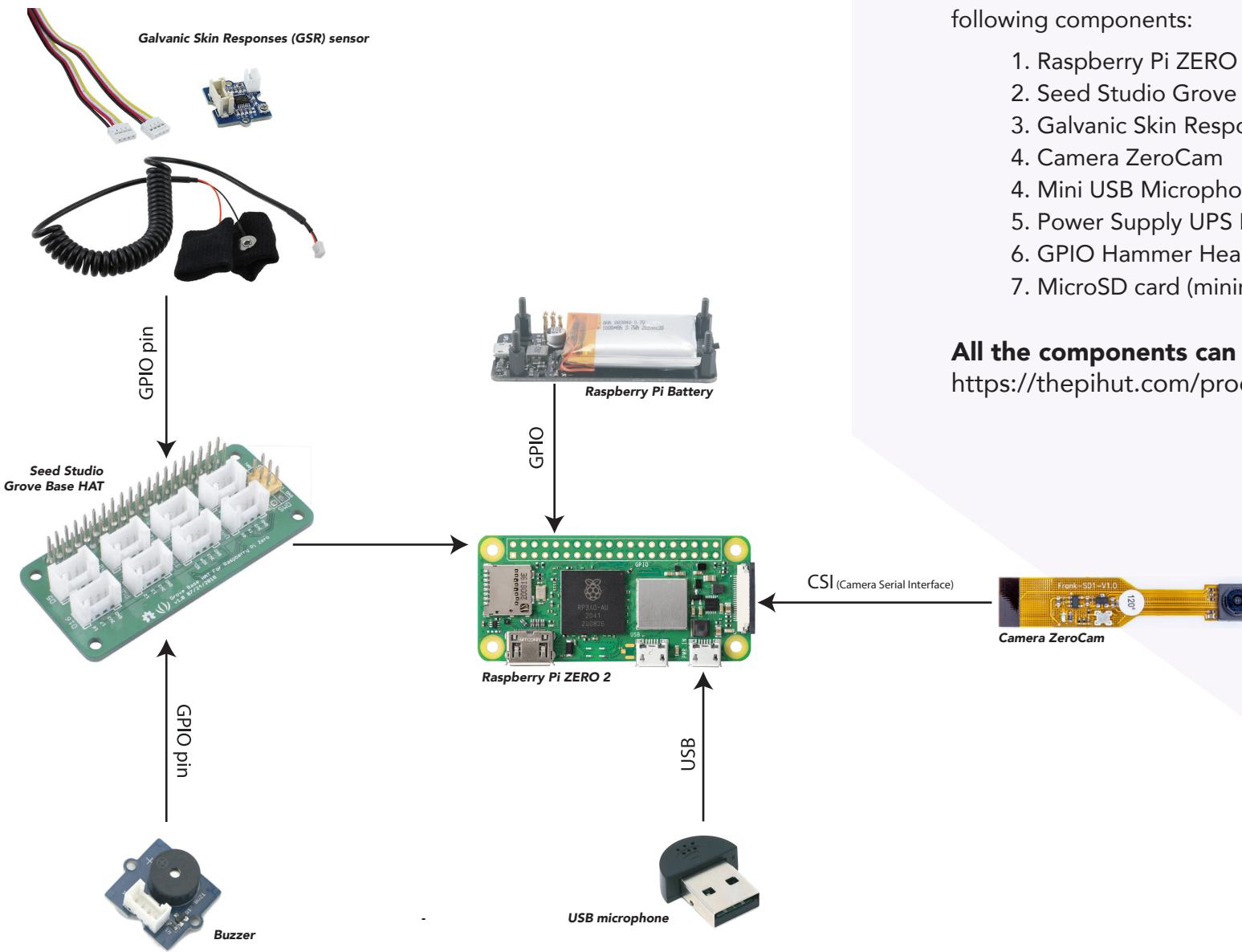


USER MANUAL



RASPBERRY PI COMPONENTS



To build the multimodal recording rig, you will need the following components:

1. Raspberry Pi ZERO 2
2. Seed Studio Grove Base HAT
3. Galvanic Skin Responses (GSR) sensor
4. Camera ZeroCam
4. Mini USB Microphone
5. Power Supply UPS HAT For Raspberry Pi Zero
6. GPIO Hammer Header (Solderless)
7. MicroSD card (minimum 32GB)

All the components can be found on:
<https://thepihut.com/products/>

RASPBERRY PI OS

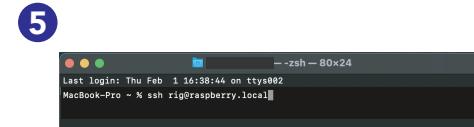
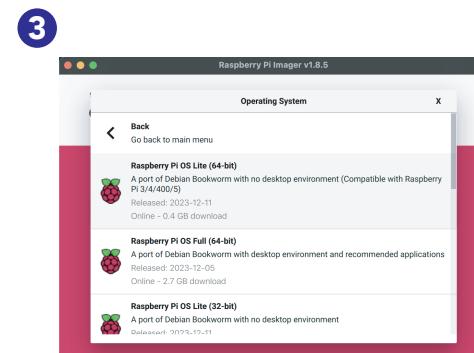
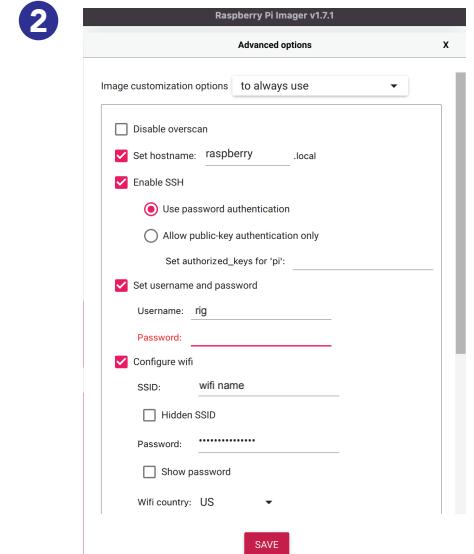
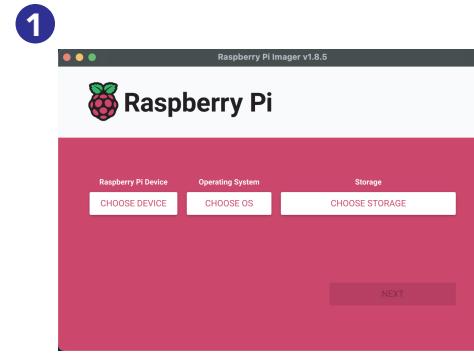
R A S P B E R R Y P I O S

Operating System (OS):

1. Download the Raspberry Pi Imager software onto your computer from the following link: <https://www.raspberrypi.com/software/>
2. In the Raspberry Pi Imager, configure the following settings:
 - Set up your Wi-Fi connection and provide your Wi-Fi network's name (SSID) and password.
 - Choose the device name for your Raspberry Pi (for example, "raspberry") and set up a username (for example, "rig")
3. Use the Raspberry Pi Imager to install the Raspberry Pi OS x64 Lite onto the microSD card.
4. Insert the microSD card into the microSD card slot on the Raspberry Pi Zero 2.
5. Open a Terminal or Command Prompt on your computer and establish an SSH connection to the Raspberry Pi by entering the following command (replace "rig" with your chosen username and "raspberry" with your chosen device name):
ssh rig@raspberry.local
You will be prompted to enter your device's password.
6. Enter your device's password to complete the connection.

Raspberry Pi Imager:

<https://www.raspberrypi.com/software/>



RASPBERRY PI APP

Raspberry Pi Recording Application:

Once you are successfully connected to the raspberry pi via SSH connection (ssh rig@raspberry.local), execute:

1. Create folders "/App/main/" in the directory "/home/rig/Documents/", as to ensure that the following path exists: "/home/rig/Documents/App/main". You can use the commands:

```
cd /home/rig/Documents/  
mkdir -p App/main
```

2. Open the directory /home/rig/Documents/App/main using the command:

```
cd /home/rig/Documents/App/main
```

3. Clone the Raspberry Pi application:

```
git clone https://github.com/ancara22/Raspberry-Pi-Recording-Application.git
```

GitHub Repository:

<https://github.com/ancara22/Raspberry-Pi-Recording-Application.git>

LOCAL SERVER

Local Server:

1. Install the server on your local machine executing the following commands:

```
mkdir rig-server  
git clone https://github.com/ancara22/pi-server.git
```

2. Open the project and install the npm packages:

```
cd rig-server/server  
npm install
```

GitHub Repository:

<https://github.com/ancara22/pi-server.git>

AWS ACCOUNT

Set the AWS Account:

1. Install the AWS CLI:

On Windows, download and run the installer from the AWS CLI download page.

On macOS or Linux, you can use the package manager or pip to install the AWS CLI:

```
npm install awscli
```

2. Configure the AWS CLI:

Open a terminal or command prompt and run:

```
aws configure
```

You will be prompted to enter your AWS Access Key ID and Secret Access Key, which you can get from your AWS Management Console in the IAM section. You will also be asked to enter your default region (e.g., us-east-1) and default output format (e.g., json).

3. Create an AWS config file: (Optional)

The AWS CLI configuration will create a file called `~/.aws/config` on Linux and macOS or `%UserProfile%\.aws\config` on Windows. You can create it manually if it doesn't exist and add configurations like the region and output format:

Amazon Web Services:

<https://aws.amazon.com>

BLOCKCHAIN FUNCTION

Deploy the Blockchain functionality:

To deploy a Lambda function named on your AWS account using the Serverless framework, follow these steps:

1. Navigate to the Function Directory:

Open a terminal or command prompt and navigate to the blockchain-api folder in the downloaded repository.

2. Prerequisites:

Before deploying the Lambda function, users need to have Node.js and npm installed on their local machines. They also need to install Serverless globally by running the following command:

```
npm install -g serverless
```

3. Deploy the Lambda Function:

After the dependencies are installed, deploy the Lambda function to AWS by running:

```
serverless deploy
```

Serverless:

<https://www.serverless.com>

EMOTIV HEADSET

Set the EEG headset:

Here's a step-by-step guide to connecting to the Emotiv headset:

- 1. Install Emotiv Apps Launcher and Emotiv BCI:** First, download and install the Emotiv Apps Launcher and Emotiv BCI applications from the Emotiv website.
- 2. Login to Emotiv Profile in Launcher:** Open the Emotiv Apps Launcher and login with your Emotiv profile credentials. If you don't have an Emotiv account, you'll need to create one.
- 3. Plug in the Headset:** Plug in the USB receiver for your Emotiv headset into an available USB port on your computer.
- 4. Start the Headset:** Turn on the Emotiv headset by pressing the power button on the side. Make sure it's charged if it's a wireless model.
- 5. Connect to the Launcher App:** Open the Emotiv BCI application. Here, you should see an option to connect to the Emotiv headset. Click on this and wait for the connection to be established.
- 6. Configure Headset Position:** Once connected, you may need to configure the headset position.
- 7. Configure Recording Quality:** In order to ensure accurate readings, it is necessary to adjust the sensors' positions and ensure their proper salinity.
- 8. Create a Face Model:** To use the facial expression detection features of the Emotiv headset, you'll need to create a face model. This involves following the on-screen instructions to make various facial expressions and train the model.
- 9. Train Facial Expressions:** After creating the face model, you'll need to train it by making various facial expressions. The headset will record your expressions and use them to recognize your emotions in the future.
- 10. Repeat Training:** To ensure accuracy, it's recommended to repeat the training process several times.