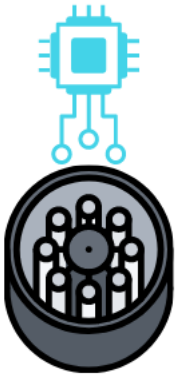


Automatic Centrifuge

Automatic Centrifuge

📝 Table of Contents

🧐 About

This repo contains

- Firmware
- Circuit Diagram
- Client auto-Installer script
- Detailed instructions

for Automatic Centrifuge project.

Getting Started

These instructions will get you a copy of the project up and running on you raspberry pi.

Prerequisites

Turn on your Raspberry Pi and execute the following commands

```
- sudo apt update
- sudo apt upgrade
```

RPiClient Installation

Auto Installer

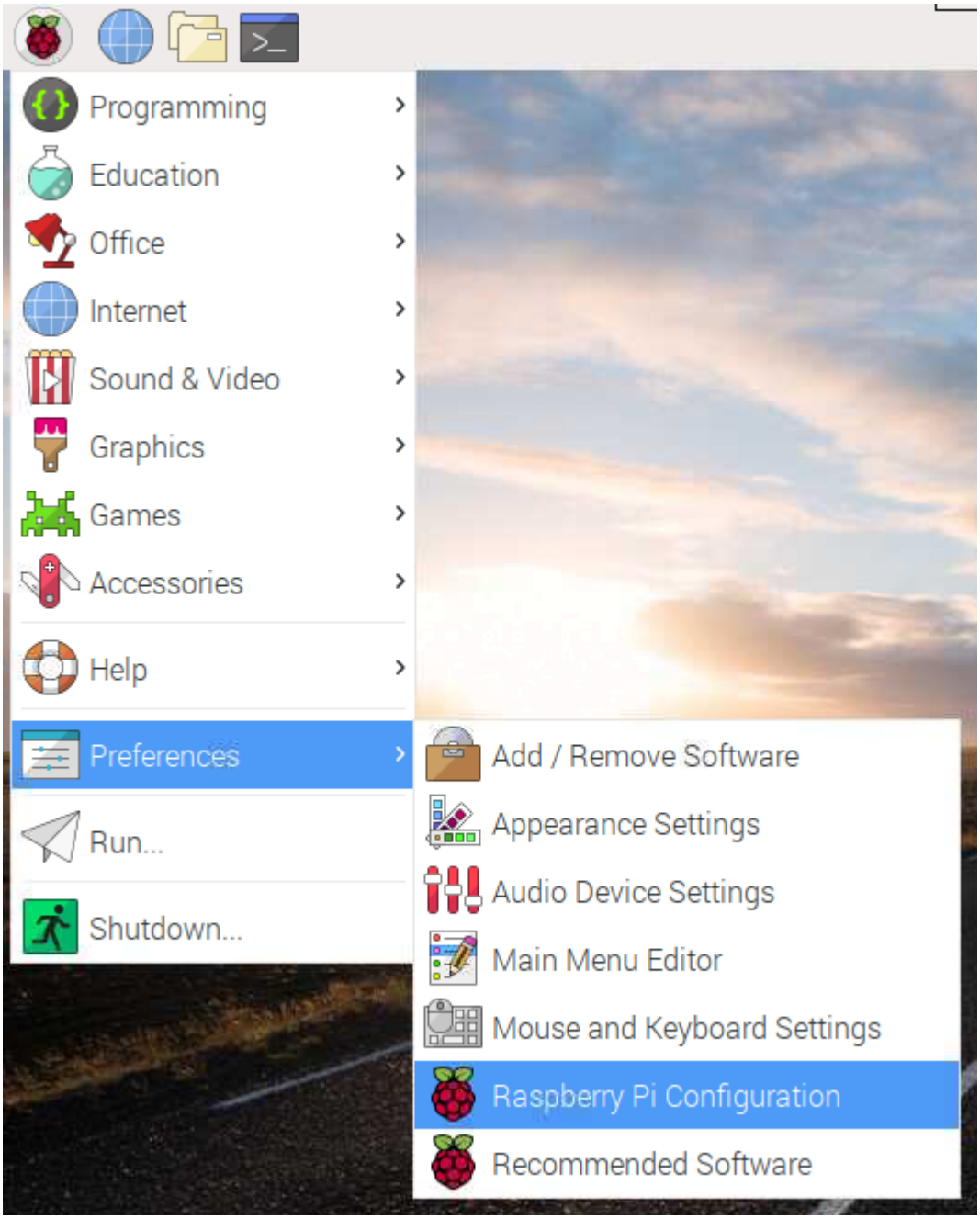
To install and Run RPi Client Automatically just run the following command on your Raspberry Pi terminal

- `curl -sSL https://raw.githubusercontent.com/Nauman3S/AutomaticCentrifuge/main/installer.sh | bash`

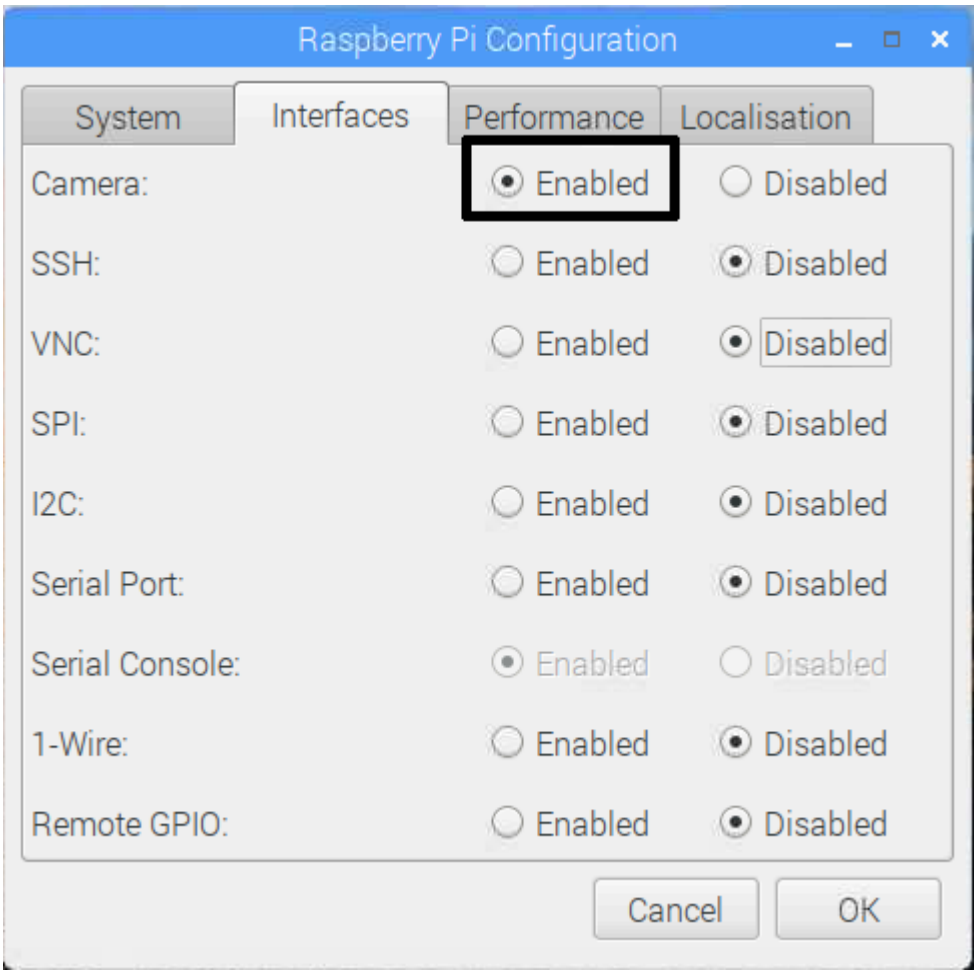
After the installer completes the process. You will see success message after installation completion.

Configuring Camera

1. Start your Raspberry Pi
2. Go to the main menu and open the Raspberry Pi Configuration tool.



3. Go to the main menu and open the Raspberry Pi Configuration tool.



4. Reboot your Raspberry Pi.

Circuit

Motor Driver Details

```
Motor Driver Header Pins(already connected to the Raspberry Pi)
```

MotorDriverPin	RPi Pin	Description
PWM1	GPIO12	*Already connected via header*
DIR1	GPIO26	*Already connected via header*
PWM2	GPIO13	*Already connected via header*
DIR2	GPIO24	*Already connected via header*

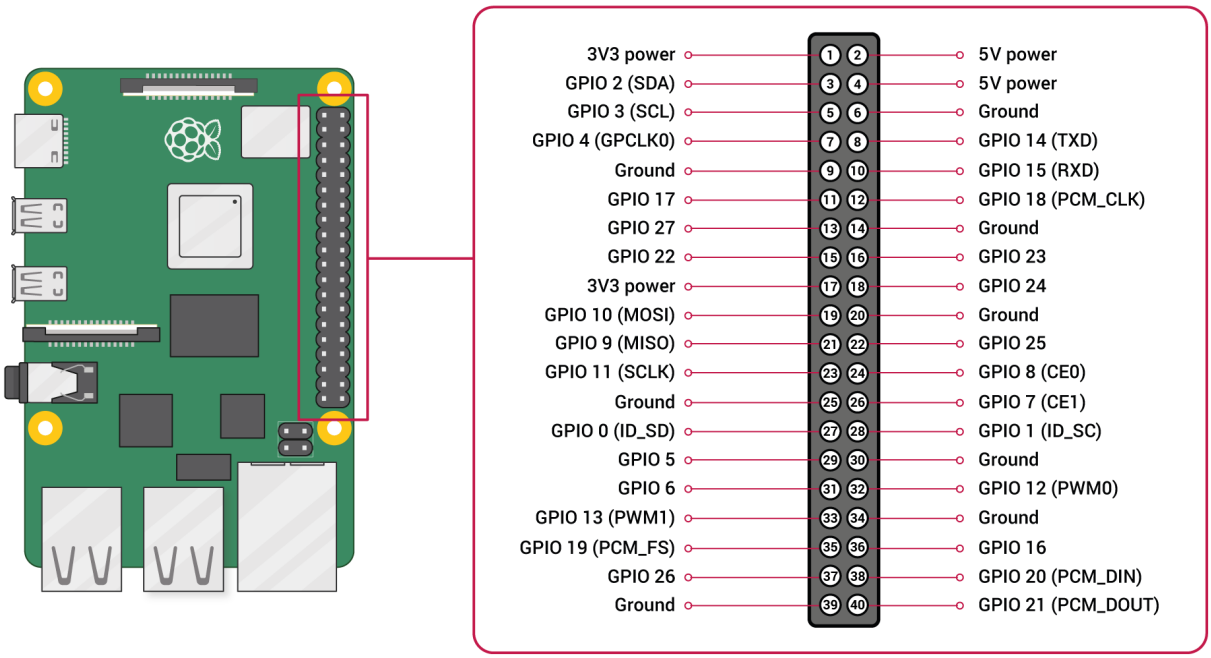
```
Motor Driver Pins for connecting motors
```

MotorDriverPin	Description

MotorDriverPin	Description
M1A	*Connect to motor1 terminal A*
M1B	*Connect to motor1 terminal B*
VM	*Positive Supply (6V to 24V)*
GND	*Negative Supply*
M2A	*Connect to motor2 terminal A*
M2B	*Connect to motor2 terminal B*

Raspberry Pi Pinout

Follow the pinout diagram given below to connect different components to your Raspberry Pi



Other Components

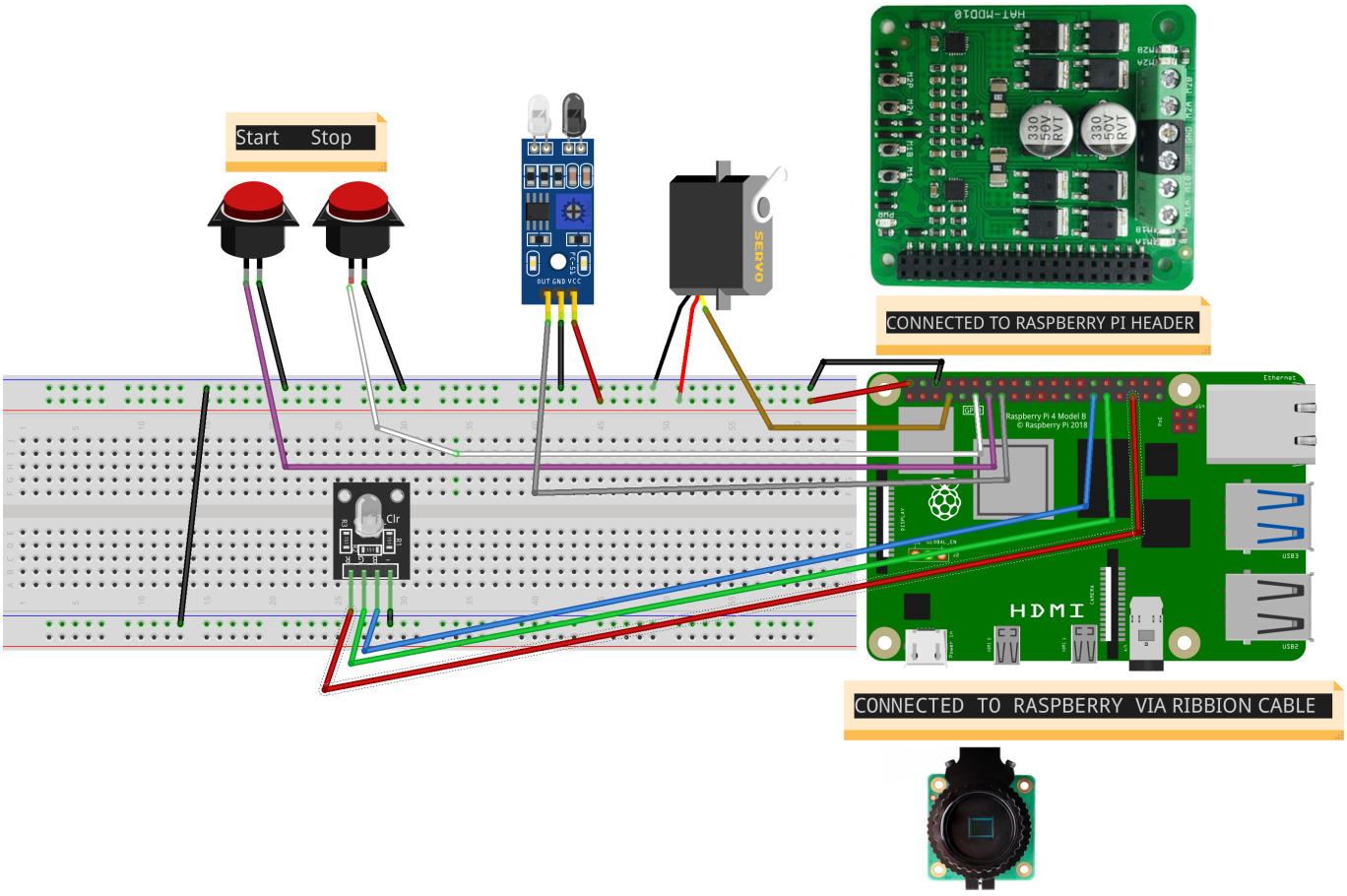
```
Other components pin connection details
```

MotorDriverPin	RPi Pin	Description
START BUTTON	GPIO27	*To start the rotation*
STOP BUTTON	GPIO17	*To stop the rotation*
IR Sensor	GPIO22	*To start centrifuge without physically touching anything*
Servo	GPIO4	*If it won't work, power it from an external 5v power source*

MotorDriverPin	RPi Pin	Description
LED R	GPIO19	*RGB LED*
LED G	GPIO6	*RGB LED*
LED B	GPIO5	*RGB LED*

Complete Circuit Diagram

Here's the complete circuit diagram of the system.



Usage

1. Run installer script on your Raspberry Pi.
2. Setup the camera as mentioned in the `Configuring Camera` section.

List of Components

Following components are used to make this project

1. Push Buttons(Generic)
2. IR Obstacle Avoidance Sensor (https://www.amazon.co.uk/Electrely-Avoidance-Photoelectric-Reflection-Detecting-Green/dp/B07G38MXW8/ref=sr_1_6?dchild=1&keywords=ir+sensor&qid=1631010821&sr=8-6)

3. Servo Motor(https://www.amazon.co.uk/ZHITING-2-Pack-MG996R-Digital-Helicopter/dp/B088NJRFD7/ref=sr_1_6?dchild=1&keywords=servo+motor&qid=1631011601&sr=8-6)
4. 6-24V 10A Motor Driver HAT (https://www.robotshop.com/en/cytron-2x10a-motor-driver-hat-for-raspberry-pi.html)
5. RGB LED Module KY-016(https://www.amazon.co.uk/KY-016-Colors-Sensor-Arduino-Starter/dp/B07MFSWMQM/ref=sr_1_1?dchild=1&keywords=rgb+led+module+ky-016&qid=1631011646&sr=8-1)

⛏ Built Using

- Python - For programming RPi Client

✍ Authors

- @Nauman3S - Development and Deployment