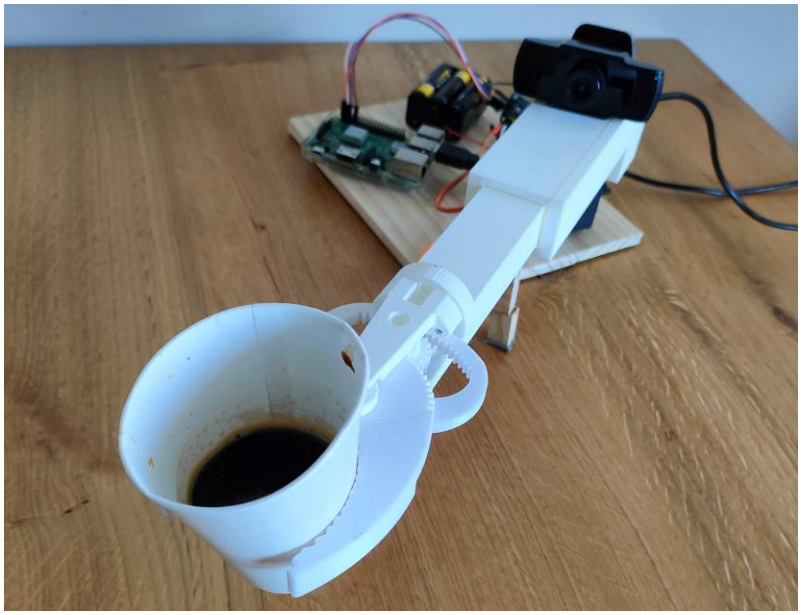

GUABAR FOREVER

THE SMARTBARTENDER YOU NEED

PROJECT SPRINT #6.
DATE: 27th May 2022

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Sprint #1
Date: 14 April 2021

GUABAR FOREVER

THE SMARTBARTENDER YOU NEED

Project description

Guabar forever is a robot thought to provide you your favorite drinks just by your voice and that it serves to your hand. The best bartender you can buy for. How it works?

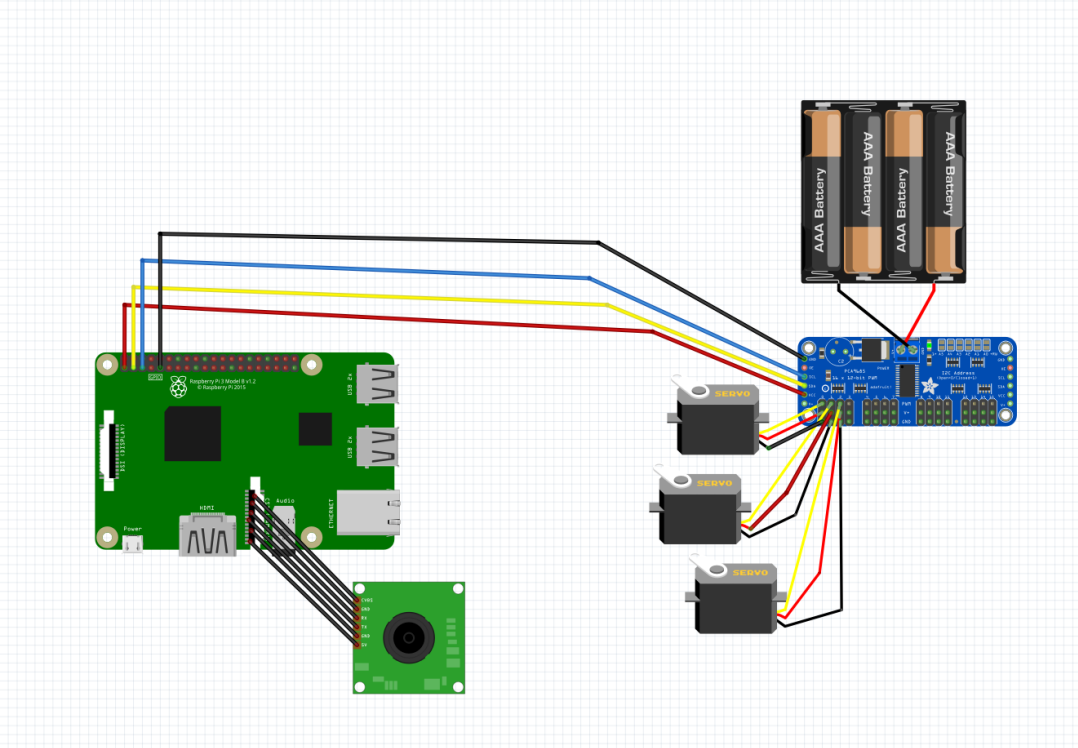
1. *You must say what do you want to drink*
2. *The robot processes your order*
3. *The robot moves to prepare your drink*
4. *At the end the robot track your face and it give you the drink where you are.*

Electronic components

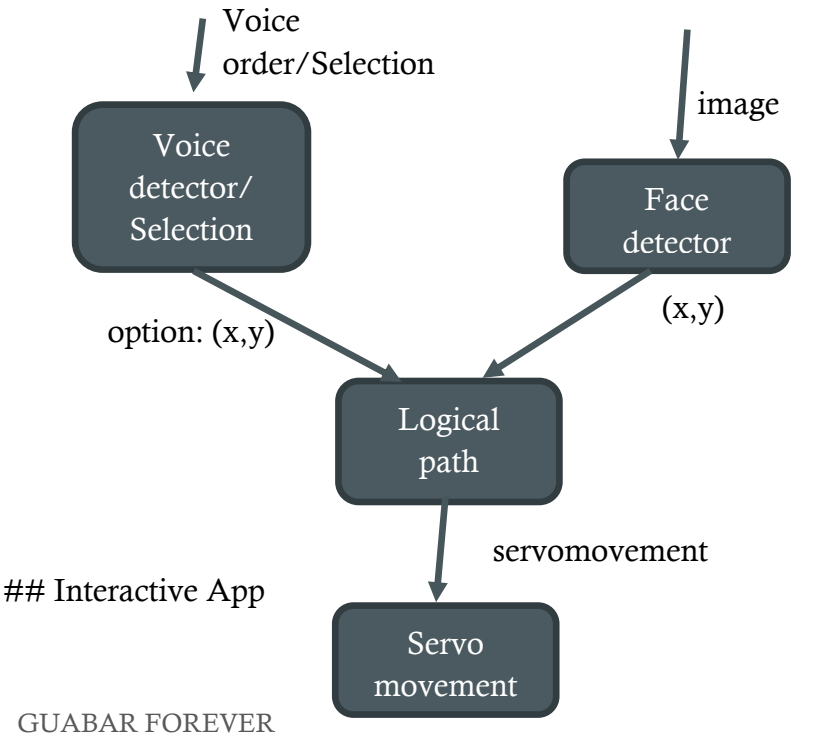
This is the list of the used components:

- *Raspberry Pi 4*
- *Micro servo SG90*
- *Adafruit Servo FeatherWing (16 channels PWM)*
- *Servomotor estándar 3001HB*
- *Webcam*
- *Power supply Raspberry Pi 4, USB-C, 5.1V 3A*

Hardware Scheme



Software Architecture



Interactive App

We create an interactive app to do the different orders to the bartender.

This is connected to the raspberry using ssh and we give the different parameters to do what we want.

To do that app we use flask. We use paramiko to create the ssh connection.

Menu Selector

To have a more than one option to ask for an order, we set a menu selector too on the app. Basically it gives you the pictures of the different drinks we have, and you just need to select the ones you want and submit the order

Voice Recognition

The microphone provided to the raspberry to process the audio it takes to recognize the orders matching every word with a predefined ones, the different drinks available.

We use speech_recognition as a library to do the voice recognition program.

Face Detection

As the last module we take data from the web camera the robot it has on the top to process the video frames to detect faces, that faces are detected with the propose of let know the robot if the person is on the right or on the left to move it selves.

We use the library cv2 to capture and process the camera images. And face_detection to do the face detection at the images.

Servo Movement

We defined a few functions that sets the different types of movements the robot have, one for open the hand, other for close it, etc.

Amazing contributions

A robot that acts as a bartender, just speak with him as confident as you can. You won't notice that is a robot, it will be your friend.

You can order to him in 2 different ways, the first one consist in select the order with a menu in app and the other consists in order by the voice as if you are talking with a bartender.

Guabar-Forever track your face to recognize where you are and serves the drink as near as possible to you.

Extra components and 3D pieces

- *STRUCTURAL ARM*
- *SERVING ARM*
- *HAND OF THE ROBOT*
- *GEARS*

The structural arm is designed to hold and move the rest of the robot.
Serving arm is the moving part placed on the horizontal arm that will approach to the client, drinks to give an extra movement to the robot.
The hand is the piece that holds the glass.
The gears are used to move the arms up and down and in and out.

Simulation Strategy

We will do a simulation with Coppelia to prove that robot is working as it is hoped to work.

Foreseen risks and contingency plan

Risk #	**Description**	**Probability** (High/Medium/Low)	**Impact** (High/Medium/Low**)**	**Contingency plan**
01	The robot is not strong enough to pick up the glass.	Low	Medium	Change the servomotor that is given the problem.
02	Problems with the voice detection	Low	Medium	Speak louder or look for some software to remove the ambient noise.
...				

References

This project has been inspired by the following Internet projects:

https://www.hackster.io/hackershack/smart-bartender-5c430e

Information to know how to do the project:

https://learn.adafruit.com/16-channel-pwm-servo-driver

https://pypi.org/project/face-detection/

https://opencv.org/releases/

https://pypi.org/project/SpeechRecognition/

https://www.paramiko.org/

https://flask.palletsprojects.com/en/2.1.x/

https://www.raspberrypi.com/documentation/