



PIXI LAMP

Pet lamp that interacts with humans through face recognition.

PIXI LAMP SPRINT #1.

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Pet lamp that interacts with humans through face recognition.

Project description

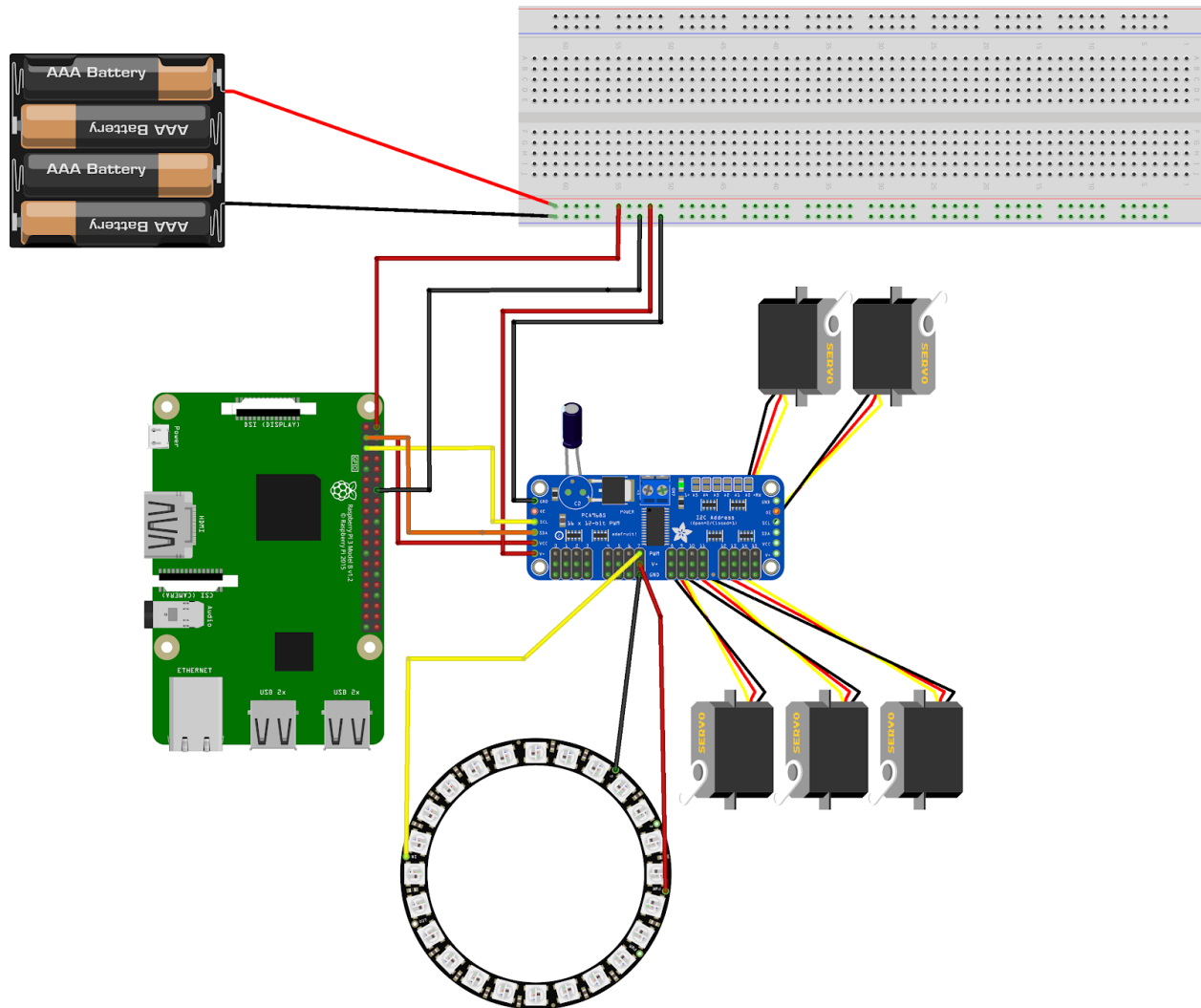
Our project consists on a robot similar to a robot arm equipped with a webcam that offers reactions throughout the use of computer vision software in order to give off the sensation of aliveness. Because it is shaped as a flex lamp (like Flexo Jr. from PIXAR) we have named it Pixi. It's reactions shall be further accentuated by using an RGB LED ring to make them more colorful.

Electronic components

This is the list of the used components:

- *1x Raspberry Pi 3 Model B*
- *1x Protoboard*
- *1x Adafruit NeoPixel 24 RGB LED ring*
- *1x PCA9685 PWM servo controller board*
- *2x SG90 Micro servo*
- *3x MG996R Hi-Torque servo*
- *1x 500W ATX PSU*
- *1x MINI WEBCAM 300K PIX.RASPBERRY*
- *1x 16Gb Micro SD card*

Scheme



fritzing

We connect the ATX PSU to the positive and ground from the protoboard. We also connect a 5V and a ground pin from the Raspberry Pi 3 and the V+ and ground pin from the PCA9685 to the protoboard. We connect Raspberry Pi 3's SCA and SCL pins to the PCA9685 SCL and SDA pins. Once RP3 and PCA9685 are connected, the servo and RGB LED ring are connected to our PCA9685. The RGB LED ring DataIn pin is connected to a PWM pin from the PCA9685.

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Extra components and 3D pieces

- *1x HC-SR501 PIR MOTION DETECTOR*
- *1x KY-018 Photoresistor module*
- *1x Luxo Jr (3D printed)*
- *1x Neopixel 12 ring mount (3D printed)*
- *1x Ball bearing (3D printed)*
- *...*

The HC-SR501 PIR MOTION DETECTOR will be used to detect in scenarios of low light intensity when something moves in the room, activating the camera or to detect when something moves behind Pixi's back.

The KY-018 Photoresistor module is used to determine when surrounding illumination is low (dark) thus putting Pixi to sleep.

The Luxo Jr will be the main structure of the robot.

The Neopixel 12 ring mount is used to mount the led ring into the head of the lamp

The ball bearing will be used to hold the main structure and provide an extra stability to the robot

Luxo Jr



Neopixel 12 ring mount



Ball bearing



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Foreseen risks and contingency plan

Risk #	Description	Probability (High/Medium/Low)	Impact (High/Medium/Low)	Contingency plan
1	Problems with servos and weight	Low	Medium	Adjust speed movement to ensure a smooth movement.
2	Pixi turns crazy	High	High	Reduce the number of actions and complexity of algorithms.
3	Pixi movements don't seem natural	Medium	Medium	Choose the better actions that makes pixi look more natural (like a pet, for example)
4	Problems with lights and movement coordination	Low	Low	Use more simple lights modes in specific cases

References

This project has been inspired by the following Internet projects:

<https://github.com/jochenalt/Luci>

<https://makezine.com/2015/08/25/pixar-robotic-desk-lamp/>

<https://www.theverge.com/2012/11/30/3710452/animatronic-pinokio-desk-lamp-pixar>

[amp-pixar](#)