Mini-Project: Animatronic Eye

Objective: The purpose of this project is to showcase the integration of 3D printing, microcontroller programming, electronics components, and assembly techniques to create an animatronic eye that can move in various directions and blink realistically.

Procedure:

1. Design completion - You will receive the CAD files for the animatronic eye, but some components will need to be included. You are tasked with completing the design and ensuring its functionality using their sketch files.
2. Mechanism simulation - Before 3D printing, you must simulate the mechanism to confirm its smooth operation.
3. Equipment provision - You will be provided with a kit containing three servo motors, 1 Arduino Uno board, and necessary nuts and bolts for assembly.
4. 3D Printing slot - You will be given a time slot to make the 3D prints and are expected to use the time efficiently.
5. Innovative modification - You will be evaluated based on making creative modifications to the design and improving its functionality.
6. Assembly instructions - The CAD for the eye will serve as your reference for assembly. You can refer to https://bechele.de/?p=814 for reference.
7. Microcontroller programming - The Arduino IDE will be used to program the microcontroller, which will control the servo motor movements and eyelid blinking.
8. Control - Once the mechanism is assembled, the servos will be controlled by the Arduino board through ROS.

Conclusion: This project serves as a comprehensive demonstration of how to design, 3D prints, assemble, and control an animatronic eye.

Instructions:

1. Please follow the sketch files for dimensions.
2. Deadline for submitting the motion simulation will be on 23rd Feb 2023, during TA hours.
3. Slots for 3d printing will be given after submitting the motion simulation.

Learning outcomes:

1. Design for manufacturing

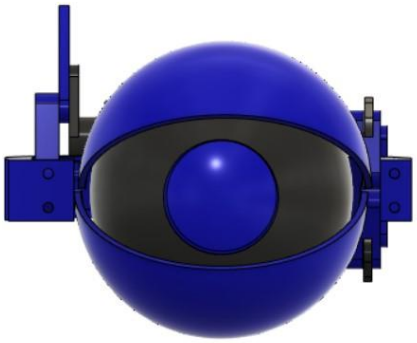
2. Use 3D printers to make prototypes

3. programming microcontrollers and its integration with ROS

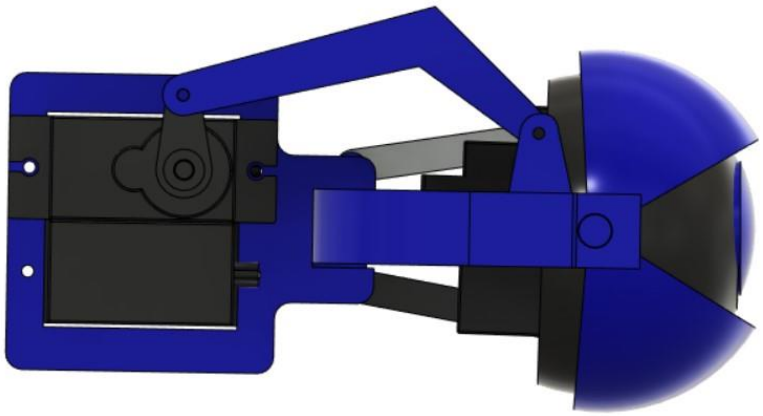
4. Apply electrical, mechanical and programming skills to make a mechatronic system

Full Assembly Images:

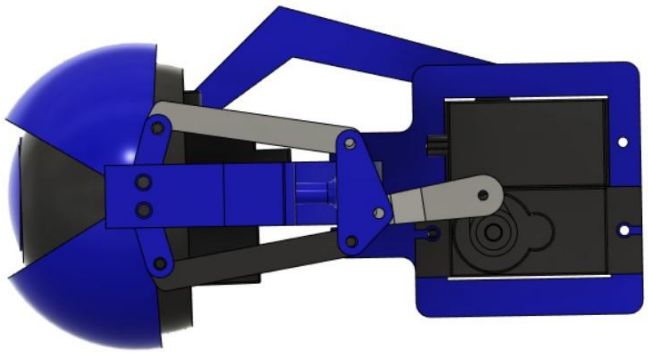
Front View:



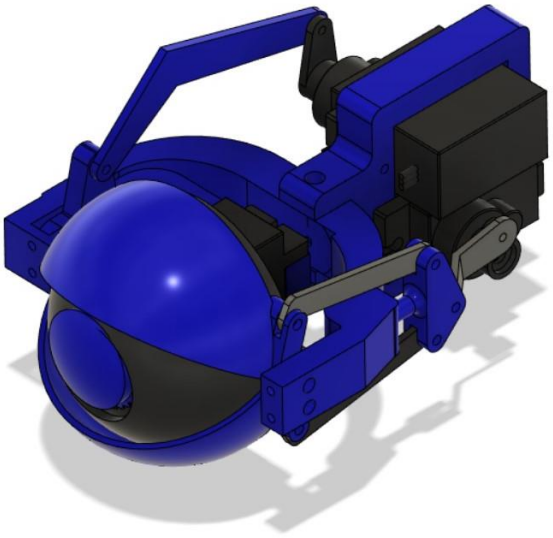
Left View:



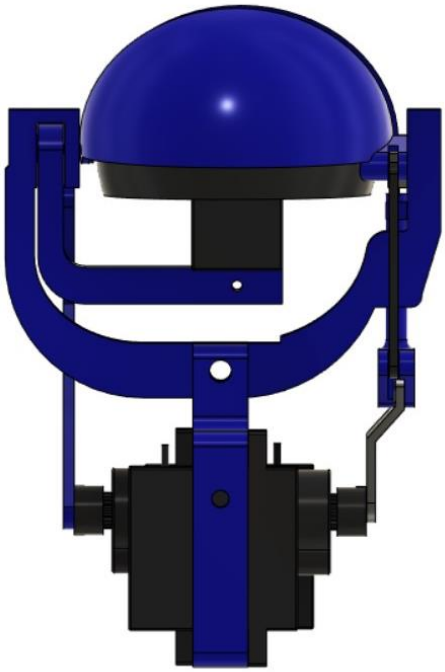
Right View:



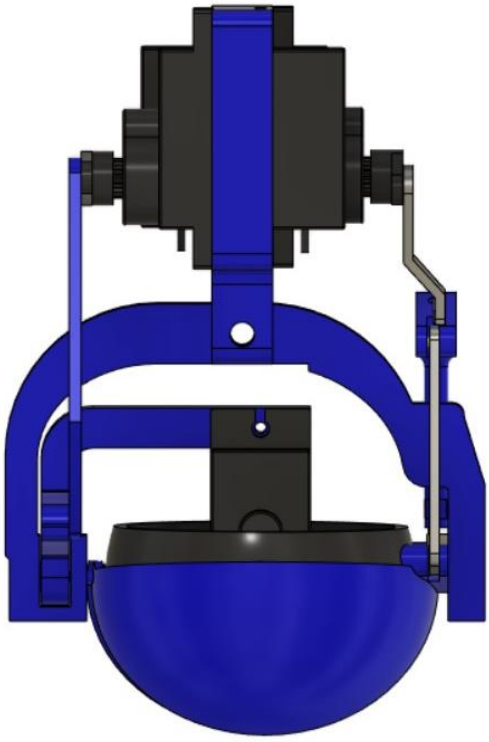
Orthographic View:



Bottom View:



Top View:



Attached Files:

1. CAD Files of the components.
2. Sketch files for the missing components. (You have to design using these files)
3. Labelled assembly file.