

2 Degree of Freedom Helicopter System

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Abstract

- **Objective:** Learn how to use control system in a laboratory environment.
- **Cost efficient and accessible** to any engineer.
- **Simulates** a helicopter control system.
- Needs to give **accurate data** and **feedback** to show the **motion** of the system.

Introduction

- Will be able to move in the **pitch** and **yaw rotations**.
- The user will be able to use a **control system** through **Matlab/Simulink**.
- Gather data from the **pitch** and **yaw encoders**.
- Learn basic control systems in a **safe environment**.

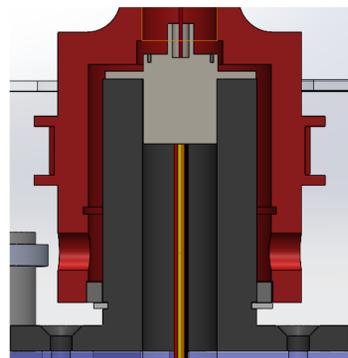


Figure 1: Internal assembly



Figure 2: Motor Assembly with Encoder

Methods and Material

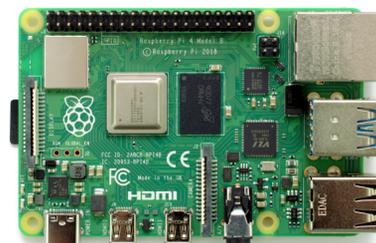


Figure 3: Raspberry Pi



Figure 4: 1 Inch PVC Pipe



Figure 5: 3D Filament



Figure 6: Aluminum Box

Construction of System:

- PVC Pipe
- Aluminum Box
- 3D Filament
- Acrylic Sheet
- Motors
- Encoders
- Raspberry Pi
- Motor Driver

Results

A CAD model was used to build the system's design. The data inputted and received was through Matlab/Simulink interface with the Raspberry Pi 4.

Discussion

- Will be used by **students** and **faculty members**.
- Can **recreate** this system and **modify** it to their use based on the **instructions** given.
- Will be more **cost effective** than existing systems.

Conclusions

- There are **existing systems** available in the **market** like this.
- These systems can be very **expensive**, difficult to **maintain**, and hard to **modify**.
- Our system is **cost efficient**, **easily maintained**, and **easily modified**.

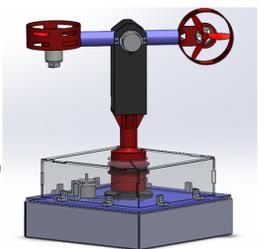


Figure 7: Complete assembly

Acknowledgements

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