## Tech Expo, Spring/Fall 2025- Team 12

# Mecha-Megalodon

Team 12: Mecha-Megalodon Capstone Project

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## **Problem** Statement

To design and develop a nine-foot submersible animatronic bull shark demonstrating the possibilities of electropneumatic control. This shark will have the ability to move throughout the water using a series of pneumatic actuators embedded into the skeleton of its tail, pulling and pushing the tail from side to side to generate thrust.

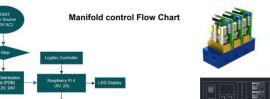




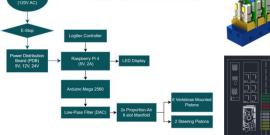
Polytechnic Institute

#### **Controls and Electronics**

PROPORTION-AIR







### **Testing and Results**

**Design Calculation & Analysis Results** 





Desired range of motion: +/- 90.2 deg

Measured range of motion: +/- 86.39 deg

 $\theta_{error}\% = 4.22 \%$ 







## **Customer Background**

Company Name: Proportion Air

Client Members: Jeff Clancy, Chris Juniper

Company Overview

Proportion Air is a global leader in manufacturing and distributing custom electropneumatic pressure air regulators and air flow control valves.

They aim to satisfy customers by having their products accurate, repeatable, and customizable.

## Requirements

#### Propulsion:

· Pneumatic actuators embedded in the tail skeleton

#### **Control System:**

- · Wired electric control housed in a waterproof enclosure
- · Allows real-time operator communication and control

#### Performance Metrics:

· Ability to swim forward, left, and right

#### **Deliverables:**

- Deliver a functional prototype of the electropneumatic shark
- · Provide complete documentation and schematics through the report

#### Purpose and Impact:

- Demonstrates Proportion-Air's pneumatic technology in a novel, high-impact application
- · Expands market exposure by showcasing capabilities in motion control and underwater robotics

## **Final Design**

