设计与制造Ⅱ（2025年度）课程项目展

项目名称： Aurelia: The Silent Underwater Explorer **组号:A10**

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Ⅰ、项目介绍

1. 项目背景

Aurelia aims to create an intelligent platform capable of flexible movement in underwater environments with minimal disturbance.

2. 项目方案与产品定位

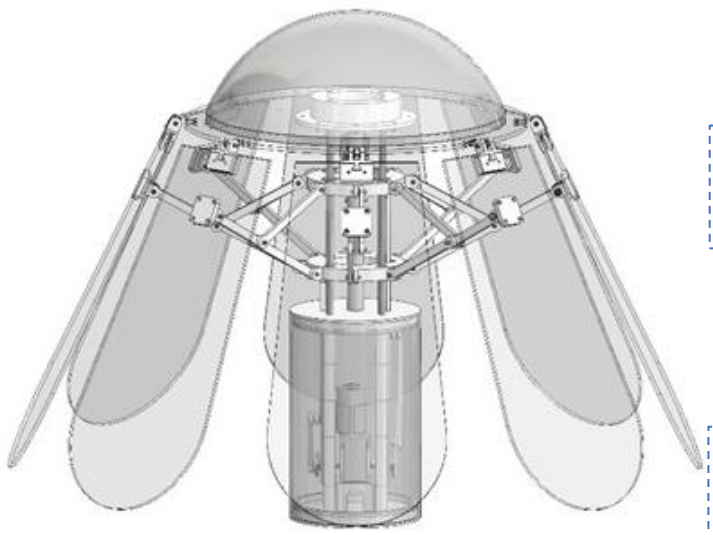
Project Proposal:

- Motion: Crank-slider & multi-linkage system mimics jellyfish propulsion.
- Buoyancy: Ballast water tank enables ascent/descent control.

Product Positioning:

- Positioning: Low-power, low-noise underwater testing platform.

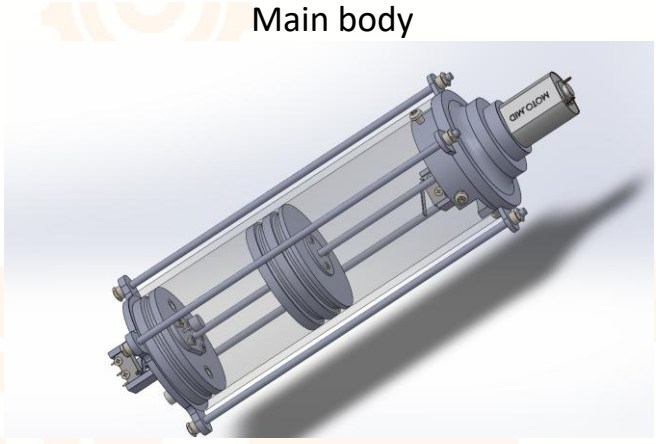
3. 建模设计



Main body

Bionic design

Kinematic optimization



Buoyancy control module

Modular integration

Ⅱ、样机制作

1. Core Structure

Crank-slider and multi-link mechanisms

Key points: Reduce the friction resistance of the connecting rod while increasing its parallelism during rotation.

2. Float Calculation

Drainage flow: 14 mL/s

Chamber volume: 207 mL

Drainage time: approx. 15 s

Ⅲ、创新点

The innovative aspects of this bionic jellyfish robot are:

- Bionic propulsion mechanism
- Modular structural integration
- Kinematic simulation-driven optimization
- Unified monitoring dashboard web interface

致谢

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