Flora Fauna UROV Sprint 2 Review

Grace, Meera, Brooke, Ashlin





Need Statement and Recap from Last week

We need to devise a method for the research team to utilize the provided ROV to collect Antarctic under-ice flora and fauna. This will enable them to enhance the current capabilities of the sub-zero ROV.





Main concept working on this week

- Storage carousel
- Canister tube + filter
- Suction nozzle
- Output attachment



Content

- Tube
 - $\circ \quad \text{Tube length} \\$
 - Tube's material
 - \circ Arm attach on the tube
- Carousel Mechanism
 - Storage
 - \circ Motion
 - \circ Connection
- Thruster
 - Motor
 - \circ Connection
 - Outlet
- Filter





Preliminary design

How does it work?





Preliminary design

Planned materials







Concept Generation-Storage Carousel

Rotating base plates- Doesn't work with fixed inlet/outlet locations, too many parts

Independent rotating plate

Clamp mechanism- unnecessary parts



Friction fit

Null location ("off position")









Preliminary design Scratch - Storage





Prototyping - Carousel









Prototyping - Filter





Preliminary design Scratch - Tube







Prototyping - Tube & Nozzle







Vacuum Outlet





Specifications

Retrieve samples	Suction for acquiring samples and canisters for storage
Operates from 20-30 cm above seafloor	Suction tube 30 cm in length – however will likely require modifying the UROV arm
Fit through 40cm hole	Design fits within the UROV's silhouette
Withstand water pressure	Materials chosen are commonly used in undersea applications
Integrate smoothly with UROV	Uses preexisting space and features. Have approval for the holes to be drilled in the hull



Feasibility assessment

Remaining Risks:

- Integrity of materials under water pressure + suction pressure
- Buoyancy/CoM
- Is the vacuum strong enough?
- Airtight design vs movable parts
 - How tight can we make our tolerances without causing unnecessary wear and tear
 - Smooth rotation of canisters while supporting suction power



Next sprint

Make changes based on data from testing

Buy more materials as needed

Further our prototype builds

- Finish carousel
- Build more storage canisters
- Design modified baseplates for UROV for attachment mechanism, determine specific points of attachment and test ease of removal
- Implement servo motor attachment into carousel
- Work on vacuum arm articulation and attachment

Test our current prototype(s) - see what works and what has room to improve

• Pool? Big bin of water?



Questions?

Do you like it?

Does it make sense?

Is there anything unreasonable?