TEAM PRESENTATION

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Introduction

1. Background Information
2. Designs and Results
3. Progress Report

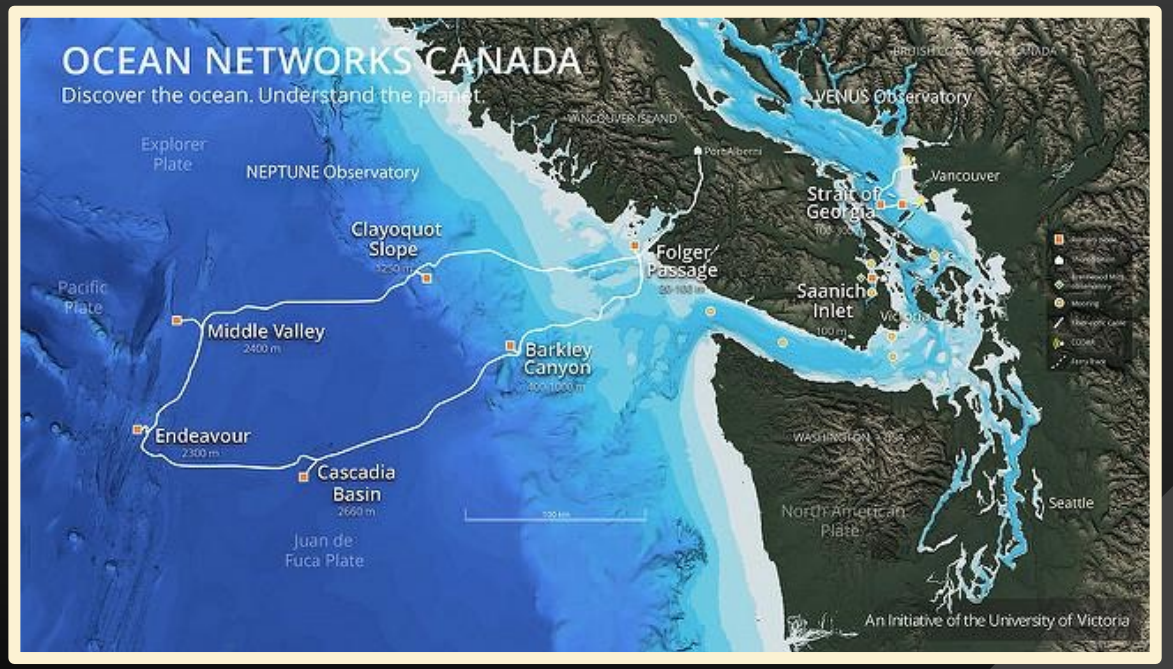
BACKGROUND INFORMATION

The Client:

Ocean Networks Canada (ONC)

- Non-profit organization owned by the University of Victoria
- Collect data about the oceans on the west coast of British Columbia
- Help forecast weather, monitor marine life, and predict earthquakes

[1]



[2]

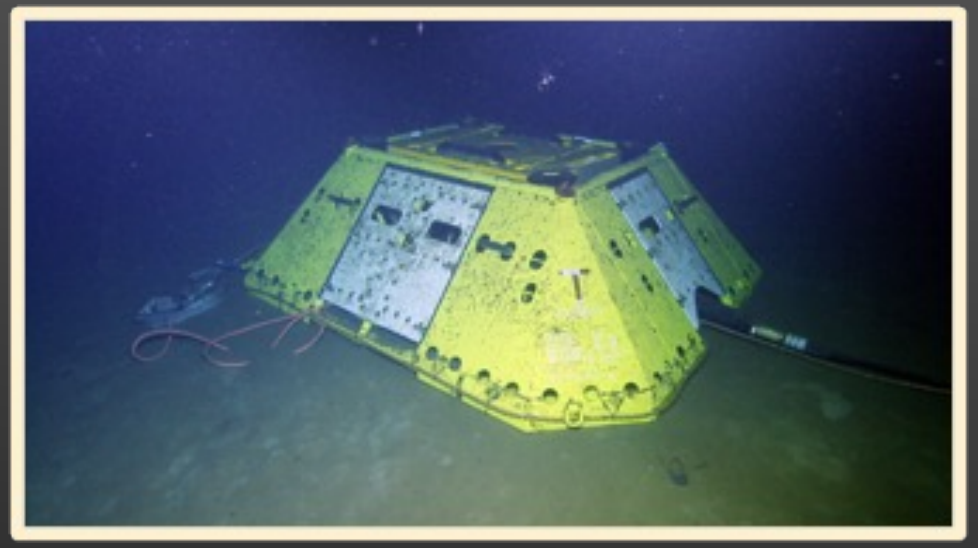
Problem Definition

Ocean debris prohibits ONC's underwater sensors from gathering data

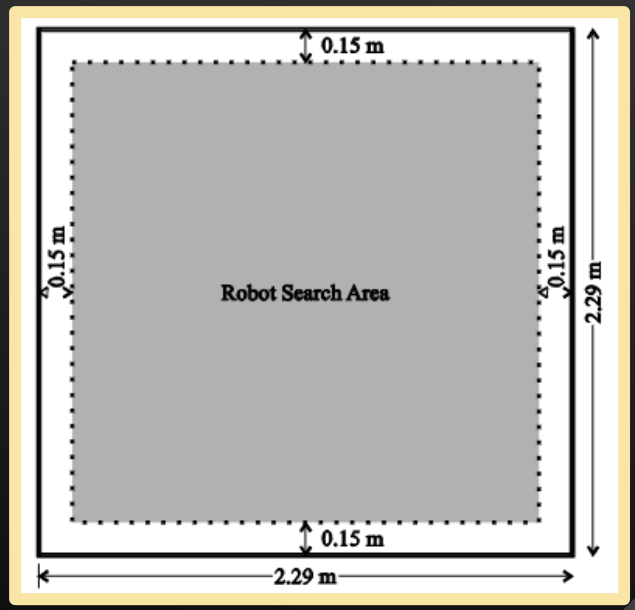
Client Need: Develop a prototype robot to simulate cleaning the ocean sensors in a dry-lab environment.

The prototype must

- Locate the source of an infrared signal
- Place a ping pong ball on top of the infrared source
- Exit the search area once the task is complete
- Maneuver without damaging the ocean floor



ONC Underwater Ocean Sensor [2]

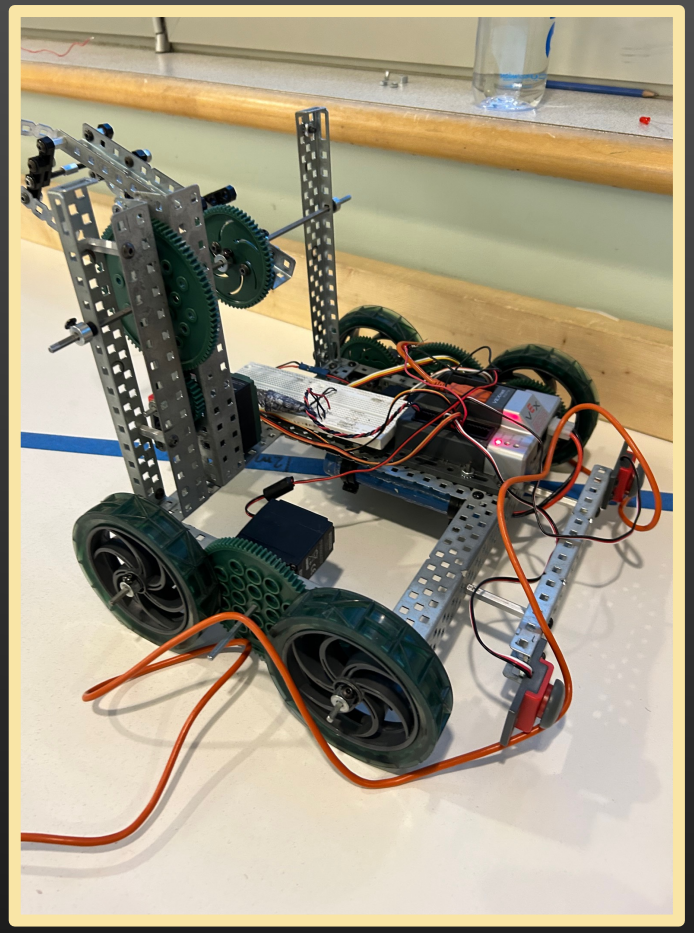


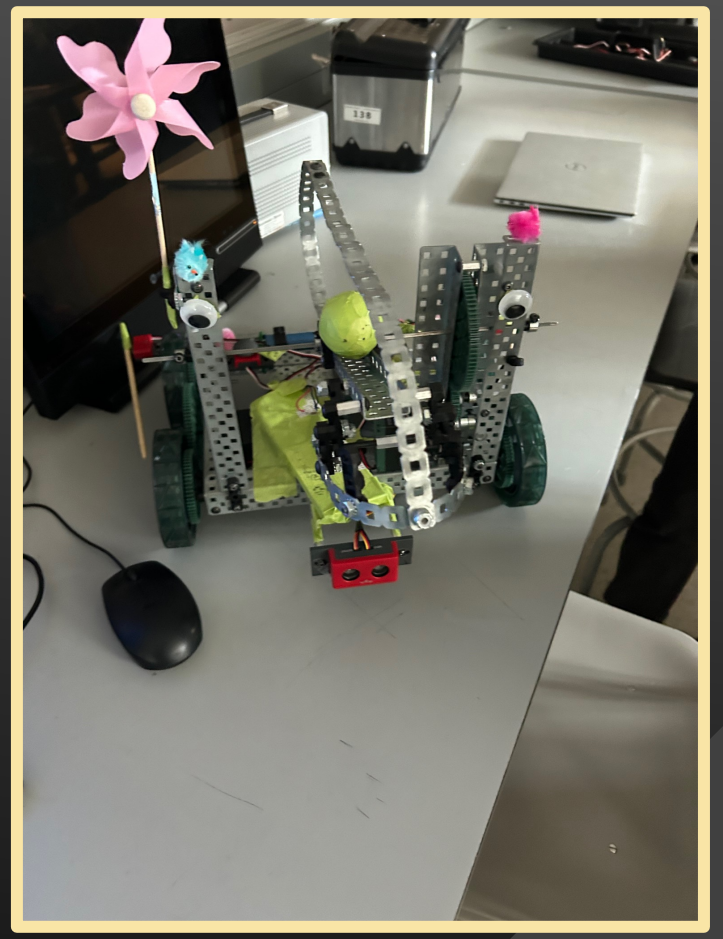
Restricted Area for Demonstration [3]

DESIGNS AND RESULTS

Design 1

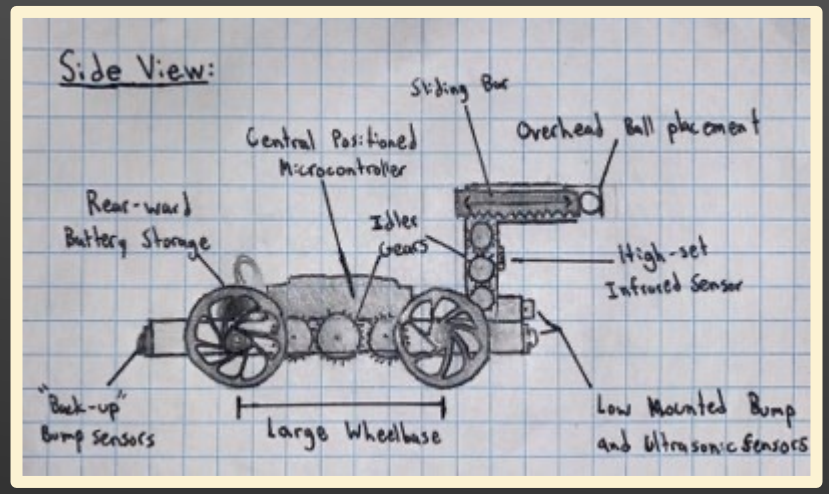
- **Crane-like mechanic for Object Positioning:** Objects can be placed extreme precision.
- **Gear Ratio for Arm Stability and Centralization:** Locks position of Crane in centre.
- **Gear Based Drive System:** Wheels move due to rotational gear.

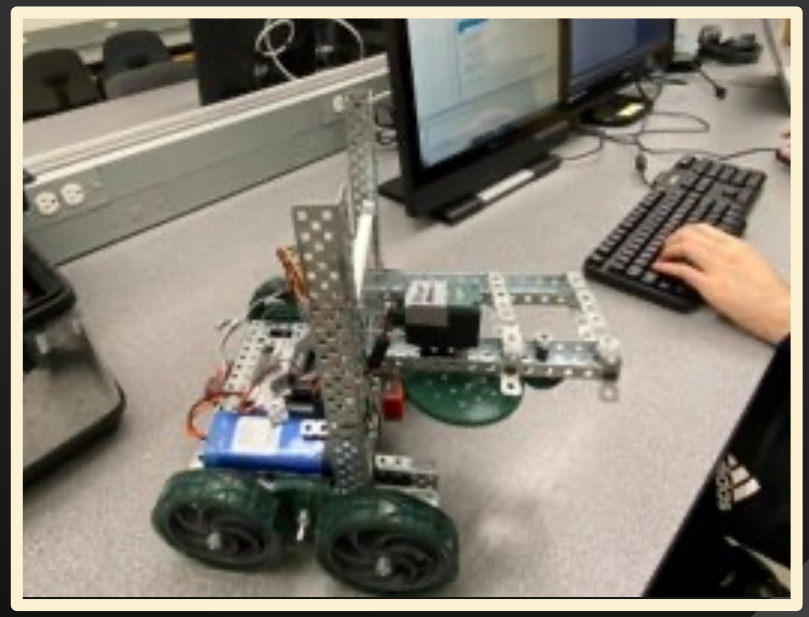




Design 2

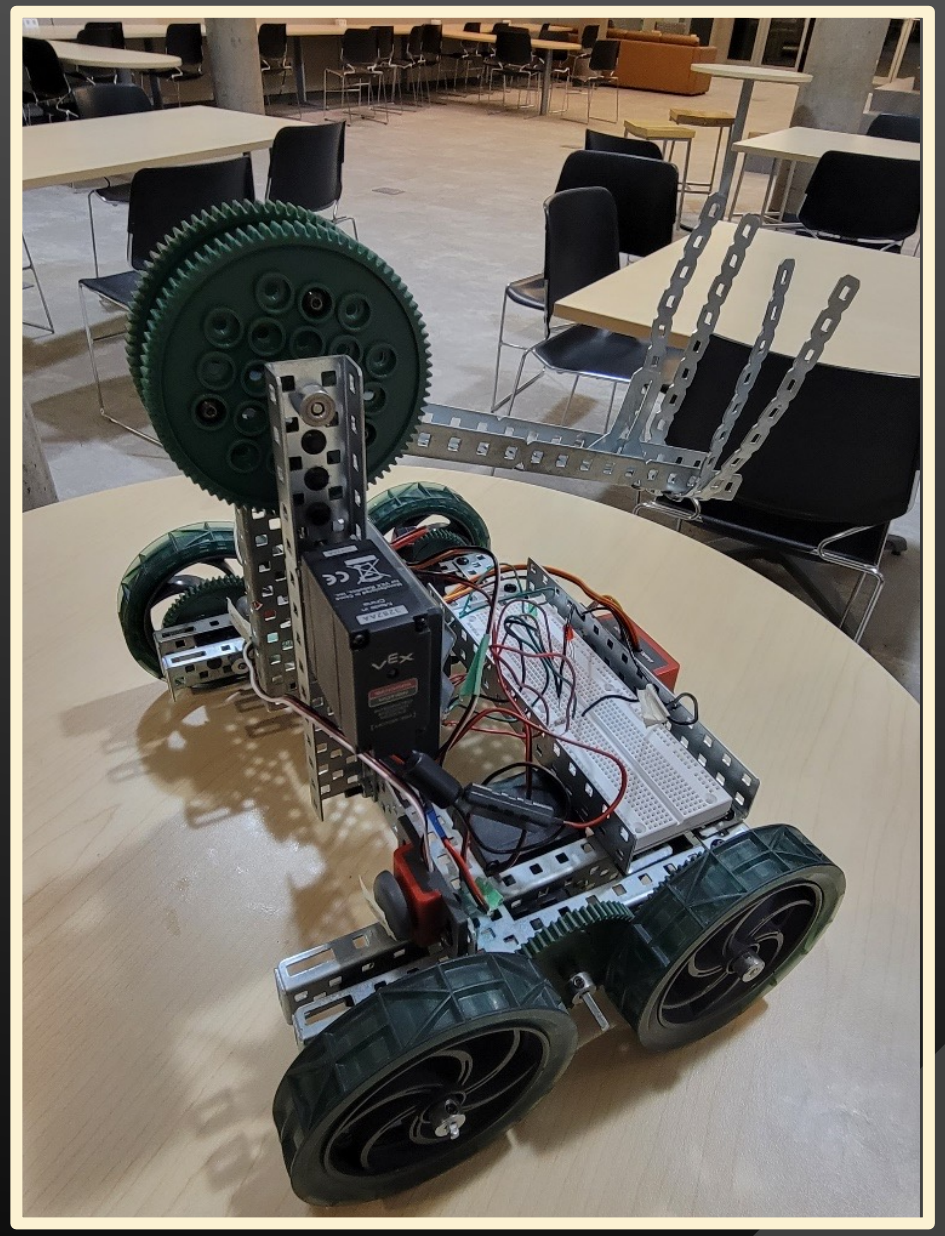
- **Affordability and Compatibility:** Mostly constructed of VEX Robotics components
- **Trapdoor Release Mechanism:** Releases the ball with minimal horizontal velocity
- **High Quality Construction:** Withstands repeated tests and harsh conditions





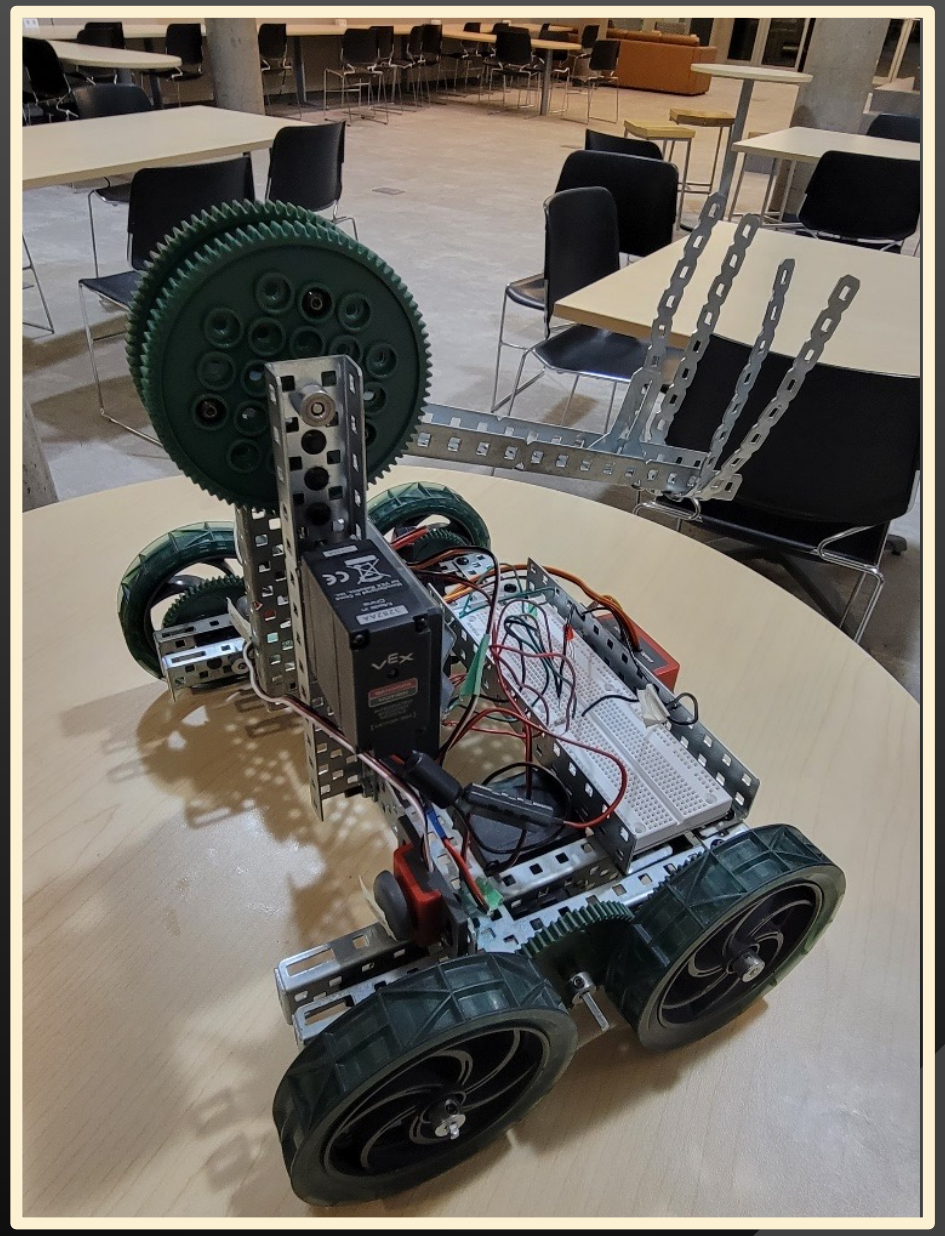
Design 3

- **Accurate and Efficient Navigation:** Precise movement and obstacle detection with an Infrared sensor and a Sonar Sensor.
- **User-friendly controls:** Switch and limit buttons for starting, stopping and sensing side walls.
- **Program Testing and Control:** Program written was designed to be efficient and test-friendly.



Some Problems

- **Experienced issues with multiple sensors:** Initial investigations could not identify and solve the issue.
- **Battery and Charger**: Suspected the issue could be power-related after conducting several testing.
- **Focused on microchip**: Working with a different set of chargers and batteries did not solve the problem. Narrowed down the root cause of the issue to be the micro-controller.
- **Resolved the problem**: Contacting the Help Desk to acquire a new microcontroller which resolved the issues.



Test Results

Criteria	Weight	Design 1 - Manny		Design 2 - Kohen		Design 3 - Arfaz	
		Score (1-5)	Weighted Score	Score (1-5)	Weighted Score	Score (1-5)	Weighted Score
Cost	0.20	4	0.80	4	0.80	4	0.80
Speed	0.05	2	0.10	2	0.10	3	0.15
Quality of Mechanical Systems	0.15	4	0.60	5	0.75	4	0.60
Quality of Electrical Systems	0.15	2	0.30	4	0.60	5	0.75
Quality of Program	0.10	4	0.40	3	0.30	4	0.40
Find IR signal	0.15	4	0.60	4	0.60	4	0.60
Maneuverability	0.05	2	0.10	3	0.15	3	0.15
Place Cleaning Device	0.15	5	0.75	4	0.60	4	0.60
Total	**1.00**		**3.65**		**3.90**		**4.05**

Result Summary

Design	Advantages	Disadvantages
1	Consistent and Precise	Lack of Adaptability
2	Durable and Affordable	Not Ocean Friendly Movement
3	Efficient and Versatile	Fragile Mechanical Frame

Given the results, Design 3 is the recommended solution for ONC

However, we will reassess after final test of Design 2

PROGRESS REPORT

Task Progress

Completed

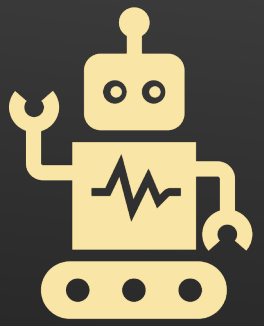
- ✓ Team Charter
- ✓ Work Plan
- ✓ Mechanical Systems Results
- ✓ Electrical Systems Results
- ✓ Final Test and Demonstration (Manny and Arfaz)
- ✓ Record Results

In Progress

- Comparative Analysis
- Conclusion/Recommendation
- Appendices
- References
- Glossary
- Executive Summary
- Letter of Transmittal

Conclusion

Background Information



Designs and Results

Progress Report

References

[1] *About Ocean Networks Canada*. Ocean Networks Canada. https://www.oceannetworks.ca/about-onc/ (accessed Mar. 26, 2023)

[2] T. Dwyer et al., "Ocean Networks Canada: Expedition in Engineering," *Nautilus Live Ocean Exploration Trust,* https://nautiluslive.org/blog/2016/05/16/ocean-networks-canada-expedition-engineering (accessed Mar. 26, 2023)

[3] I. T. Chelvan. Robot Design Project. (2023, Spring). Engineering Design and Communication. Victoria, BC: University of Victoria. [Online]. Available: https://bright.uvic.ca/d2l/le/content/271352/viewContent/2129453/View

QUESTIONS

THANK YOU FOR LISTENING!