

TEC-V

MILESTONE 5

By: Michael Dowling & Zealand Brennan



CLIENT

- DR. Wood
 - **Professor** | Ocean Engineering and Marine Sciences
 - **Program Chair for Ocean Engineering**



MILESTONE 5:

<i>Tasks</i>	<i>Completion%</i>	<i>Michael</i>	<i>Zealand</i>	<i>To Do</i>
Multi Fild Upload	60%	60%	0%	Testing
Styling	90%	90%	0%	Gain user Feedback
Forward Facing Sonar	30%	30%	0%	Review File Types and API
Autonomy	80%		80%	

TOOLS

ROV

- Python
- Data Retrieval

Webpage

- Html + JavaScript
- Environmental creation and control

Autonomy

- Gazebo
- Sensor recognition
- Obstacle avoidance



MILESTONE

TASKS

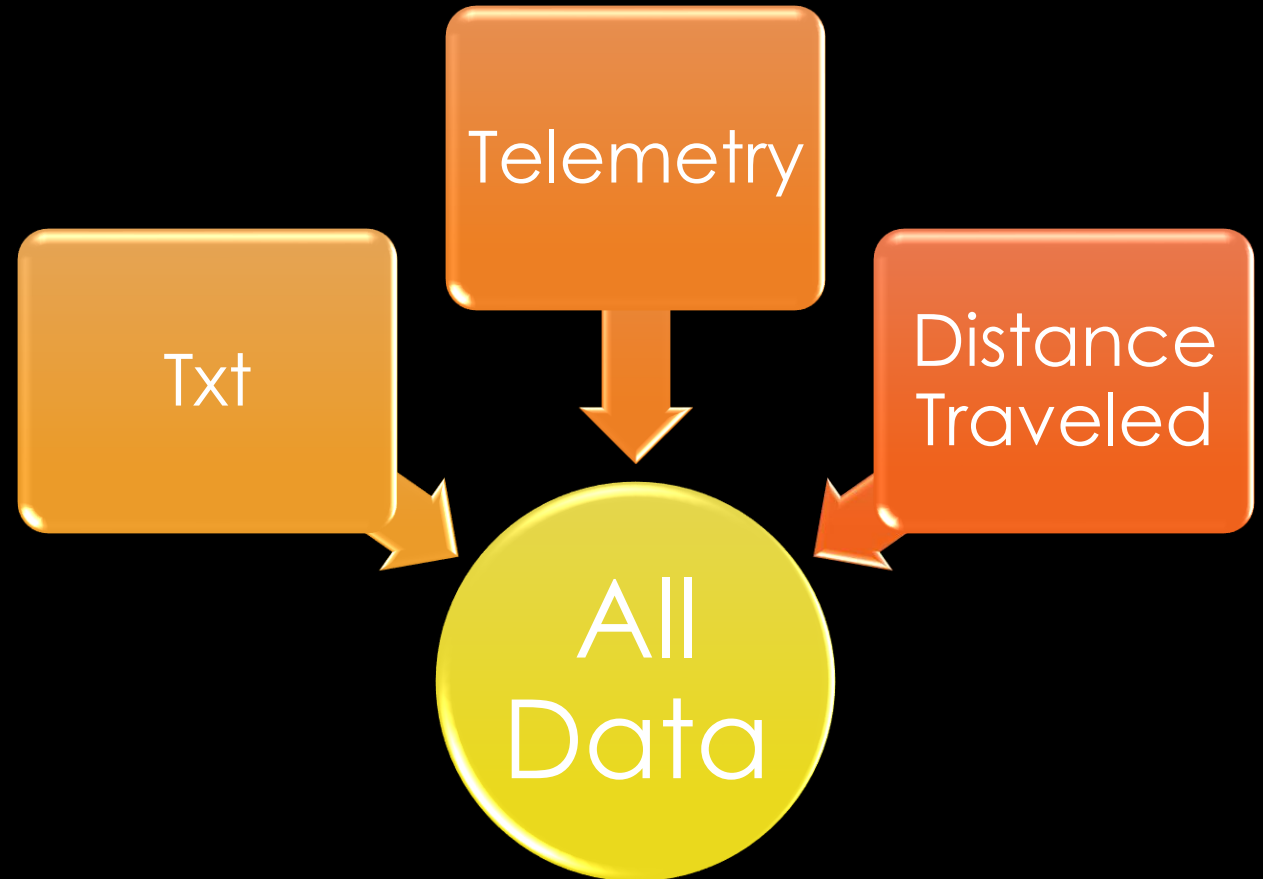


MULTI FILE
UPLOAD

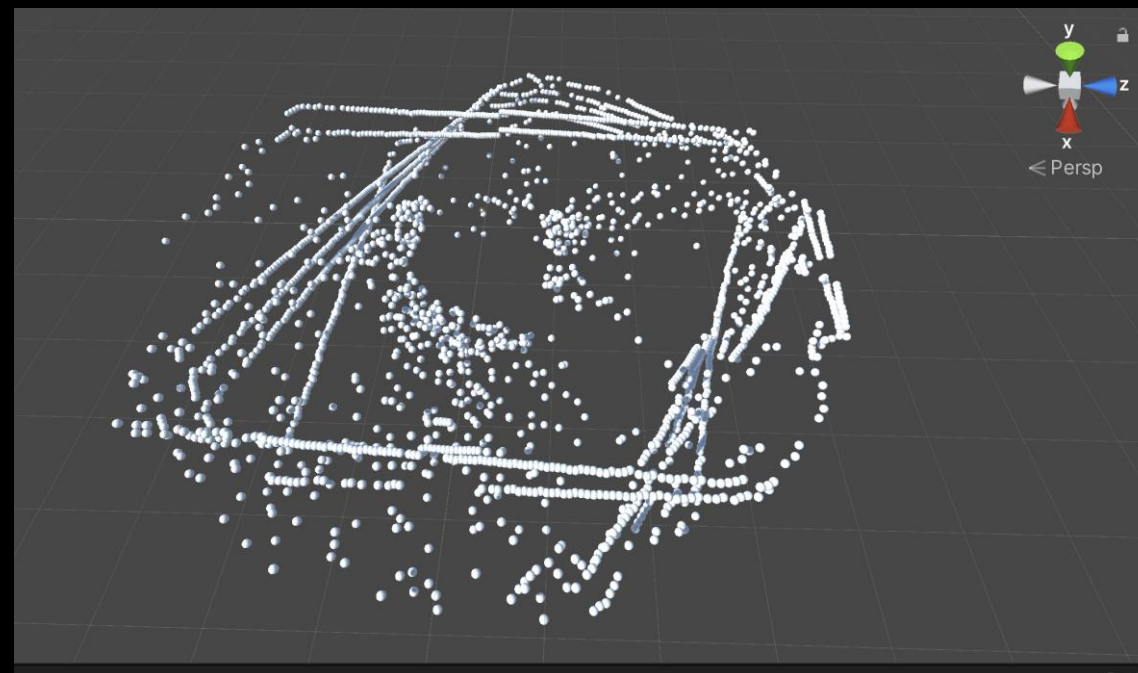
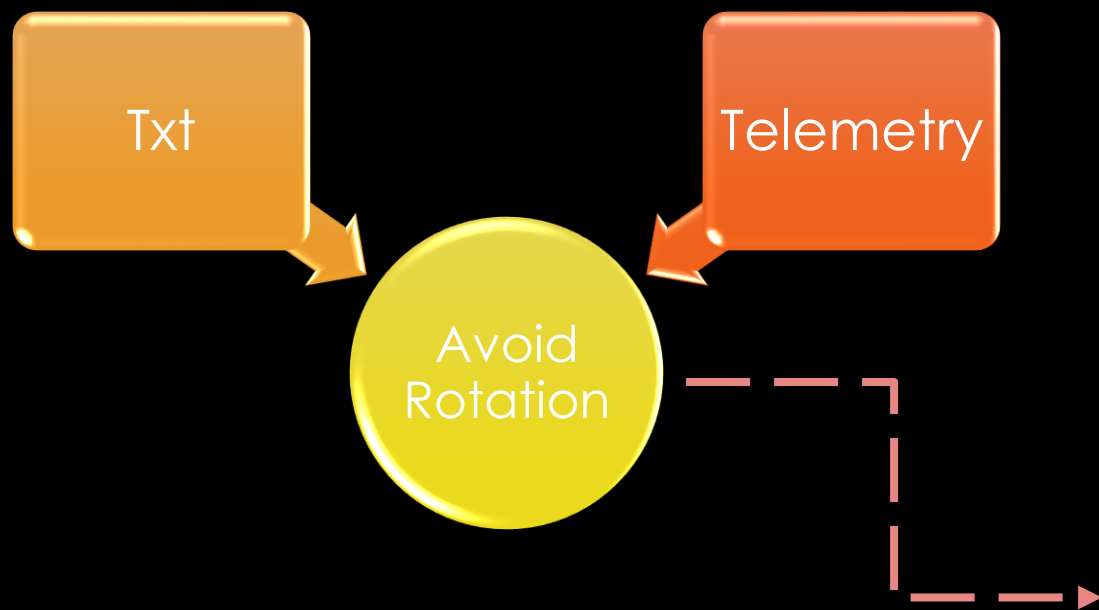
UPDATED FUNCTIONS


Load Coordinates

- Three different possible files:
 - Txt – Holds collected data from sonar
 - Telemetry- outputted by Q-Ground
 - Distance traveled – onboard IMU



WHY?



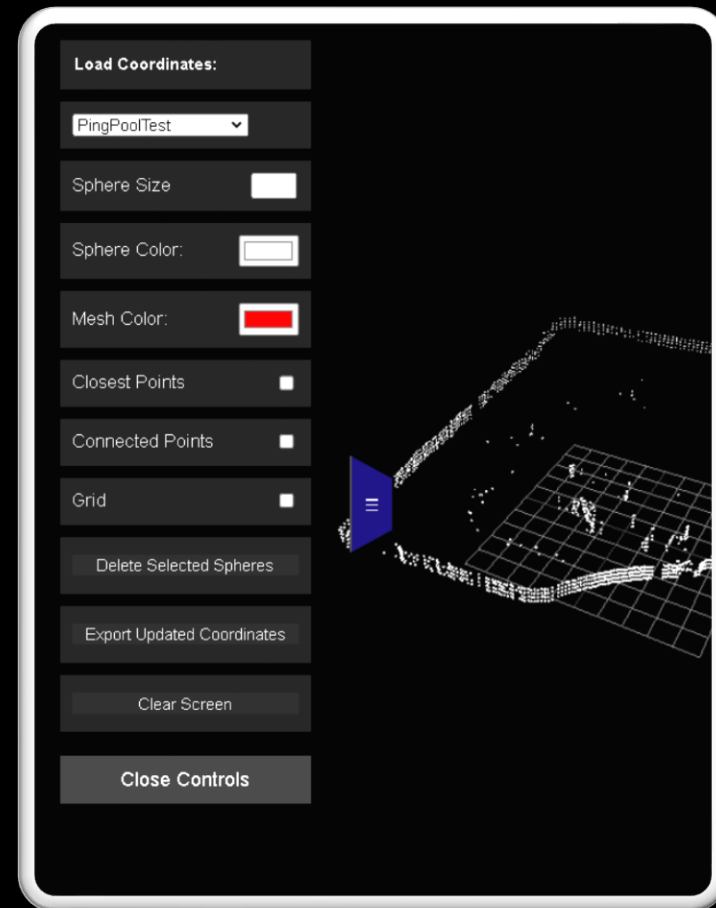


STYLING

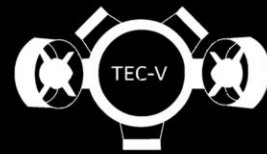
CLIENT FEEDBACK

Edit Layout

- Make it more user-friendly
- Reactive page



UPDATED UI



Load
Coordinates:

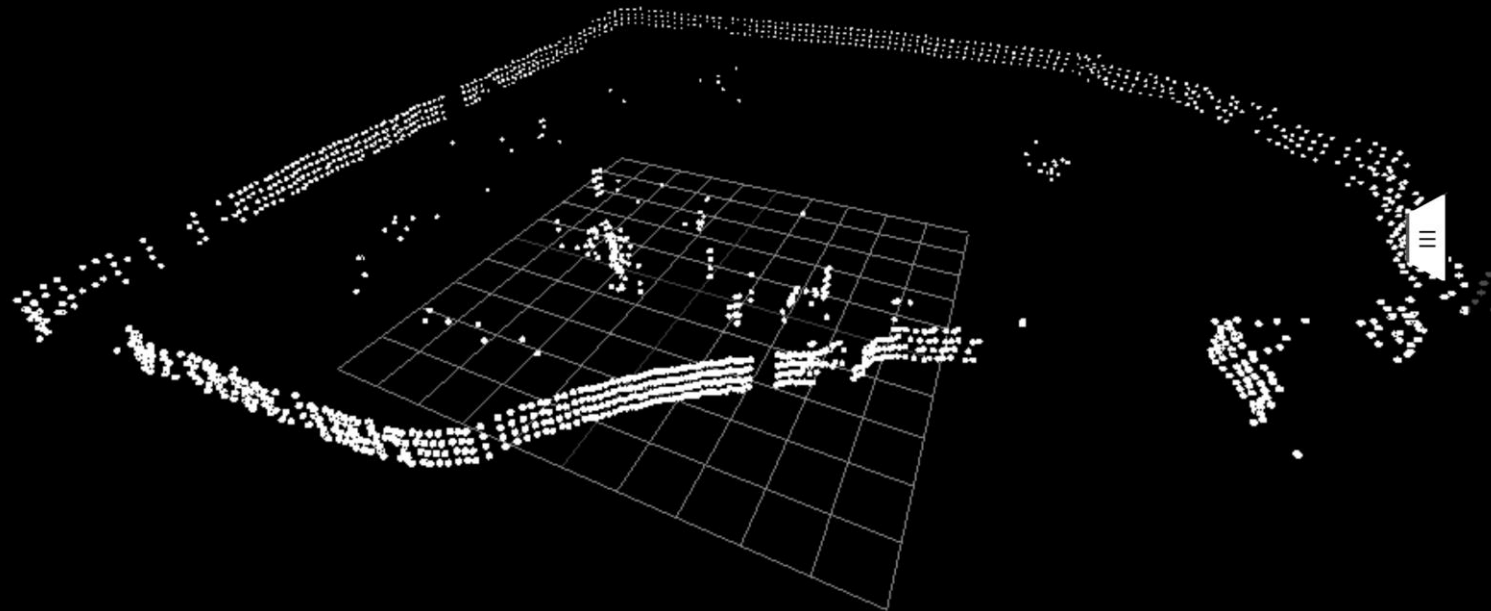
PingPoolTest

Delete Selected
Spheres

Export Updated
Coordinates

Clear Screen

Close Controls



Sphere
Size

Closest
Points

Connected
Points

Grid

Sphere
Color:

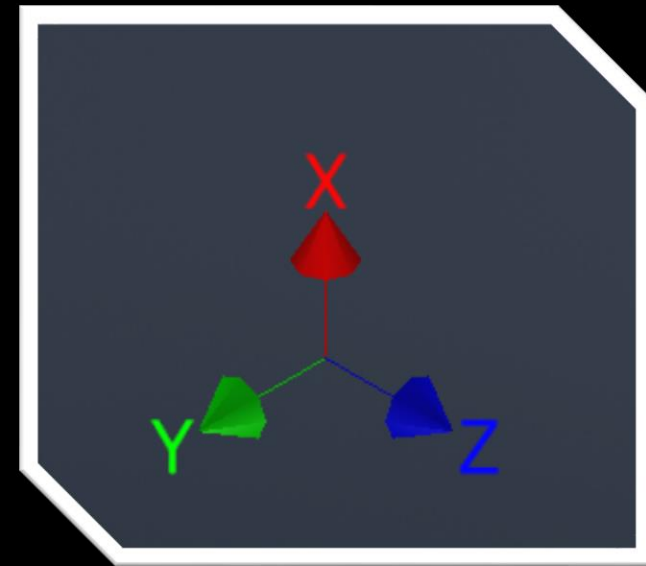
Mesh
Color:

Close Controls

PLANNED FEATURES

Coordinate Layout

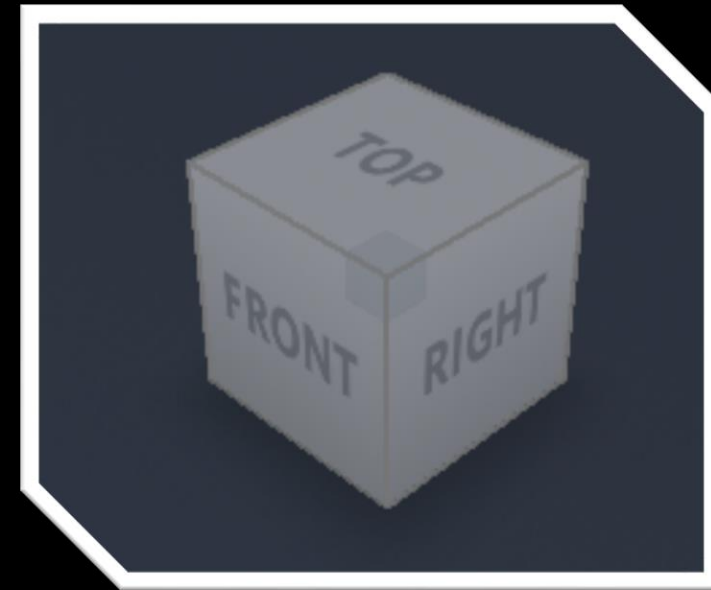
- Allow users to understand orientation of the object



PLANNED FEATURES

View Model

- Allow users to quickly focus on the model and choose a viewing location.





NEW SONAR

SOLUTION 1

File Format

- Read Files using API documentation
 - `.svlog`
 - “Sonar View” Proprietary format
 - API did not work.
 - Declared structure
 - Partial Read

```
SVLog_reader.py > ...
1  import struct
2
3  # Define the structure of one entry according to the provided fields
4  entry_structure = [
5      ('os_mono_profile', 'I'),
6      ('ping_number', 'I'),
7      ('start_mm', 'I'),
8      ('length_mm', 'I'),
9      ('timestamp_ms', 'I'),
10     ('ping_hz', 'I'),
11     ('gain_index', 'H'),
12     ('num_results', 'H'),
13     ('sos_dmps', 'H'),
14     ('channel_number', 'B'),
15     ('reserved', 'B'),
16     ('pulse_duration_sec', 'f'),
17     ('analog_gain', 'f'),
18     ('max_pwr_db', 'f'),
19     ('min_pwr_db', 'f'),
20     ('transducer_heading_deg', 'f'),
21     ('vehicle_heading_deg', 'f'),
22     ('pwr_results', 'H') # Assuming pwr_results is an array of u16, need
23 ]
24
25 # Function to unpack a single entry
26 def unpack_entry(file_stream):
27     entry_data = {}
28     for field_name, field_type in entry_structure:
29         if field_name != 'pwr_results':
```

MAIN ISSUES

Direct SSH

- Directly connect to sonar
 - Retrieve only the required Data
 - Does not work

```
Test.py > send_command
1 import socket
2 import json
3
4 IP_ADDRESS = '192.168.2.92' # Replace with your sonar's IP address
5 PORT = 51200 # Replace with your sonar's port
6
7 def send_command(command):
8     with socket.socket(socket.AF_INET, socket.SOCK_STREAM) as sock:
9         try:
10            sock.connect((IP_ADDRESS, PORT))
11            print("Connected to OmniScan 450.")
12            sock.sendall(command.encode('utf-8'))
13            print("Command sent.")
14        except Exception as e:
15            print(f"An error occurred: {e}")
16
17 if __name__ == "__main__":
18     # Example command to set start_mm to 0, adjust pulse_len_percent a
19     command = json.dumps({
20         "id": 2197,
21         "params": {
22             "start_mm": 0,
23             "pulse_len_percent": 10, # Adjust as needed
24             "filter_duration_percent": 10 # Adjust as needed
25         }
26     })
27     send_command(command)
```



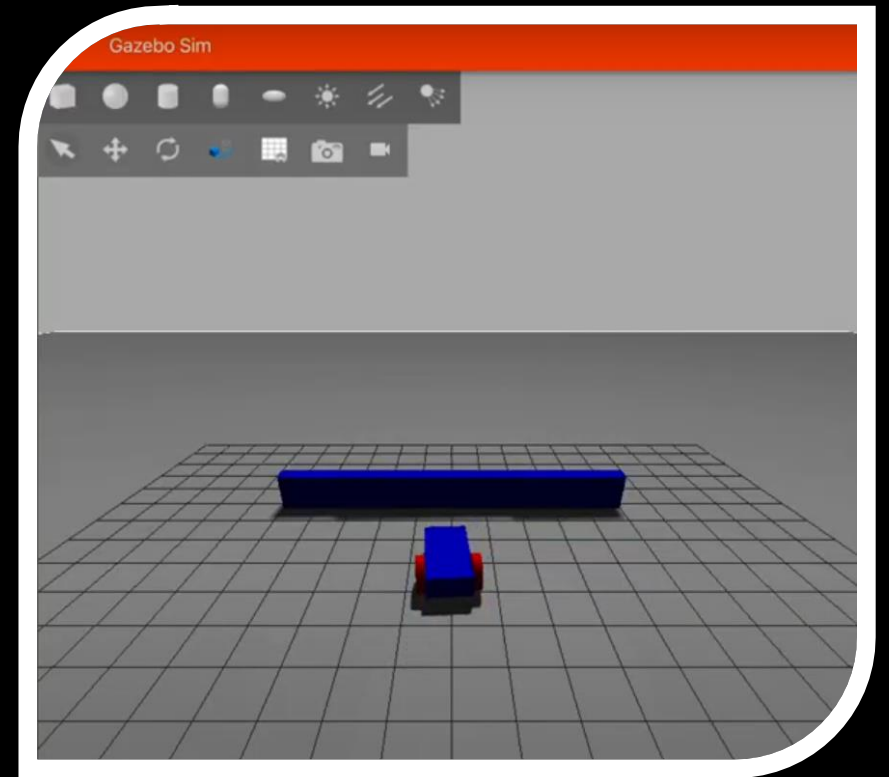
AUTONOMY

GAZEBO - SENSORS

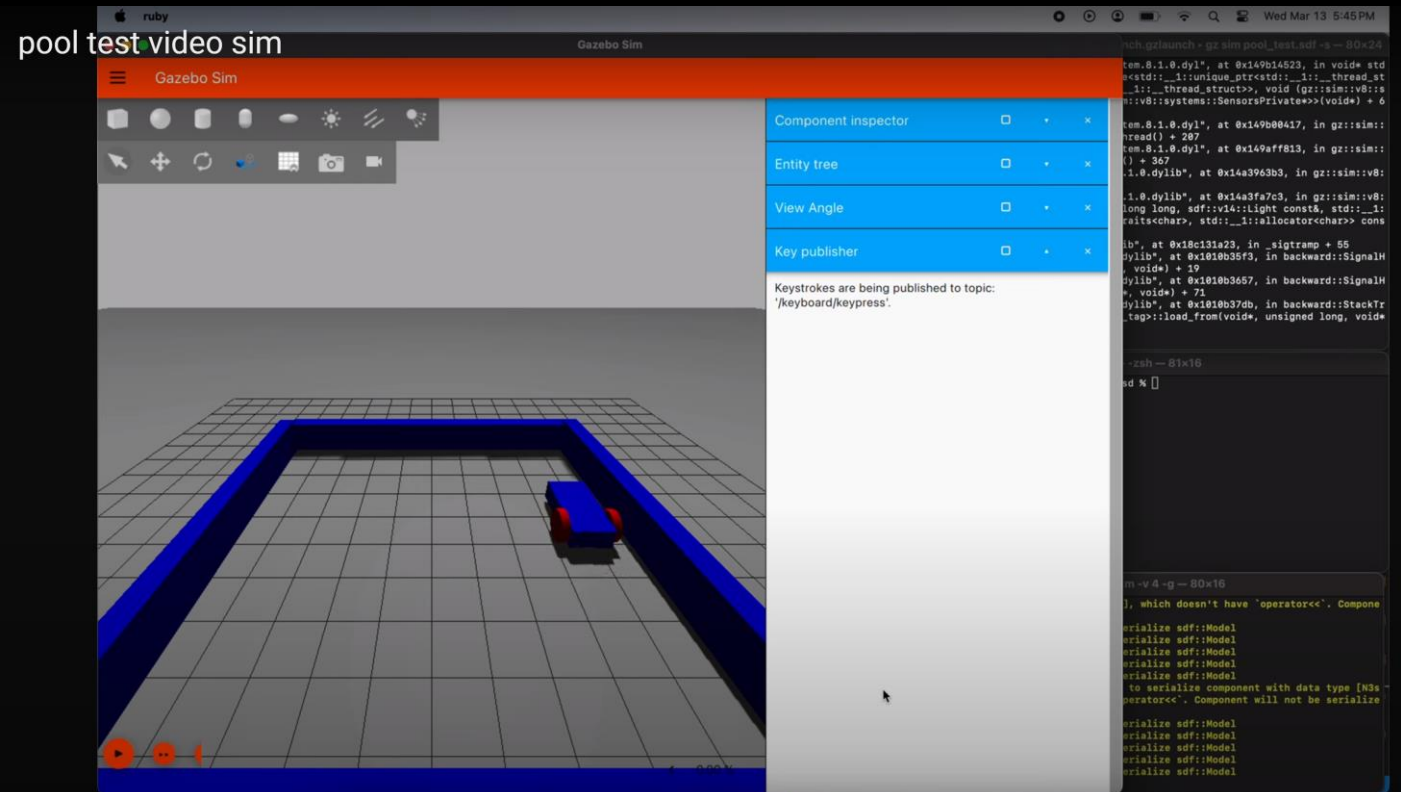
IMU

Contact Sensor

Lidar



GAZEBO



https://youtu.be/LZ0vSPYP_a4

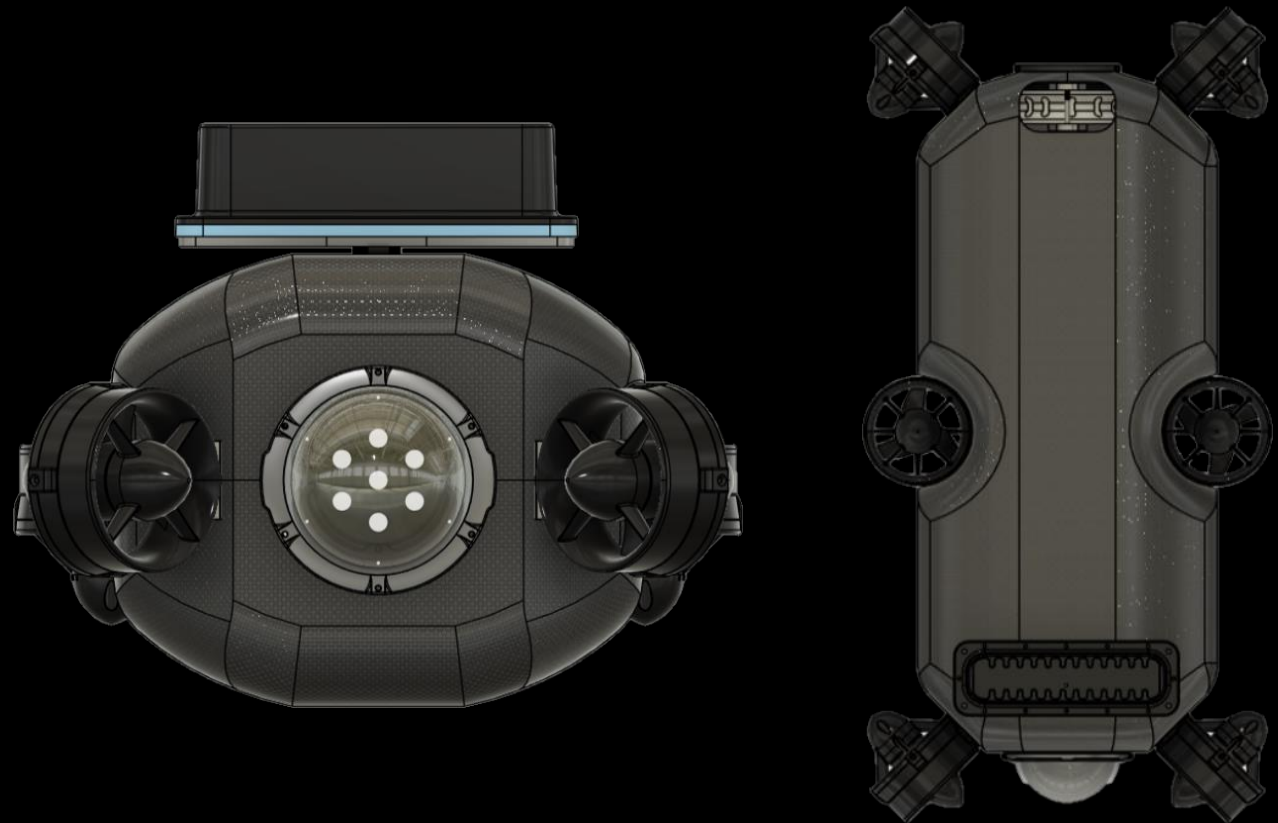


MILESTONE 6

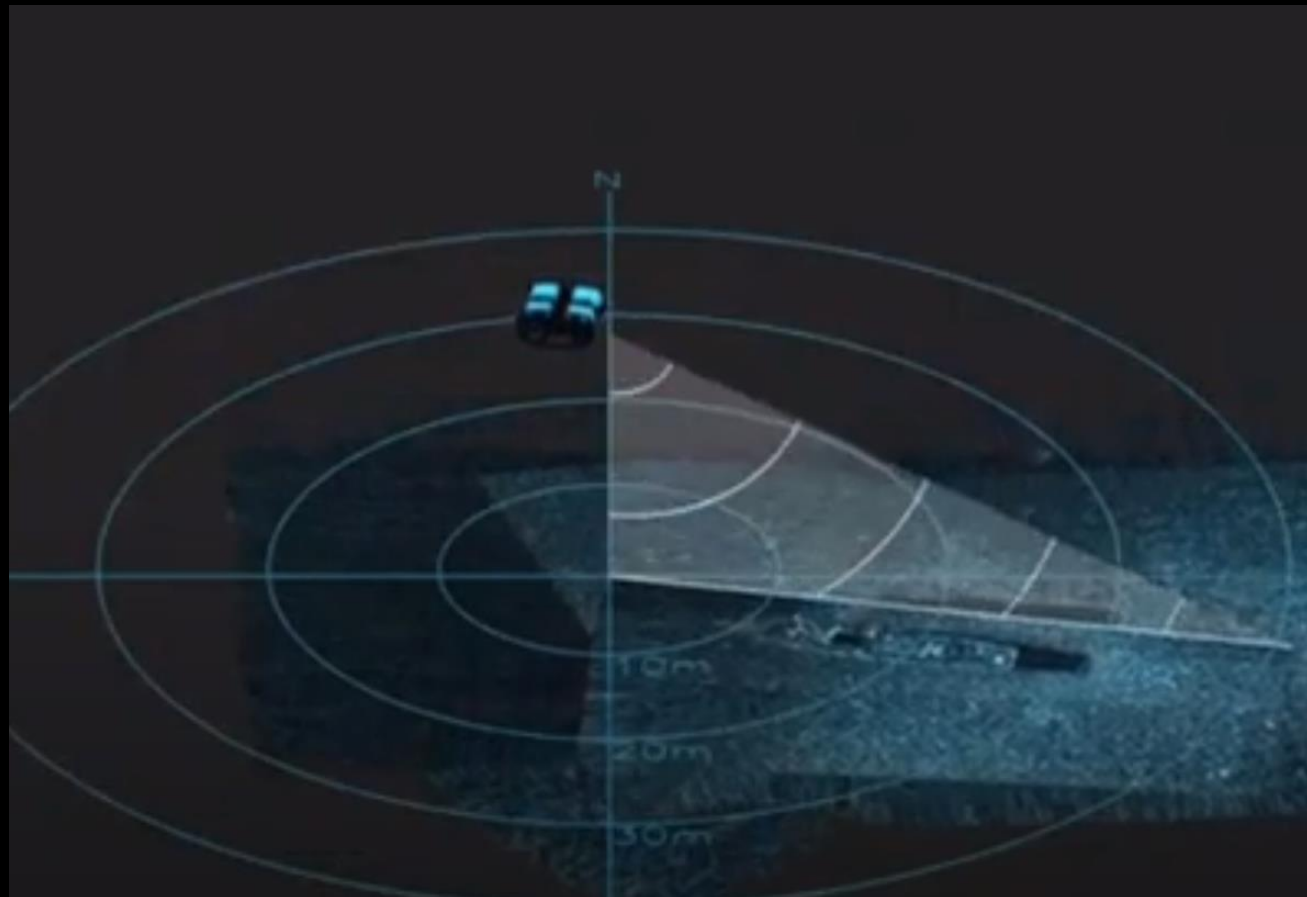
MILESTONE 6:

Task	Michael	Zealand
Testing	Gain valuable data from an actual cave system and see how well we can rebuild it.	
Homepage Website Redesign	Simplicity and usability must be altered.	
Cloud Plot Webpage	Determine possible risks and solutions to vast datasets.	
Autonomy	Implement decision making	

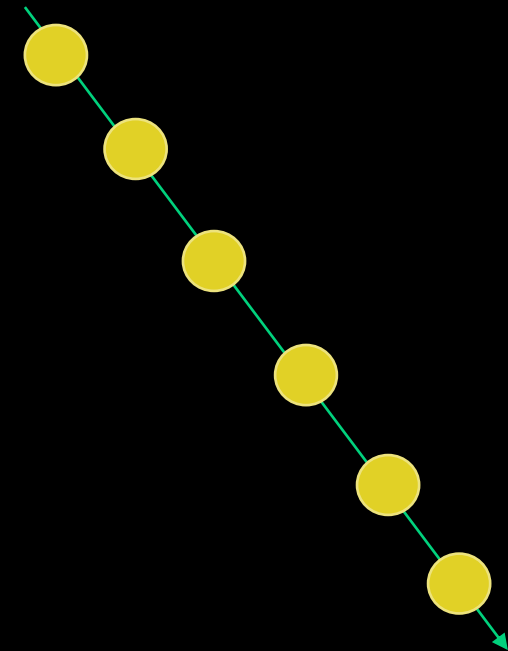
OMNISCAN 450 FS



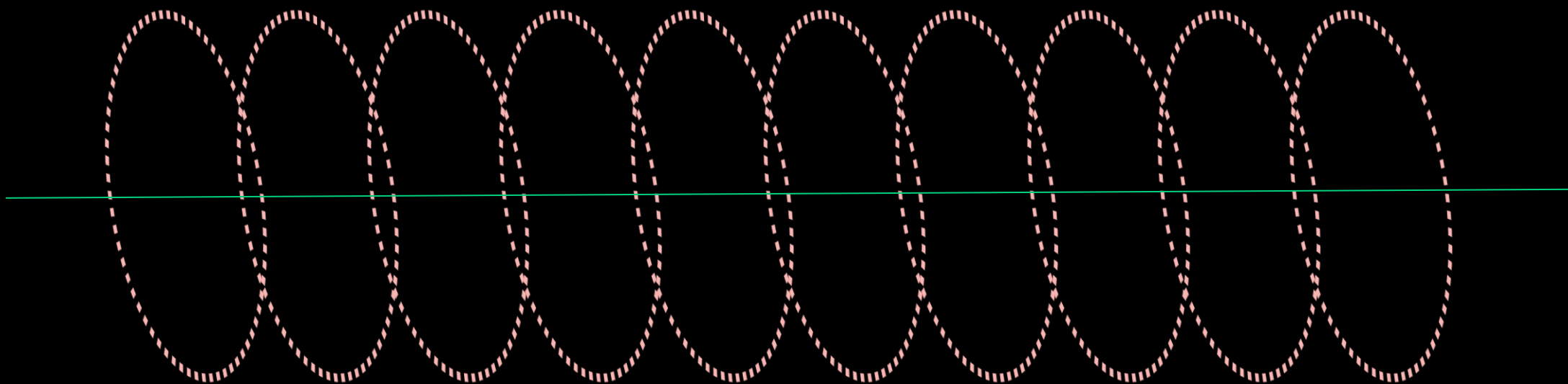
OMNISCAN 450 FS



PING 360



PING 360



SHOWCASE POSTER



TEC-V

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Faculty Advisor(s): Marius Silaghi, Dept. of Electrical Engineering and Computer Science, Florida Institute of Technology

TEC-V:

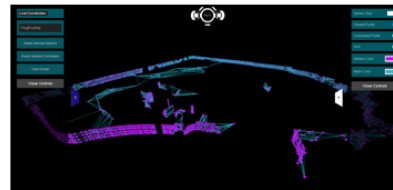
- T- Topographic
- E- Exploration
- C – Cave
- V – Vehicle

Purpose:

- Cave Mapping
-
-
-
-



Cloud plot Webpage:



Functions:

- File Upload
- File Export
- Delete Data Points
- 2 Forms of line Connection
- Color Adjustments

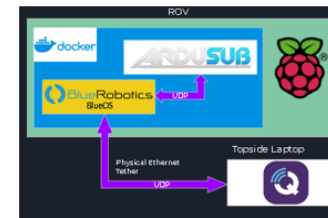
Points of interest:

• WEBPAGE:

-
-
-

• AUTONOMY:

-
-
-



LIVE DEMO

TEC-V- Cloud Plot

https://bluecodehydra.github.io/3DCloudPlot_Webpage/

WEBPAGE LINK

TEC-V

https://bluecodehydra.github.io/FIT_Project-TEC_V/data.html

QUESTIONS?

