

TEC-V

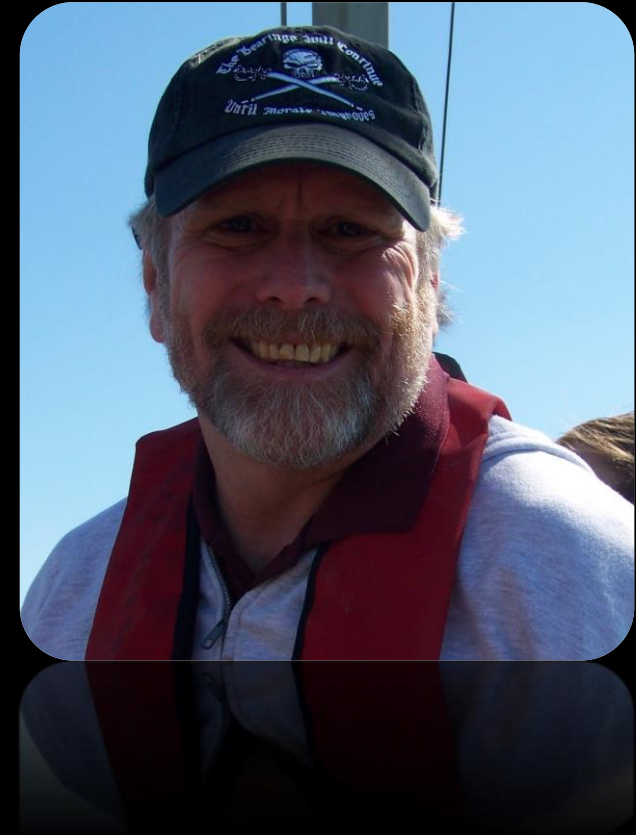
MILESTONE 5

By: Michael Dowling & Zealand Brennan



CLIENT

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



MILESTONE 5:

Tasks	Completion%	Michael	Zealand	To Do
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

INITIAL FUNCTIONS

Load Coordinates

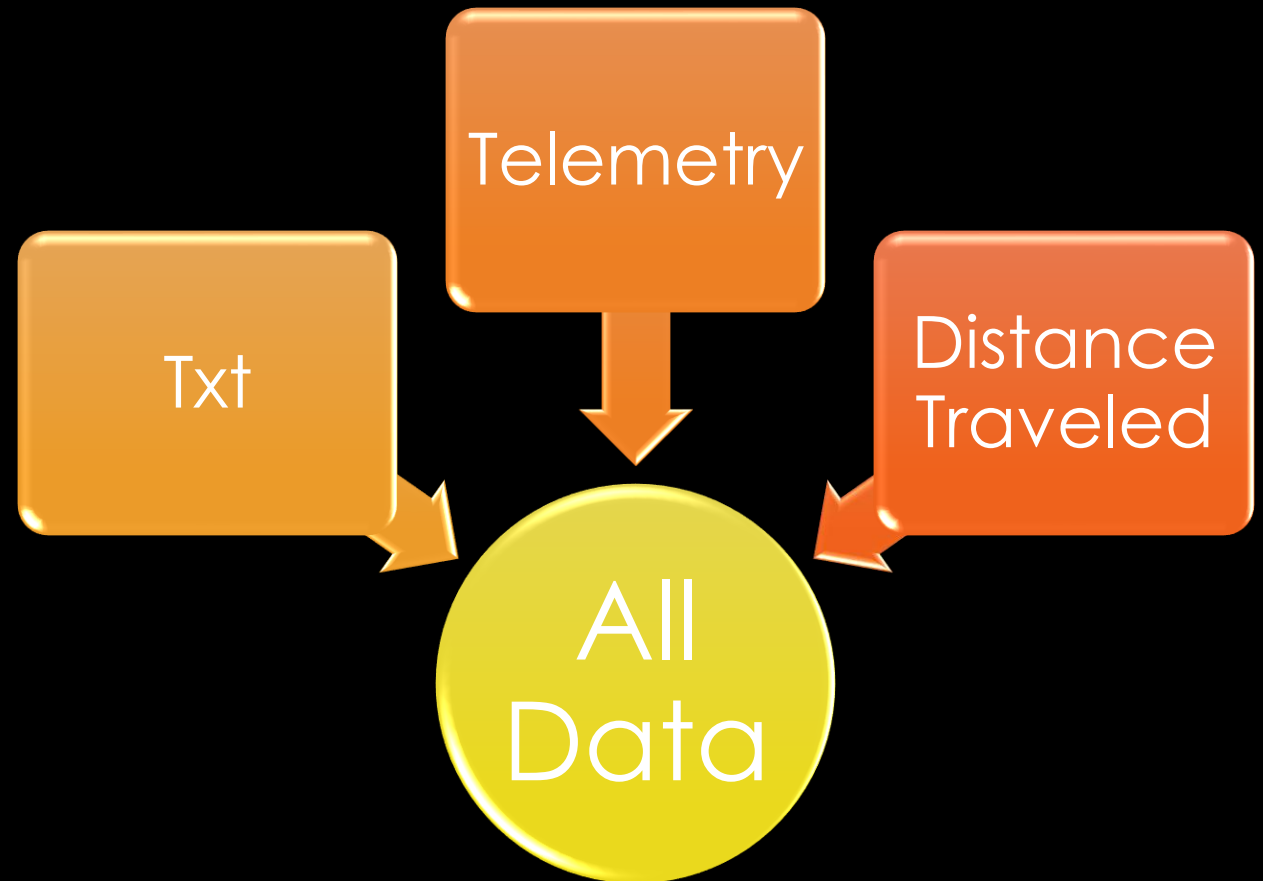
- Opens file explore
 - Allows only .txt extensions to be selected

```
TestFiles > Omniscan Sample 1.svlog
55  US !5: Gs A 0 < RI i US C FF J 5p N enq A * ETX ( # y ; F B ] , < ( NAK v H s t x A C FF
60  },
61  "message": {
62    "pitch": 0.02059021219611168,
63    "pitchspeed": -0.0027733170427381992,
64    "roll": -0.002021550899371505,
65    "rollspeed": -0.0004942654049955308,
66    "time_boot_ms": 1878720,
67    "type": "ATTITUDE",
68    "yaw": 2.87296462059021,
69    "yawspeed": -0.08060027658939362
70  }
71  }*[BR  BS NUL NUL ETX NUL NUL NUL NUL NUL B NUL NUL l CS NUL 7 ACK NUL NUL EOT : NUL US NUL
72  < > ) ' 8 ; 36 ` g v ` _ SOH j s / v h \ t q Kb ( n NAK O
73  q US | Ep DEL | W f % \ w [ l \ X F ] { Bu SI q j y
74  k ` mx { Q # z = DEL _ _ DEL * \ U ] DC1 ~ [ y 0 D = o ] n
75  [ RS wh ESC E DEL W ] s q S ] ~ d [ 2 2 " X l $ &
76  P + ! } | - g { o } o } BS t W FS FF ( 6
77  J < P " L s O M E H M 8 K D CR = BC A A - NUL E M BEL C [ K G S G E M ) # 00 : J BS 5 \ ?
78  9 R 6 Am B " SOH I @ G B NUL X M *
79  = DEL 0 H R S C 7 @ z A > ' RD % O NAK = + DEL 1 ! A I $ - 2 Di @ 1 f K ) - 0 0 SD % ^ B
80  "header": {
81    "component_id": 1,
82    "sequence": 183,
83    "system_id": 1
84  },
85  "message": {
86    "pitch": 0.02048434503376484,
```

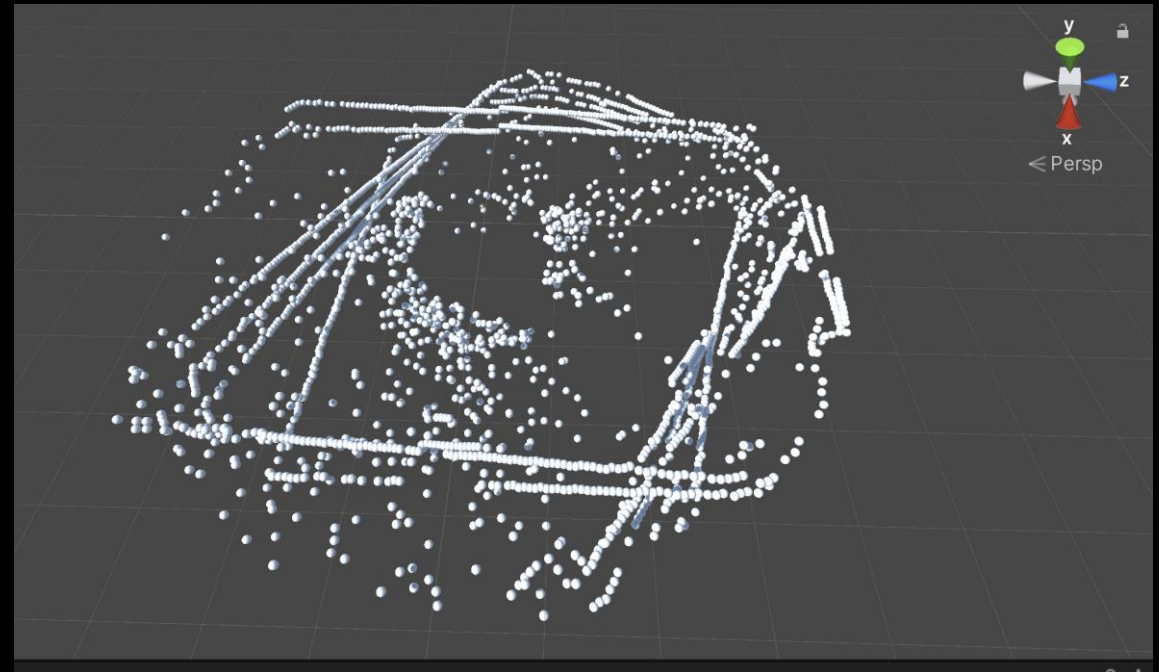
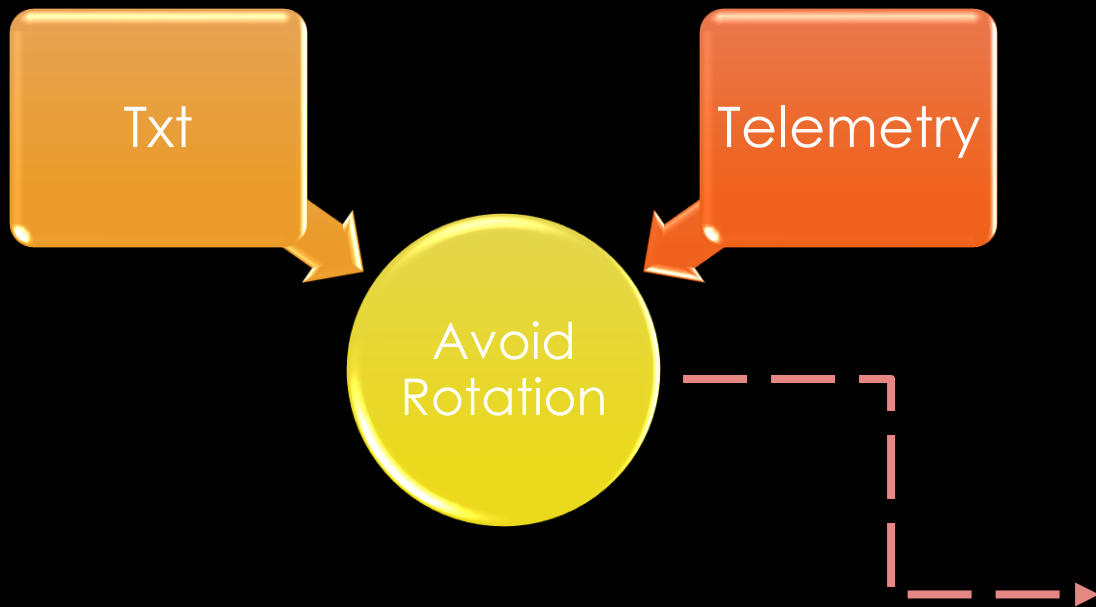
UPDATED FUNCTIONS

Load Coordinates

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



WHY?



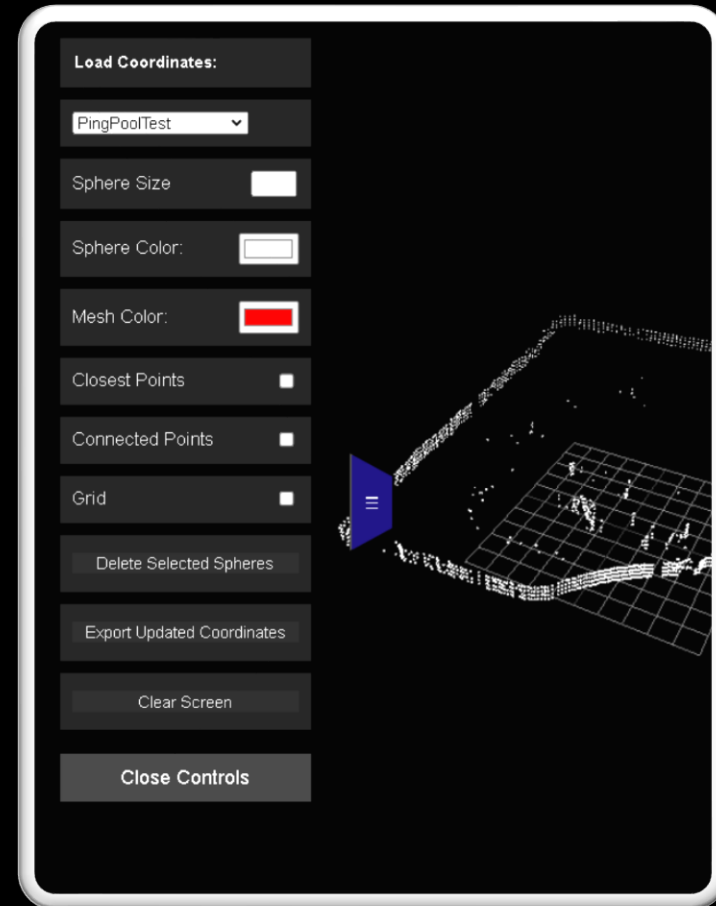


STYLING

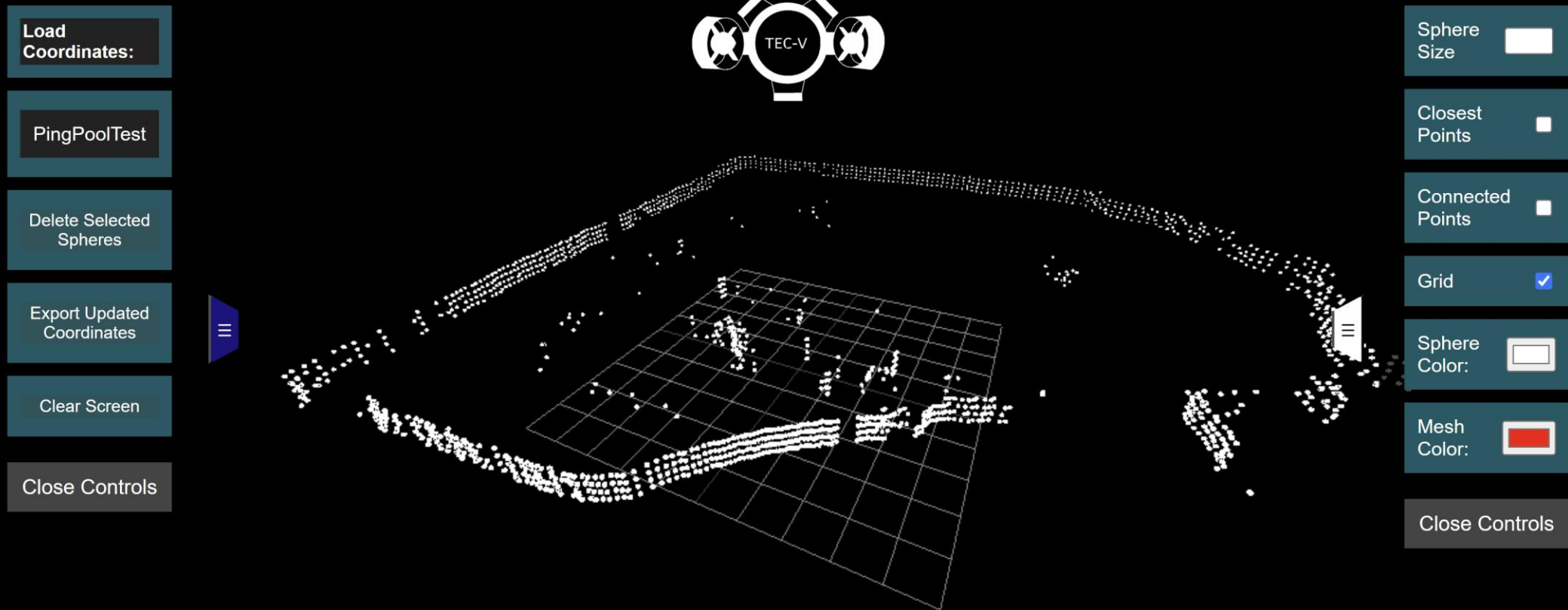
CLIENT FEEDBACK

Edit Layout

- Make it more user-friendly
- Reactive page



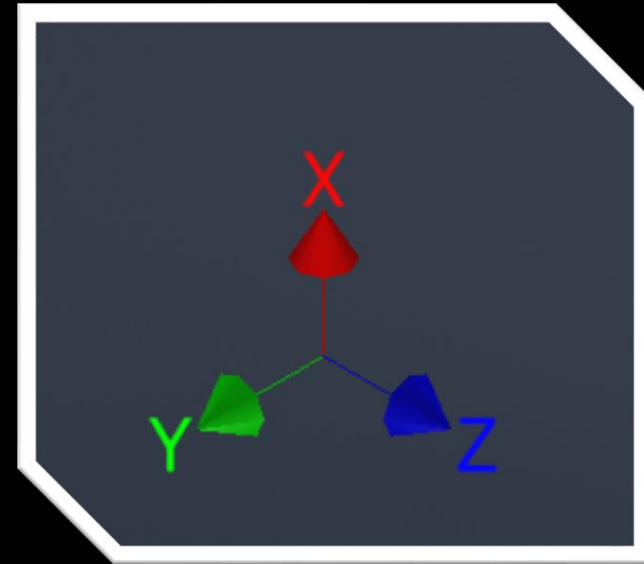
UPDATED UI



PLANNED FEATURES

Coordinate Layout

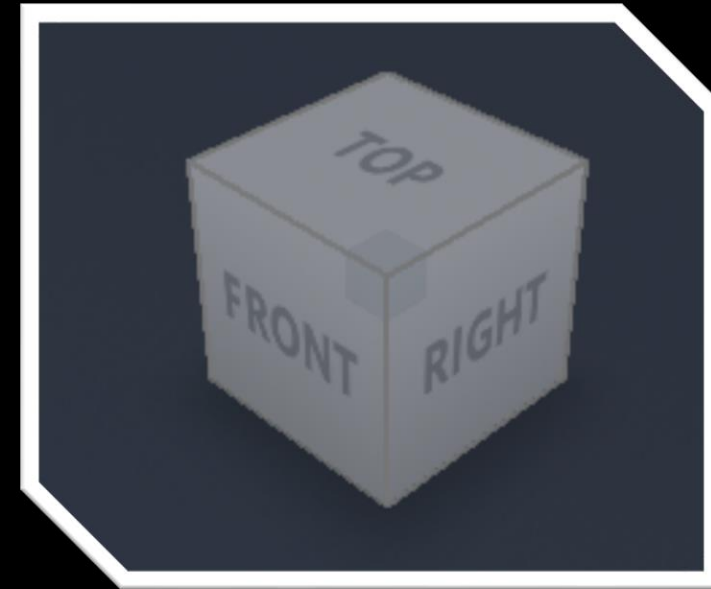
- Allow users to understand orientation of the object



PLANNED FEATURES

View Model

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





NEW SONAR

MAIN ISSUES

File Format

- Three different types:
 - .sl2
 - Could not identify
 - .svlog
 - “Sonar View” Proprietary format
 - .xtf
 - Standard side scan sonar filetype

```
TestFiles > Omniscan Sample 1.svlog
55  US!5:GS A<RIi US CFFJ5pNENQA*ETX(#y ;F B],<(NAKVHStxAC
60  },
61  "message": {
62    "pitch": 0.02059021219611168,
63    "pitchspeed": -0.0027733170427381992,
64    "roll": -0.002021550899371505,
65    "rollspeed": -0.0004942654049955308,
66    "time_boot_ms": 1878720,
67    "type": "ATTITUDE",
68    "yaw": 2.87296462059021,
69    "yawspeed": -0.08060027658939362
70  }
71  }*[BR BS NULNUL ETXNULNULNULNULNULNUL B NULNUL1 GS NUL7 ACKNULNULNUL EOT: NUL U8NUL
72  <v'8;36`g v`_SOHj s/vh\ t qKb(nNAK04
73  qUS|EpDEL|Wf%\w[1\X F]{BuSI qjy
74  k`mx{ Q#Z=DEL _ *U] DCI~[ y0D =ô] n
75  [ RS wh ESC EDELW] s qS] ~ d 2 2 2 2 "X1l s&
76  P + ! } | -g { o } o } BS t W FS FF (6P
77  J<P" LsOQM E H M8K D CR=BC A - NUL EM BELC[K GSG EM] #00: J BS 5?
78  9R6 AmB " SOH I@G B NUL X M*
79  =DEL0 H RS C 7 @zA > 'RD%0 NAK = + DEL 1 ! A I $ -2Di@ 1fK) - 00 SD% ^B
80  "header": {
81    "component_id": 1,
82    "sequence": 183,
83    "system_id": 1
84  },
85  "message": {
86    "pitch": 0.02048434503376484,
```

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 as
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)
```



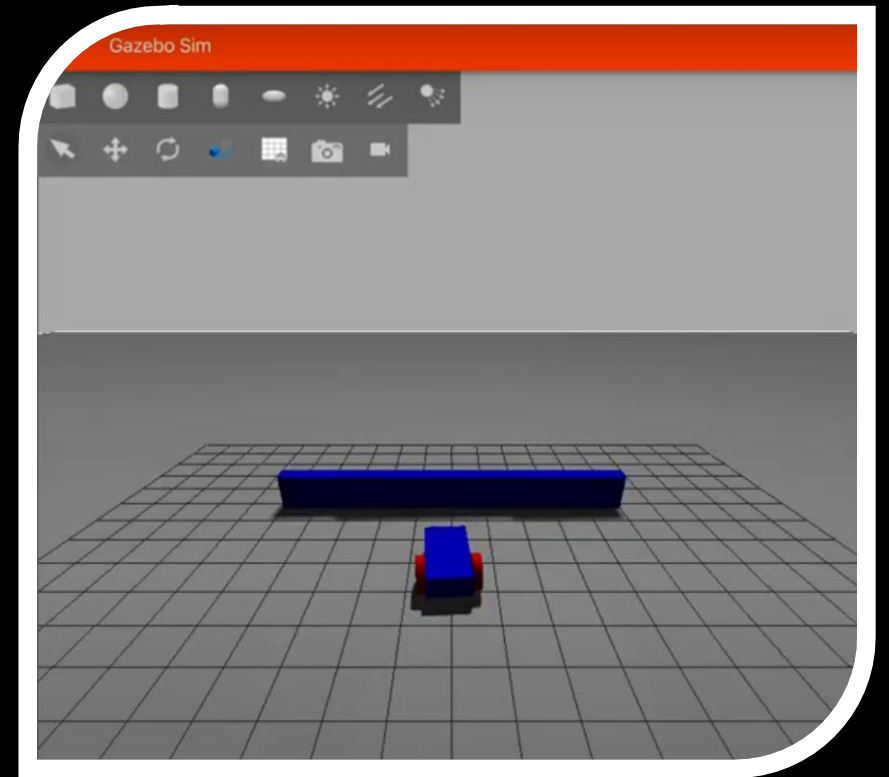
AUTONOMY

GAZEBO - SENSORS

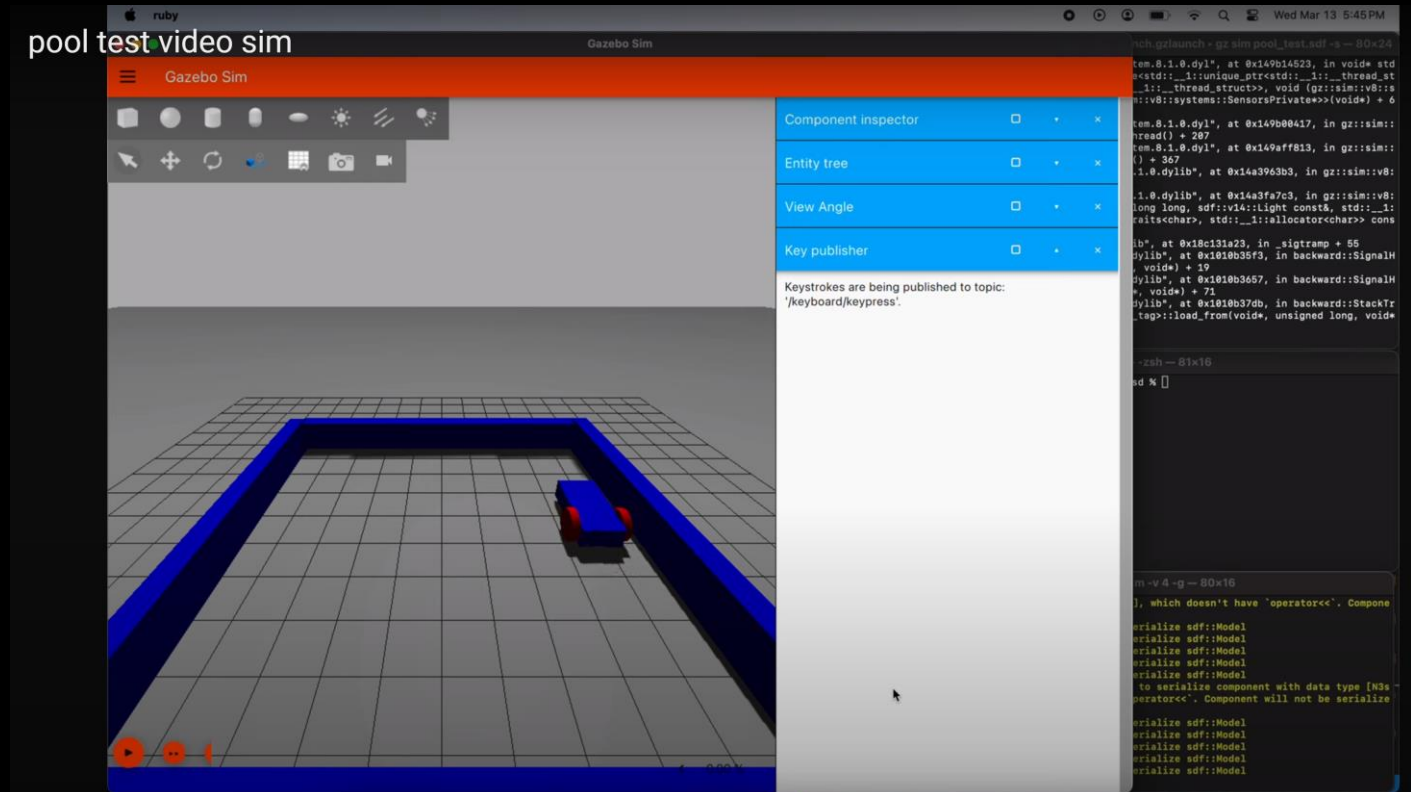
IMU

Contact Sensor

Lidar



GAZEBO



https://youtu.be/LZ0vSPYP_a4



MILESTONE 6

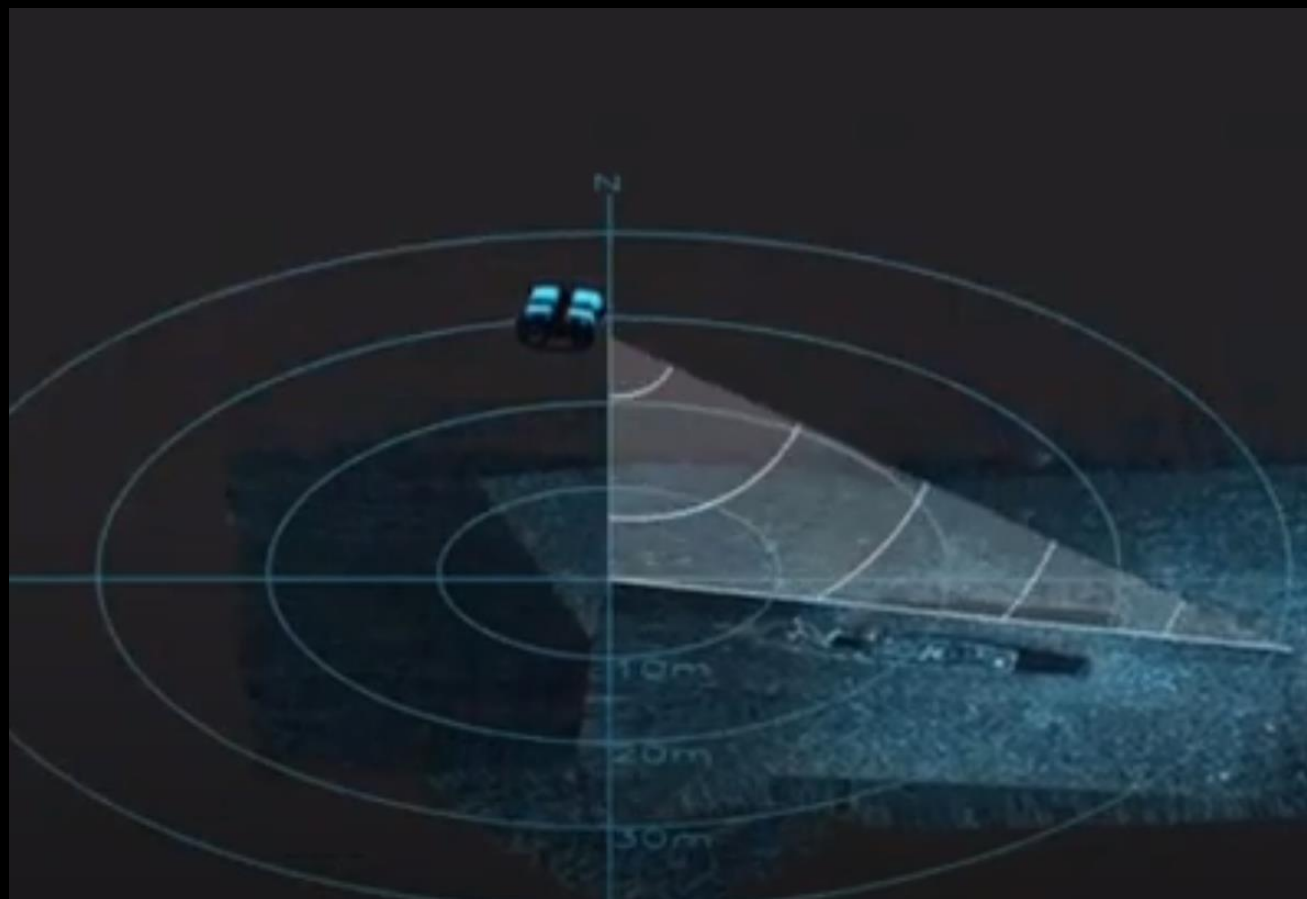
MILESTONE 6:

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	

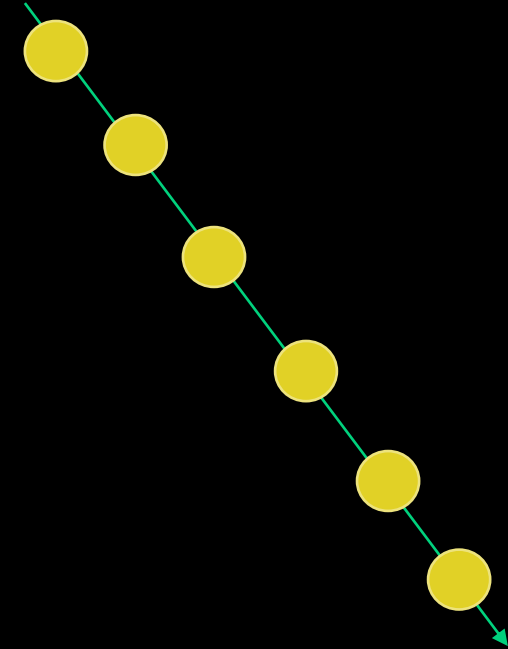
OMNISCAN 450 FS



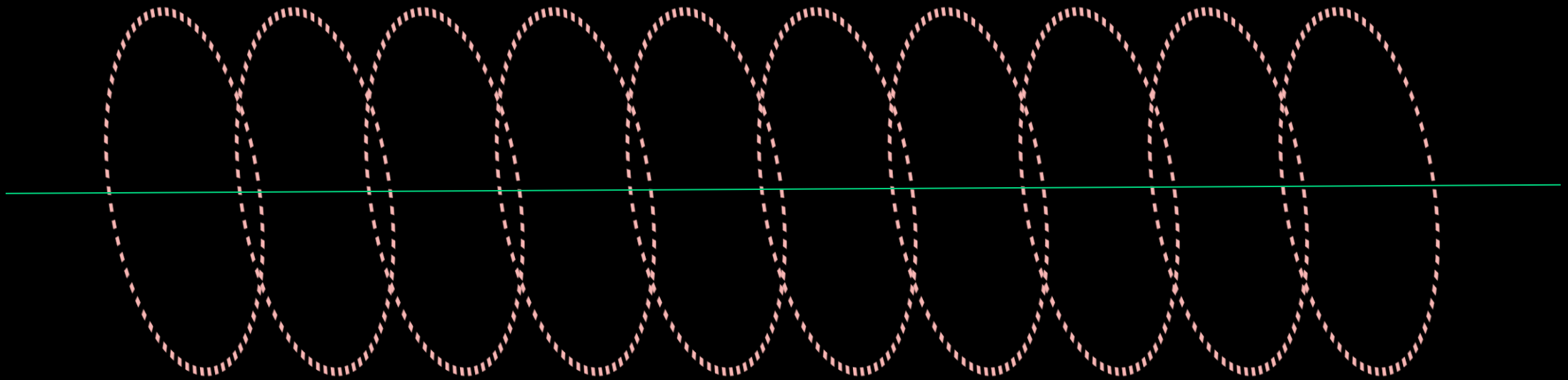
OMNISCAN 450 FS



PING 360



PING 360



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?

