# 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	Completi on%	Michael	Zealand	Το Οο
Multi Fild Upload	60%	60%	0%	Testing
Styling	90%	90%	0%	Gain user Feedback
Forward Facing Sonar	30%	30%	0%	<b>Review File Types and API</b>
Autonomy	80%		80%	

#### TOOLS

#### ROV

PythonData Retrieval

#### Webpage

 Html + JavaScript
Environmento creation and control

#### Autonomy

- Gazebo
  - Sensor
  - recognition
  - Obstacle avoidance





#### INITIAL FUNCTIONS

#### Load Coordinates

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

TestFiles >	≅ Omniscan Sample 1.svlog	
	us ! 5 � : � G gs A � O � < R I I US C FF � J � 5 p N ENQ A � * ETX ( � # y _ � ; � F � B ] , � < ( NAK V H STX A C FF	an - House
	},	And a second sec
61 🗠	"message": {	in the second
62	"pitch": 0.02059021219611168,	and the second s
	"pitchspeed": -0.0027733170427381992,	perne. Taks
64	"roll": -0.002021550899371505,	Size-
	"rollspeed": -0.0004942654049955308,	
	"time_boot_ms": 1878720,	<b>BERNARD</b>
	"type": "ATTITUDE",	Server .
	"yaw": 2.87296462059021,	Seattle
	"yawspeed": -0.08060027658939362	
70	}	Service States
	}*[BR	and the search of the search o
	<b>◇◇◇◇◇◇◇◇◇◇◇◇◇◇◇◇◇◇◇◇◇◇◇◇◇◇◇◇◇◇◇◇◇◇◇◇</b>	
	q <mark>us</mark>  �Ep <mark>bel</mark> \$ \$W\$f%\\$w\$[\$1\X\$F]{Bu <mark>sr</mark> qjy	
	k`mx{ Q#z= <b>bet</b> \$\_\$	Balance And Andrews
	���Ç <mark>ins</mark> ��wh�esc�E <mark>bel</mark> W�]s�qS]��~��d��¤� <b>@</b> � <b>@</b> ��"�X�1� <sup>\$</sup> �&	The second secon
	<b>·ϙ</b> ϙϙϙϙ;ϙ;ϙ;ϲͺͺͺͺͺͺͺͺͺͺͺͺͺͺͺͺͺͺͺͺͺͺͺͺͺͺͺͺ	
	J�<�P"L50�M�E�H�M8K�D�CR=BC�A�- <sup>NUL EM</sup> BELC[K�GSG <mark>EM</mark> )�#00 <b>�:</b> �JB55\?	No.
78	⅁℞ℰⅆℷⅆ℩ⅆℴℴ℩ℴℴℴℴℴℴℴℴℴℴℴℴℴℴℴℴℴℴℴℴℴℴℴℴℴℴℴℴℴℴℴ	
	� �=bel@�HrsC�7�@zA�>'RD%�O <mark>nak</mark> =�+bel1�!�A�I\$-2Di@�1fK)-�0�SD%^B	Bar-
	"header": {	
81	"component_id": 1,	John .
82	"sequence": 183,	
83	"system_id": 1	
84	},	No. of the second
	"message": {	All Street and Street Street Street
	"pitch": 0.02048434503376484,	BARE STREET

#### UPDATED FUNCTIONS

#### Load Coordinates

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











#### CLIENT FEEDBACK

#### Edit Layout

- Make it more user-friendly
- Reactive page

Load Coordinates:	
PingPoolTest V	
Sphere Size	
Sphere Color:	
Mesh Color:	
Closest Points	a standards
Connected Points	And the second s
Grid 🗖	
Delete Selected Spheres	
Export Updated Coordinates	
Clear Screen	
Close Controls	

### 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
  - .x†f
    - Standard side scan sonar filetype

i iies /	
55	us!5 <b>@:@G<u>cs</u>A@0@<riiuscff@j@5pnemqa@*etx(@#< b="">y_@;@F@B],@&lt;(MAKVH<mark>STX</mark>AC)</riiuscff@j@5pnemqa@*etx(@#<></b>
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,
	"yawspeed": -0.08060027658939362
70	}
71	}*[BR� �bs nulnul@etxnulnulnulnulnul@Bnulnul]�cs nul7�acknulnulnul@eot�:nul @U8nul
72	��<����)�'8���;���36 <b>@`g</b> ���v`_ <mark>sm</mark> j�s/v�h\��t�qKb(n <mark>mu</mark> 04
73	q <mark>us</mark> │�Ep <mark>met</mark> �│�W�f%\�w�[�l\X�F]{Bu <mark>sı</mark> qjy
74	ĸ`mx{_Q#z= <mark>pet</mark> �_��� <mark>pet</mark> �*\U]�� <mark>pct</mark> �~��[����y0�Đ����=ô���]�n
75	���Ӷ <mark>ℼ</mark> ��พһ� <mark></mark> ᡂ₽₢₽ <mark>₶</mark> ₩�]ѕ�qS]��~�� <b>Ქ</b> ��₿� <mark>₿</mark> �� <mark>₿</mark> �� <sup></sup> ₽₩₽Х� <b>1</b> �Ś�&
76	<b>���P��+����!�}�� -g�{o}�o�}<u>∎s</u>��t��ш<mark>FS</mark>��<b>�</b>FF����(�6ℝ</b>
77	J�<�P"LsO�M�E�H�M8K�D�CR=BC�A�- <mark>nulembel</mark> C[K�GSG <mark>em</mark> )�#00�:�Jbs5\?
78	9R6�AmB�"� <mark>son</mark> �I@G�B <mark>wu</mark> X�M*
79 🖂	� �= <mark>mel</mark> ��H <mark>ms</mark> C�7�@zA�>'RD%�0 <mark>mm</mark> =�+ <mark>mel</mark> 1�!�A�I\$-2Di@�1fK)-�0�SD%^B
	"header": {
81	"component_id": 1,
82	"sequence": 183,
83	"system_id": 1
× .	},
	"message": {
	"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

	import struct
	# Define the structure of one entry according to the provided fields
	<pre>✓ entry_structure = [</pre>
	('os_mono_profile', 'I'),
	('ping_number', 'I'),
	('start_mm', 'I'),
	('length_mm', 'I'),
	('timestamp_ms', 'I'),
	('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, ne
23	
24	
25	# Function to unpack a single entry
26	<pre>v def unpack_entry(file_stream):</pre>
	entry_data = {}
	for field_name, field_type in entry_structure:
	if field_name != 'pwr_results':

### MAIN ISSUES

#### Direct SSH

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

🍖 Test	t.py > ♀ send_command
	import socket
	import json
	<pre>IP_ADDRESS = '192.168.2.92' # Replace with your sonar's IP address</pre>
	<b>PORT = 51200</b> # Replace with your sonar's port
	<pre>def send_command(command):</pre>
	with socket.socket(socket.AF_INET, socket.SOCK_STREAM) as sock:
	try:
10	<pre>sock.connect((IP_ADDRESS, PORT))</pre>
11	<pre>print("Connected to OmniScan 450.")</pre>
12	<pre>sock.sendall(command.encode('utf-8'))</pre>
13	print("Command sent.")
14	except Exception as e:
15	<pre>print(f"An error occurred: {e}")</pre>
16	
17	ifname == "main":
18	<pre># Example command to set start_mm to 0, adjust pulse_len_percent a</pre>
19	<pre>command = json.dumps({</pre>
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	

# AUTONOMY

#### GAZEBO - SENSORS





#### 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



#### SHOWCASE POSTER

#### TEC-V:

• T-Topographic

NORTHROP GRUMMAN

ENGINEERING & SCIENCE STUDENT DESIGN SHOWCASE

> FLORIDA TECH

- E-Exploration
- C Cave
- $\cdot V Vehicle$

#### Purpose:

- Cave Mapping



#### Functions:

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





TEC-V Michael Dowling, Zealand Brennan, Stephen Coster, Gabor Papp, Henry Hill

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





#### 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?

