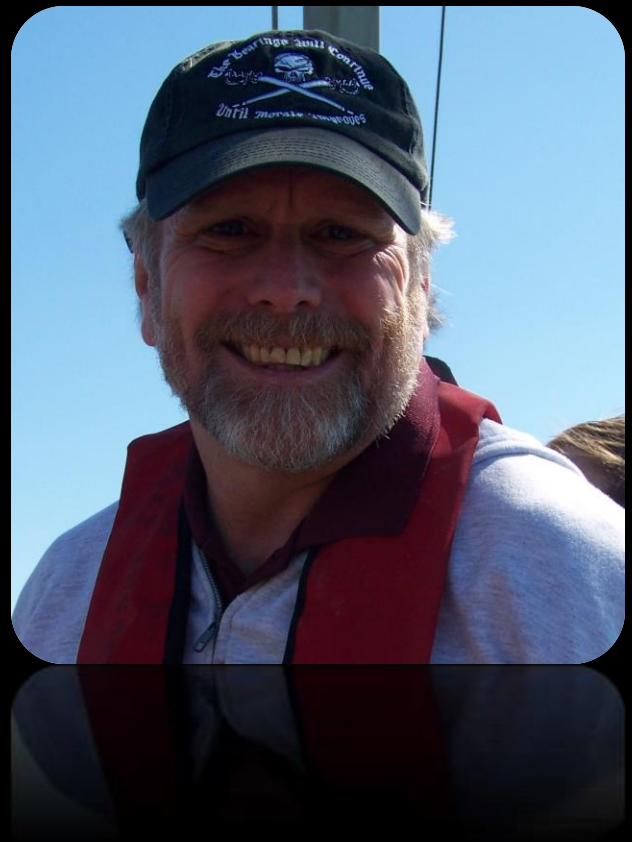
TEC-V

MILESTONE 4

By: Michael Dowling & Zealand Brennan

CLIENT

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



MILESTONE 4:

Tasks	Completion%	Michael	Zealand	To Do
Cloud Plot Application	70%	70%	0%	Finish CSS styling
Application Functions	70%	70%	0%	Implement more options for different file uploads
False Data	90%	90%	0%	Remove more false data
Rotational Compensation	50%	50%	0%	Account for rotation of AUV
Autonomy	30%	0%	30%	Implement Pathway Identification

TOOLS

ROV

- Python
  - Data Retrival

Webpage

- Html + JavaScript
  - Environmental creation and control

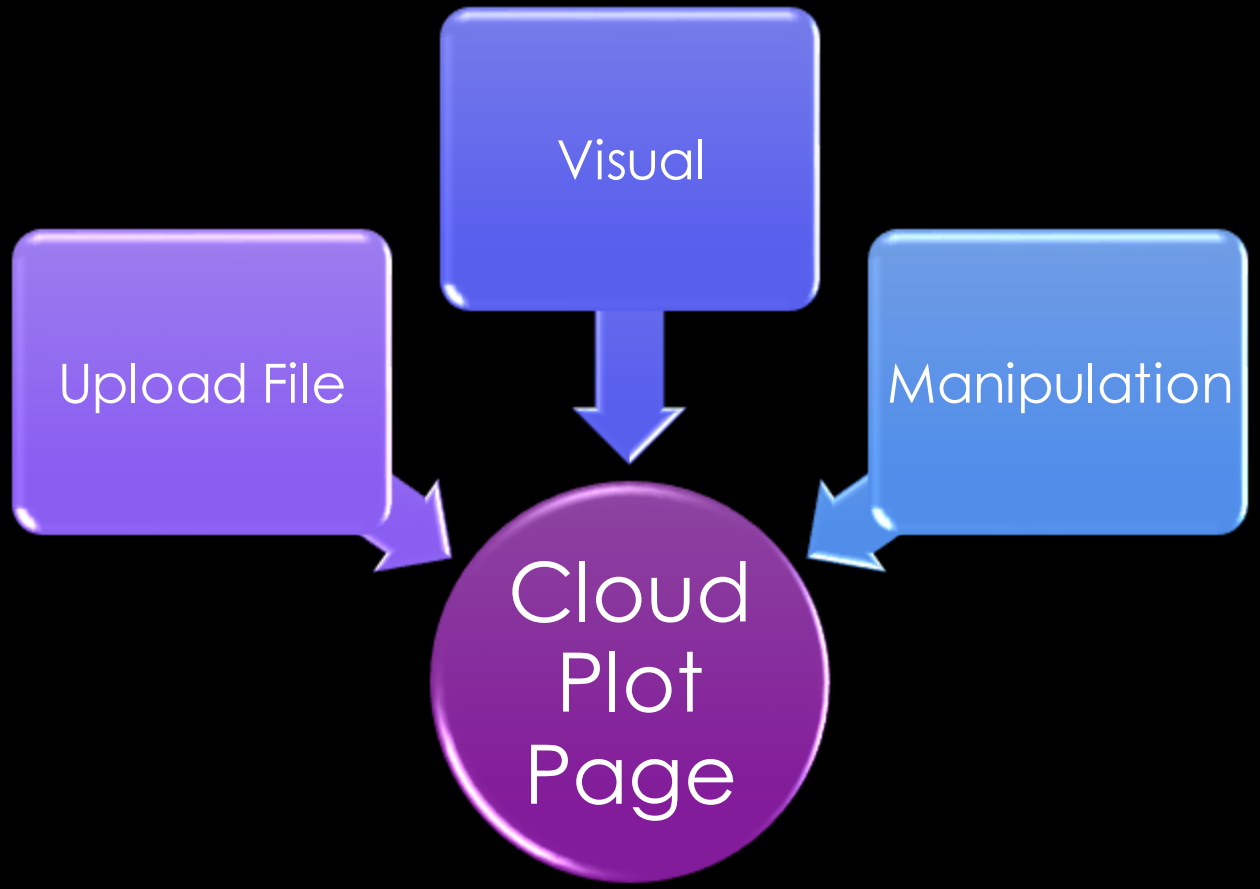
Autonomy

- Gazebo
  - Sensor recognition
  - Obstacle avoidance

MILESTONE TASKS

CLOUD PLOT WEBPAGE

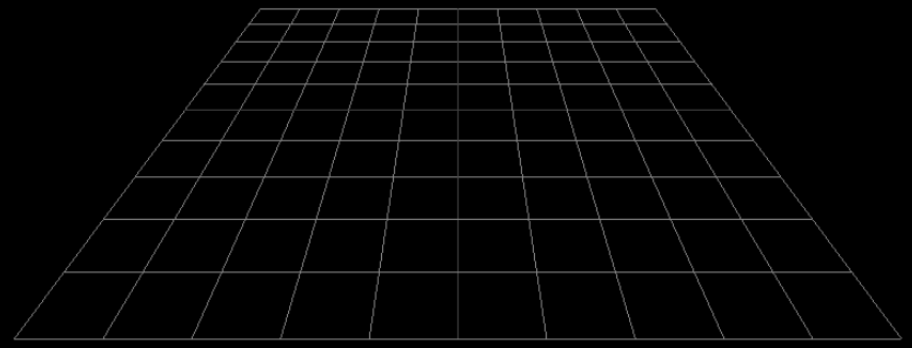
WEBPAGE CREATION



WEBPAGE CREATION - SETUP

Main Components

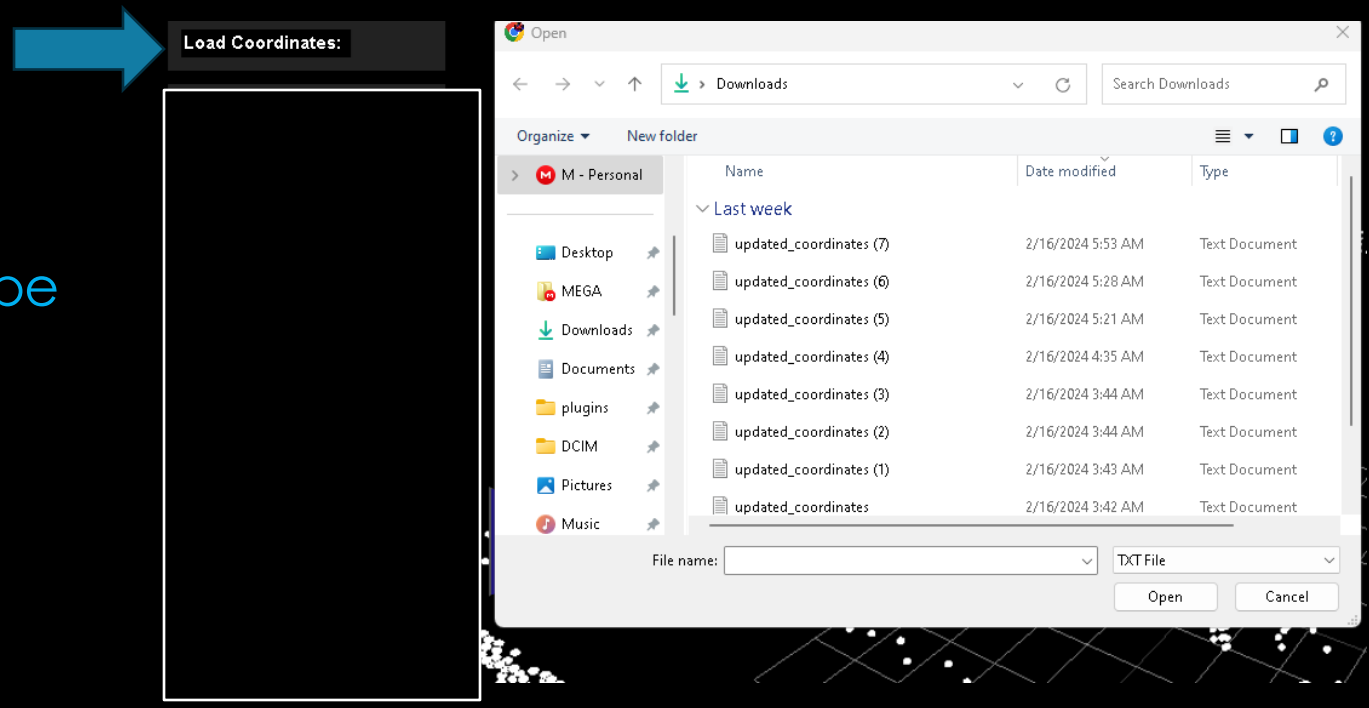
- Three.js
  - Sets environment
- Orbital controls
  - Zoom in/out
  - Angle manipulation



INITIAL FUNCTIONS

Load Coordinates

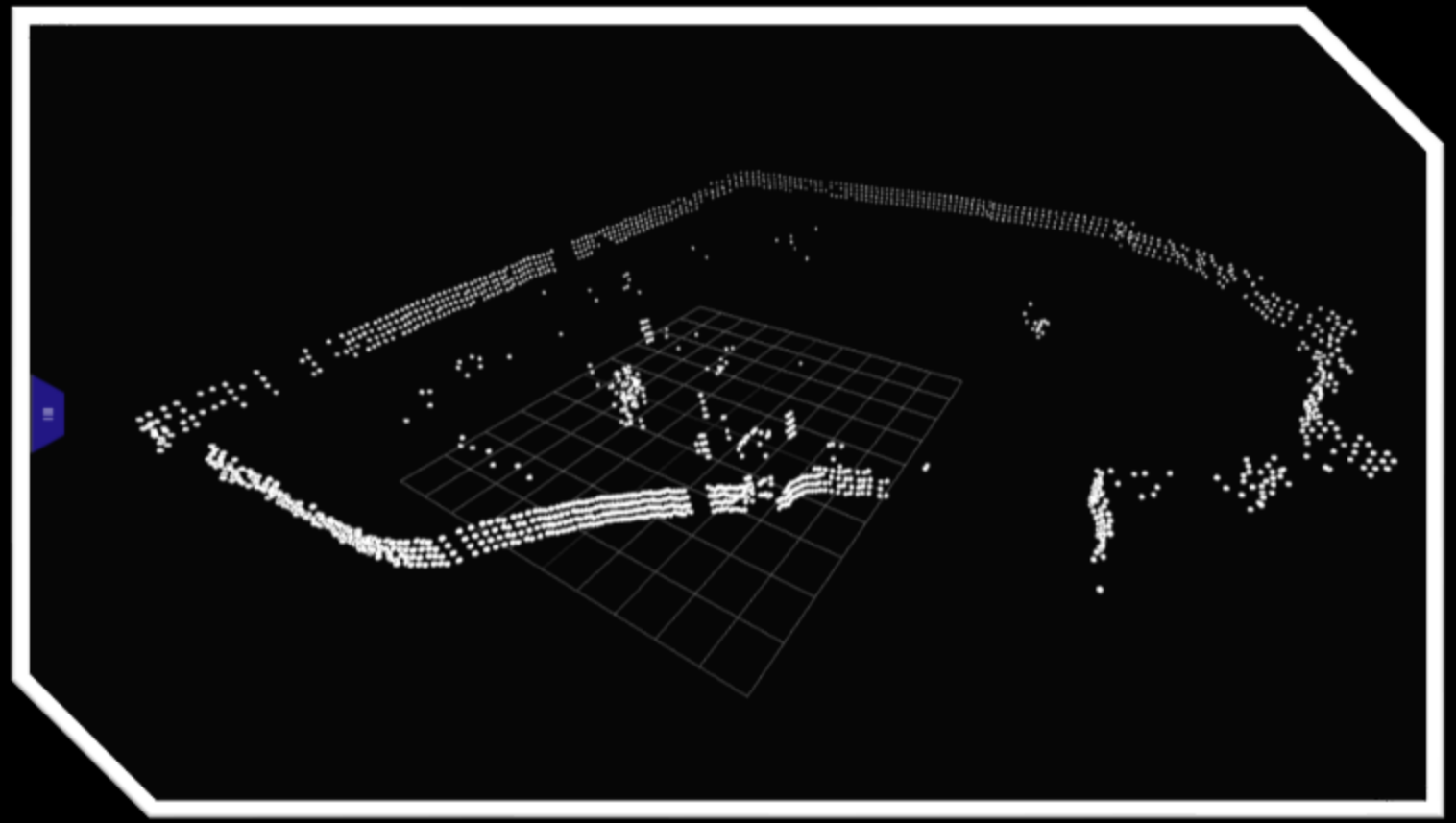
- Opens file explore
  - Allows only .txt extensions to be selected



INITIAL FUNCTIONS

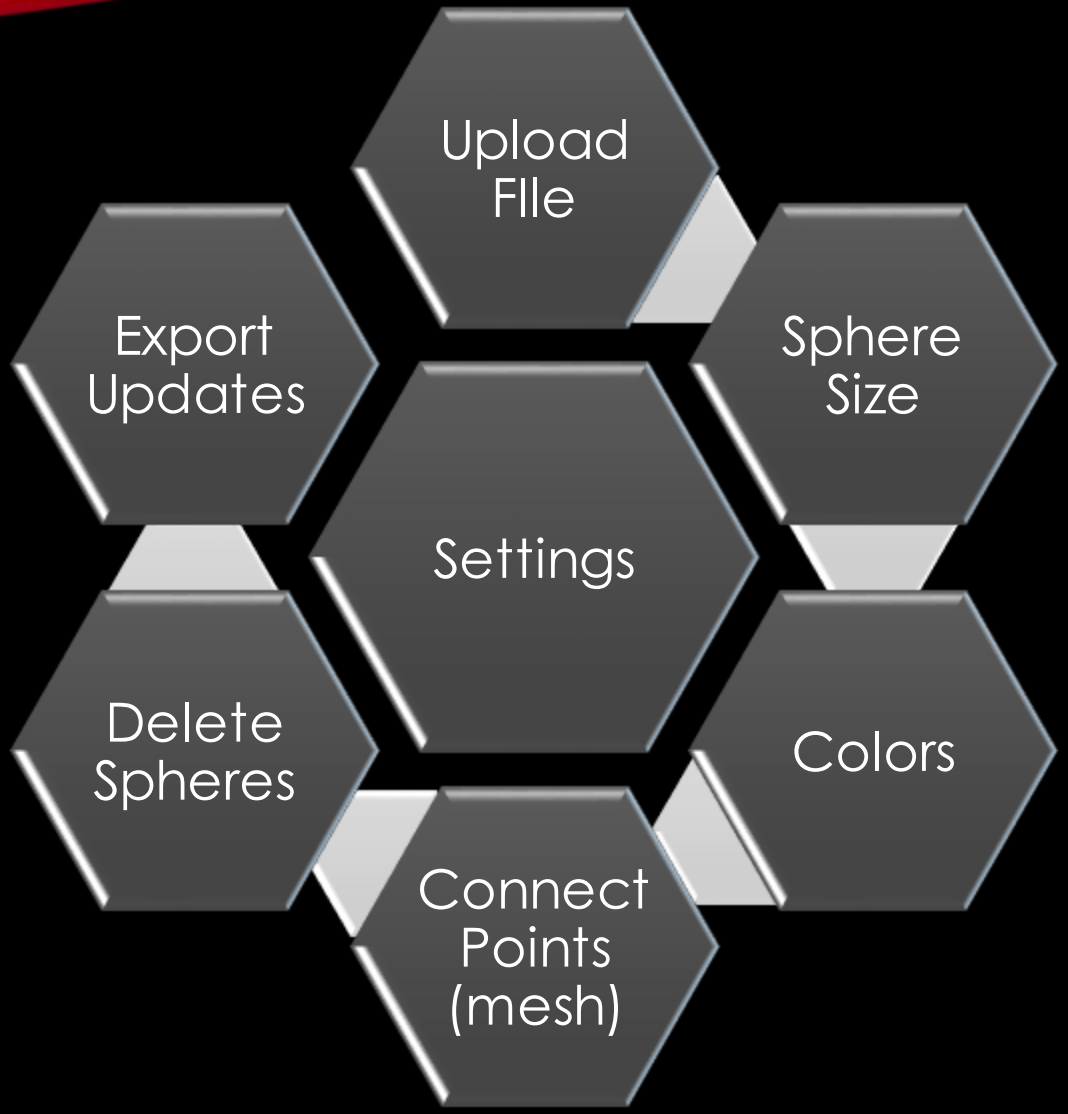
Load Coordinates

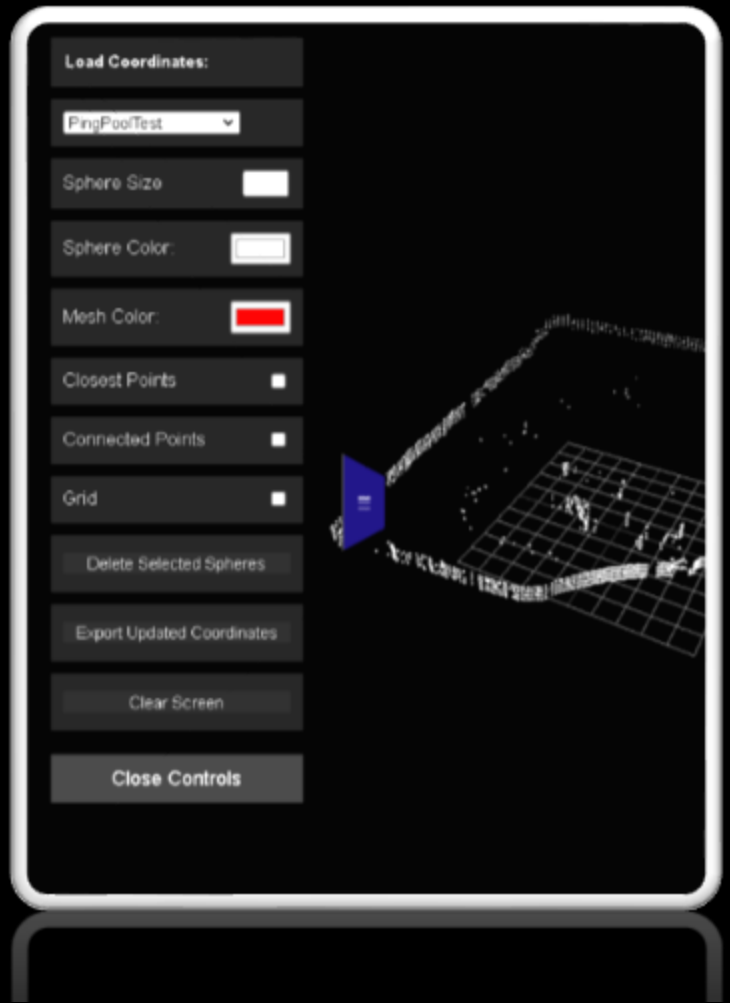
- Code (JavaScript)
  - Reads data from the input file
  - Designates sphere at each coord



NEW SETTINGS

WHAT CAN THE USER ACCOMPLISH?

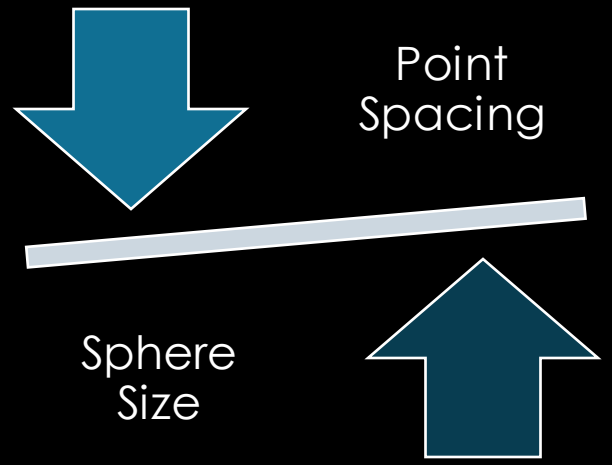




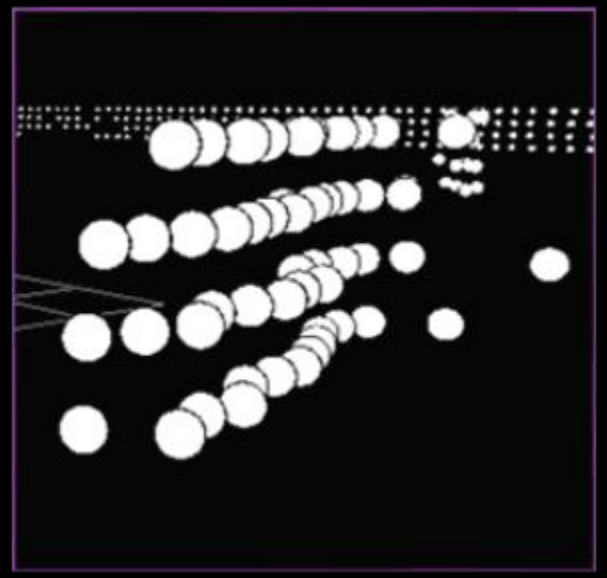
SPHERE SIZE

Reason

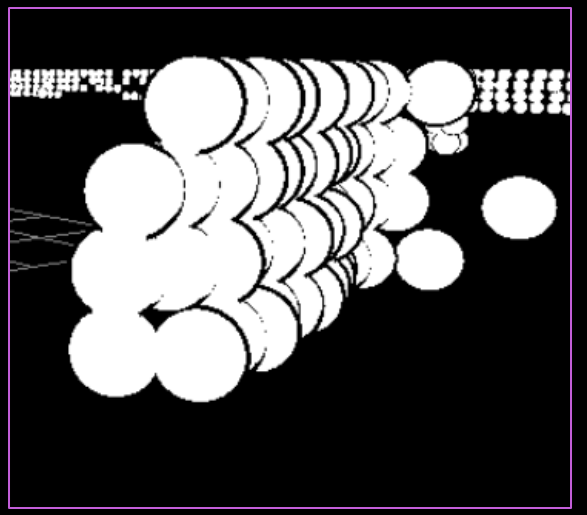
- Spacing between points



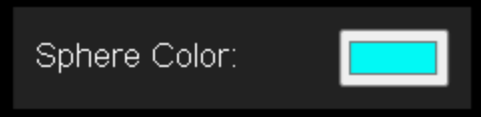
Initial Size



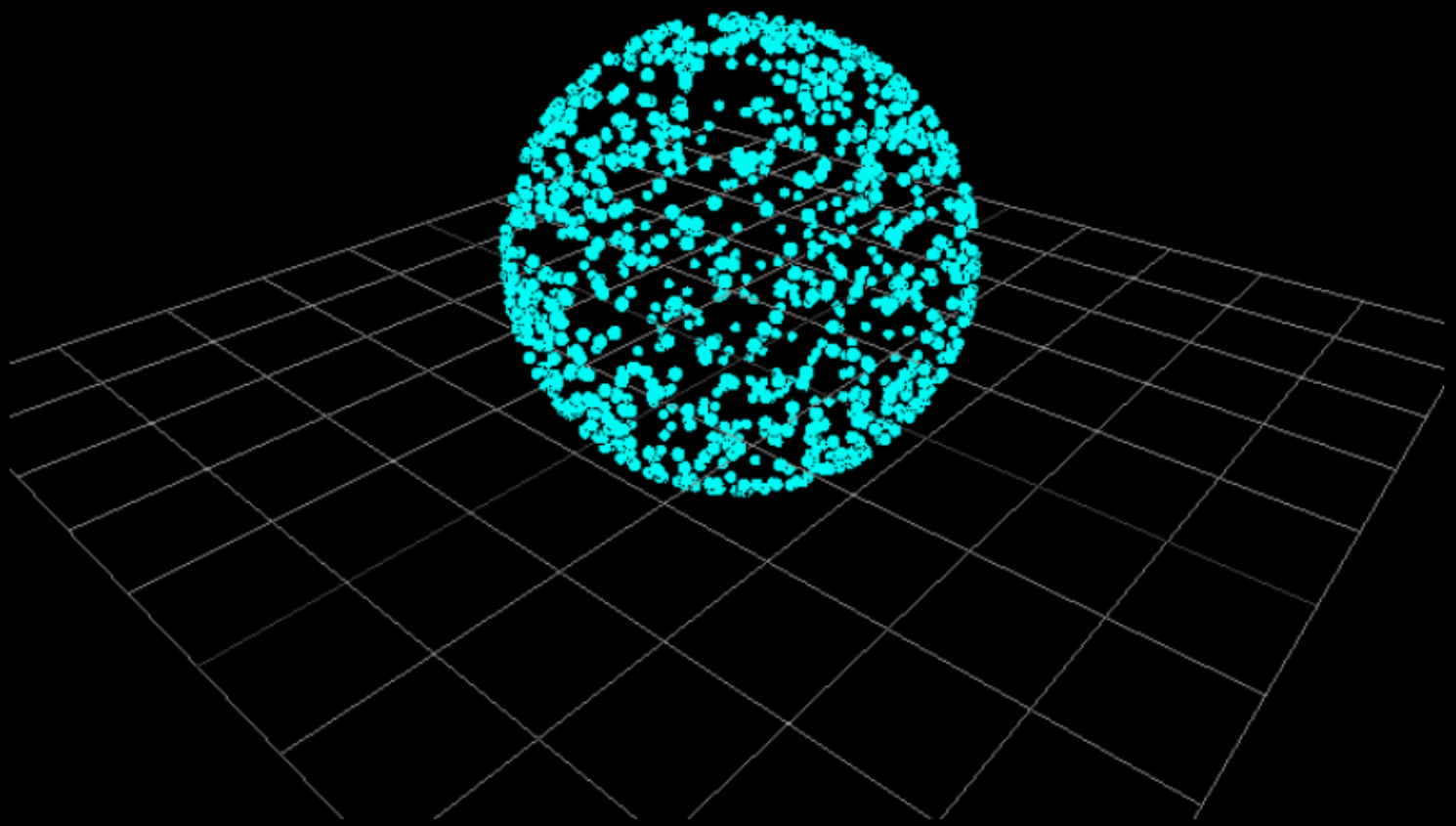
x10



SPHERE COLOR



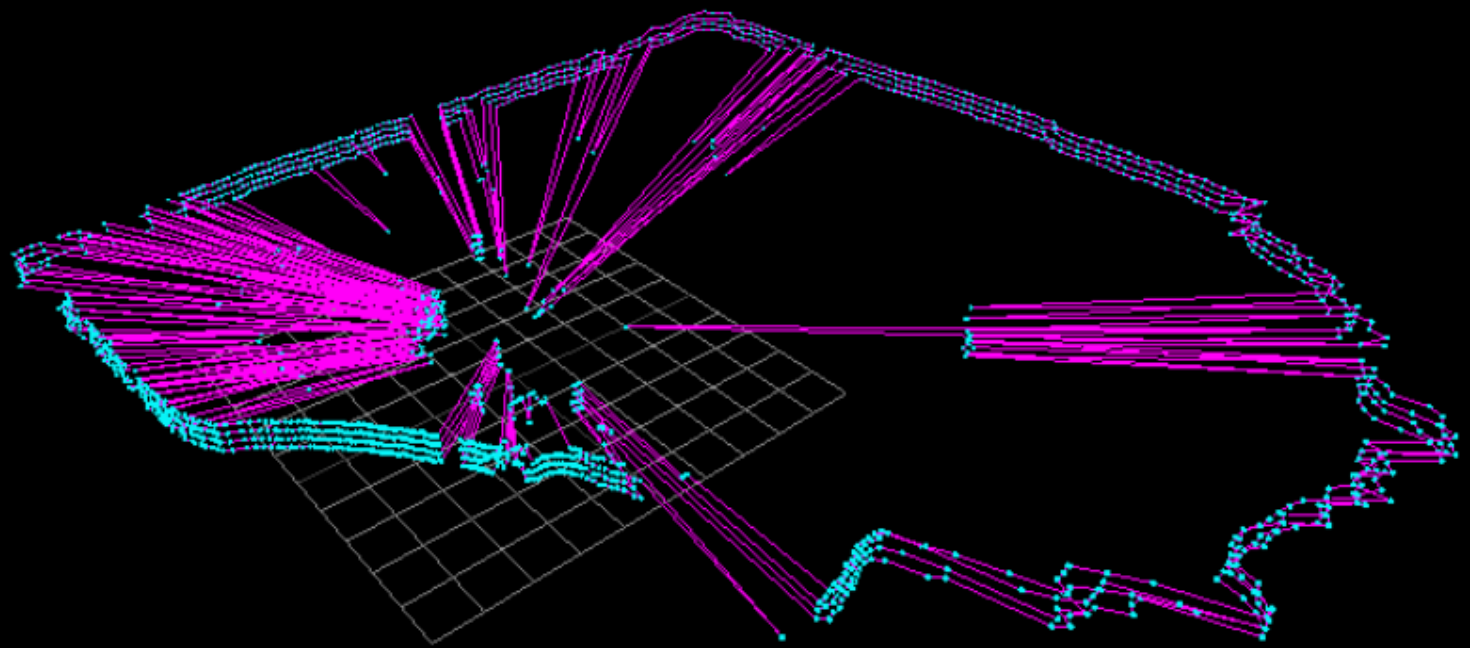
- Opens Color Wheel
- Allows user color options



CONNECTED POINTS

Connected Points ☑

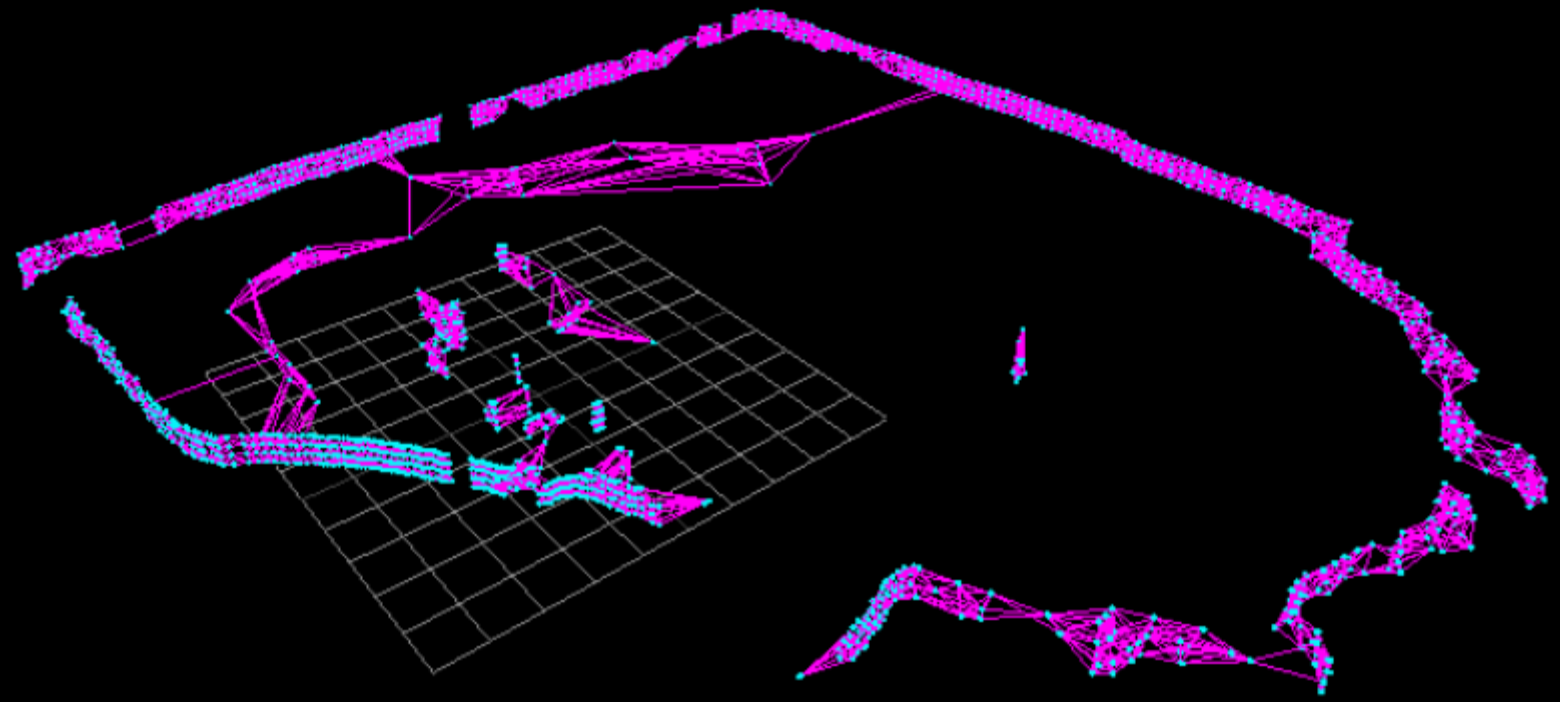
- Looks at the previous point and current
- Places line intersecting these points



CLOSEST POINTS

Connected Points ☑

- Reads from file
- Looks at the current point
  - Finds 8 closest variables
- Downsides:
  - Done during file Upload
  - Creates latency

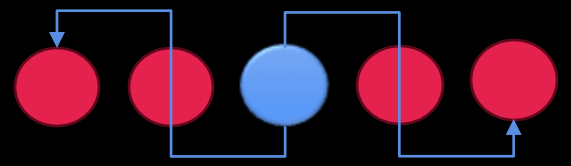


OUTSIDE INPUT

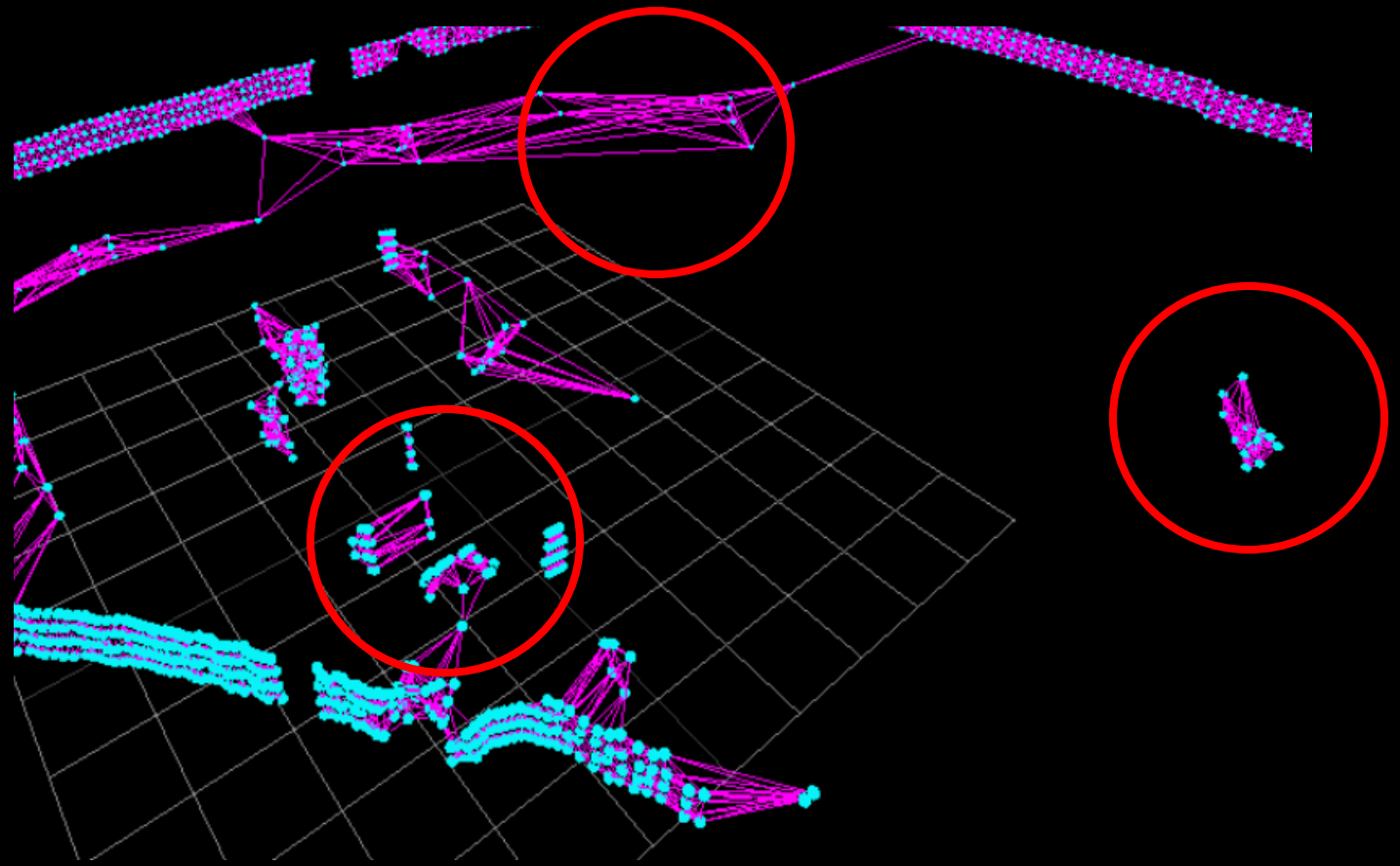
SPHERE DELETION

Problem:

- False Data
- Points that do not exist
  - Original solution



- Downsides:
  - Deletes true points



SPHERE DELETION

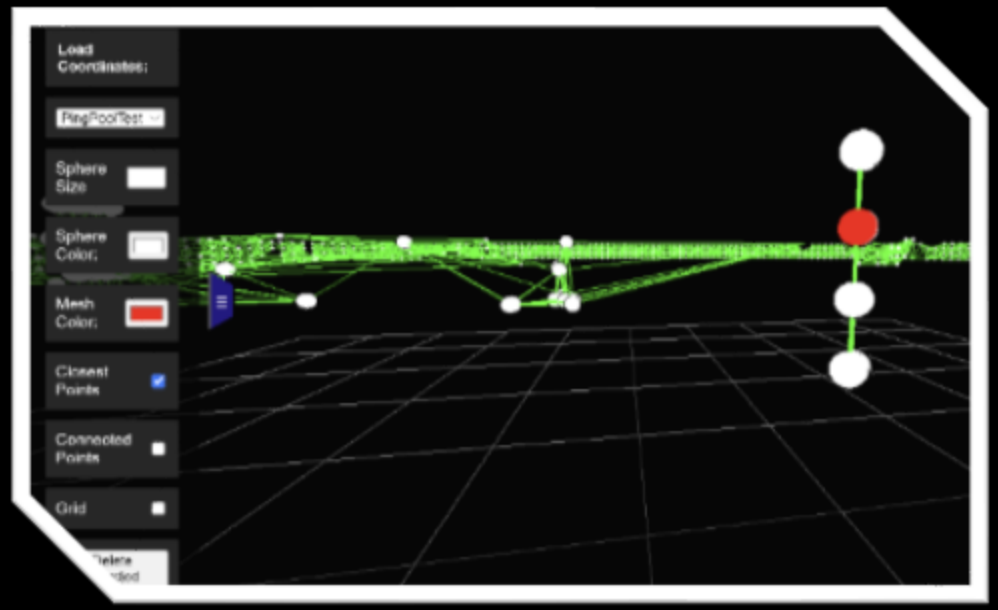
Problem:

- Each Coordinate Point
- Sphere Creation
- Storage Array

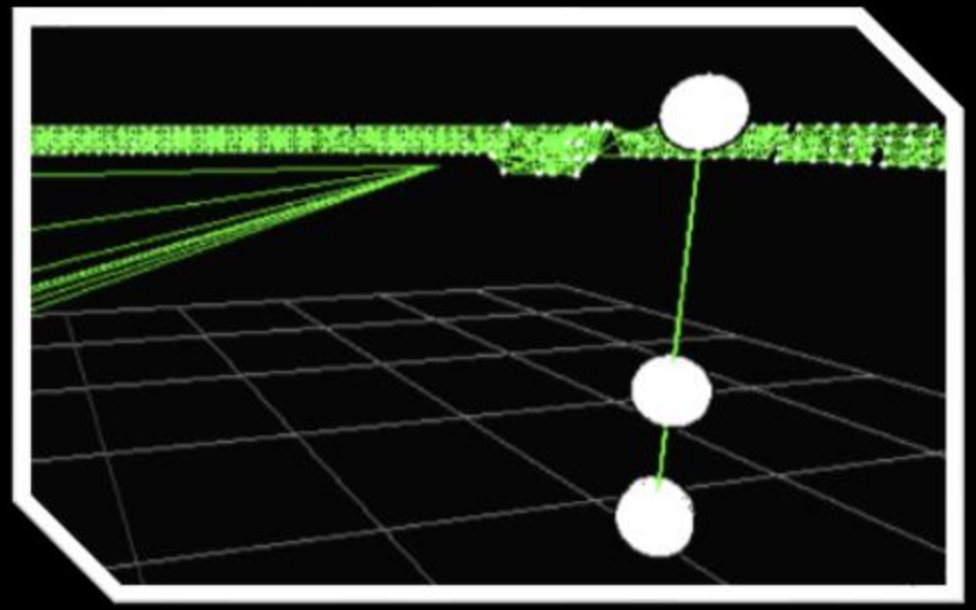
```
//=====================================================
// Delete Spheres
//=====================================================
let selectedSpheres = []; // Array to keep track of selected spheres

function selectSphere() {
    raycaster.setFromCamera(mouse, camera);
    const intersects = raycaster.intersectObjects(scene.children);

    for (let i = 0; i < intersects.length; i++) {
        if (intersects[i].object.isSphere) { // Ensure we're only interacting with spheres
            const selectedSphere = intersects[i].object;

            if (selectedSphere.selected) {
                // Sphere is already selected, deselect it
                selectedSphere.material.color.set(sphereColor); // Change color back to default
                selectedSphere.selected = false;

                // Remove from selectedSpheres array
                const index = selectedSpheres.indexOf(selectedSphere);
                if (index > -1) {
                    selectedSpheres.splice(index, 1);
                }
            } else {
                // Sphere is not selected, select it
                selectedSphere.material.color.set(0xff0000); // Highlight color
                selectedSphere.selected = true;

                // Add to selectedSpheres array
                selectedSpheres.push(selectedSphere);
            }

            break; // Stop the loop after processing the first intersected sphere
        }
    }
}
```

ITERATION 1

Before:

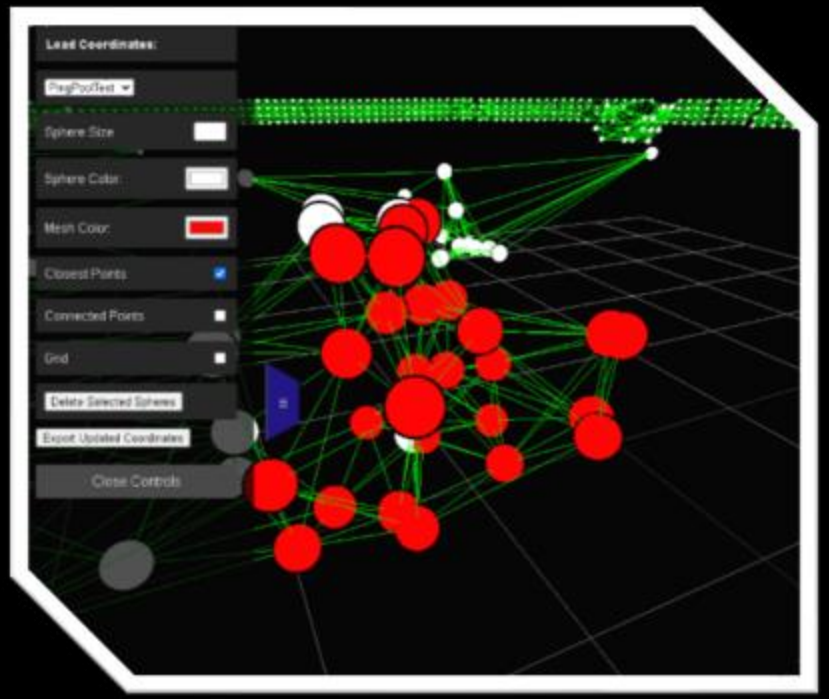


After:

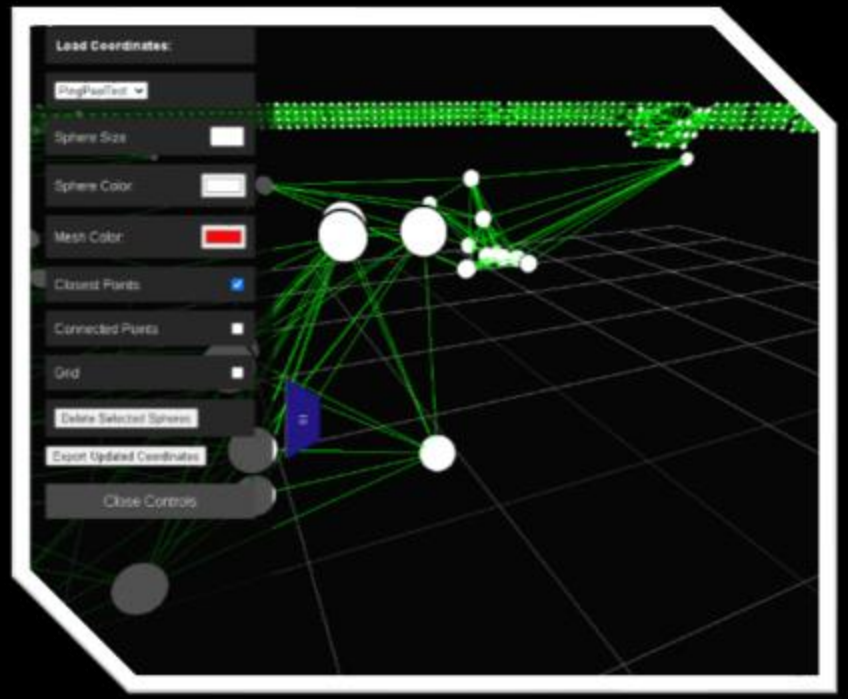


ITERATION 2

Before:

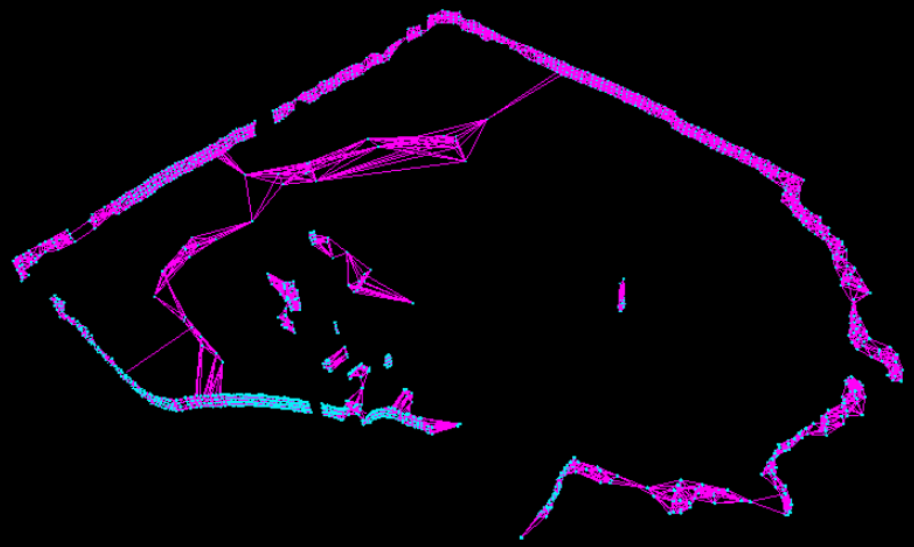


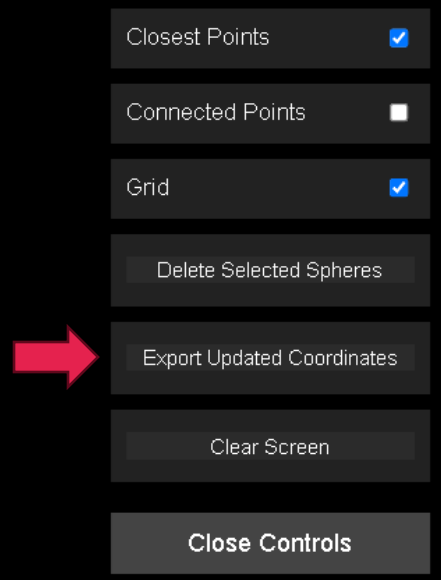
After:



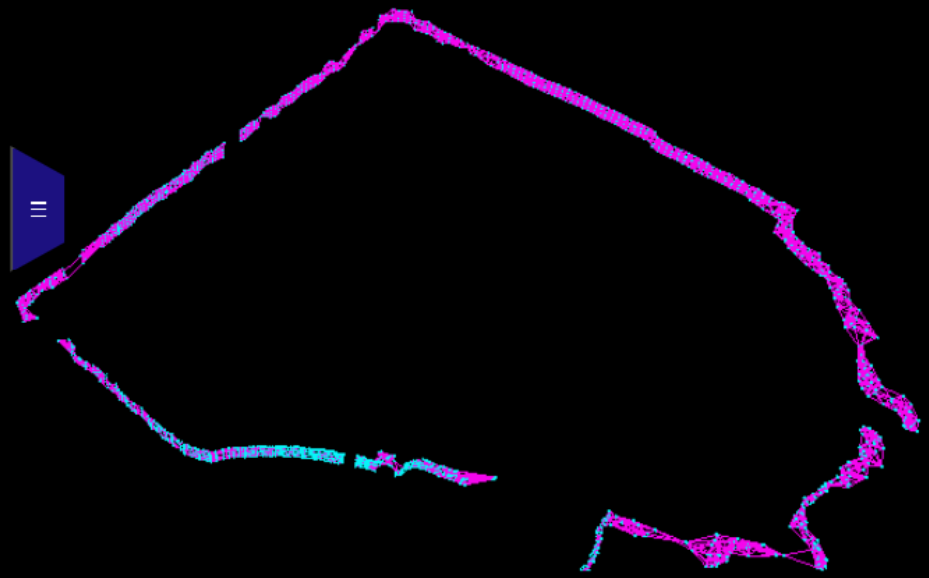
EXPORT UPDATE ARRAY

Before:





After:



AUTONOMY

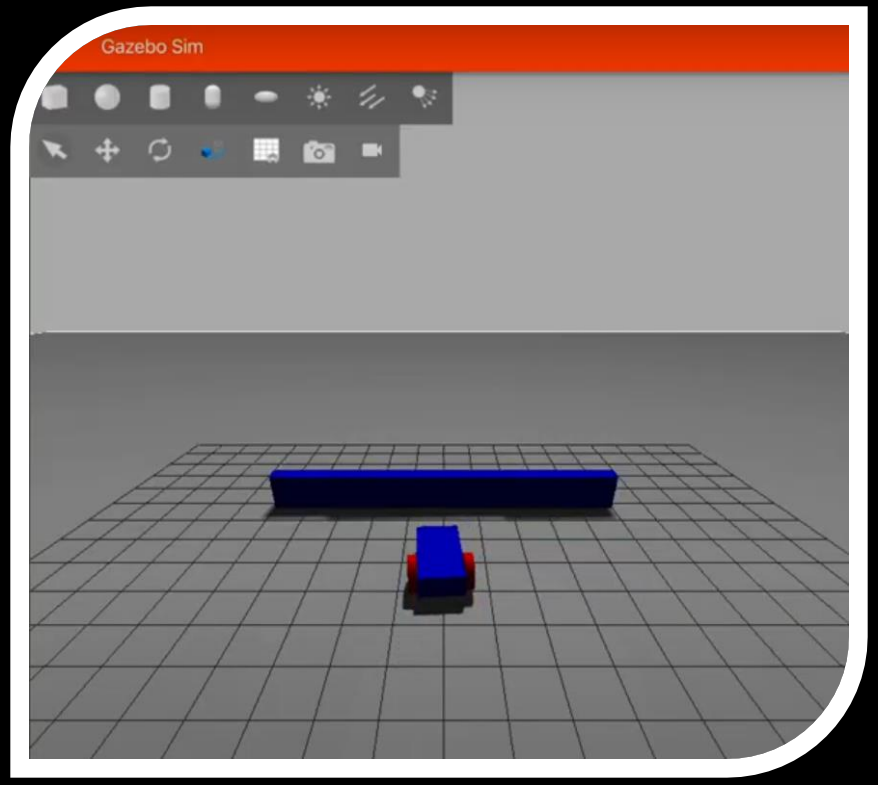
GAZEBO

IMU

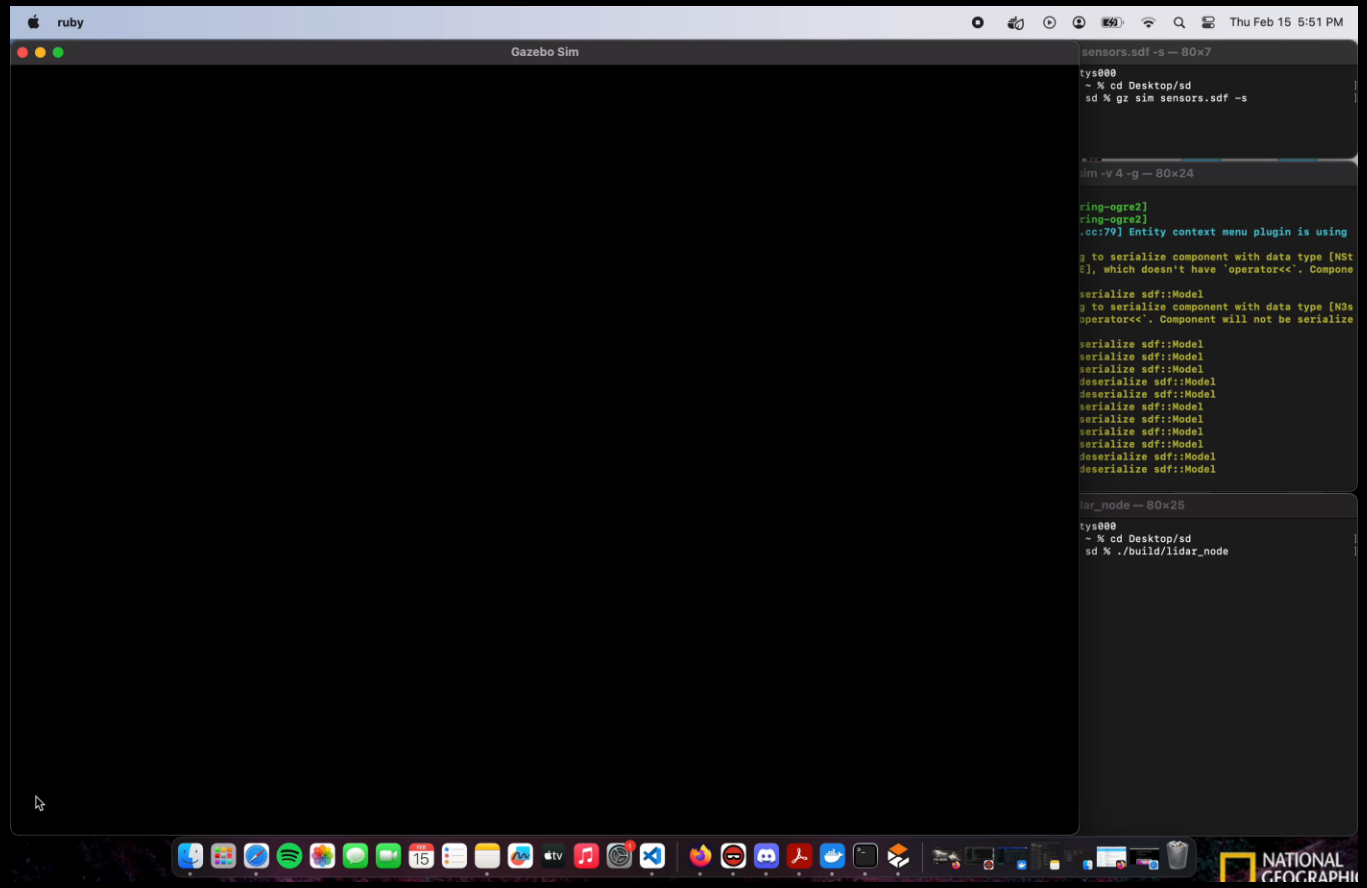
- Orientation
- Angular Velocity
- Linear Acceleration

GAZEBO - SENSORS

- IMU
- Contact Sensor
- Lidar



GAZEBO


ruby
Thu Feb 15 5:51 PM
Gazebo Sim
sensors.sdf -s — 80×7
tys000
~ % cd Desktop/sd
sd % gz sim sensors.sdf -s
im -v 4 -g — 80×24
ring-ogre2]
ring-ogre2]
.cc:79] Entity context menu plugin is using
g to serialize component with data type [NSt
E], which doesn't have `operator<<`. Compone
serialize sdf::Model
g to serialize component with data type [N3s
operator<<`. Component will not be serialize
serialize sdf::Model
serialize sdf::Model
serialize sdf::Model
deserialize sdf::Model
deserialize sdf::Model
serialize sdf::Model
serialize sdf::Model
serialize sdf::Model
serialize sdf::Model
deserialize sdf::Model
deserialize sdf::Model
lar_node — 80×25
tys000
~ % cd Desktop/sd
sd % ./build/lidar_node

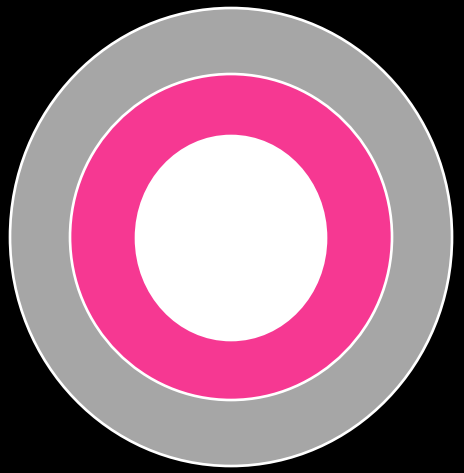
ADVISOR FEEDBACK

Uncertainty

- Represent uncertainty with gray sphere

Current Sphere

Updated Sphere



CLIENT FEEDBACK

Edit Layout

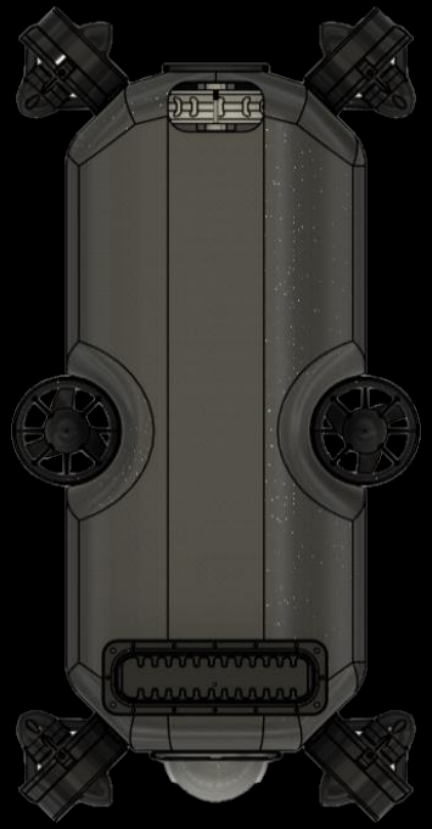
- Make it more user-friendly
- Reactive page

MILESTONE 5

MILESTONE 5:

Task	Michael	Zealand
Multi Fild Upload	Have the ability to upload different file types simultaneously	
Styling	Make the webpage more user friendly.	
Forward Facing Sonar	Retrieve data from new sonar and save the information.	
Autonomy		Utilizing Gazebo as a testing ground for partial pathing using the current data sets we have.

OMNISCAN 450 FS



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?