Progress Report

JANUARY 9, 2026

GitHub

As a final deliverable, I plan to submit a GitHub repository containing all the projects, assignments, and technical reports developed during this period.
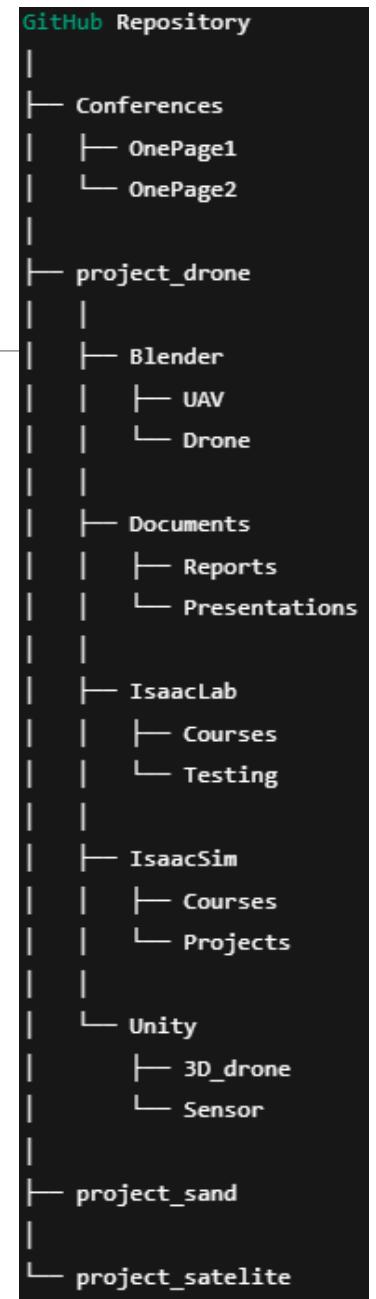
The repository has already been created and is available for review. Over the next few days, I will be progressively uploading each project and organizing the content to ensure it is clear, well-documented, and easy to navigate, including code, reports, and relevant results.

https://github.com/PaolaRojas24/SkySpec
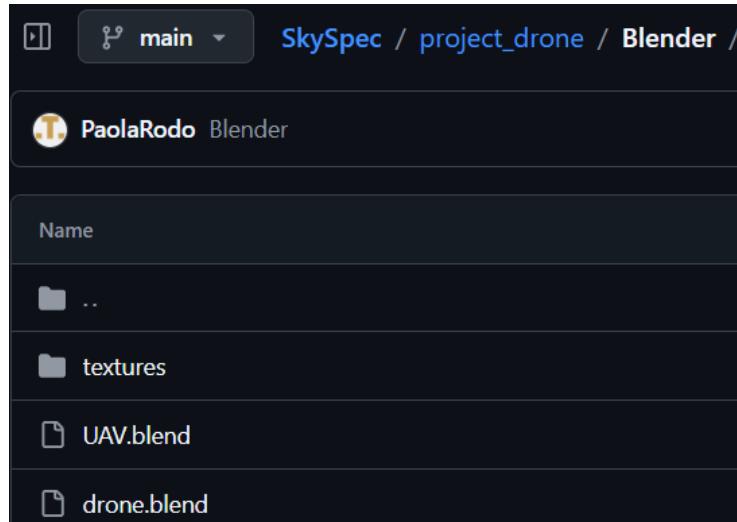
GitHub Repository

The idea behind this repository is for it to serve as a well-organized container for all the work developed during the internship, with a clear separation between documentation, technical development, and independent projects.

```
GitHub Repository
|
├── Conferences
|   ├── OnePage1
|   └── OnePage2
|
├── project_drone
|   |
|   ├── Blender
|   |   ├── UAV
|   |   └── Drone
|   |
|   ├── Documents
|   |   ├── Reports
|   |   └── Presentations
|   |
|   ├── IsaacLab
|   |   ├── Courses
|   |   └── Testing
|   |
|   ├── IsaacSim
|   |   ├── Courses
|   |   └── Projects
|   |
|   └── Unity
|       ├── 3D_drone
|       └── Sensor
|
├── project_sand
|
└── project_satelite
```

Blender & Unity

The Blender and Unity section contains the preliminary and foundational work done with the UAV drone model.
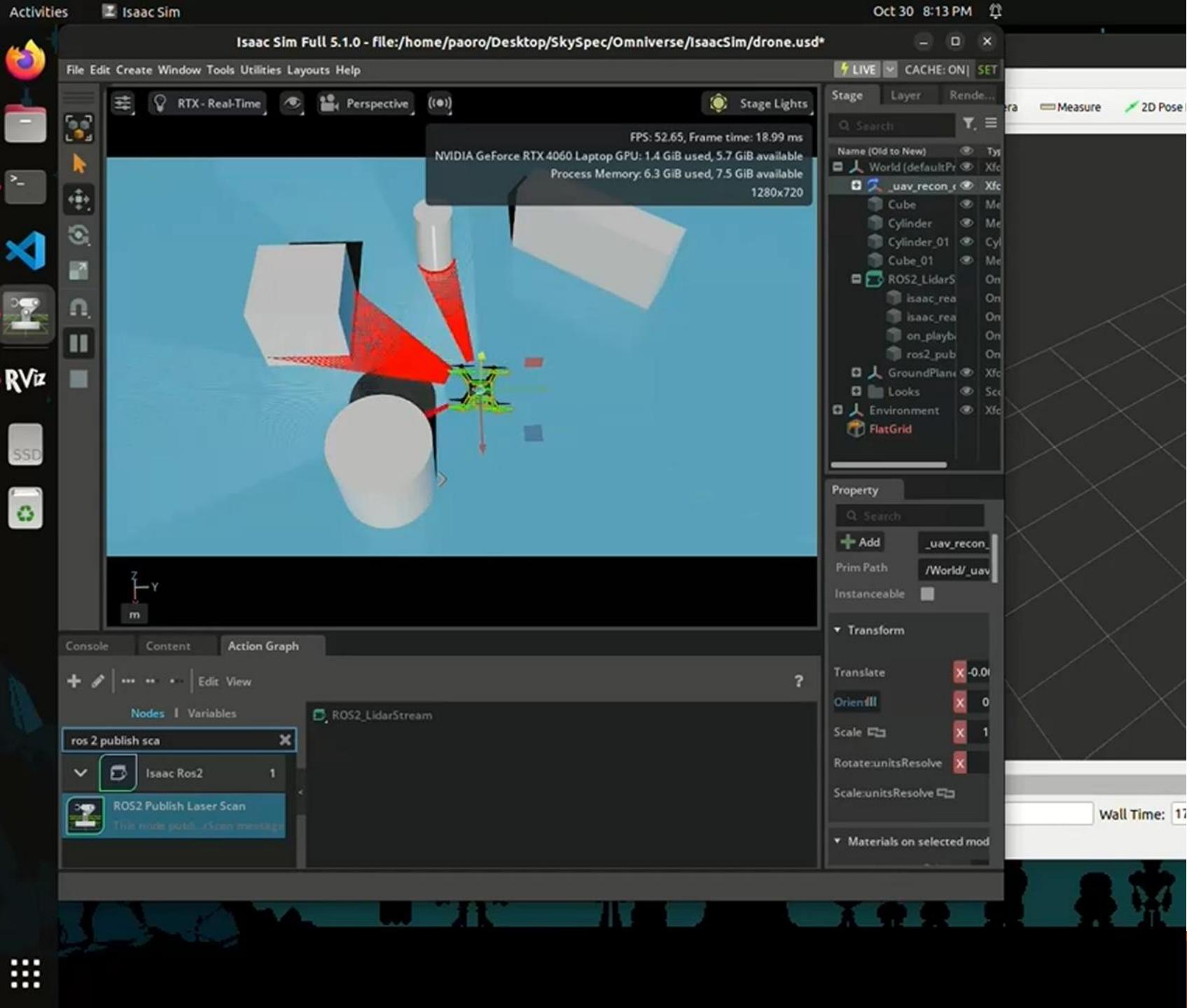
In Blender, this includes the 3D UAV drone model itself, as well as basic animation of the drone's motion.
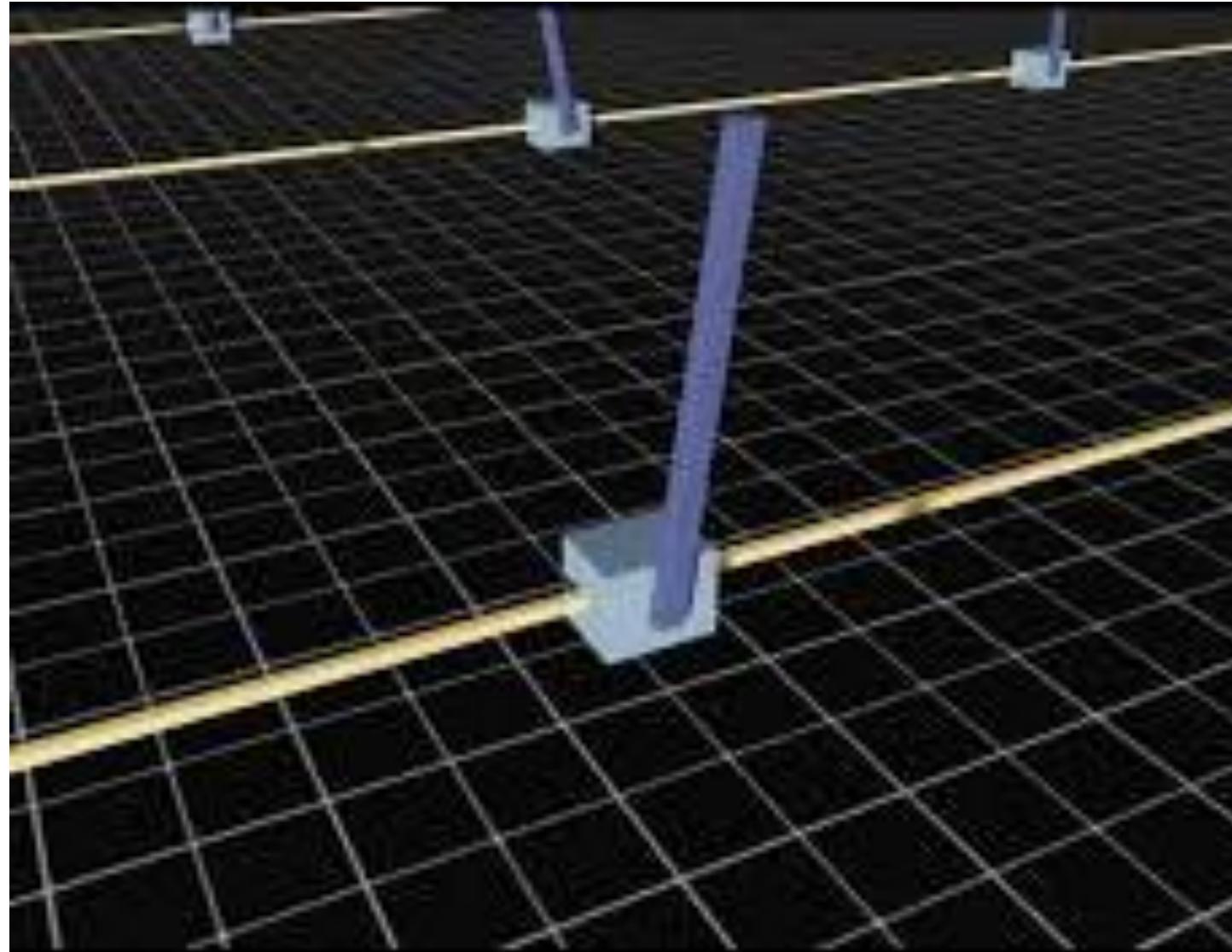
In Unity, this section includes a drone flight simulator controlled with WASD keys, as well as a proximity sensor simulator.

Isaac Sim

The Isaac Sim section contains all projects developed directly in NVIDIA Isaac Sim.

This includes the work completed as part of NVIDIA Isaac Sim courses, as well as more advanced projects involving a drone equipped with LiDAR and IMU sensors, integrated with ROS.

Isaac Lab

The Isaac Lab section focuses on reinforcement learning projects.

It includes the RL environments developed during NVIDIA courses, such as Cartpole and Reach, which served as validated, working examples of the RL pipeline.

In addition, this section documents all attempts made to develop a reinforcement learning environment for a drone, including experimental configurations, partial implementations, and documented failures.

Satellite and sand data.

The Satellite and sand data section is dedicated to computer vision projects.

For the satellite project, this section will contain all progress related to training computer vision models capable of detecting ships in satellite imagery.

In parallel, this section will also include progress on the oil detection in sand project, where the primary deliverable is a trained neural model that can distinguish oil versus sand in hyperspectral images, initially formulated as a binary classification task.

Conferences & Documents

Finally, the Conferences and Documents section consolidates academic and technical documentation.

This includes one-page summaries of conferences attended through OIST, as well as technical reports, project documentation, and presentation materials related to the drone project, including the presentations used to report progress.

Next Steps

I will continue uploading and organizing all projects, code, and supporting materials in the GitHub repository, ensuring clarity and proper documentation.

For the drone project, I will prepare structured reports describing the technical issues and errors encountered, with the goal of clearly documenting the challenges faced.

In parallel, for the satellite project, I will work on developing a basic ship detection model using a freely available and accessible dataset as an initial proof of concept.

Finally, for the sand analysis project, the objective is to achieve a binary classification model capable of distinguishing sand from oil using hyperspectral images.