

III Workshop 2024 - EMBM-VD

Identification of targets and control of drones



CONTEXT:



- My Contribution:
 - o Focus on the 3D representation of drones in a simulated environment.
 - o Integration of the project with VR technologies to enhance interaction and realism









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SMARY

- Development of Virtual Reality Simulation
- Drone Control with Virtual Reality
- Augmented Reality Setup on Meta Quest 3
- Integration with Unity and Cesium for Airspace Simulation
- Development of Position Updates with MQTT
- Facilitating Interaction with InputField and Lists
- VD E

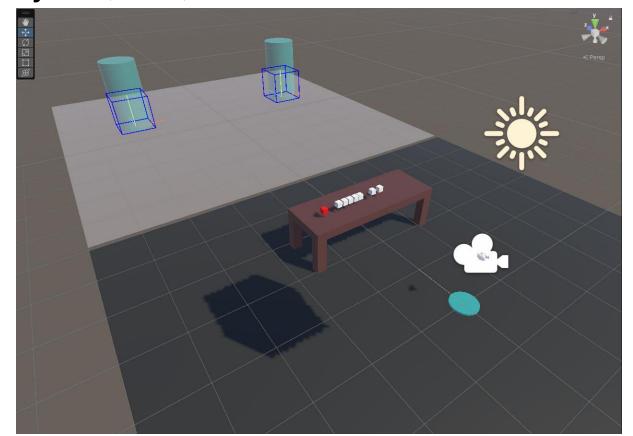
Drone Overview and Visualization on Map

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Development of Virtual Reality Simulation

- Implementation of head and hand interaction in the virtual environment.
- Interaction with objects (cubes) in the scenario.



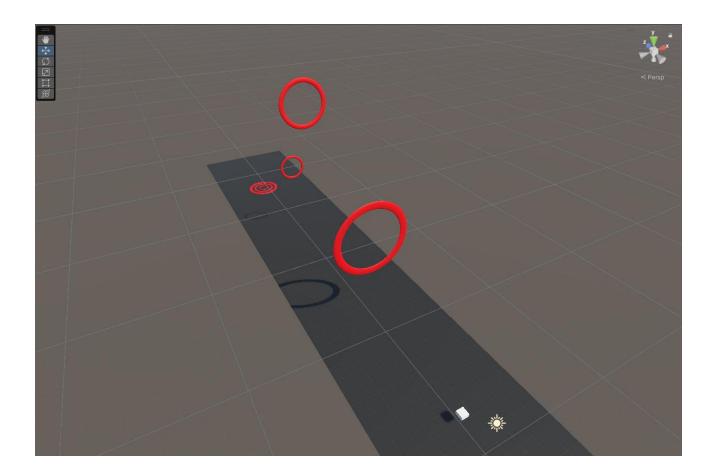






Drone Control with Virtual Reality

Right Simulator

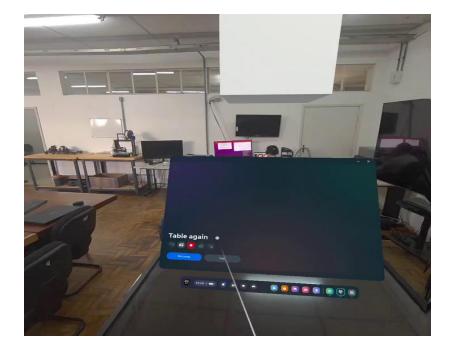






Augmented Reality Setup on Meta Quest 3

- Meta Quest 3 setup for capturing and interacting with the physical environment.
- Development of tests with spawning cubes and spheres and physical interaction with the environment.

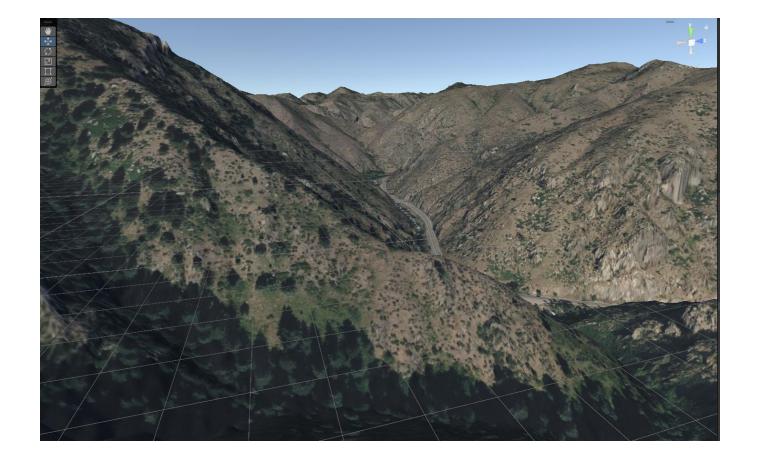






Integration with Unity and Cesium for Airspace Simulation

Unity integration with Cesium to represent spacecraft locations on the world map.





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Development of Position Updates with MQTT

• Drone positions are updated in real-time through coordinates received via MQTT.

```
▼ 161.24.23.15

▼ conceptio
 ▼ unit
 ► other (18 topics, 43677 messages)
 ► air (44 topics, 102026 messages)
 ► land (44 topics, 106766 messages)
 ► surface (6 topics, 14559 messages)
 ► space (2 topics, 4853 messages)
 ► weather (4 topics, 12 messages)
```

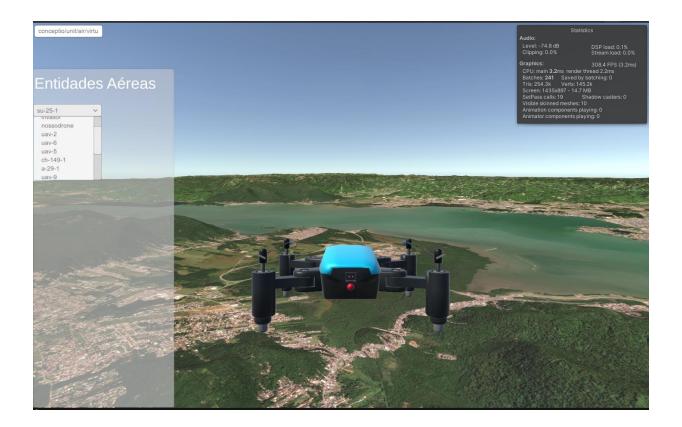
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}
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Facilitating Interaction with InputField and Lists

- Implementation of an input field to facilitate switching MQTT paths.
- Idea of creating a list of present drones, similar to VR Forces, to enhance user experience.



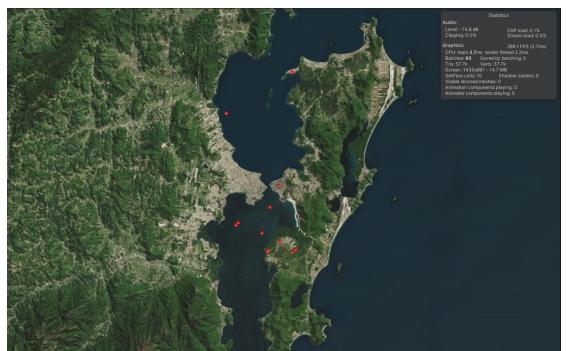






Drone Overview and Visualization on Map

- Each red dot represents an active drone, which can be clicked to instantly switch to a 3D view of that specific drone.
- Upon selecting a drone, users are seamlessly taken to a 3D visualization, providing a comprehensive overview of the drone's environment and status







Final considerations

Questions/Comments?!

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