



Summer 2020 Intern Outbrief

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Visualization and Immersive
Technologies Department***

August 13, 2020

Introduction to me

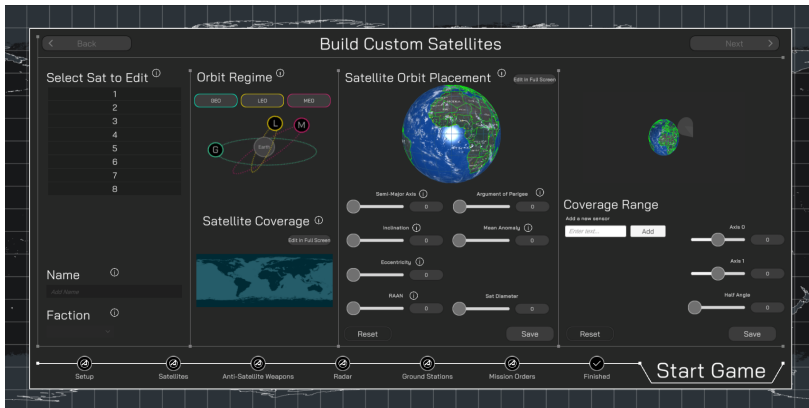
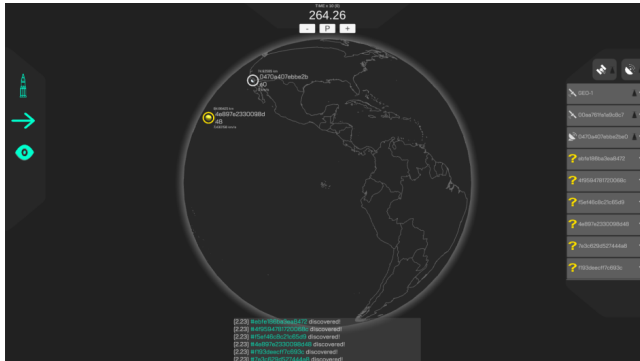
- Olin College of Engineering
 - *Small project-based engineering college in Needham, MA*
 - *Class of 2022*
 - *Major in Engineering with Computing*
- Currently living in Durham, Connecticut with my family
- Clubs and Hobbies
 - *Theater Tech*
 - *Fire Spinning*
 - *Swimming*
- Interned with VITD last summer too
 - *Last internship I focused on Web Development, but wanted to learn something new*



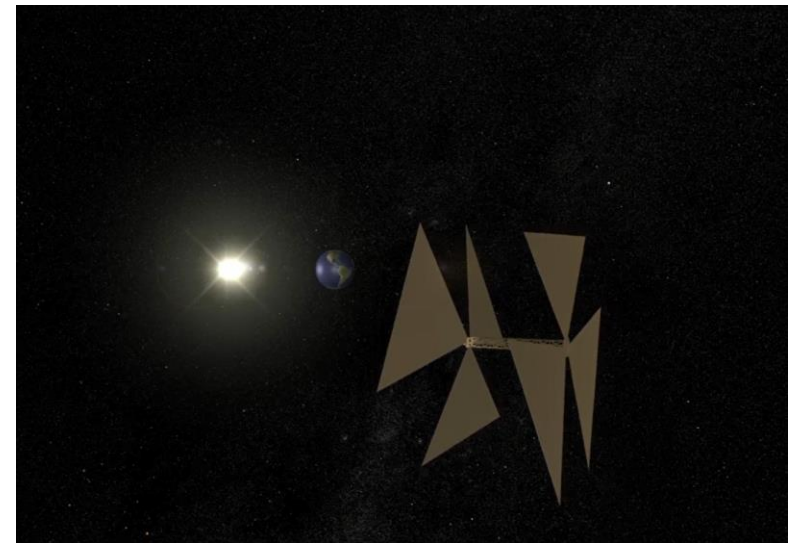
Fire spinning

Two Projects

I worked on two projects this summer



NeoForce



iLab Interstellar Object
Return Summer Intern
Study

NeoForce

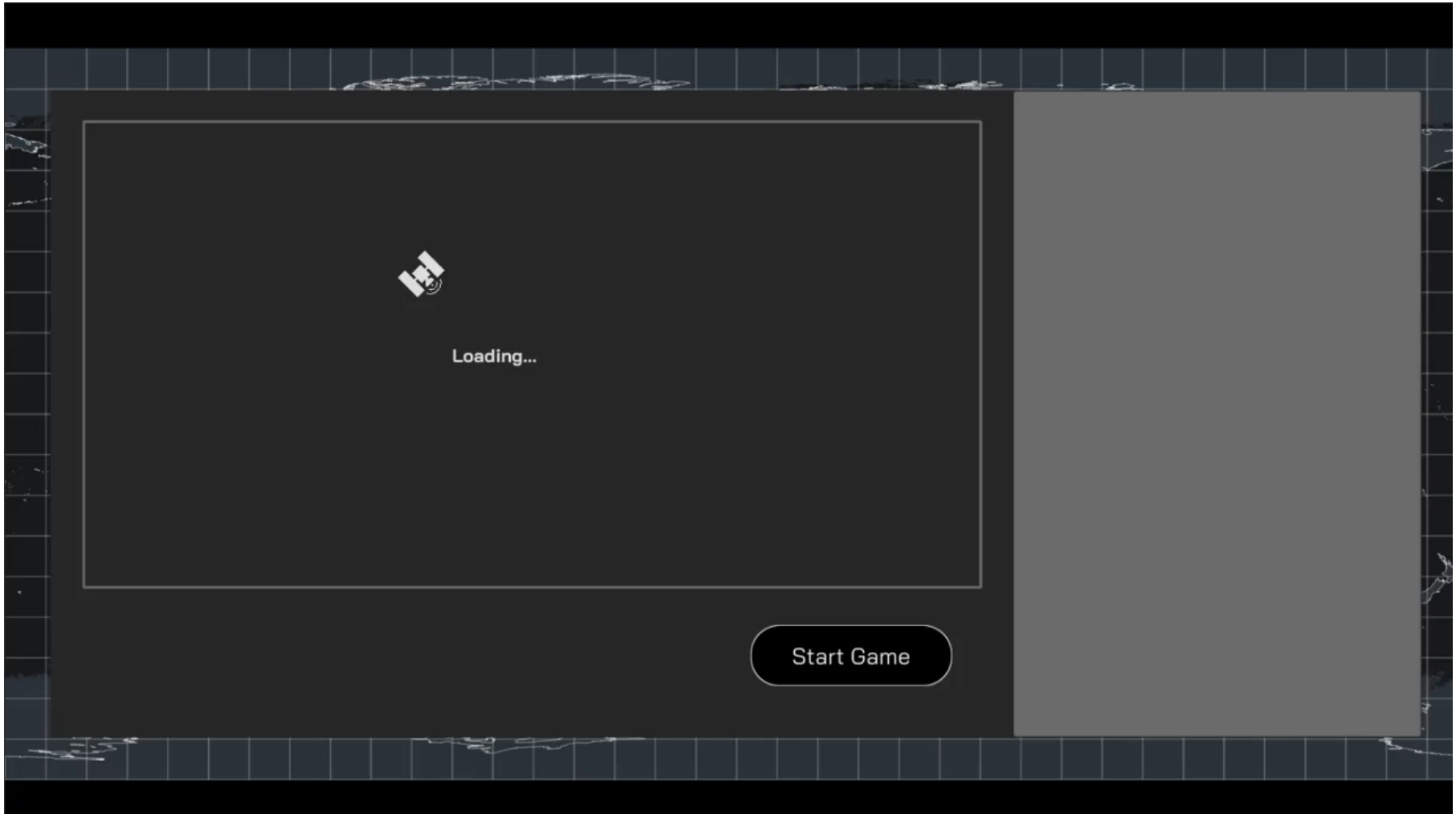
POC: Tanner Stevens, Josh Cohen

- NeoForce is a gaming platform that leverages commercial technologies for space operations and training by simulating space operations in a multi-player videogame environment. It is part of the Prairie Ventures line.
- NeoForce differs from most wargame tools because it is not tied to pre-defined rules.
- Customer: Randy Villahermosa, iLab
- Technologies Used
 - *Unity, a game engine*
 - *Aerospace's astrodynamics library, Astrolib*
- Tanner Stevens and Jack Lam are the main developers on NeoForce



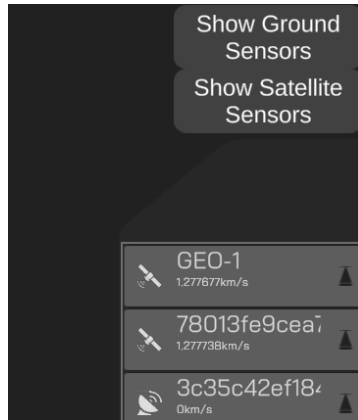
NeoForce

First task: Loading screen



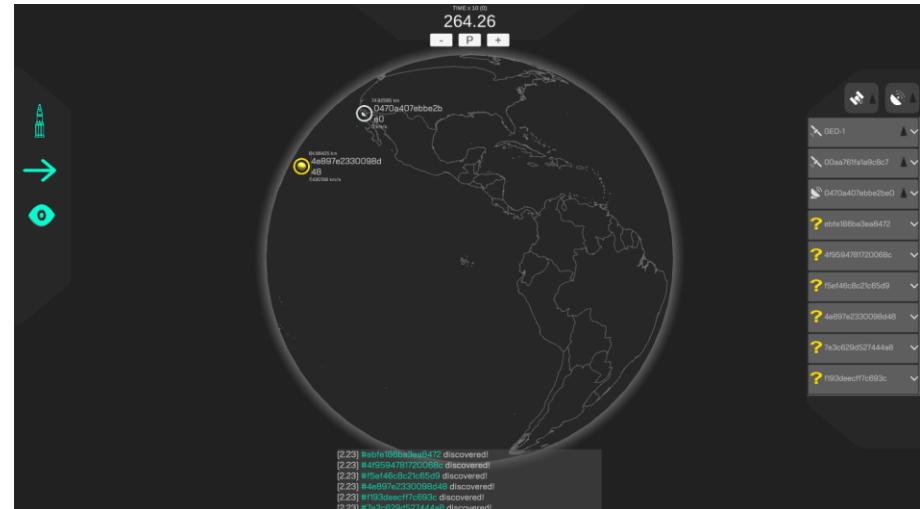
NeoForce

Redesign of Toggle All Satellite/Ground Station buttons

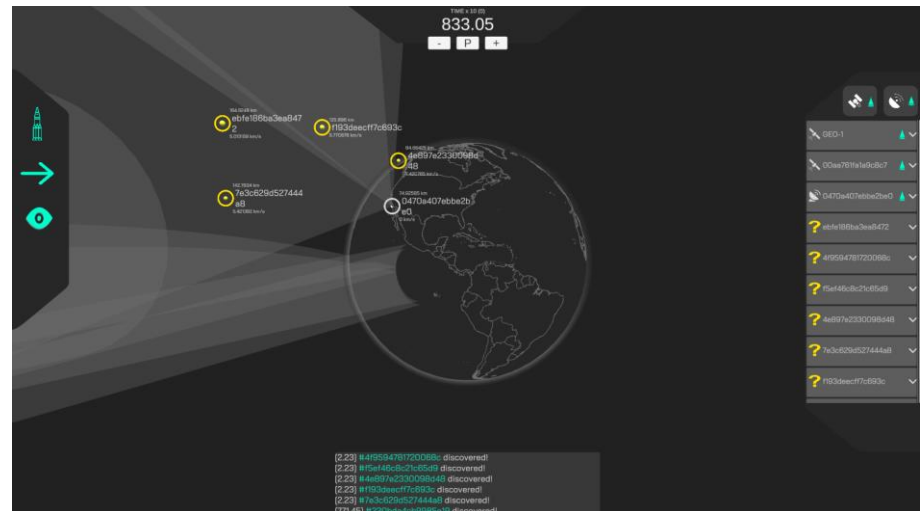
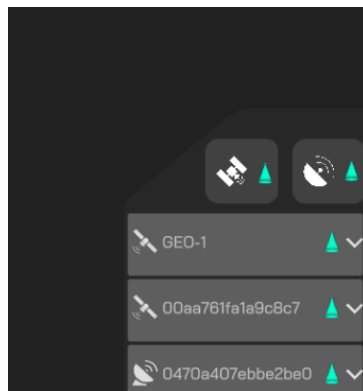


Before

Function

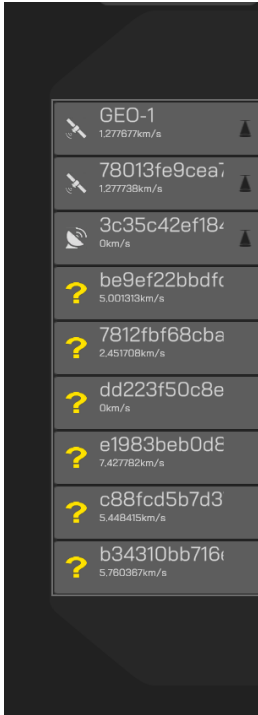


After

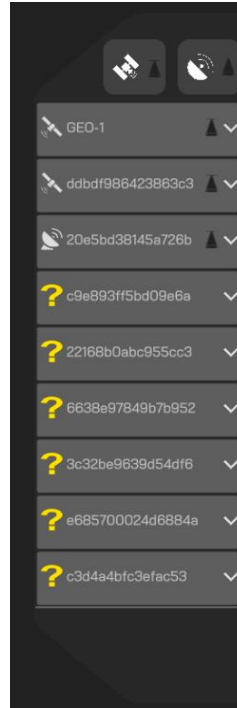


NeoForce

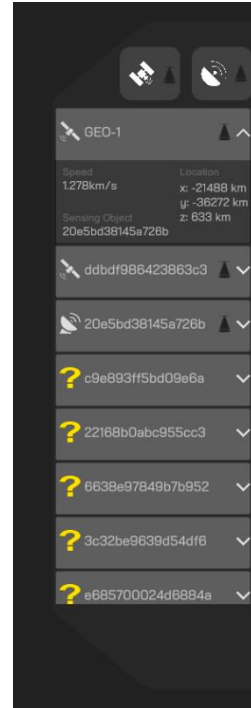
Make dropdown panel for each satellite/ground station



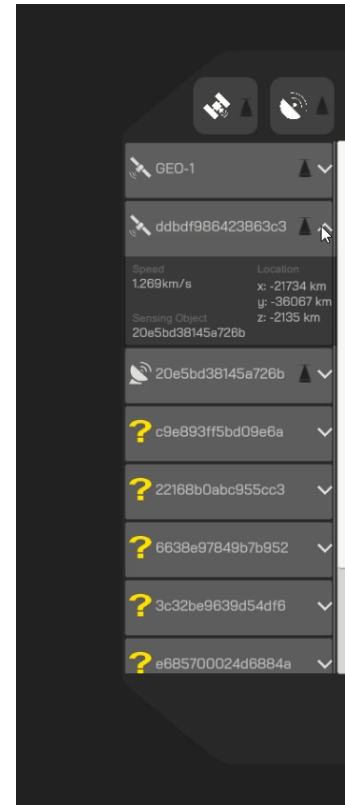
Before



After
(dropdown
closed)



After
(dropdown
open)

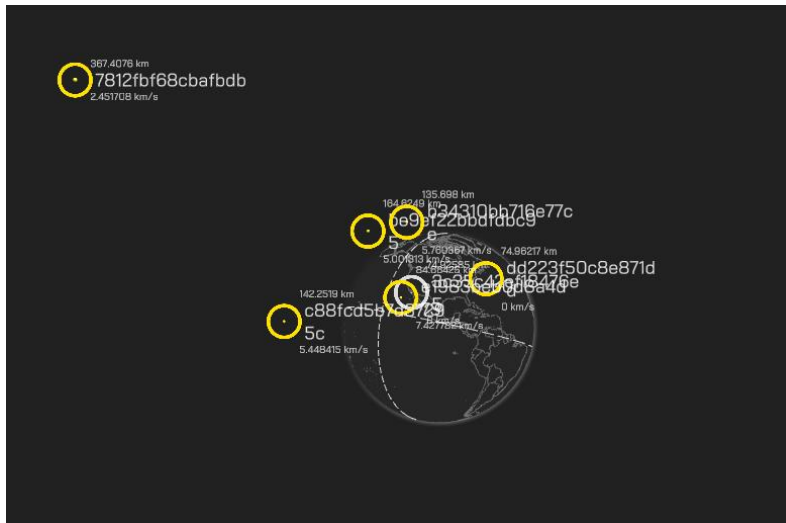


Video

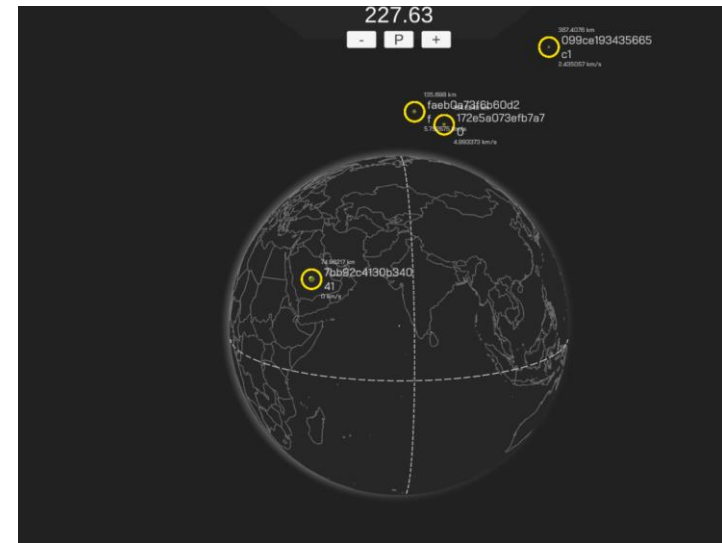
NeoForce

Hide object markers when object is on other side of earth

- Needed to learn about raycasts in Unity



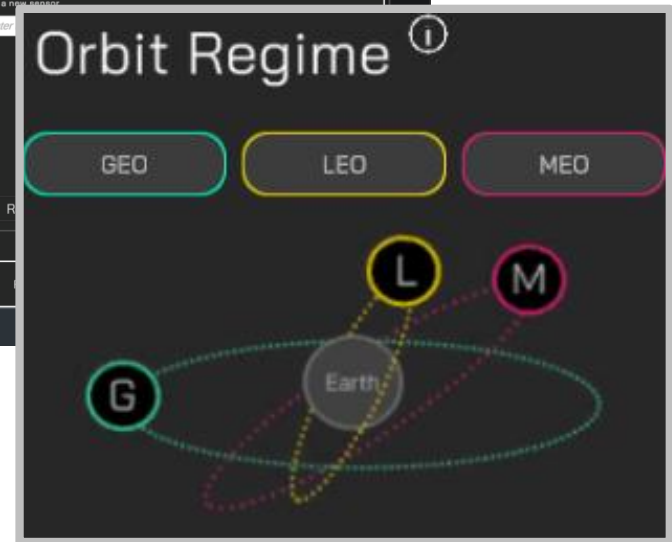
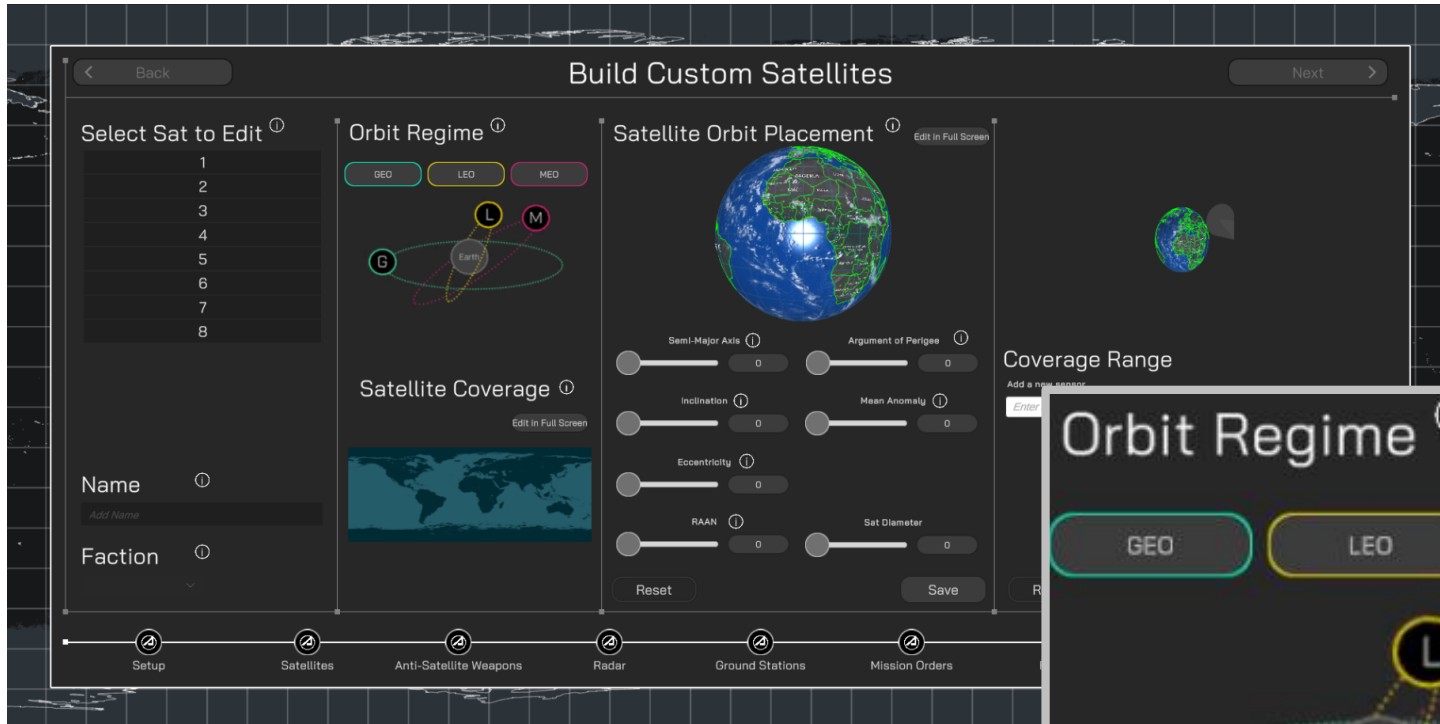
Before



After

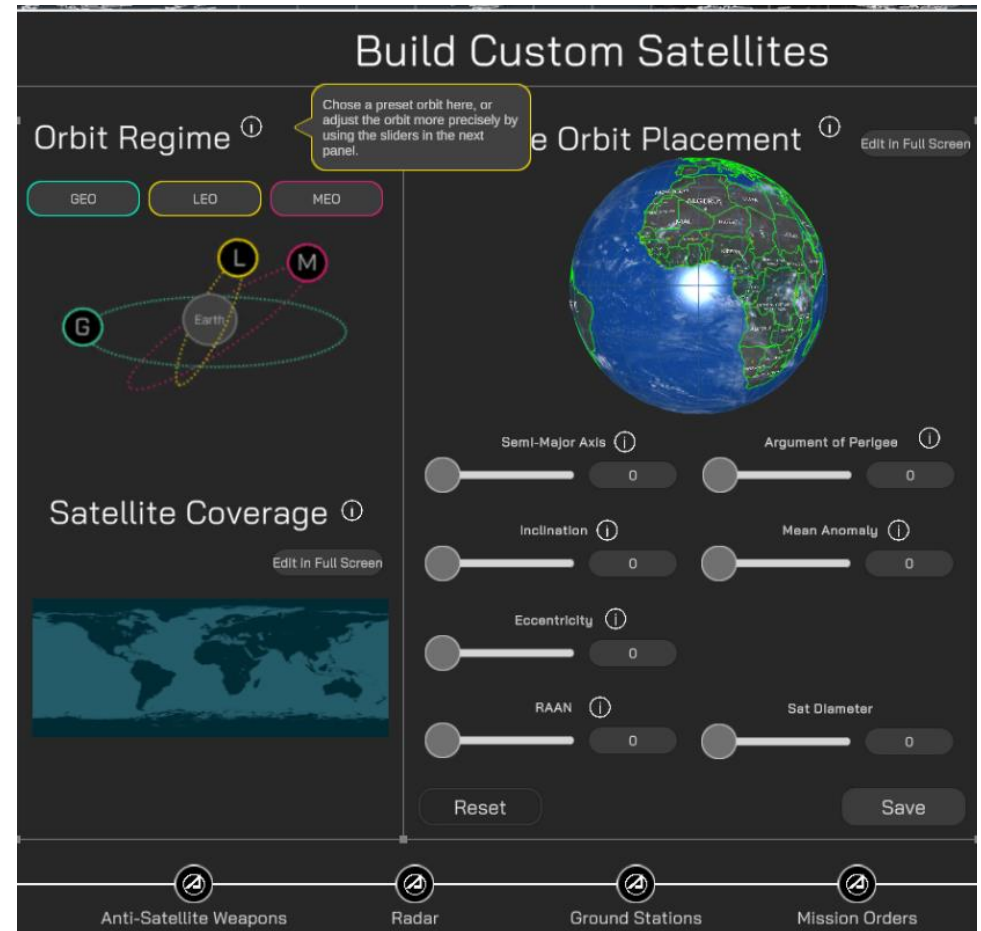
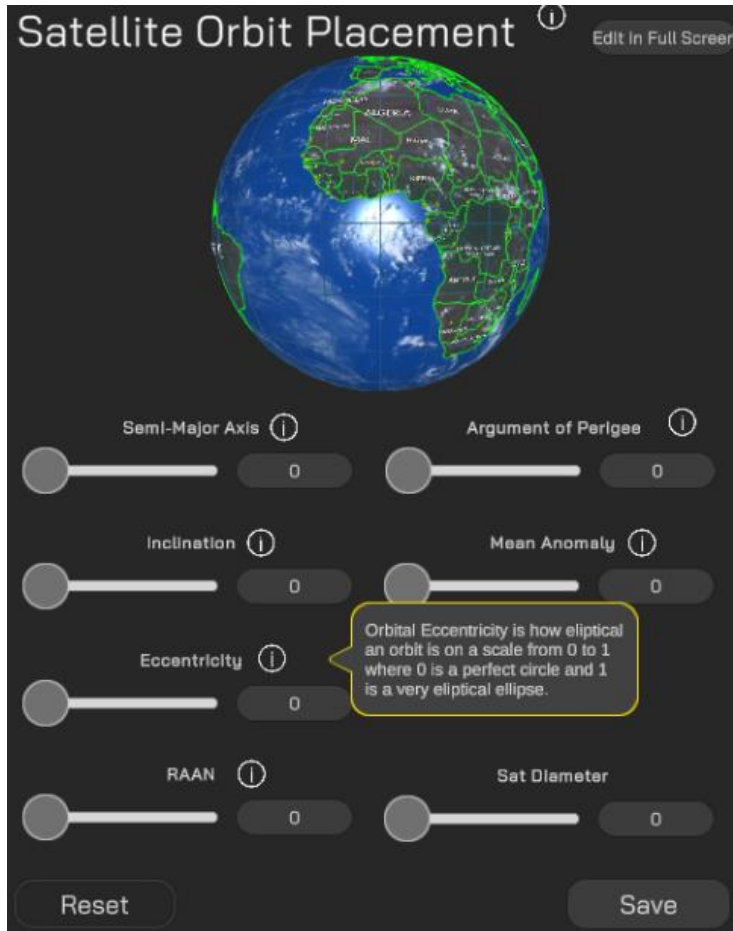
NeoForce

Create shortcuts for LEO, MEO, and GEO orbits



NeoForce

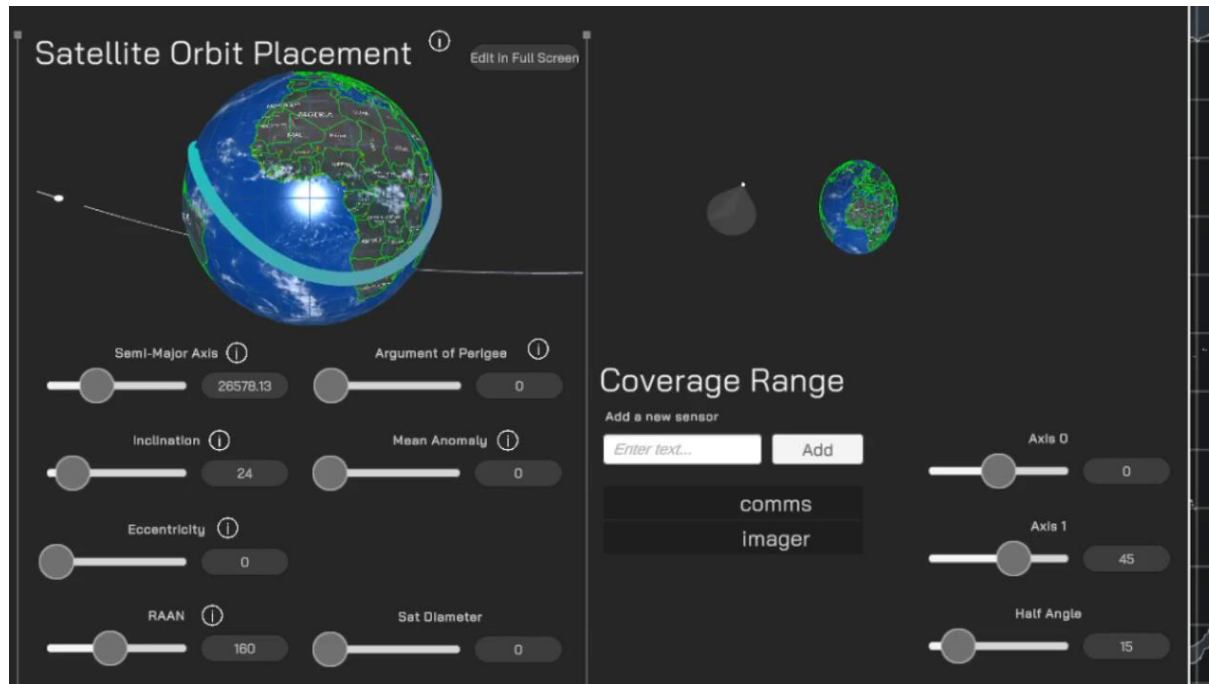
Add informational tooltips



NeoForce

Create a subscene for configuring the sensor cones

- This was my biggest task, since it required:
 - Making a subscene with a camera, earth, and sensor cone
 - Getting that subscene to appear on an image
 - Integrating the subscene into the main scene
 - Making the cone respond to the user's input via sliders



NeoForce

What I learned + Impact

- Technologies that I learned
 - *Unity*
 - *C#*
 - *Strengthened my skills with Git, I had never worked with multiple branches or pull requests before*
- More abstract skills
 - *Got experience onboarding to a project*
 - *Finding the right balance between asking for help and spending some time trying something on my own first*
- Impact:
 - *Overall I helped to make the user interface more functional and intuitive, which will help NeoForce to meet it's goal of reducing the learning curve for space operations*



iLab Interstellar Object Return Summer Intern Study

POC: Todd Sheerin

- The overall goal of this project was to create a mission plan to capture a sample from an interstellar object and return it to earth
- Customer: iLab, Randy Villahermosa, Concept Design Center
- Team had 17 multidisciplinary interns
- 3 week project
- I was the Visualization subteam lead
- I used Unity to make a short video explaining the project



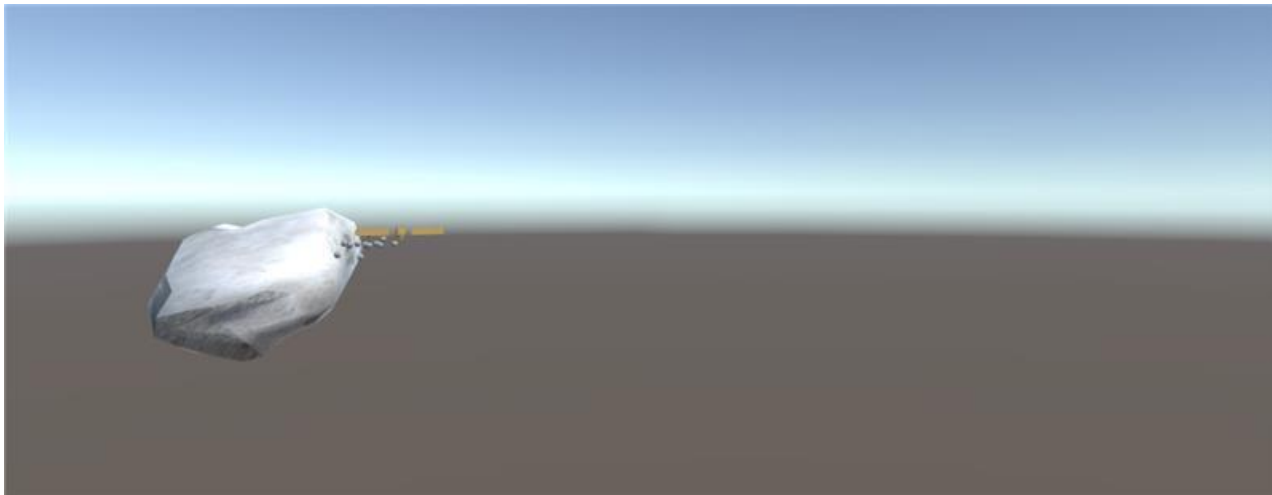
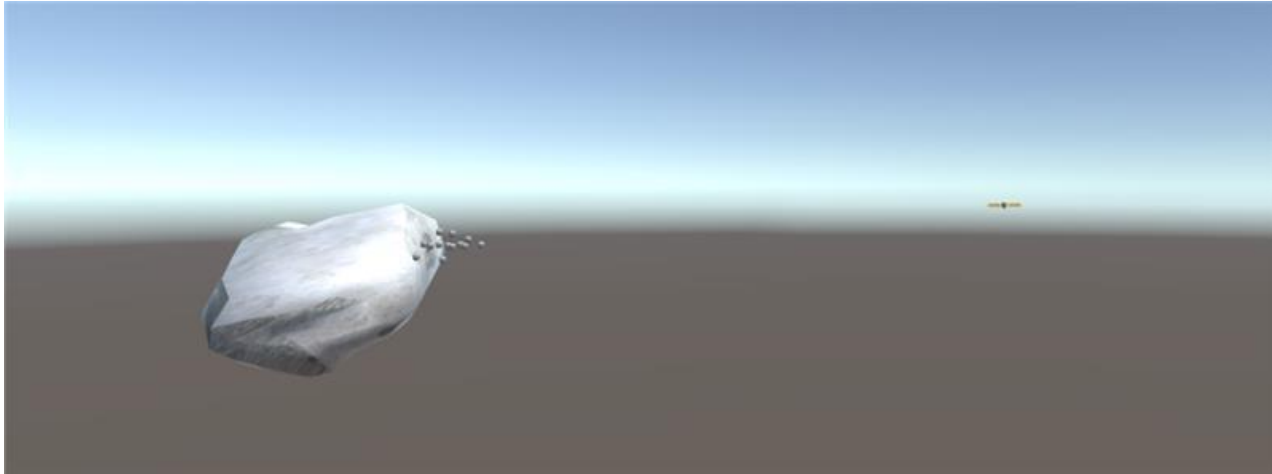
iLab Interstellar Object Return Summer Intern Study

Main Camera View



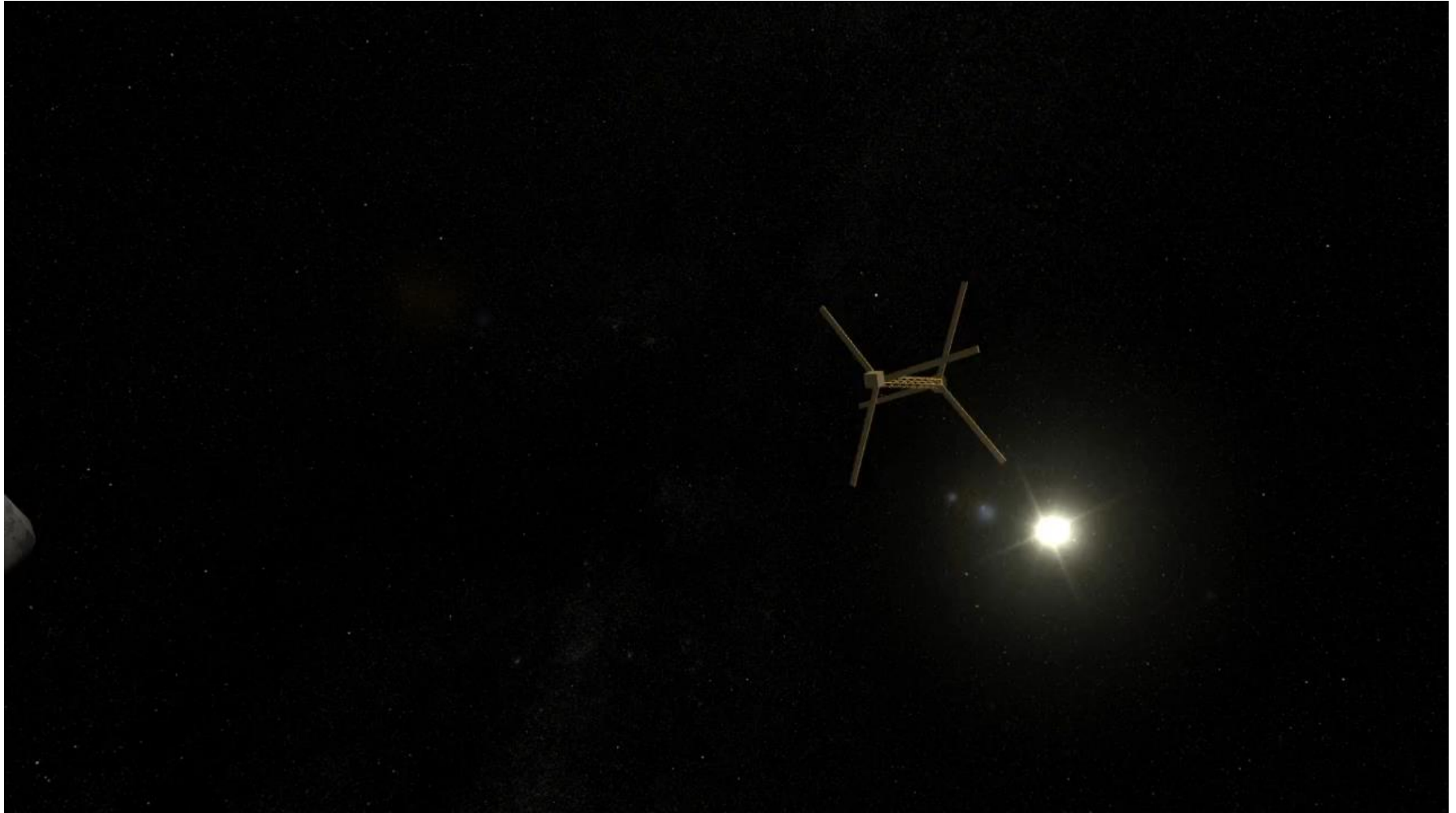
iLab Interstellar Object Return Summer Intern Study

Process



iLab Interstellar Object Return Summer Intern Study

Moving Camera View



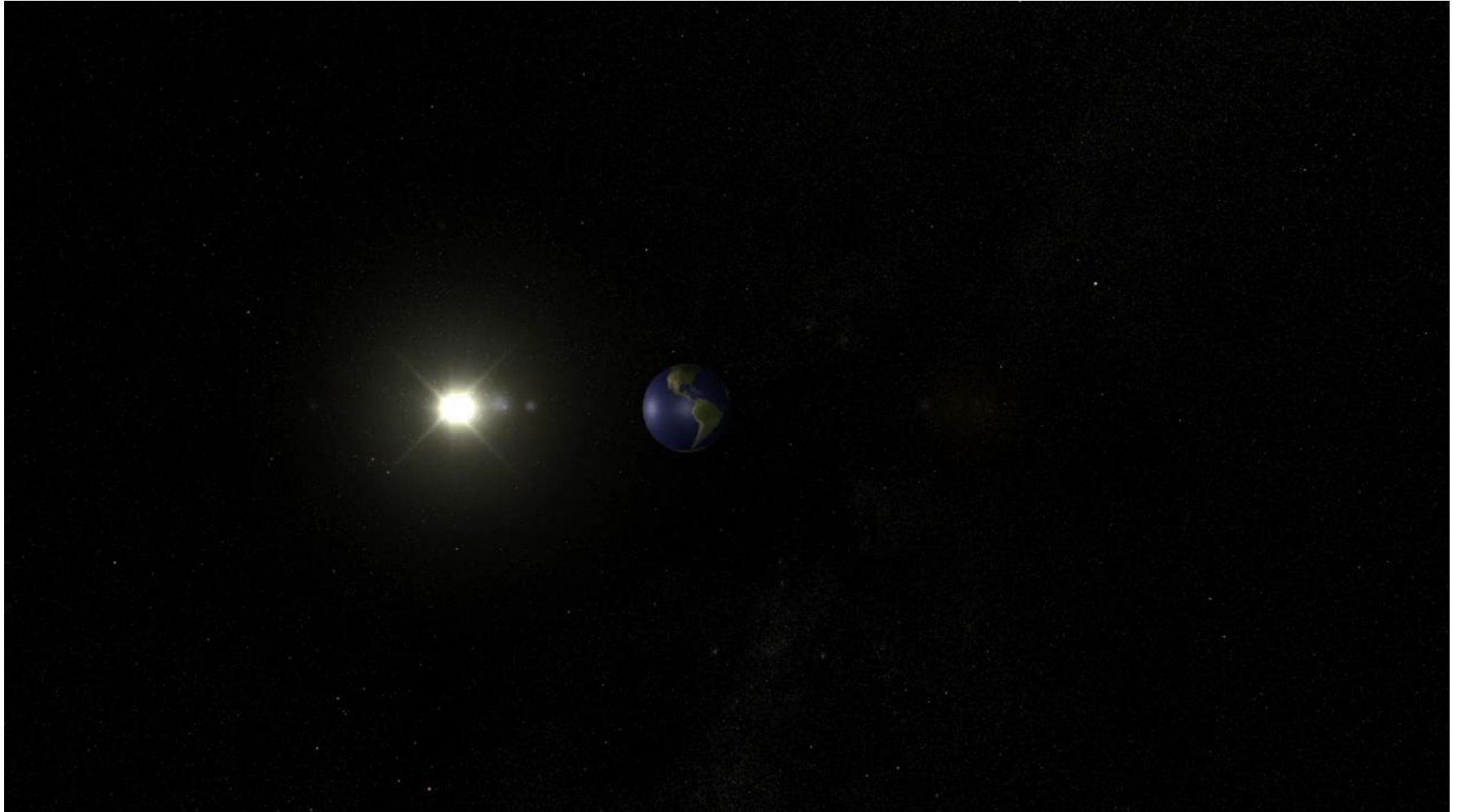
iLab Interstellar Object Return Summer Intern Study

Camera that follows the collector satellite



iLab Interstellar Object Return Summer Intern Study

View of satellite with solar sails out



iLab Interstellar Object Return Summer Intern Study

What I learned + Impact

- Technical Skills
 - *Strengthened my Unity skills*
- More general skills
 - *Working with a multidisciplinary team*
 - *Figuring out how to translate what other people were explaining into a model in my head, then translate the model in my head into code*
- Impact: My visualization explains the mission plan to people from both technical and nontechnical backgrounds



Internship Experience



- Things that I liked in general
 - *I really liked my projects this summer, and I got to apply what I learned in school*
 - *I got to learn skills that I would not have learned in school*

Virtual Internship pros and cons:

Pros

- It does not feel as awkward to take a break or get up and stretch
- I have gotten to experience working remotely
- More efforts were made to reach out to interns

Cons

- It is more difficult to connect socially with people
- Difficult to get a sense of what projects other people are working on
- No doughnuts at the intern events



Questions?