



LOCKHEED MARTIN

Lockheed Martin Space endeavors to change the way the world interacts with space. Just like air traffic controllers today manage the thousands of planes flying through the sky, so too do we need space traffic controllers to manage and maintain the ever-growing number of satellites that have become an integral part of our day to day lives. From satellites to space junk, we aim to provide our customers with complete situational awareness in the space domain.

Background

Lockheed Martin is currently expanding the Global Space Domain Awareness Sensor Network, deploying telescopes across the globe to collect more and more data on objects in space. The Space Domain Awareness (SDA) team at Lockheed Martin needs an interactive visualization tool to help satellite operators better understand the seemingly endless amount of data we collect about the objects that orbit the Earth. Utilizing advancements brought on by the video game community, virtual reality has become an immersive capability where humans can intuitively interact with nearly any environment. Space traffic controllers need to be able to quickly, and efficiently understand the big-picture while maintaining the capability to explore specific interactions between space objects and the information we collect about them.

Project Description

Below is a summary of the tasks we expect to be completed to create a VR experience for the future space traffic controller.

1. Create a virtual reality and desktop environment for visualizing data from the space object catalog from the perspective of an observer on Earth
2. Create interactive objects within the VR environment to display detailed information about each object
3. Implement fundamental aerospace concepts to alert the user to potential space events (i.e. pending collisions/unexpected maneuvers)
4. Design the user's VR experience to be both intuitive and engaging

Some of the skills that will be leveraged and improved include (but are not limited to):

1. Game Design
2. Unity, C#, HTML, CSS
3. Databases (SQL)
4. Data Analytics
5. User experience/interface

The tasks will be accomplished in an agile environment with a helpful product owner. Daily scrum meetings will help facilitate development with the product owner visiting the School of Mines campus for Sprint Demos. The finished project is a fully functioning VR experience to visualize and interact with

the provided data. The product will be demonstrated to Lockheed Martin leaders and ultimately used to effectively communicate the type of data products that Lockheed Martin can provide to its customers.

Requirements

We are looking for a team of 3-5 engineering students. Students should have an interest in game design and virtual reality development, focusing on human factors engineering and the user experience. Because of the emphasis on an intuitive and enjoyable experience for the user, the team may also include a graphic designer or a member who is passionate about graphic design.

The team will be working closely with members of the Space Domain Awareness team at Lockheed Martin. The Space Domain Awareness Mission spans more than five Lockheed Martin locations and at least three international partners. This is a global effort that will, without a doubt, have a lot of visibility within the aerospace community.