

Observing Space in Your Own Space

Studying the solar system can be very boring for Astronomy and Astrophysics students. The only representations we have of our solar system are images in our textbooks, images found online, or 3D models that are scalable yet small. This presents a problem for students because they don't have a good way to view the planets and their scale, making learning boring. There has been some work using Augmented Reality (AR) where you can scan a planet and view it on your phone, however I haven't seen an application where you can view planets that are moving in AR. Our project is to replicate the solar system using AR in the real world and making it scalable so you can see it across a small field or walk around campus looking for the planets. Creating this type of application will get students interested in learning and will give them a chance to interact with the students.

This proposed system will take what students are learning on paper and move it into real life. The students will be able to understand the solar system in a whole new way and be entertained by their search for the different planets. We will use mobile devices to run the project, whereas the development will be done in Unreal using C++. We will also be using HD models from NASA when rendering the planets in AR.

See Figures 1 & 2 below.

The project is aimed at students, specifically astrophysics students, who are struggling to conceptualize the mechanics of the Solar System. The project will task

these students to “hunt” down the planets, in a scaled-down Solar System model across real space such as the NMSU campus. The students will be able to use a digital map on the application to tag their geographical location on the map. The geotagging will allow students to share where they spotted the planets to help visualize the planets’ orbits to help in their calculations. Astrophysics faculty could be used as a resource to find out about student needs and requirements, such as the information they need to learn. The project’s evaluations can be tested with an in-house alpha test by the project team with a beta test of the system with live volunteers, organized by the faculty, later down the road.

Currently when learning about our solar system and planet placement, we look to flat diagrams, and miss a large part of our learning process because of this. We are trying to develop a new and fun way for students to learn about the solar system. This project will promote an engaging way to learn more about our solar system. Our project will be able to reach much further than just astronomy students. With all the game elements involved in our projects it will make it so that more students can be involved. Hopefully we can create a space where students can enjoy learning more in a low-pressure environment. Our hope is that students will thrive in this calm learning environment.

Our team will accomplish the proposed project combining our skills and using an iterative approach. Our team is experienced in this area because we have worked together to create our game titled Knock Blocks in a previous semester. We were

successful in assigning tasks, using version control, and bringing everything back together to form a cohesive and working product. Our group has experience in scripting and developing games in Unity, so the switch to Unreal should not present a problem. Phillip has worked in the VR lab at NMSU and has experience with creating VR environments and linking controls to peripherals. All 4 members have taken Software and Game Development courses together where we worked as a team to design, create, and complete a project. These skills would make our team a perfect fit to accomplish this project.

Resumes:

https://drive.google.com/drive/folders/1tIGv-OPhw7_DJoG-9RX0Pu9dKr7gwSeZ?usp=sharing

Sketches & Concepts:

Figure 1: Scaling Concept across the horseshoe.

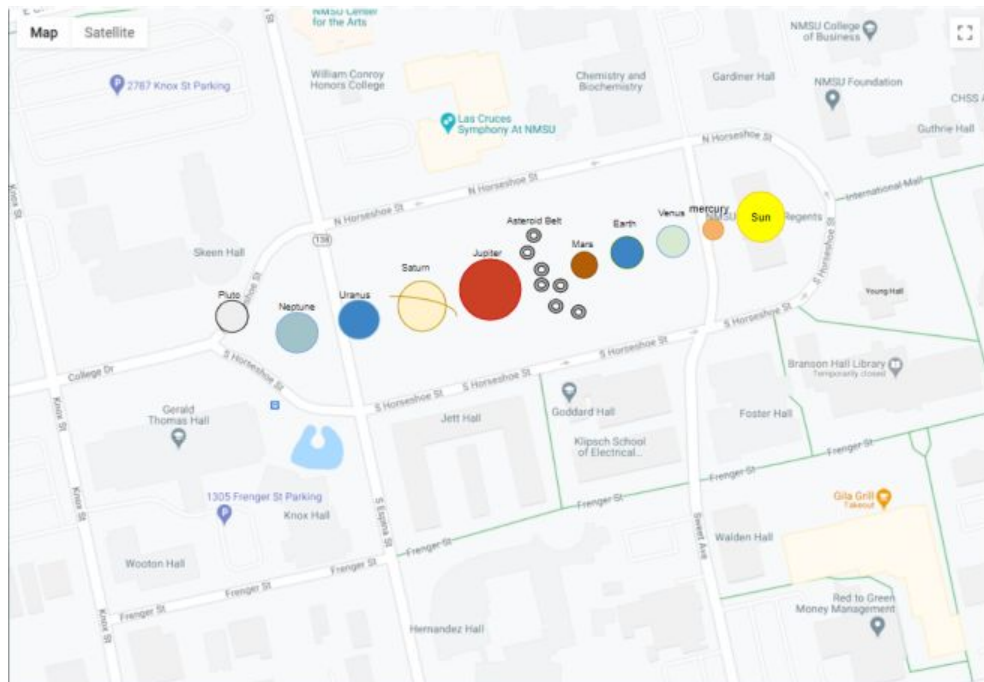


Figure 2: AR concept rendering:

