Summary Description: My First Unity Experience While Doing A Pedagogical Research Study

Tags: software; Unity; research; pedagogy; Augmented Reality; Undergraduate Student Research Initiative (USRI); Fusion 360

Why I did this: After my first year of engineering, I was asked by my MacEwan University teacher, Dr. Davis, if I wanted to participate in an Undergraduate Student Research Initiative (USRI) study. The study was centered around researching if augmented reality tools could aid in a student’s learning.

I wanted to participate mostly because it was an opportunity to learn the Unity game engine (which I have never used before, but heard it was great for developing games and simulations). In this study I researched what other articles focused on AR for pedagogical use and if I could develop scenes in Unity (and Fusion 360 for drawing) that reflected engineering course concepts that could be better explained with AR model scenes.

(summary pic of system)

Design Walkthrough:

Parts: Unity; Fusion 360 (if you need to make models); smartphone

I made a summary video on YouTube that showcases what Unity scene’s I was developing and what engineering course branches (Mechanics, Computer) they were fixed on. The video description also has details for the project and each scene. In Unity, I used an AR library called EasyAR because my phone didn’t have the depth-AR capabilities that other AR libraries needed.

YouTube link (apologies for the shakiness; I was holding the camera by hand trying to record, and keep the background aligned, and activate buttons/bars): https://www.youtube.com/watch?v=5aArtjM2tWk

Another version (I tired to stabilize the shakiness of the first video, but it made other items shaky): https://youtu.be/g37nufiZfr4

(pics of system)

Lessons Learned and Future Changes:

Unity is a pretty cool simulation tool. This was my first experience with the basics of Unity (layout, folder placement, tool locations) and its pretty nice to use. This was also my first real coding experience, and I did not find that too overwhelming; I coded scripts in C# (all animations, except the Valve one, were created through coding writing, like rotations, UI buttons, colour manipulations).

I gained an understanding of an immediate use of AR in 3D modeling. So far, a prime use of AR is to take computer model prototypes and visualize their placement in the real world without physically creating an expensive time consuming model with immediate changes/regrets to that model; e.g. placing a AR-model of a complex engine in a real-world empty corner, and immediately realizing that currently installed fuel supply lines, from the real-world, would approach the AR-engine's fuel injection points at an impractical location/angle, quickly making me realize that "I should have modeled the engine's fuel lines on the other side", but I didn't build the engine yet, so I could easily change the 3D model without causing money-losing regrets.

References:

Unity game engine: https://unity.com/

YouTube video: https://www.youtube.com/watch?v=5aArtjM2tWk

YouTube video, ‘attempted’-stabilized version: https://youtu.be/g37nufiZfr4