CST-320 Technical Report - Prototyping HCI Applications

Period (9/20/21-9/26/21)

Student Name: Diego Guerra, Ryan Scott, Andrew Esch

Faculty Name: Isac Artzi

Project Topic: 2

Current task(s) (refer to the tasks listed in LoudCloud and/or instructor directions; detailed bullet list):

1. An inventory of all the skills you have acquired in using Unity so far. You may no all have the same skill and knowledge, so you will make a table, in which you mark who in the team has the skill
2. A summary of what have you prototyped and explored so far regarding your project ideas, including:
    a. ideas
    b. sketches of concepts not yet implemented
    c. exploratory assets, interactions, scripts
    d. for each one of the items above, indicate who is responsible. There could be more than one person responsible for an item
3. Include several representative Unity screenshots, depicting your project ideas as they stand today.
4. Describe what UI elements you plan to integrate and how they will serve the project. Include representative screenshots from your work with the UI tutorials.

Activities performed this week (bullet points with explanations):

- Setup both Oculus Quests to fully function with all computers (using two separate developer accounts)
    - Previously, only one Oculus quest could function using Ryan's computer and Andrew's developer account. Now, both team devices are set up and available to test.
- Below describes the individual responsibilities and activities performed for this CLC project:

• Andrew:

○ Add skills to table

○ Work on prototyping UI Elements & creating representative screenshots in Unity

§ Utilize Adobe XD

○ Get hands & grabbable objects working in Unity

○ Create a Menu & Fire-Extinguisher Script

○ Import these scripts & any other scripts from this topic to GitHub

- Diego:
  - Add skills to table
  - Sketch prototypes:
    - § Hallway and 2 minigames
  - Attempt to implement one sketch idea into Unity
    - § Maybe the hallway (create simple room with doors, text, etc.)
  - Import any scripts from this topic into GitHub
- Ryan:
  - Add skills to table
  - Do a sketch of a fruit ninja game
  - Import some assets to indicate grabbable objects
  - Space with fruit floating in space as a scene in Unity
  - Create a script that maybe represent some aspect of the fruit ninja game
  - Import Fruit Script and any other scripts from this topic into GitHub
  - Film the Loom!

Overall progress (describe new knowledge acquired, successes, ideas generated, etc.):

- Skill Inventory Table

Item #	Who gained the skill/knowledge?	Explain Skill/Knowledge Gained
1	Ryan, Andrew, Diego	Duplicate, Manipulate, and Destroy Prefabs in Game using C# script
2	Ryan	Toggle between Cameras using C# script
3	Ryan	Creating a new custom skybox
4	Andrew	Creating Unity UI GameObjects and a Menu Canvas skeleton using Unity UI Toolkit
5	Andrew	Learn and Utilize Adobe XD for creating UI Element Toolkit, components, and states
6	Andrew	Manipulate Particle Systems in Unity (using the editor and C# scripts)
7	Diego	Create Basic 3D Objects in Blender
8	Andrew, Diego, Ryan	Utilize Photoshop and Illustrator for creating

		sketches and assets

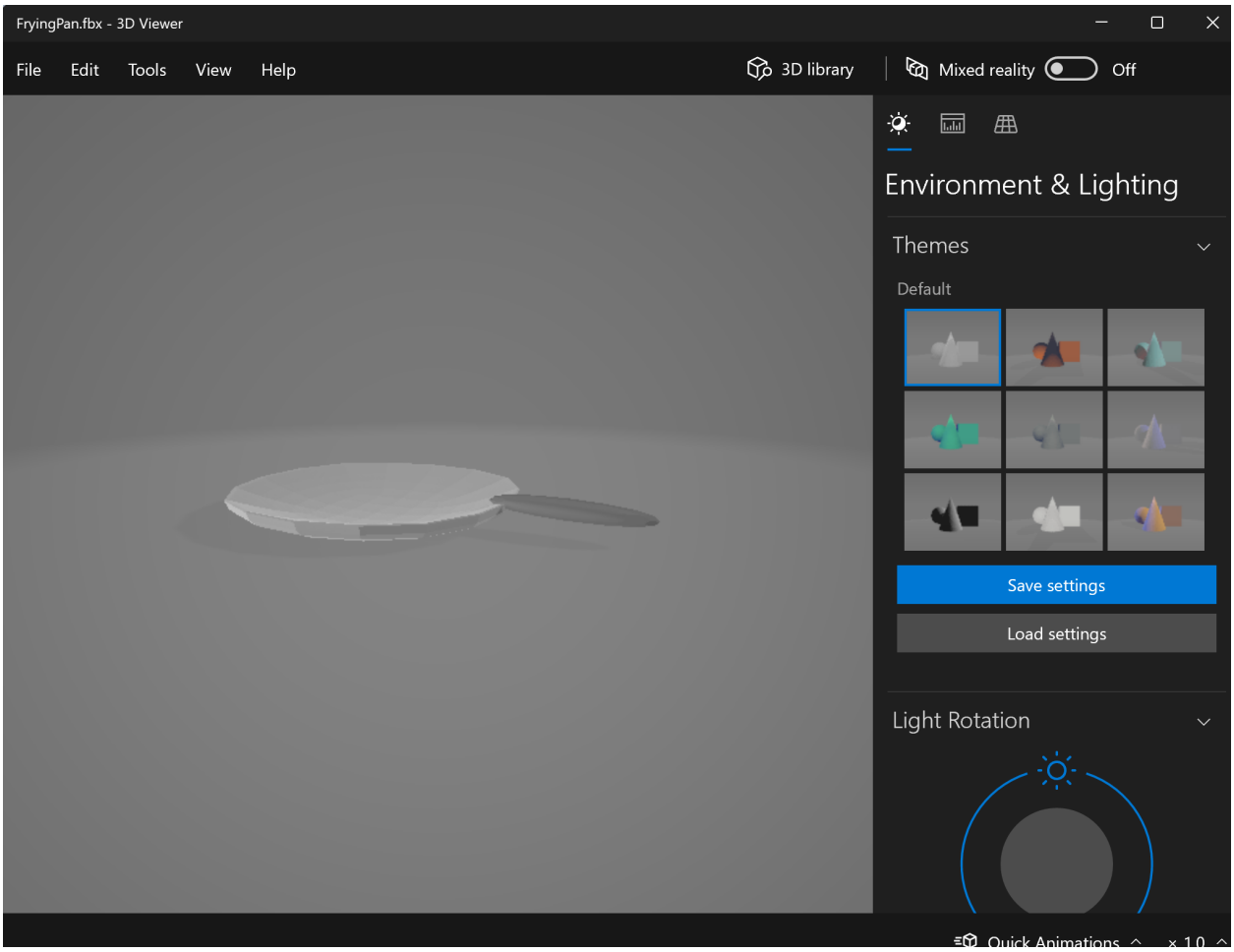
Project Ideas

- Our Project Choice: Imagine if you were an astronaut
    - In the year 2100, a large private space company hires you as an astronaut as part of a research experiment. Your job is simple, to demonstrate to the researchers what it would be like for the everyday human to survive in space for long periods of time.
        - The user will be able to explore what it would be like to be on a space station, perform various activities in space, be another world, manually maneuver a rocket ship, and float around in zero-gravity.
- Ideas to prototype for this project includes:
    - Game Activity Ideas
    - Ideas of Various Scenes and Assets
    - Project UI Elements

Game Activity Ideas

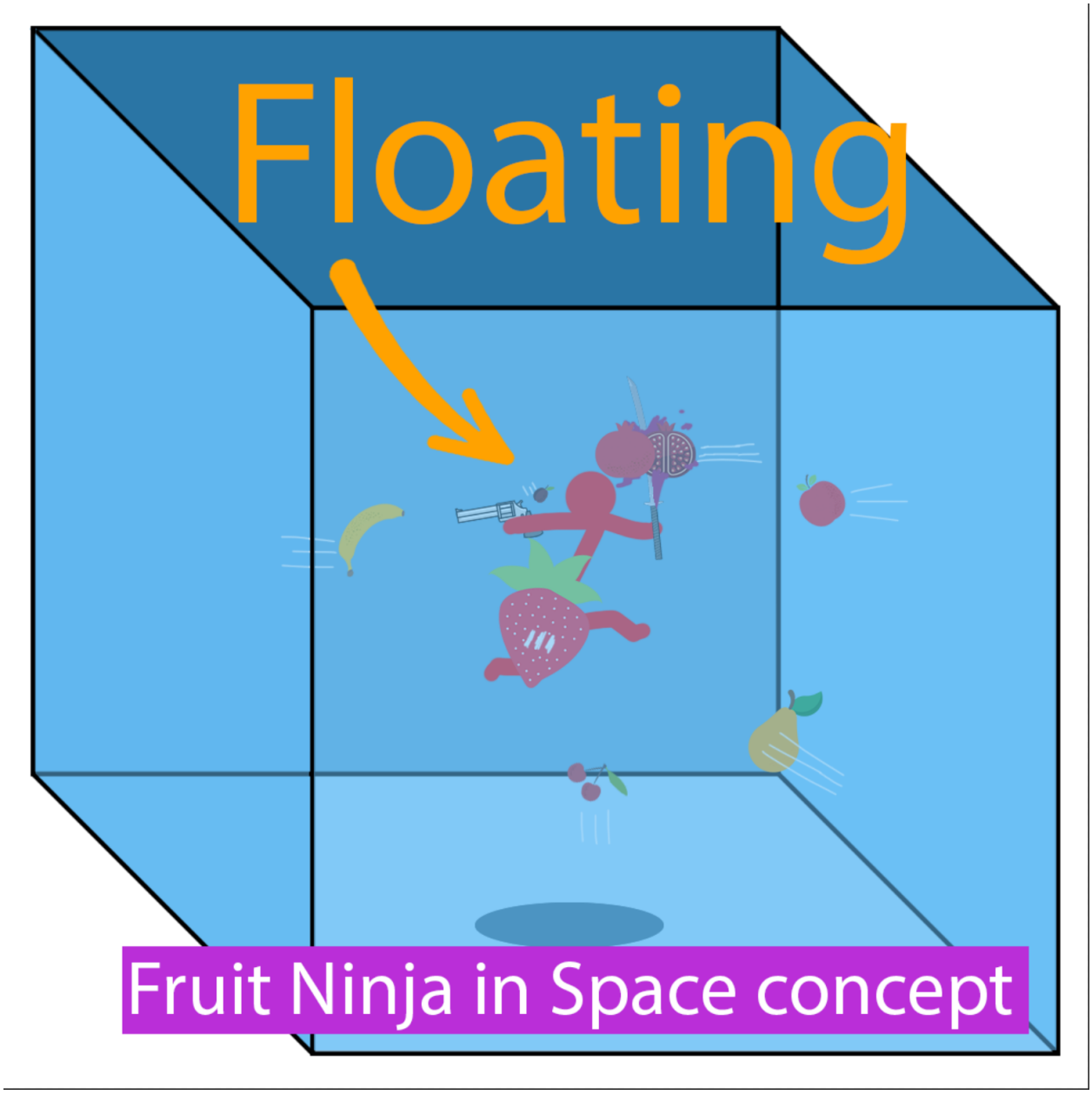
1. Cook a pancake (or some other food item) in space (Idea by Ryan)
    a. Simple idea
        i. Create a room with the following objects:
            1. A grabbable pan
            2. A grabbable lid
            3. A stove
            4. A grabbable pancake
                a. 5 different models: Uncooked, Slightly Cooked, Almost finished, Finished, and Burnt.
        ii. The goal: Keep the pancake on the pan and stove with zero-gravity for until the pancake is fully cooked. The user will be scored (0-100) based on how cooked the pancake is.

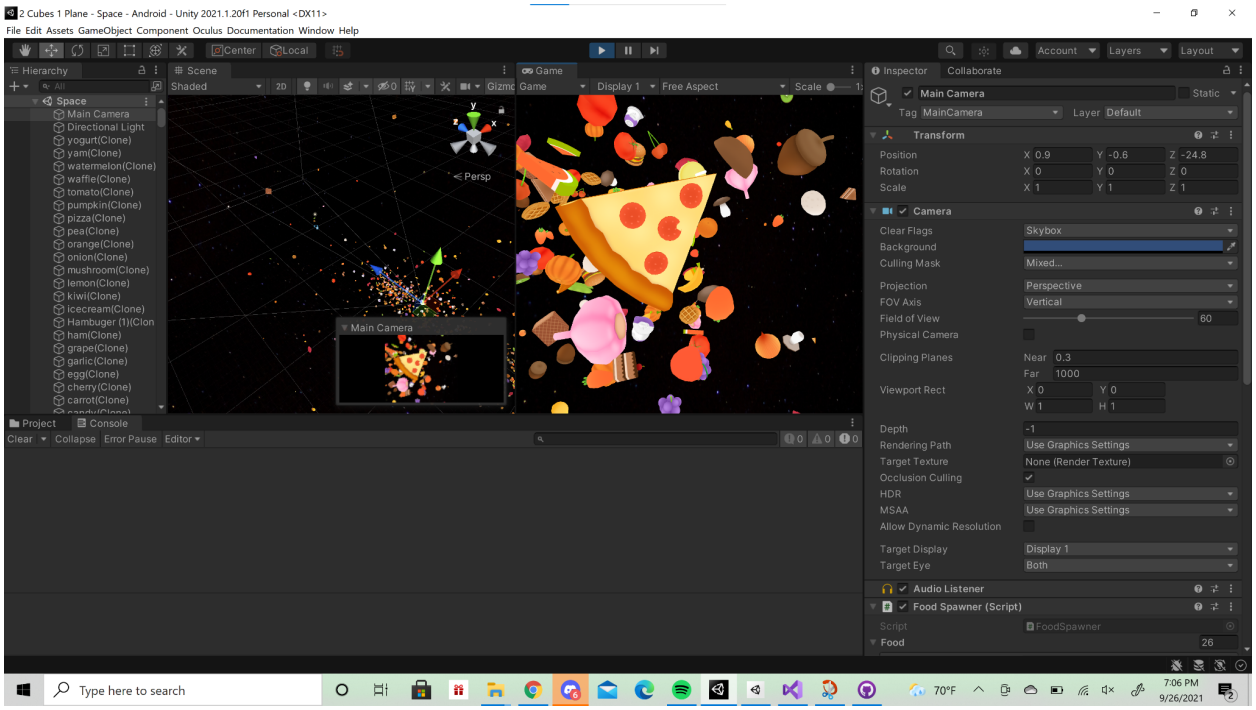
    b. Sketches and Other Screenshots:



c.

2. Target Practiced (Idea by Ryan)
    a. The user will be enclosed in a glass room with zero gravity
    b. Various objects (fruit, soccer balls, etc.) will fly at the user in any and all directions
        i. In space, all objects will not de-accelerate, and users can maneuver around in zero-gravity using the fire extinguisher.
    c. The goal: Deflect as many of the objects as possible
        i. Utilize a score system, where deflecting certain objects will give more points than others
    d. Users will have to cut the fruit like the popular mobile game “Fruit Ninja”.
        i. Idea inspired from implementing this game in a different context for this project.
    e. Users can also use different types of tools to deflect objects
        i. Examples: Metal Rod, Hammer, Sword, etc.
    f. Sketches & Other Screenshots

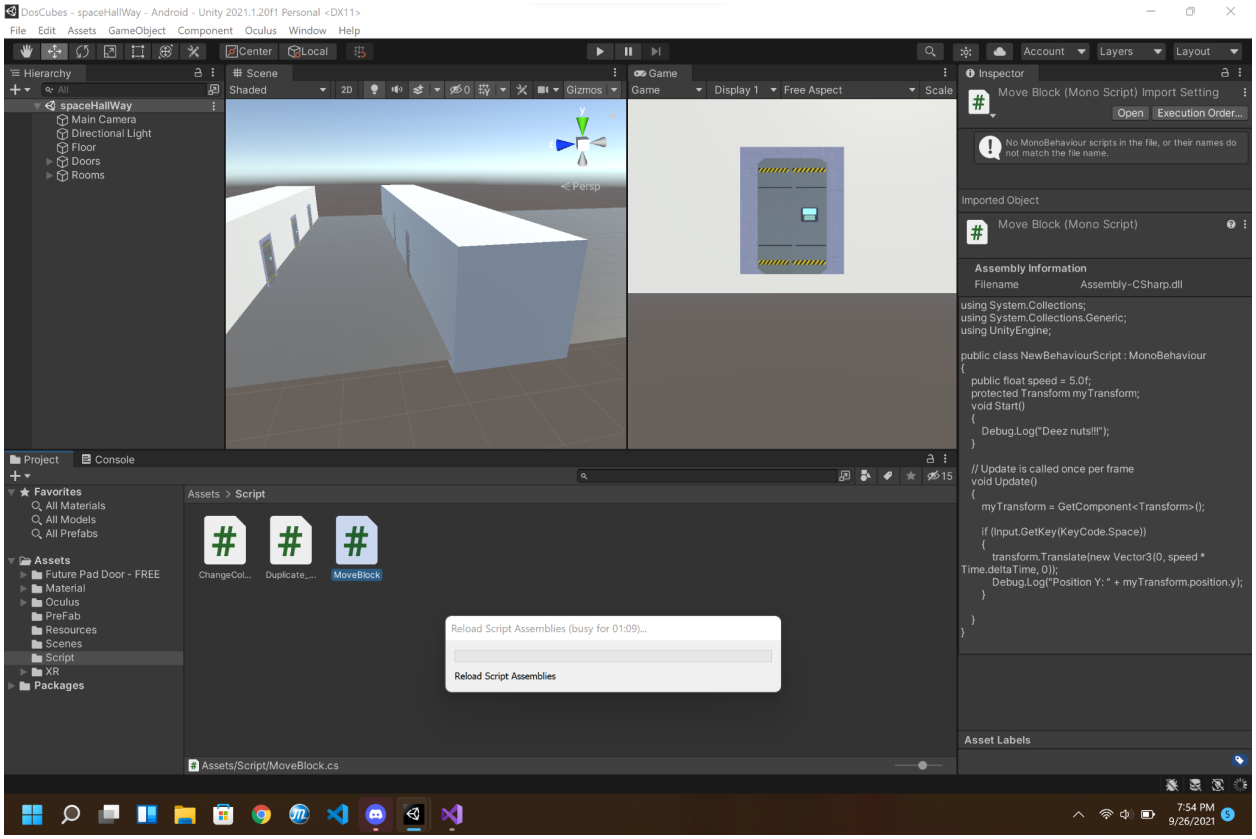

Floating
Fruit Ninja in Space concept



3. Space Frogger (Idea by Andrew, Ryan, and Diego)
    a. Inspired from the popular game “Frogger”
    b. The user will experience a simulation where asteroids, spaceships, or other objects will fly through at a constant rate.
    c. The goal: Maneuver through the projectiles for as long as possible, and make it as far forward as possible.

Scene and Asset Ideas

1. Space Station Hallways (Idea by Diego)
    a. Once the user arrives at a space station, the user will see a hallway full of doors. The user can select a door to go through. Each door signifies a different type of activity, so opening a door will load a new scene with a new activity.
    b. Sketches:



2. Fire extinguisher (Idea by Andrew)
    a. Inspired from the movie “WALL-E”
    b. The user will always have a fire extinguisher in their inventory. They can utilize this tool to maneuver in space, dodge incoming projectiles (e.g., asteroids), and use them in other activities.
        i. Prototype C# Script is located on GitHub

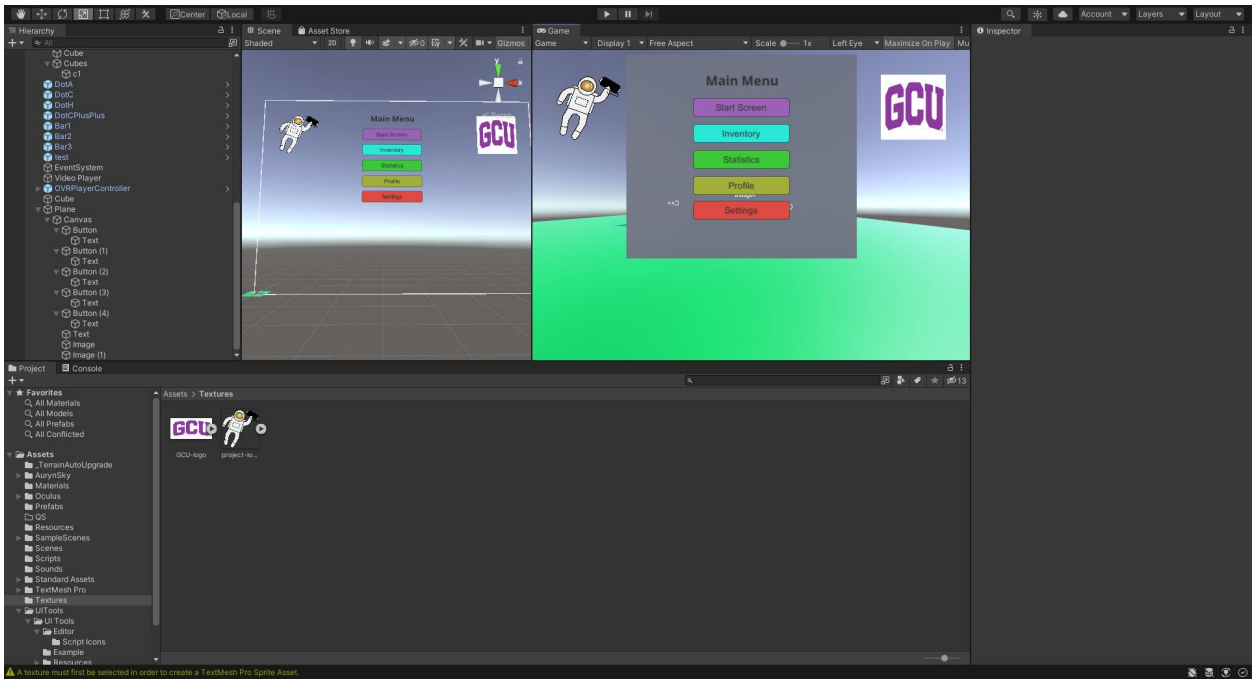
Planned UI Elements

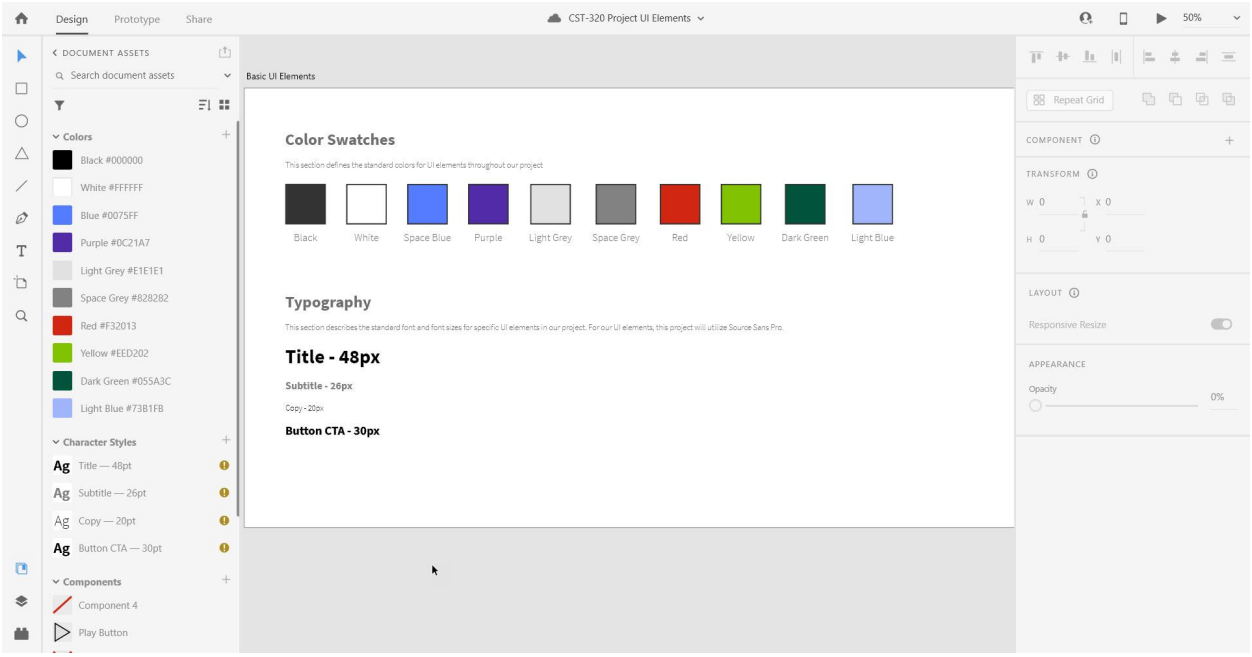
1. Adobe XD & Unity UI Toolkit (by Andrew Esch)
    - Our team will utilize Adobe XD as a separate UI toolkit, which will then be implemented in Unity using the Unity UI Toolkit.
    - Adobe XD will define and prototype the application's standard colors, fonts, components, hover states, and functionality.

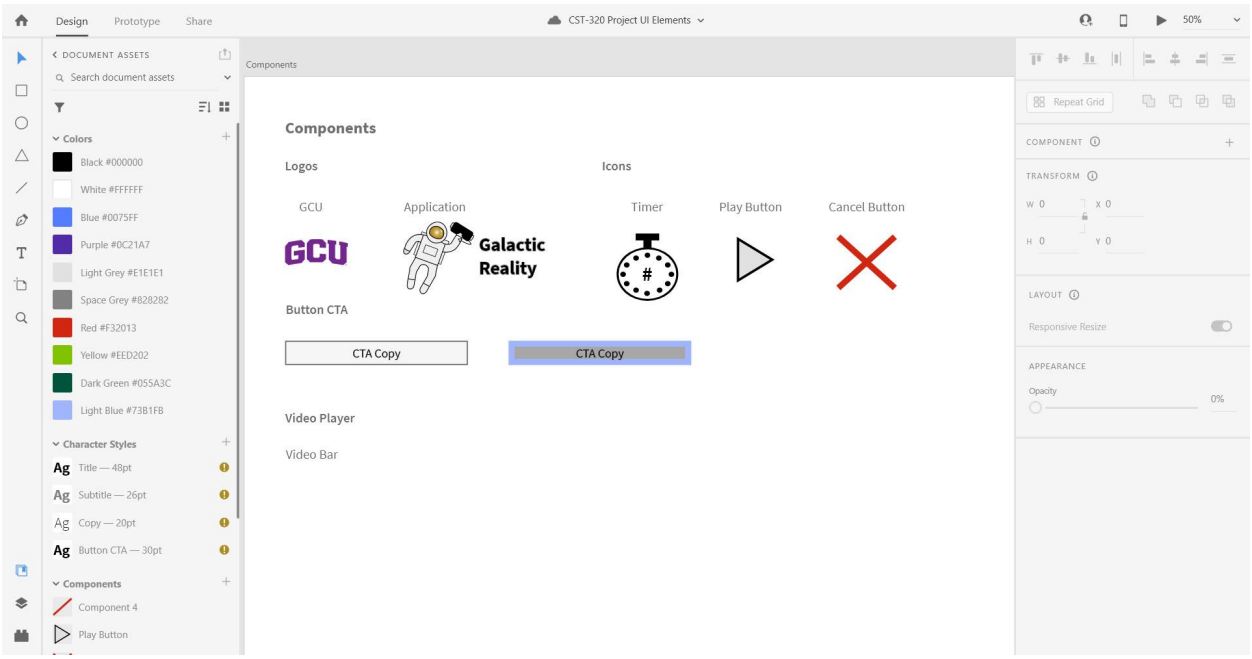
2. Simple UI Elements (for Unity) (by Andrew Esch)
    - Menus
        i. Examples: Start Menu, Main Menu
        ii. They will either appear when the user clicks a button on the oculus controller (e.g. the "Y" button), or will be scattered throughout the scene as "holograms".
        iii. Items must be easy to identity within the menu
    - Timers
        i. Starts a countdown timer to initialize an action in-game (Example: Rocket Launch Countdown Timer).
            1. Initialized by another related action
            2. Example: User decides to start a time-based experiment in space. Once the scene loads, the timer UI element appears to indicate when the experiment will start.
    - Video Player
        i. Displays video assets and other videos from direct URLs to the user through the Oculus Quest as a hologram.
    - Text
        i. Simple copy element defined by the standard typography.
    - Button
        i. These UI elements are utilized by either including them within a menu or as standalone Call to Actions (CTAs).
        ii. They appear as futuristic holograms for the user to interact with.
    - Images/Logos
        i. These UI elements will be displayed with other UI elements in the Unity UI Toolkit (e.g. Menus, Video Players)
3. Non-traditional UI Elements (ideas to consider for further exploration; not implemented in Unity UI Toolkit) (by Andrew, Ryan, and Diego)
    - Physical Buttons/Levers/Cranks
        i. Easy to implement with a script and physics engine
        ii. When the user or user's hand is in range, activate a hover state with a small description to explain that the object is interactive.
    - Door
        i. In the a hallway, opening a door plays a cutscene and opens a new scene
        ii. Doors will lead into another hallway, mini spacecraft

UI Element Screenshots (by Andrew Esch)

- The first screenshot depicts an implementation of the menu in Unity UI using the Unity UI Toolkit Tutorials. There are two versions implemented: A canvas implementation, and an in-scene hologram.
- The next three screenshots depict the project UI Element Toolkit created in Adobe XD. It includes:
    - Color and Typography Standards
    - Custom-designed Logo & GCU Logo
    - Custom-designed icons
    - Prototype depictions of some UI Elements listed above for Unity as Holograms
        - Menu
            - Prototype script available on GitHub
        - Timer
        - Video Player




Design
Prototype
Share
CST-320 Project UI Elements
50%
DOCUMENT ASSETS
Search document assets
Colors
Black #000000
White #FFFFFF
Blue #0075FF
Purple #0C21A7
Light Grey #E1E1E1
Space Grey #828282
Red #F32013
Yellow #EED202
Dark Green #055A3C
Light Blue #73B1FB
Character Styles
Ag Title — 48pt
Ag Subtitle — 26pt
Ag Copy — 20pt
Ag Button CTA — 30pt
Components
Component 4
Play Button
Basic UI Elements
Color Swatches
This section defines the standard colors for UI elements throughout our project
Black
White
Space Blue
Purple
Light Grey
Space Grey
Red
Yellow
Dark Green
Light Blue
Typography
This section describes the standard font and font sizes for specific UI elements in our project. For our UI elements, this project will utilize Source Sans Pro.
Title - 48px
Subtitle - 26px
Copy - 20px
Button CTA - 30px
Repeat Grid
COMPONENT
TRANSFORM
W 0
X 0
H 0
Y 0
LAYOUT
Responsive Resize
APPEARANCE
Opacity
0%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Component 4
Play Button
Components
Components
Logos
GCU
Application
Galactic Reality
Icons
Timer
Play Button
Cancel Button
Button CTA
CTA Copy
CTA Copy
Video Player
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Responsive Resize
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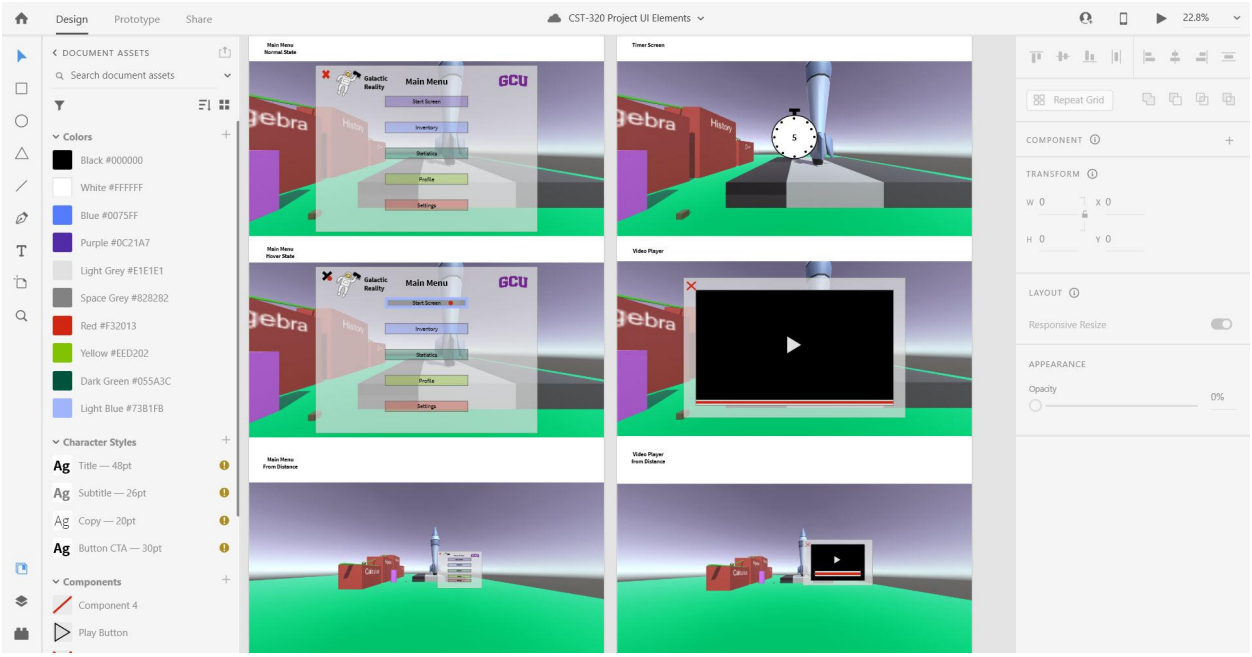

Issues that need to be resolved (bullet list):

- Creating grabbable objects in Unity that function with the Oculus Quest 2.
- Cannot get UI Toolkit Menu Features to work with scripts (E.g. Buttons, Opening New Menus)
- Diego's laptop isn't working with VR and any recent Blender release
- Cannot utilize Unity Collaboration for sharing projects together, Unity will sync project settings, but will not sync assets
- Diego's laptop currently can only run Blender v2.75, any other later version will throw a tantrum

Next steps (how will you mitigate the issues listed above; bullet list):

- Follow Padlet tutorial to resolve grabbing objects in Unity
- Look into Unity tutorials on working with scripts for planes, canvas, images, etc.
- Look into editing Blender and VR settings to work on Microsoft Surface.
- Move all assets into one project that will be shared through a thumb drive or external storage and figure out a system for collaborating without the built-in Unity Collaboration system.

Other comments:

- GitHub Link: https://github.com/drewesch/CST-320
    - Our Unity Scripts are located under /Scripts/Topic-2