Technical Project ESOF-2918

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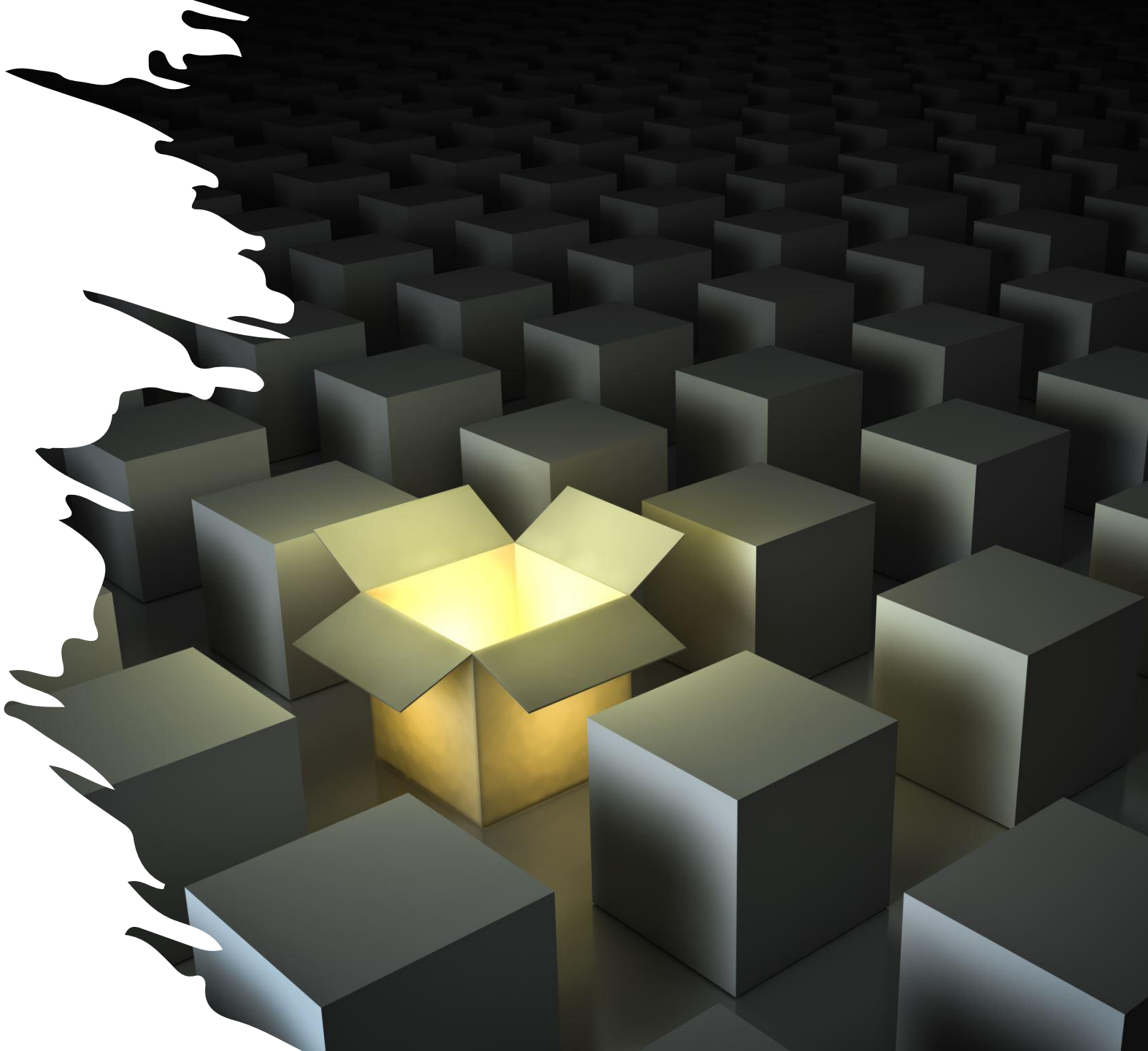


Our problem

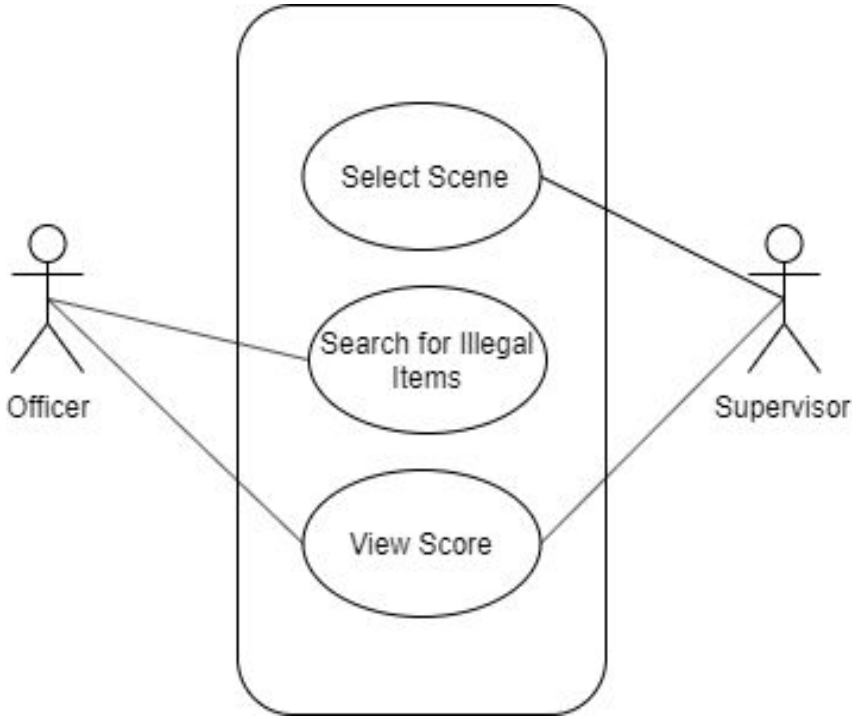
- The current process for training potential employees for the CBSA (Canada Border Services Agency) to search vehicles for illegal substances is **expensive** and **unrealistic**.
    - High travel costs to Quebec training location
    - Training cannot be dangerous to officers therefore limitation of what you could train
    - Every scenario has an illegal item in current training

Our Solution

- Create a VR application that simulates the procedure of searching vehicles in CBSA
  - Make around 50% of the scenarios contain an illegal substance - more realistic
  - With VR we can include unlikely scenarios that are dangerous to officers, such as finding a bomb in a vehicle
  - The VR system could travel from port to port, eliminating high travel costs

Use case diagram:

- Two participants
  1. Officer
  2. Supervisor
- Three actions:
  1. Select scene
  2. Search for illegal items
  3. View Score



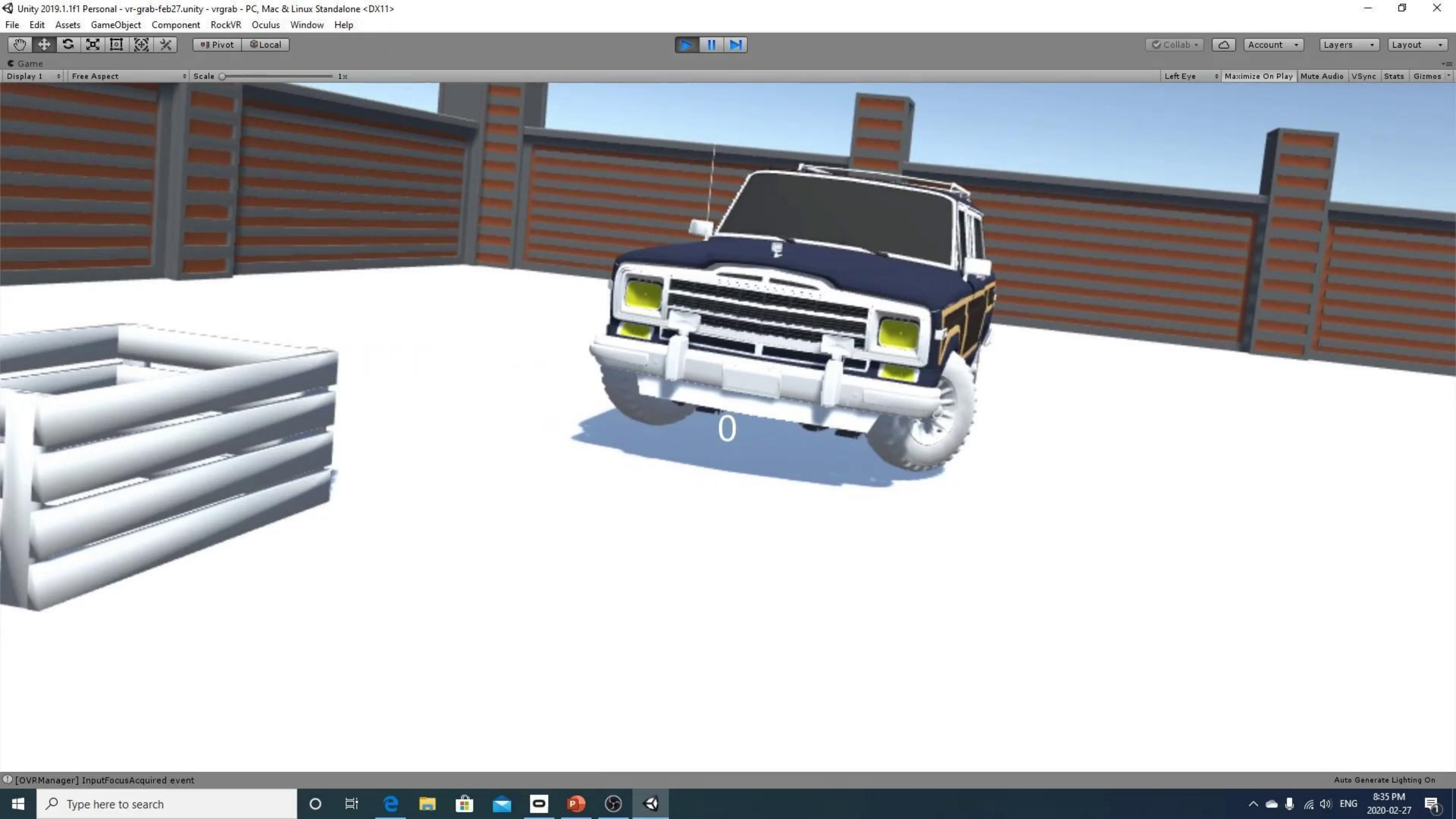
Formula for score calculation:

$$Score = \left(\frac{Number\ of\ illegal\ items\ found}{Number\ of\ illegal\ items\ in\ car} - \frac{Number\ of\ legal\ items\ wrongly\ selected}{Number\ of\ illegal\ items\ in\ car}\right) x\ 100$$

Example: 3 illegal items in car, 2 are found, 1 legal item is wrongly selected. Score would be 33%

Most Recent VR System Demonstration

We have done more work but we cannot access the ATAC machine to get videos or screenshots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File Edit Assets GameObject Component RockVR Oculus Window Help
Pivot Local
Collab Account Layers Layout
Game
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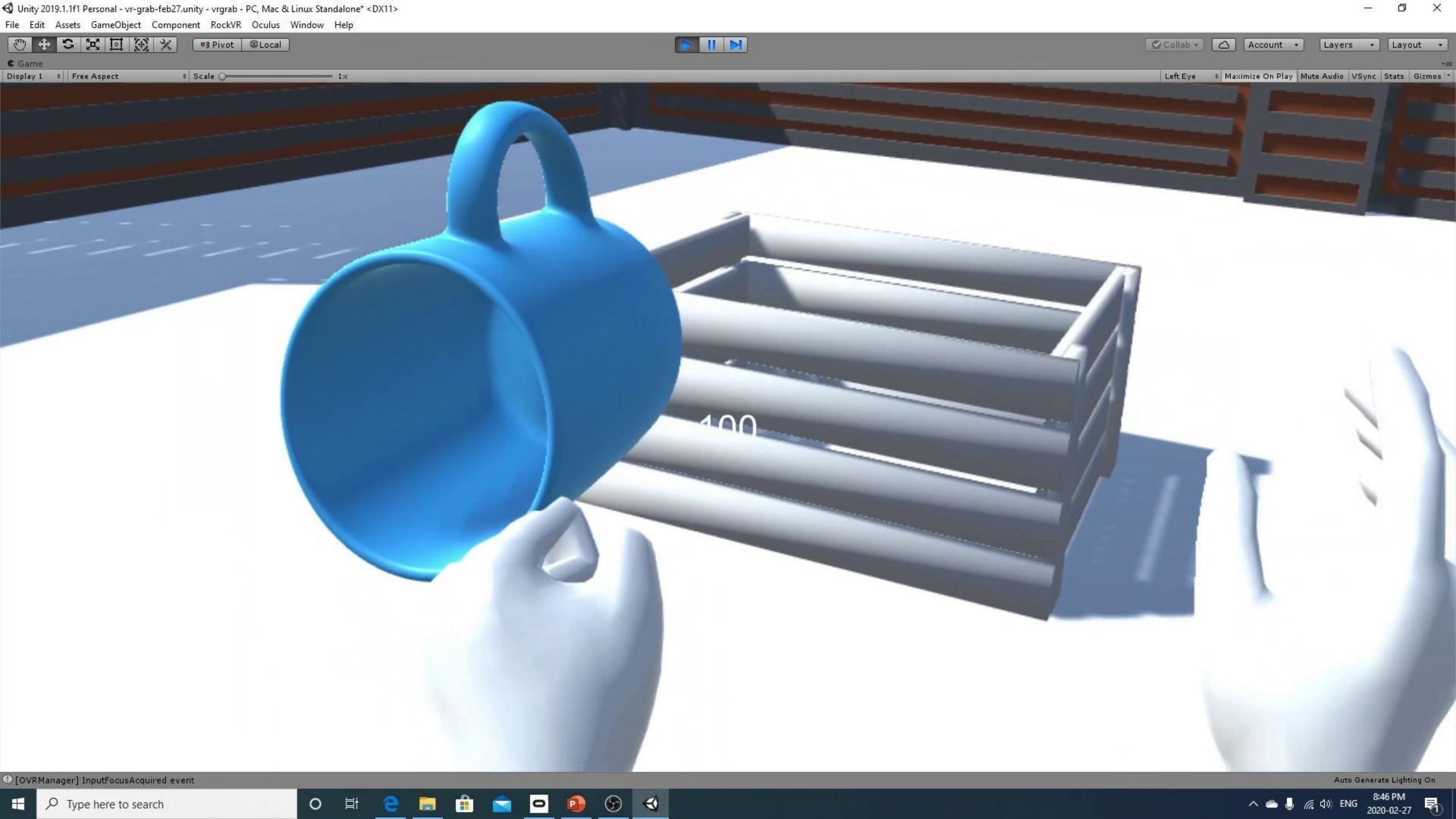
Unity 2019.1.1f1 Personal - vr-grab-feb27.unity - vrgrab - PC, Mac & Linux Standalone* <DX11>
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Left Eye Maximize On Play Mute Audio VSync Stats Gizmos
100
[OVRManager] InputFocusAcquired event
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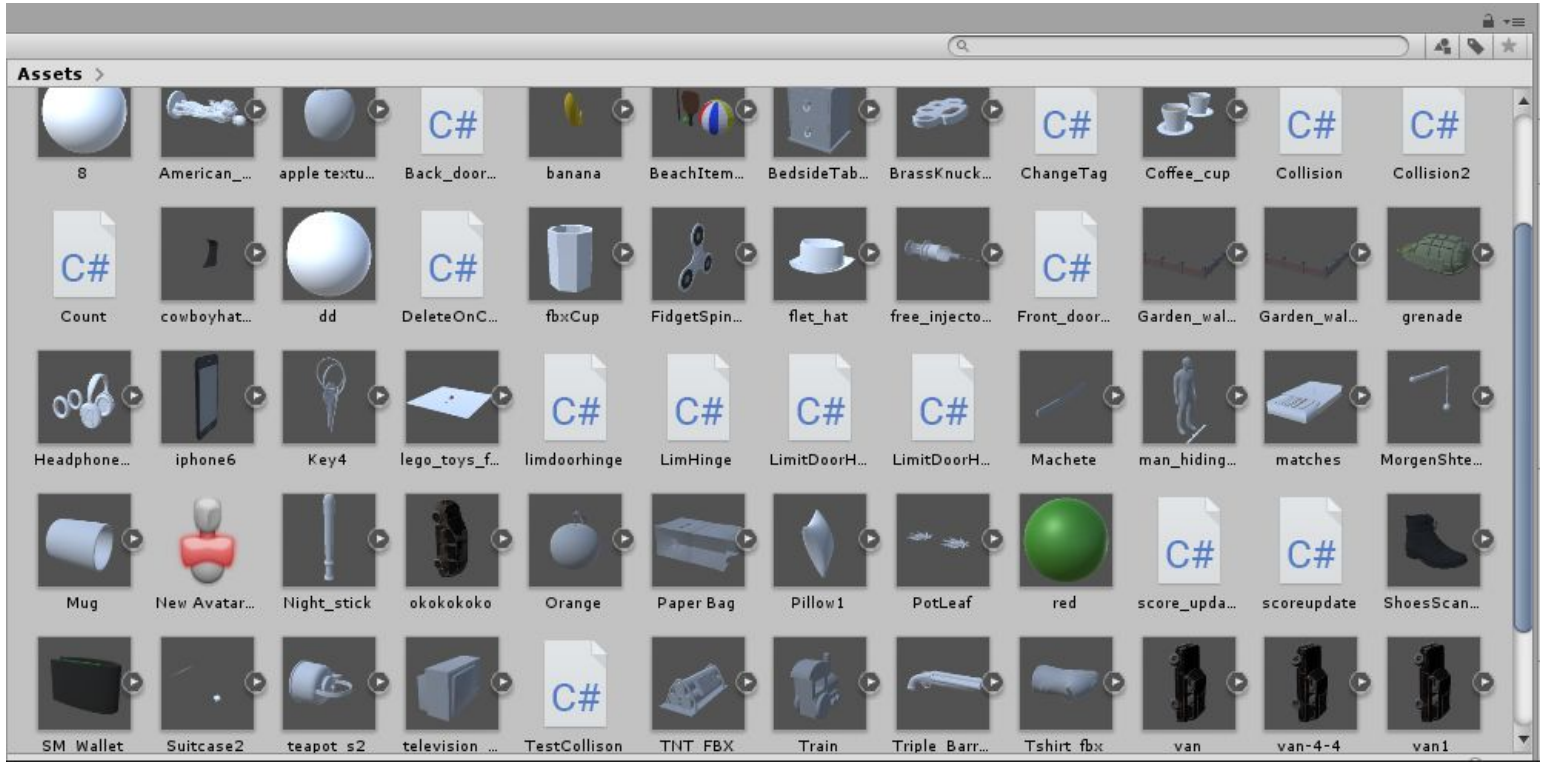
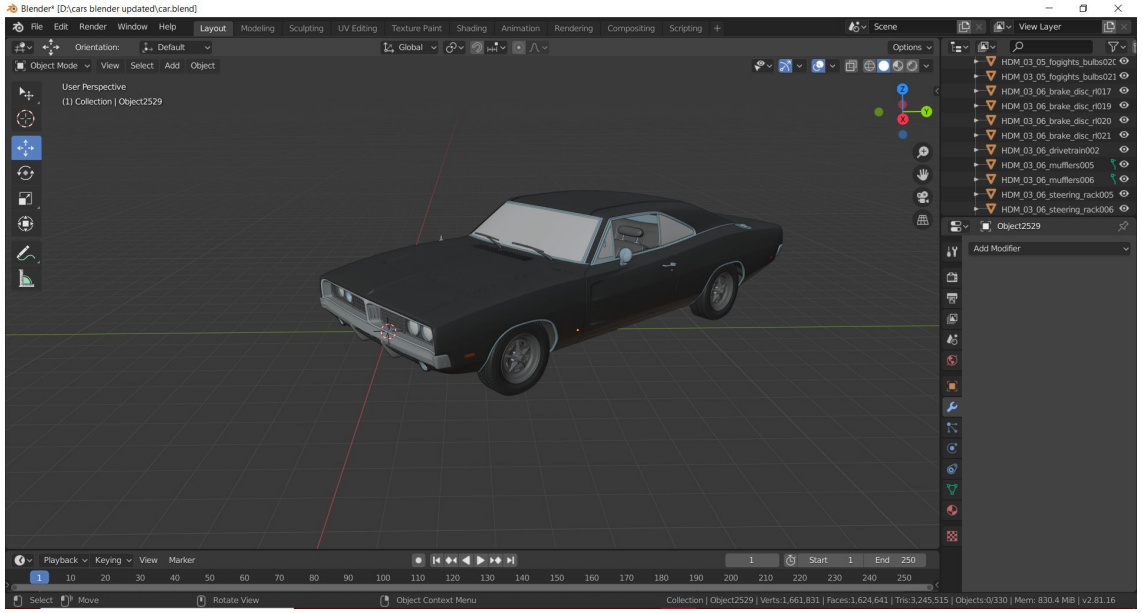
What We've Done Since Then: 1

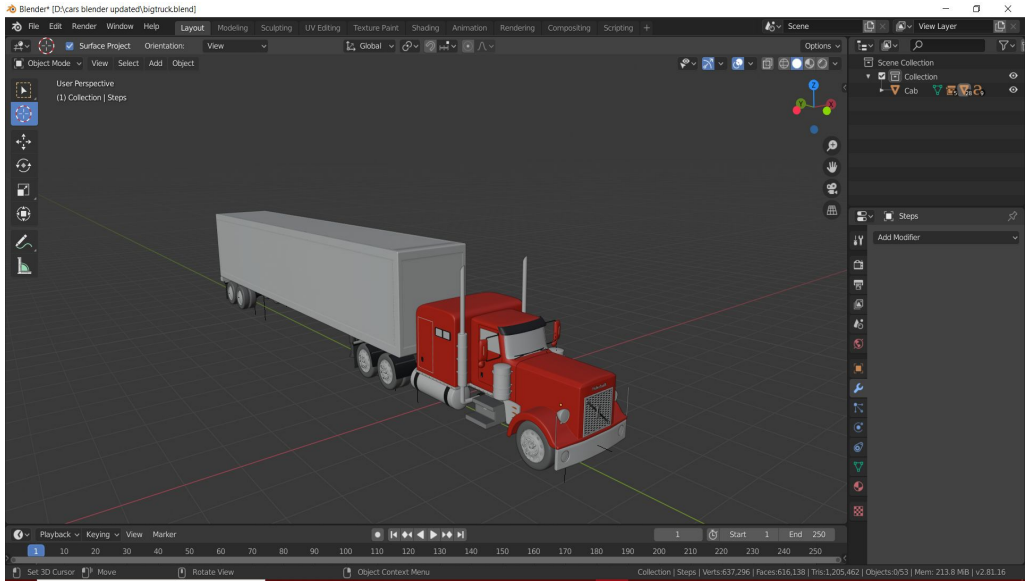
- Imported around 50 assets and created 5 unique scenes.



What We've Done Since Then: 2

- In all 5 scenes we had the same car, so we found a semi, a car, and other vehicles we were putting in place of the Jeep Cherokee



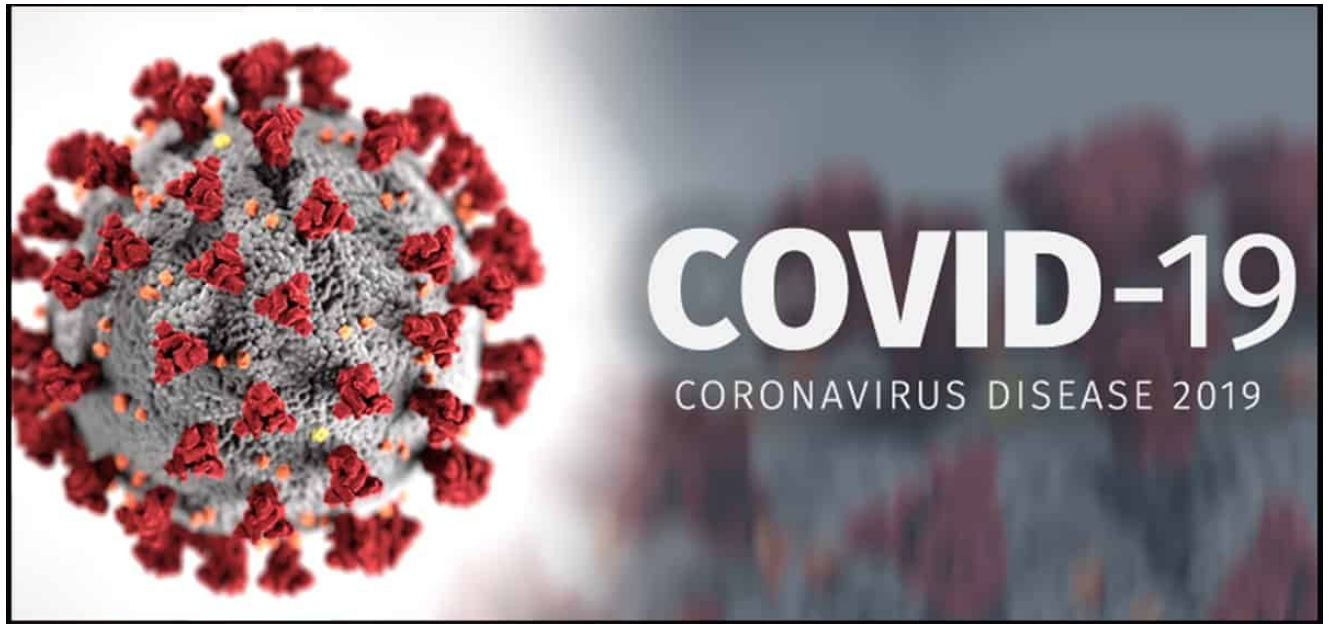


What We've Done Since Then: 3

Started creating a UI where users can select to

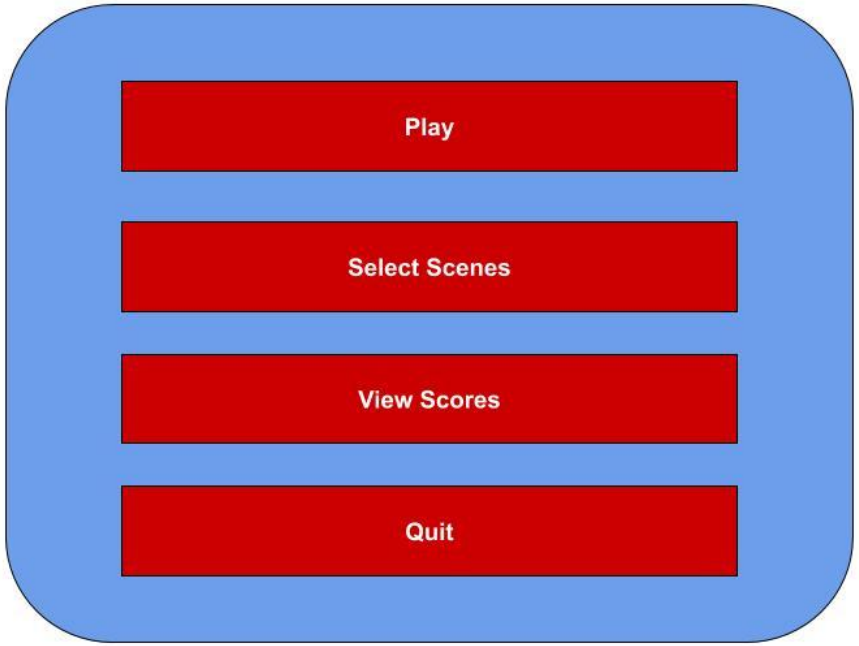
- Play Random Scene
- Select certain scenes
- View score
- Quit

Everything Was Going Great! Until...



What We Still Needed To Do

- Randomizing objects being placed in vehicles
- Finish the UI
- Have a button to finish scene
- Finish the Score Aspect when a scene is completed



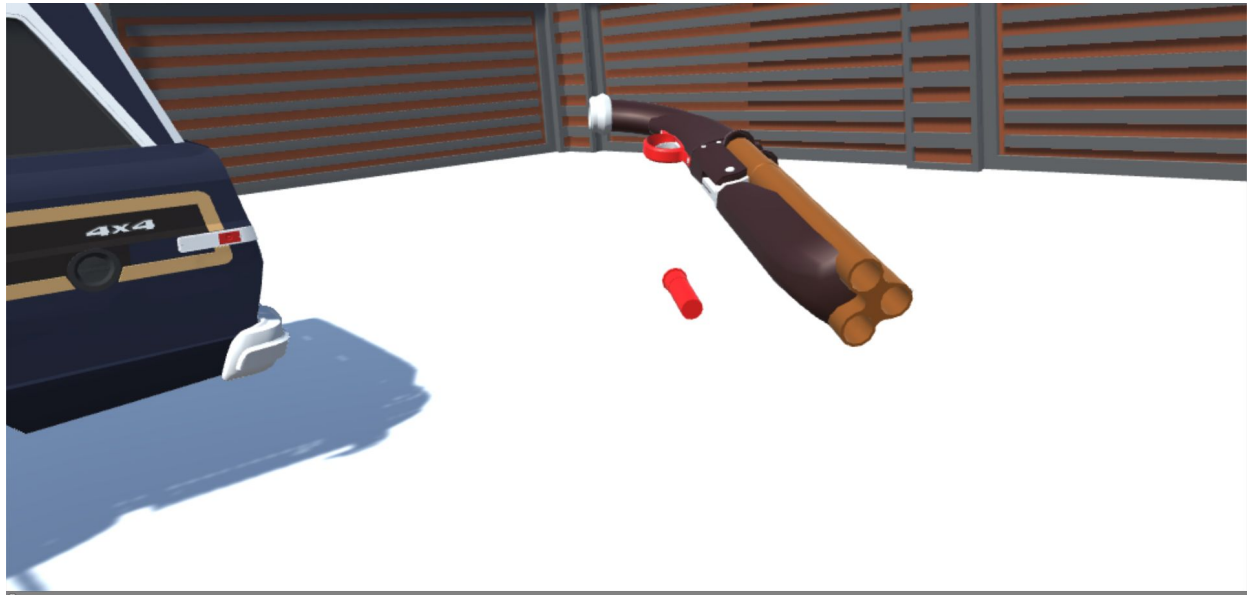
Our Ideal Simulation

- User begins game - Start Menu pops up
- User selects play random game - they are placed in scene
- They drop whichever items they think were illegal in the bin
- They select the Finish Button
- Their score is displayed and recorded to be viewed later
- They are brought back to the Start Menu

Issues encountered

- Shotgun hitbox

  (Fixed) We didn't put the grabbable script on component



- User climbs over planes in vehicle (Not fixed but have an idea)

Issues encountered

There are 3 issues as we testing the door:

1. When “grabbing” the door to open it, you can just pull the door apart from the car and carry it around. (Not Fixed, but have idea)
2. You can grab the door anywhere and not just the handle (not fixed, but have idea)
3. To open the door you needed to slam it, and to close it you had to have the motion as if you were opening the door. (Fixed)

Limitation

- Lack of Flexibility
  - Lack of scene variety, unless we can randomize
  - Not realistic, doesn't emulate people hiding things in unique places
  - Very hard to design our own assets, need to use whatever is created
- Usage Limitation:
  - Designed for Border agent training, not robust for something else.

Questions?