TEMPTARE

FURMAN COMPUTER SCIENCE

An ATTEMPT at Game Development in Virtual Reality

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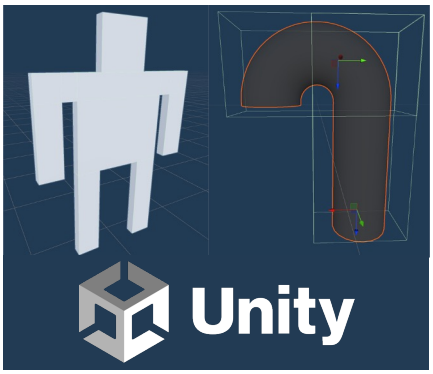
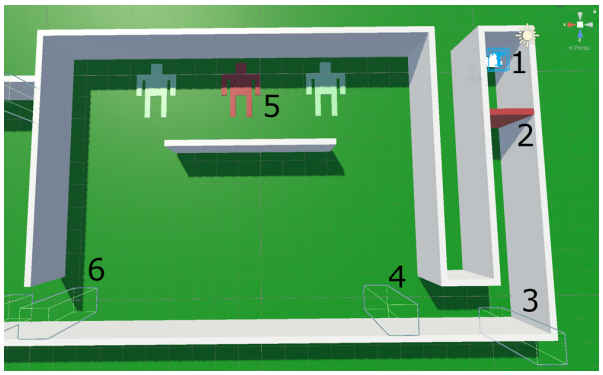
GAMEPLAY



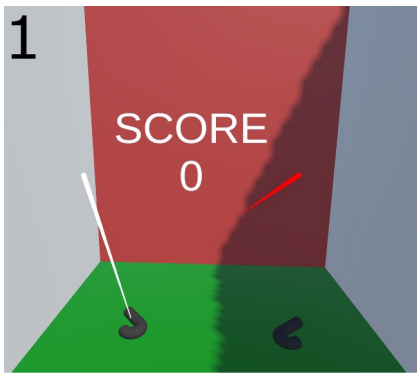
Top Left:
- Body Prefab - used for the targets

Top Right:
- Blaster Prefab
- Top arrow - attach point for being held in the user's hand
- Bottom arrow - spawn point for the bullets

Bottom:
- The game was created using Unity, a game development engine



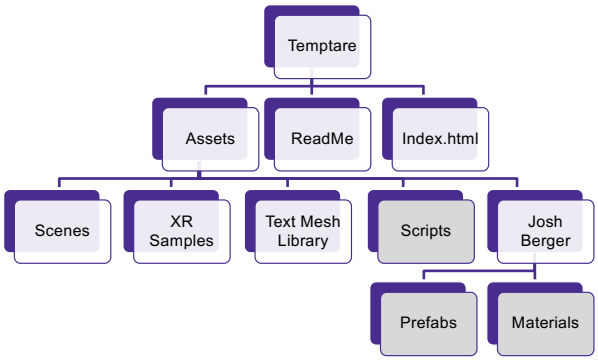
1. User's spawn point
2. When the red wall is shot, the user moves towards Point 3
3. CameraDirectionChanger - on collision, the user moves towards Point 4
4. CameraBodyFlipper - on collision, the targets at Point 5 flip up
5. Targets - green are friendly, red are hostile
6. CameraStopper - on collision, user's motion stops



A closer look at the user's spawn point:
- The score is displayed above the user's head at all times during the game
- Two blasters are at the user's feet and can be picked up
- Shooting the red wall will destroy it and the starts the game

INTRODUCTION

- Inspiration:
  - Call of Duty: Modern Warfare II
  - Men In Black: Alien Attack (Universal)
- Training Course from MWII
- Ride mechanics and concept from MIB
- How gun safety is integrated in the game:
  - Counts the number of times the gun is pointed at friendly targets
  - Shooting a friendly target ends the game
  - Only rewards shooting hostile targets



METHODS

- Created unique Prefabs and Materials using Unity's Manual Interface
- Made numerous scripts from starting the user's movement to controlling the bullets with C#

CHALLENGES

Controlling the User's Movement and Collisions:
- The original idea was to only recreate MWII's Training Course
- It was necessary to prevent user from walking through walls

Solutions that did not work at all
- Adding a Box collider and RigidBody to camera
- Transforming position was incompatible with Unity's input controls

Solutions that worked sometimes
- Moving parent's position backward on collision
  - Only forwards collisions
- Tried grabbing direction of camera's velocity
  - Garbled
- Tried saving previous positions to move back to on collision

That's when I decided to switch to moving along a track

CONTEXT

- Over 40,000 deaths and 85,000-130,000 injuries a year caused by firearms in the United States (Megan L. Ranney et al.)
- Gun safety desperately needs to be taught to the American populace
- One way to teach it is through a video game (specifically in VR)
- VR can often be better than traditional learning techniques because it enhances:
  - Immersion, Learner Enjoyment (Motivation), Repetition
- VR can be an effective means of eliminating risks
  - Not giving beginners actual guns
- Hopefully, making such a game will reduce the number of casualties from gun violence in the US each year

http://github.com/joshberger5/SeminarProject