GAME NAME:

The Gauntlet

DEVELOPER NAME:

Austin Fernandez.

TEAM MEMBERS:

Austin Fernandez (Solo Developer).

PROJECT MANAGEMENT:

Austin_Fernandez_Senior_Project_Games (monday.com)

ARTIFACT OVERVIEW:

A playable build (.exe) of a first-person target shooter game in a sci-fi setting.

GENRE:

A first Person Shooter, built for PC. Best if played using a keyboard and mouse.

SCOPE OF WORK:

An Unreal Engine 5 game with one complete level and a tutorial. Gameplay systems such as health, checkpoints, incoming and outgoing damage, simple movement, advanced movement, and responsive user interface systems are necessary, as well as enemy AI systems and a leaderboard. The programming for the above systems is to be completed using Blueprints.

Additionally, the two levels will need to be sketched out, and then whiteboxed with the player's movement capabilities in mind. Once the bulk of the mechanics are built, a rigorous testing and balancing process will begin to ensure a sensible game flow. Afterwards, the game will be post processed and refined.

STORY OVERVIEW: *

The player, a soldier in training, is entering a combat simulator to refine their skills and prove themselves qualified for an upcoming mission. The world in which this game takes place is one of both great opulence and mendaciousness, where the leading factions of the galaxy aim to conquer the stars, as well as each other. This training simulator is designed to get the soldiers familiar with their futuristic and powerful equipment so that they may more effectively take over other worlds.

*Note: This game will be more focused on the level design and mechanics, so this story is more like lore as opposed to a playable narrative. The idea for this game came about from a much larger idea I had. The narrative functions as a way for me to better shape the gameplay and the aesthetic; however, I have no plans of implementing the story directly into the game. In other words, the player won't know about any of this.

CHARACTER BREAKDOWN:

Given the focus of this game, specific characters will not be present, the only part of the player that may be visible is the player's hands.
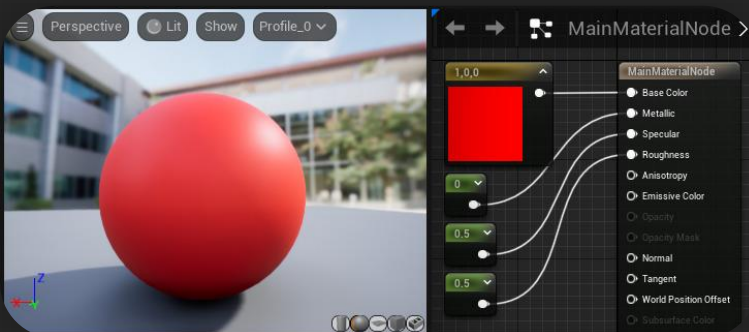
ART STYLE:

- **Style of Environment:**

- **Lighting Reference:**

Very bright, neutral color temperature on the directional light as in the left image. But with certain elements having emissive properties, as in the two above images.

- **Shaders/Material Reference:**

Colors will vary.

- **Audio Reference:**
  - Weapon sound FX (23 second mark).
    - https://youtu.be/9i5sc5kUgws?si=G0tGrC8zWUYplEsH&t=23
  - Targets destroyed FX.
    - https://www.youtube.com/watch?v=NsT9S0kn-v4
  - Double Jump FX (22 second mark).
    - https://youtu.be/ftnFlgUX6ms?si=Hr5qeej5sn17Mg1d
  - Ambient Intro/Menu music (30 second mark).
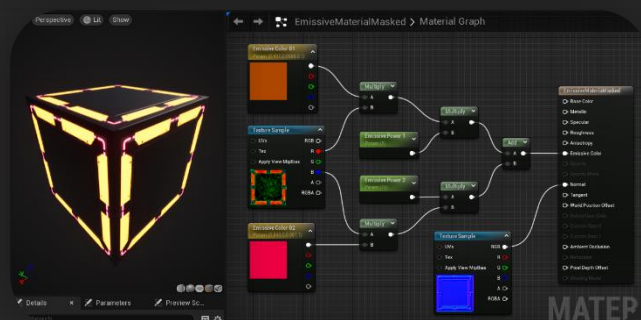   - https://www.youtube.com/watch?v=PpJQZH9B1Y4

ENVIRONMENT AND ASSETS STYLE:

Modular kit, light, synthetic look and open spaces.

Example weapon, modern and sleek.

Emissive barriers and cover, as well as simple decorative shapes.

PLAYER:

The player is viewed through the first person, and the only parts of the player that are visible will be the arms. An example of this can be found below, but it's essentially how First Person Shooters are always set up.

Given the setting, the player has an exosuit which enables directional dashing as well as double jumping. The arms would be found online and animated in Unreal or if it proves too difficult, scrapped entirely if need be.

GAME FLOW:
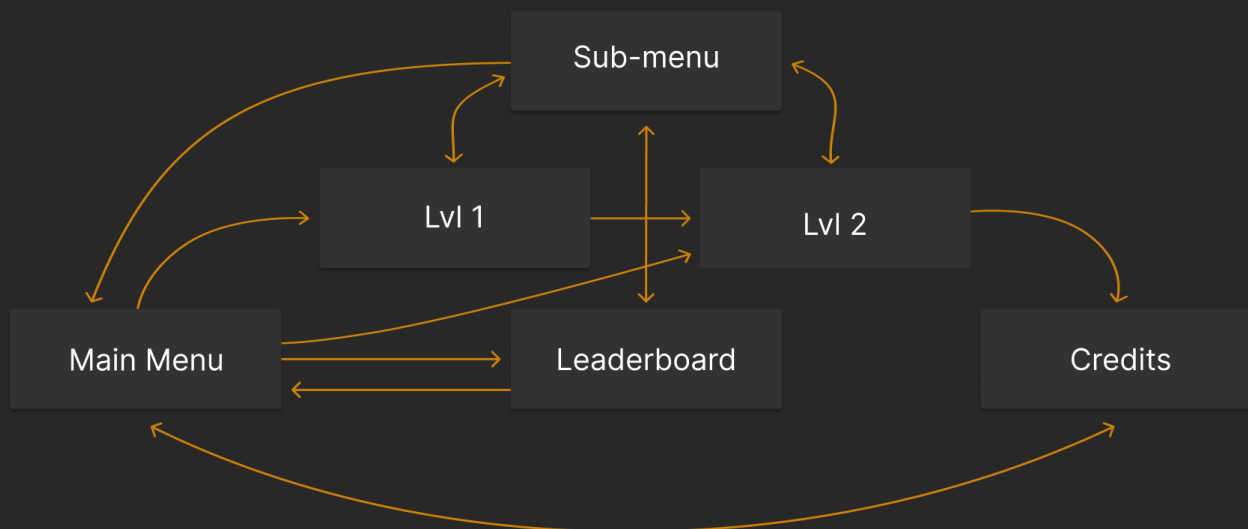
The game begins with a main menu and moves into the tutorial or main level depending on the user's choice. If possible, the main level will be locked until the tutorial is completed, but for the sake of Convergence, it will likely not be set up that way. For the feature to work at a showcase, I'd likely need to restart the game every time someone new came up, or program in some sort of command code for it to toggle.

Additionally, the submenu will not allow the user to move from one level to the other. It instead acts as a pause menu in which you can view the leaderboard or return to the main menu.

TECHNICAL DESIGN:

Gameplay Mechanics:

- Player walking and sprinting
- Directional dodge (Doom Esc)
- Double jump
- Camera bobbing and zoom to aim function
- Instantiation based shooting
- Player reload systems
- Player health
- Player damage
- Enemy health
- Enemy damage
- Enemy Ai (generally much less capable than the player, but still dynamic)
  - Nav mesh
  - Player tracking
  - Sensing
  - Ranged attacks
  - Patrol path or random point locomotion
- Scene transitions
- Responsive user interface (ammunition, health bar, timer)

Code:

- Blueprints
- Material editor
- Shader graph

Archival:

- GitHub repository
- Local backups at every milestone
- Backup copies stored on an external drive

Tools:

- Quixel Bridge Library:
  - Megascans
  - Models
  - Assets
- Unreal Marketplace (free assets)
  - Modular environments
  - Models
  - Animations
- Turbosquid
  - 3D models
- Textures.com / Polyhaven

Animation:

- Weapon recoil
- Hand position
- Enemy walking/running (will be online/default assets)
- Simple UI animations
  - Filling a slider
  - Button animation on hover and press
- Blend spaces to transition animations

VFX:

- Niagara system or Cascade system
- Muzzle flash (atypical, given the sci-fi nature of the game)
  - Weapon will make use of "energy" rather than bullets
  - Shown via bright colored particles
- Target destruction (Dissolve into particles via shader graph)

CORE SCOPE: ASSET LIST

- Player hand/arm models
- Player animations (firing, crouching, dashing)
- Enemy/Target model
- Enemy Animations
- Static mesh for building exteriors
  - Walls
  - Doors
- Barriers
- Stairways/ramps
- UI Text fonts
- Particle systems
  - Shooting
  - Destroying targets
- Modular asset kits for environment
- Skyboxes
- Decorative assets
  - Static vehicles
  - Signboards
  - Small Structures

CORE SCOPE: STRETCH GOALS (in order of priority)

- Interactable environment
  - Jump pads, temporary buffs around the map
- Grapple system
- Radar in corner (akin to Destiny franchise)
- Reload animation
- Short into/outro sequence showing the simulation being loaded

RATIONALE:

This idea was chosen due to the nature of the way in which it will be presented. This game can be short enough to show off quickly and replay able enough to retain a sense of completeness. The genre of game was chosen due to the feasibility of creating it in the Unreal Engine, as well as how it keeps the necessary animation work at a minimum by ensuring the majority of the player's model is not visible.

Some techniques that will be used in the development of this game include parenting camera position to a physical mesh in to achieve a slight head bob, footstep sound scaling in speed with the player's movement, and blend spaces to transition between animations depending on player speed. Additionally, simple force vectors will be used for double jumping and dashing, utilizing vector math to give the player control of the direction in which they go.

This project also enables a liberal use of modular assets for creative level design, which is an important skill to sharpen for the industry.

RESEARCH AND REFERENCES:

References for this game include Titanfall 2, for some movement and aesthetic inspiration, Ghostrunner, for its environmental materials, and THE FINALS, for the overall aesthetic. All the above games have been very well received and stand out as the best of their respective genres.

Titanfall 2 and THE FINALS will also be referenced for the layout of the maps. Both games are first person shooters that have dynamic movement, so studying the layout of their levels should help me better understand the principles behind their design and apply that to The Gauntlet.

LEGAL AND ETHICAL CONSIDERATIONS:

This game is unique enough in its structure and purpose to not infringe upon the niche filled by the above referenced games.

The Unreal Engine is free to use for non-commercial purposes, as are the asset libraries it includes. The same can be said of the texture sources I have in mind and Turbosquid.

CONSTRAINTS AND CONTINGENCY:

Potential issues:

- Failure to prototype certain systems
  - Directional dash (may end up needing to be forward only)
  - Point system in combination with a timer
    - If there's an issue here, the point idea will be scrapped.
- Lack of available assets that fit the aesthetic
  - I'll use simple shapes and emissive maps instead for a low poly style.

Contingency and Rescoping:

- In the event one or more integral systems won't be ready in a timely manner…
  - Rescope project to limit player speed somewhat and slow down the pace of combat.
  - Consider cutting off enemy AI systems, and making the targets less responsive, using a simple animation path for movement instead.
    - In this case, health and incoming damage would also be scrapped, and the game would become more of a shooting gallery.

Narrative Effect:

- The narrative of this game is of generally lesser importance compared to the mechanics and level design. Any of the above cuts would have a minimal impact on the game's narrative.

REQUIREMENTS AND RESOURCES:

- A system capable of running Unreal Engine 5
- The Quixel Bridge asset library
- The Unreal Marketplace free asset library
- External storage device
- GitHub account

All the above are already acquired.

REFERENCES:

Titanfall 2, Respawn Entertainment

I like the visual style of this map, including the color scheme, and the emissive materials.

THE FINALS, Embark Studio

The **lighting** in the above images is similar to what I envision for The Gauntlet. I plan to bake most of the lights for performance. Lighting will highlight detailed normal maps and help ground the assets in space.
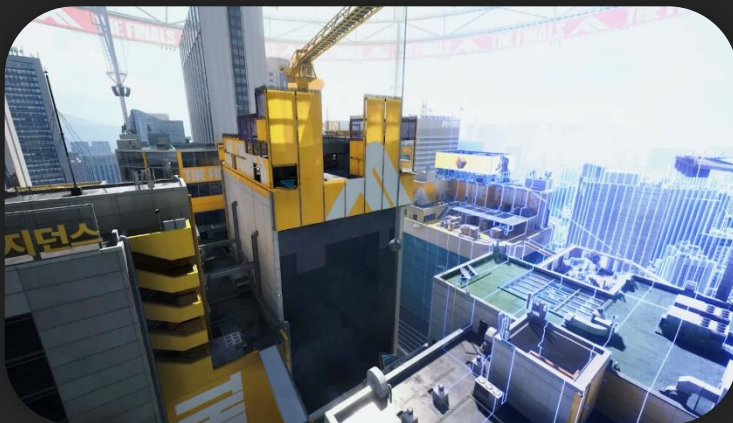
Destiny 2, Bungie

The above image is reference for the weapon position in the viewport, as well as FOV.

THE FINALS, Embark Studios | Mirror's Edge, DICE

The visual style of the environments is great reference for the environmental aesthetic of the game. I like the mostly white/grey modern appearance with the strong accent color to mark interactive or important elements.

Titanfall 2, Respawn Entertainment

Aside from the visual style/emissive assets mentioned earlier, I like the background elements of this map as well. Providing a backdrop would help ground the game and contribute to the aesthetic. I also plan to use an effect like the orange walls to mark the end of the playable space.


Sketchfab assets

The weapon on the left is a good example of the style of gun I envision. I want something with a sight attached that fits the minimalist style of the environment. The weapon on the right is a great reference for adding emission to parts of the weapon.

Unreal Engine default meshes

The meshes above will potentially be used for the targets/enemies. They fit the visual style perfectly, and already have some animations completed. Additionally, the skeleton for these meshes has plenty of free animations made for it online.
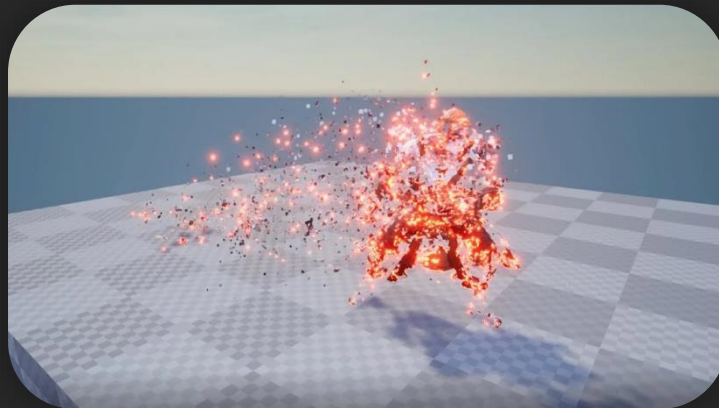
Example of Unreal Engine 5 Niagara particles

Reference for the what the enemy death particle effect will resemble.

The Gauntlet