Testing & Validation

Project Name: SciFi_Lab_3D_Scene_Pixel_Art
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Your testing and validation strategy will depend on your project.

1. Testing Strategy

The testing I conducted on my project was primarily Performance testing and secondary playtesting for minor issues. I wanted to make sure the scene could be easily accessed and loaded efficiently in most if not all devices that have access to Blender. To do that I focused on minimizing vertices used per object and primarily used textures to add detail wherever possible. I also conducted a small playtest while showcasing the scene to my supervisor and peers, which helped me locate missing textures and z-fighting in parts of the scene.

2. Test Cases and Findings

To test the performance of the scene, I conducted 2 tests. On the first one I limited my laptop's GPU limit to only 30% of the original, forcing my computer to run Blender and all background software with a third of its maximum power. During the second test, I used the library computers at university and loaded up the scene on those, since the computers are on a lower end compared to my laptop. The desired results were both able to run the scene at a minimum 30 FPS and be stable.

Performance Testing	Desired Result	Results	Succeeded?	Software
Limit GPU Usage to 30%	Minimum Stable 30 FPS on render view	46-51 FPS	YES	Blender
Use Library Computers	Minimum Stable 30 FPS on render view	32-34 FPS	YES	Blender

For the Playtest, I noted down all issues located by my peers and my supervisor on our weekly meetings. I then corrected all the mistakes that were spotted and then went over the entire level while:

- Flying with the camera around the level
- Using Walk Navigation to view the level from the player's perspective
- Using the security camera's perspective to view the level from the Render's perspective

Playtest Testing	Desired Results	Results	Succeeded	Software
Check UVs are unwrapped correctly	No texture stretching or missing textures	No texture stretching or missing textures	Yes	Blender
Normals work as intended	Lights bounce off the object correctly	Lights bounce off the object correctly	Yes	Aseprite
Check level has no missing textures, missing objects or z-fighting	No missing Texture, objects or z-fighting	No missing Texture, objects or z-fighting	Yes	Blender

3. Future Testing and Validation

For future testing, I would like to continue on Performance and look into more compact textures as currently, I'm using 2 textures of 1k resolution (1024x1024), a Colour palette texture and a texture file all made in Aseprite. While this is highly efficient with how much lag it will cause, I have found there to be a lot of wasted space on the 2nd texture file due to the way I generated the file. I would like to reduce the size but that would cause all the UVs to be messed up and would take hours to fix, of which I do not have time to at this current moment.

4. Reflection

1. Introduction

The goal of the project was to create a 3D level that told a desired story with all the unique textures I created.

2. Key Achievements

I believe I displayed a very well-developed way of creating textures for the objects in the scene while also minimizing the amount of lag the textures would cause the level itself. I also made the 3D models themselves extremely performant as I mostly relied on Textures for any sort of detail, so I kept the vert count of most of my objects below 30 verts per object.

3. Challenges and Problems Encountered

While I do believe I had completed this project to the highest of my extend with the time I was given, I do believe I had not fully utilized the tools at my disposal and had waste lots of time early in the project with jumping straight into modelling. This prevented me from completing a great amount of research I desperately needed in the later stages and slowed down my progress.

Another issue I encountered was the way I decided to do my textures, while it is a unique and extremely efficient in performance, it does take a long time to get right and at the beginning I wasted lots of time trying to get the Normal Maps to work correctly which, once again, slowed down my progress by a lot. Even after learning what the issue was with my Normal maps, it took a long time to go back and fix all already existing textures by hand.

Finally, another major problem I encountered was the lack of research I had done throughout the project. I had neglected researching this project further due to the limited amount of time in my disposal to procure a scene that I am satisfied with, which in the long run had greatly slowed down my workflow due to the lack of inspiration and knowledge of the subject.

If I had a greater understanding of my theme and scene from the start, it would have prevented me spending 1 week building a level layout only to have to tear it down again since it did not fit the theme of the potential game it would have been. I had originally created the level to be too linear which prevented exploration from the player's end and made it harder to avoid the enemies while in combat, making it impossible to not get hurt even on small encounters.

4. Lessons Learned

Spend more time at the start researching media of the theme I aim for to reduce time wasted thinking of ideas on my own without inspiration. Spend more time at the start researching and experimenting with different methods of modelling and texturing before fully committing to a style that could hinder the workflow.

5. Future Improvements and Next Steps

Reflect on potential improvements and future development.

6. Conclusion

I learned to not rush into working on the project before I completed ample amount of research for the theme and the techniques and methods I would be required to use.