DAGD 340 Process Book

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DAGD 340
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What is this Project?

Our class is going to work on and improve the project that the previous 340 class worked on. The project is a VR interactive history of Grand Rapids, done for the Grand Rapids Public Museum. The goal is to showcase the same location across various time periods, from exploring an Anishinabe Tribe village to walking the streets of current downtown Grand Rapids. The goal over the course of the semester is to clearly define every aspect of the project, from UI to File Management, as well as improve and add to what is currently in the project. We want to define what everything should look like, how many poly's each model has, and create a standardized method to create and name everything. This will allow future classes to continue the project easily by having defined standards. This will also allow for minimal redundancies in assets, and prevent future students from having to recreate assets to fit into the project.

Week 4 & 5- Kickoff

During these weeks the class was deciding who the management team will be, and how the class will be split into smaller project groups. It was decided that there would be six teams, each working on a different aspect of the project. I decided to join Project UI/UX, which has the responsibility of developing a cohesive UI and UI style guide that can be used by future groups, as well as improve the User Experience to make the game feel more user friendly.

The UI/UX team consists of Justin Lai, Emily Foster, Jordan Wynalda, Rachel Myszak, and myself. We decided that our team lead would be Jordan. The UI/UX project falls under the Optimization and documentation scope on the management team. The main Project manager that we report to is James Zitnik. We also have an Art Director and a Technical Director that we can contact if we have any specific questions or if we are stuck somewhere. Dalton Jones is the Art Director, while Ryan O'Conner is the Technical Director.

Week 6- Planning & Research

This week was spent researching different solutions for player movement, UI systems, and player interaction. We also took a look at what was currently in the project and noted down what we have, what can be improved, and any bugs that we found.

I did research on different movement systems in VR, and how they can be implemented to make player experience smooth and easy to use. The main form of movement I researched is Joystick movement, which is where the player stands still and uses the sticks on the controller to move and rotate their character. A good example of this comes from H3VR.

I also looked into player interaction with objects, and found a method that allows for an easier user experience. The method is a way to pick up and bring objects closer to the player without having to move around and physically grab it. When the user holds a button, a line will be drawn out from the hand into the environment. When this line intersects an object within a certain range, it will give a visual cue that it can be brought to the user. If the user then presses the grip buttons while the line and object are overlapping, the object will be brought to the players hands.
This method works really well for users who have trouble moving around and bending over to pick up objects, and it makes it easier for all users to interact with the level.

During this phase I also hopped into the project in VR and took note of any bugs/user experience issues that I found. For example, there was a bug that could happen when teleporting where you would be teleported out of the level. There was also an issue with the user experience when getting into the canoe where the player would be teleported suddenly without warning. I also noted that the UI was not interactable, and that there was barely any UI to begin with. All of these errors combined into a rough user experience, so one of our goals is to improve the experience for everyone.

At the end of this week, we consolidated our research into a rough list of potential ideas and bugs that we can work on over the next few weeks:

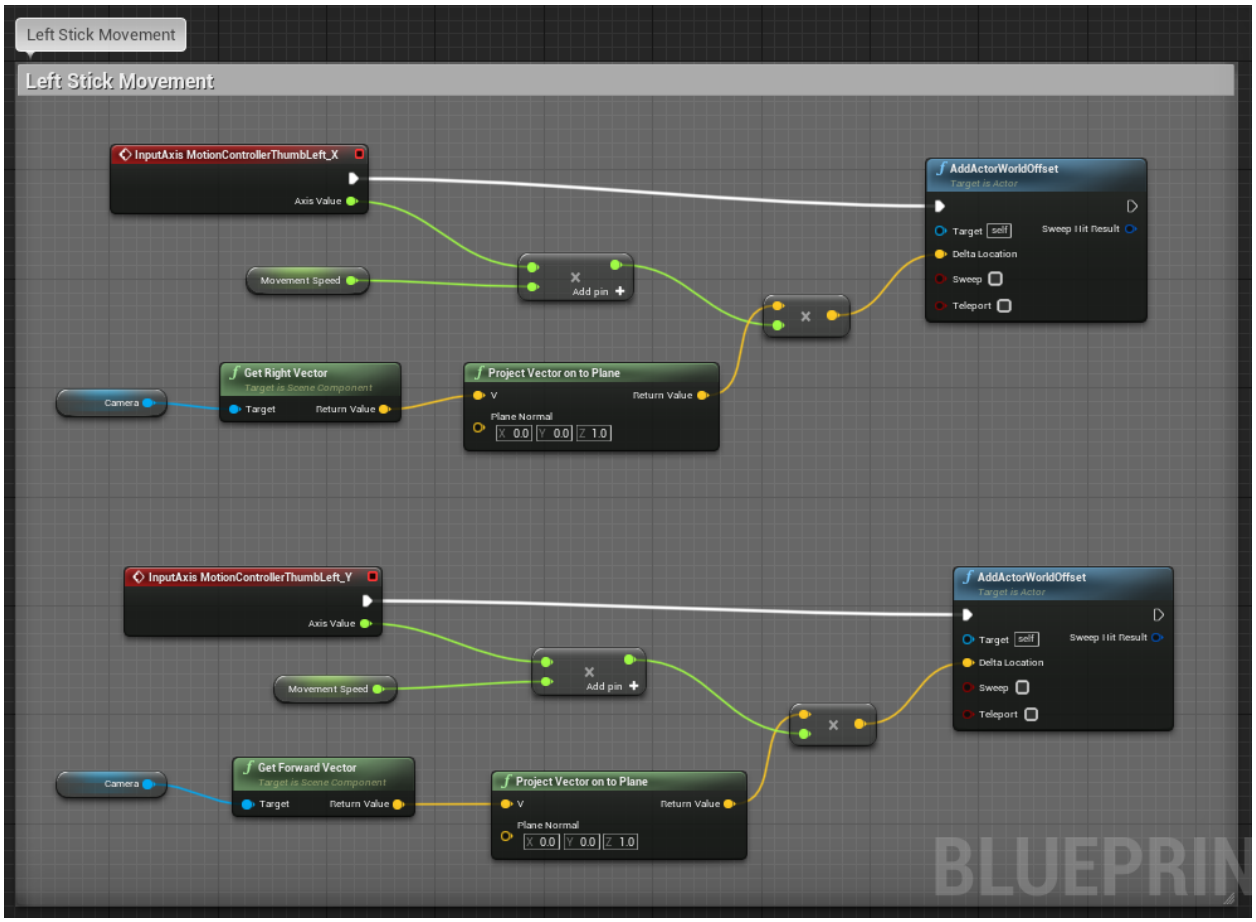
- Make teleporting into objects not clip player out of the world
    - Content > VirtualRealityBP > Blueprints > HMDLocomotionPawn
- UI change for when player reaches nav mesh bounds
- Menu UI stuffs
    - Start instructions UI
    - Interaction UI
- Index finger buttons currently don't have functions
- Middle finger buttons grab stuff
- Moving in canoes (other team? Stretch goal?)
- Content > Terrain: make interaction from StartRoom to GrandRiver
- Middle stick down, draw a line out. Used to pick up far off objects/navigate UI
- More in-depth player movement systems (give player options for how to move)

Overall I felt really good about this part of the project. We had clear goals and improvements to make, and we knew what we wanted to focus on.

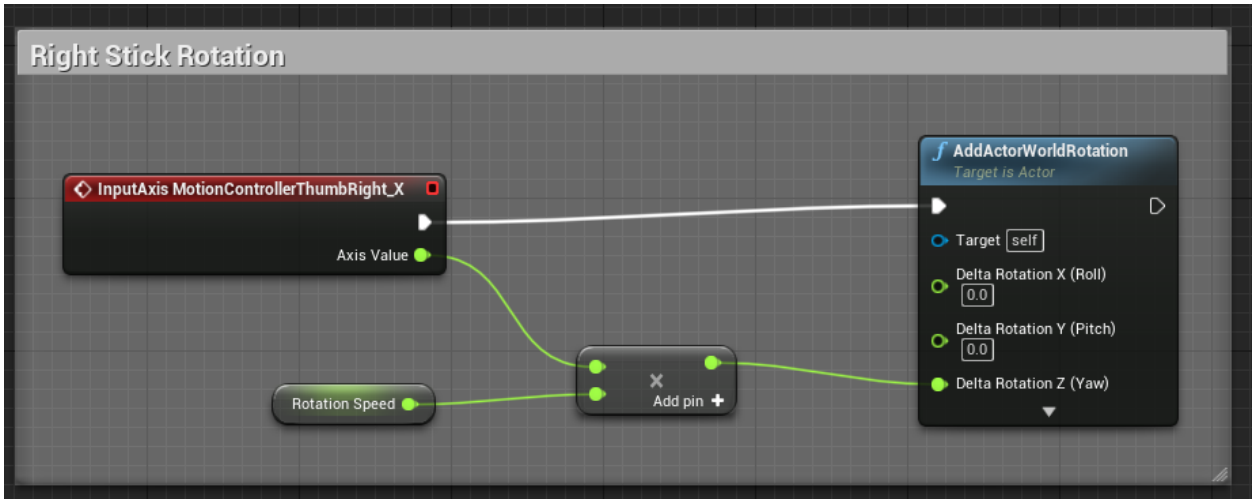
Week 7- Movement

This week I focused on player movement. I created a system where the player can move using the left stick, and rotate/turn themselves around using the right stick. I also added gravity and a collider to our player to allow them to stick to the ground. I also fixed a bug with teleporting.

Movement Code:



Rotation Code:



With the addition of these new methods of moving, we had to add a few things to our plan.

- First, we needed to improve the way that joystick movement and teleporting seamlessly interact. There were some bugs that made the experience a bit confusing.
- Second, we need to change the Navmesh Bounds to work seamlessly with joystick movement. Currently, the player can go beyond the intended play area.

I also noticed an issue with some of the UI where it will appear and just stay there, even if we leave the trigger box that pulls it up. UI will be focused on in the coming weeks.
There was also an issue with lag during testing, but hopefully when we merge with the Anishinabe group that will be fixed.

Overall I feel satisfied with my work during this week, and our project seems to be at a good point. We still have clear goals and Ideas on how to solve these problems. My other teammates are working on the UI Style Guide and teleporting, and we should be able to work on UI in-engine once they finish the style guide. Only two of the three programmers have access to VR headsets so testing is an issue, but otherwise things are looking good in terms of progress. If we were to do this again, I would like to ensure that everyone has access to the equipment we need to develop this project.

Week 8- Midterms

During this week I started to create the new pickup/interaction system. I wasn't able to get very far due to other midterms and projects taking up a lot of my time this week, as well as not having access to my VR headset/desktop during the later half of the week.

We didn't have any changes in our goals this week, as no new bugs or ideas came up while working. I would have liked to focus more of my time into the project this week, and if I had to do this again I would like to manage my time and schedule a bit better. I would also have pre-loaded a bunch of the work in the beginning half of the week due to my issues with accessing VR and my desktop while not at home. My team is still working on teleportation and the UI Style Guide, and hopefully within a week or two we can start implementing UI into the project.

Week 9- Interactivity

This week I did not have access to my computer, as I was away from home. So, I decided to do some research on ways to improve interactivity for users, and how it will help users with disabilities or movement issues. Ultimately I decided that a way to grab objects from far away was best, as it allows users to interact with the environment without too much movement.

I don't have any big comments on project decisions, as not much has changed to our plan and designs. The only thing that would have been better is if I had access to my computer so I could continue working on mechanics.

Week 10- Interactivity

This week I created the object interaction / pickup from far away. The player can click down on either thumbstick and a pointer will be drawn, using the default VR line.

When the pointer is drawn, the game sends a linetrace out from the player's hand. If this linetrace collides with an object that can be picked up, it will return true. The player can then press the grab button, in this case the trigger, to bring the object to their hand. The main goal of this interaction is to give players another way to pickup and interact with objects in our environment. This also helps people who have movement issues or disabilities interact with objects easier, as it allows them to pick up objects without moving or bending over.

Overall I think our Project plan is working well, the idea of making these UX changes to benefit people who have a hard time moving was a great idea. It overall improves the experience and accessibility of the project.

Week 11- Bug Fixes

During this week I had my hands full with other classes, so all I did was make some bug fixes to the movement, rotation, and item interaction to make them more seamless and usable.

No changes were made to our project plan / process.

Week 12- UI Functionality

This week, I started working on UI functionality and scene switching while I waited for the art side of our team to create the Hub assets. I learned how to make functional menus for VR, and how to switch scenes using those menus. I also researched ways to make the Hud stick to the player's camera.

No changes were made to our project plan / process. If we did this next time, I would have had the art side of the team create the Hub assets sooner so I can bring them in and implement them sooner.

Week 13 & 14- Project Merge + Hub

This week, I got access to the Github repository and brought in everything that I had been working on so far and added it to the UI/UX branch.

The art team finished the assets for the Hud during Week 13. I then imported them and made them functional. They will switch between scenes, and the player can bring it up and put it away by pressing Y or B respectively. The player picks which scene to go to by pointing their hand at the menu option, and pressing the trigger button.

The Hud will stick to the player's camera and move when they move their head. It will also maintain it’s spawn rotation.

No changes were made to our project plan / process

Week 15- Final Deliverables

This final week was spent creating the UI / UX Post Mortem, Slide Deck, Onesheet, and Video. I added in what I have done during the semester to the port mortem and slide deck, and I added in my contact info to the onesheet.

I then recorded footage of our project to show off the Interactivity, Movement, and Hub. I then sent that footage to Jordan so he could edit it.

Peer Review

I was a part of the UI / UX team. Jordan was our team lead, he communicated with the management team about progress and updates. Jordan and Rachel were in charge of art and the style guide. Emily, Justin, and I were in charge of mechanics and functionality, with Justin moving to being the representative from the programming pool later in the semester. Overall, I thought we worked well together. Our weekly meetings went great, communication was good, overall we all did our parts. There could have been more collaboration between me and the other programmers, but overall it went really well.

Personal Post- Mortem

Overall, the main things I learned during this project was implementing mechanics and systems to work with VR. I learned a lot about how to focus on the user and their experience, and how to refine it and make it a more enjoyable and accessible experience. I learned how to develop UI for VR, and to make it function well in the engine. I also gained experience with working on a team and reporting what I did in scrum-style updates.

This project has helped me with my idea for my personal VR Tactical Turn Based Game. It has allowed me to think about the players' experience, and how to improve it. It has also given me a good idea of how to plan and execute this project using these new ideas. I also now have experience developing for VR, so I won’t have to learn that workflow when I start working on the next project.