

Production Diary – Neo Drive Semester #2

Creative Practice 4 (M5X01569)

Connor Hale (1701744)

Introduction

My name is Connor Hale (1701744) and this is my production diary of Neo_Drive from the 28th of January to 10th of May 2019.

This is the second semester on the project, please see the first Production Diary to see the progress from the start of the project by contacting me directly through email 1701744@student.uwtsd.ac.uk

This semester is based on polish and making the first prototype of the game better and more visually appealing. Either through more robust mechanics, adding more mechanics, creating final versions of textures and finished level design.

My main role is still the Unreal Engine Artist, and I am tasked with making the game feel more like a viable product instead of a prototype.

To make it easier to read the document please use the Content outline (For word) or bookmarks (For .pdf) and use the dates provided to see the progress more coherently.

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28.01.2019

This was our first lesson back for the second semester. Since Jess was not in we had a group discussion session where we made sure everyone was up to speed and if anyone had any ideas for the coming semester.

We brought up different themes, ideas and references and all agreed on a new theme for the level. Although still keeping with the theme of a rundown overgrown city we thought of using art deco buildings and 1930 neon signs to make an old London esque city racetrack.

We all started a Pinterest and I was invited to the Teams group chat, so we can all talk about our level with each other if needed.

31.01.2019

Today I am doing research into something I put off the last semester. It was a way to create a real loading screen that loads all the levels assets with a working progress bar. Since our current loading screen is fake and temporary, I want it to load the level based on how fast the computer is.

Using this as reference (P, 2019) <https://www.youtube.com/watch?v=Rv0vJUzewCs>

I plan on making a test version of the load screen, to see if it is possible to make the game more seamless and more professional.

01.02.2019

Today we sat in our teams after we were all debriefed on our current assignment for creative practice this semester.

We all sat down and created our first priority list and started to get some ideas for how long some of the higher priority assets will take. Everyone who was present assigned themselves some tasks to complete. Now that we have some sort of plot of where we are going as a team, I will need to complete a Gantt Chart to plan my further semester and facilitate for my Unreal Engine tasks and modelling for the “Overgrown” level.

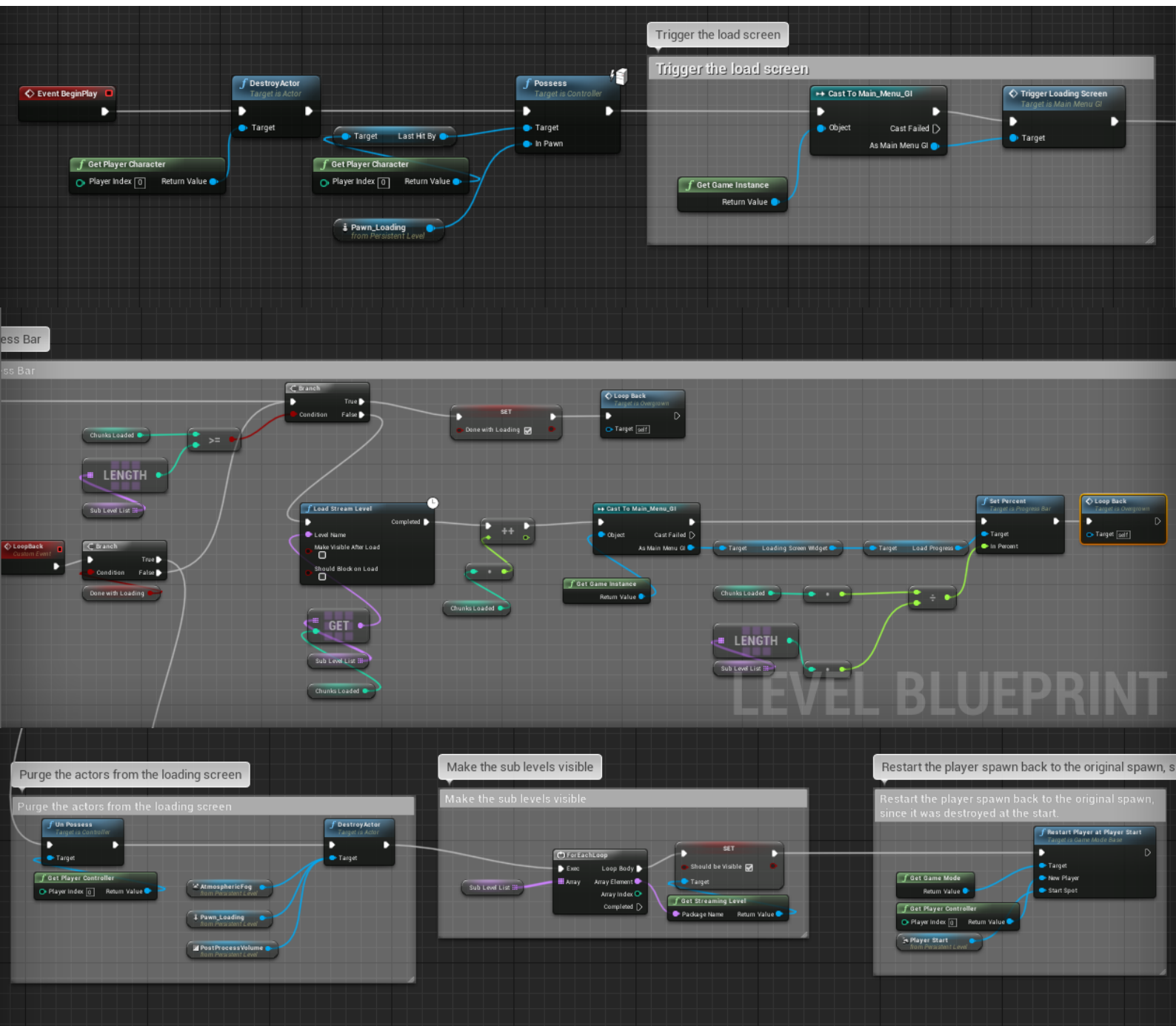
Persistent Level - (Attempt 1)

I started with the Persistent Level today using the tutorial above. Following step by step to set up each level and every asset to work in the persistent level since it is designed to load each group of assets (See Figure A1).



‘Figure A1: Every level and asset in the persistent level.’

I then worked on the code from the tutorial that will load in each group of assets in order. (See Figure A2)



‘Figure A2: The code that loads the assets and puts it into a format so it can be used to accurately show up on the loading bar.’

Test - Failed

The initial test failed since the loading bar is not working, I will need to work on this another time.

04.02.2019

Priority List - (Unreal Engine)

In this week's meeting session, I sat with the Unreal team and created a quick priority list with the order of tasks that need completing (See Figure B1).

Priority List Unreal Team:-

High:

A.I

Positioning 1st – 2nd – 3rd etc

Leaderboard

Overdrive

Boost

Medium:

Health

Guns

Shield

Low:

Loading Screens

UI

HUD

Powerups (Weapon upgrades)

‘Figure B1: Priority List for the Unreal Team’

I made this list in order of completion that I think will best fit the project.

Since loading screens are a low priority on the list, I will have to put it off for now.

11.02.2019

Priority List - (Overgrown Level)

This week's session was an update on the Overgrown city team. We have some buildings to work with and I am waiting on Joe's concept for Neon Signs. I created a quick priority list for the team and me. We will need to give out the tasks at a later date (See Figure C1).

Priority List – Asset List

Modular Buildings - H

Spine Track Pieces - L

Tree models - H

Bushes - M

Grass - M

Vines - M

Lamp post - M

Bins - L

Trash bag - M

Neon Signs -H

Crane – M

Debris – H

‘Figure C1: Priority List of assets for Overgrown’

12.02.2019

I have lost my Gantt Chart and will need to redo it. This gives me a chance to review my current backups of work that I have currently.

I am using Google Drive as a cloud backup

My computer and USB as a physical backup

As a result of not backing up my work straight away I lost some of my work. I will need to keep this in mind going forward.

18.02.2019

Gantt Charts Plan

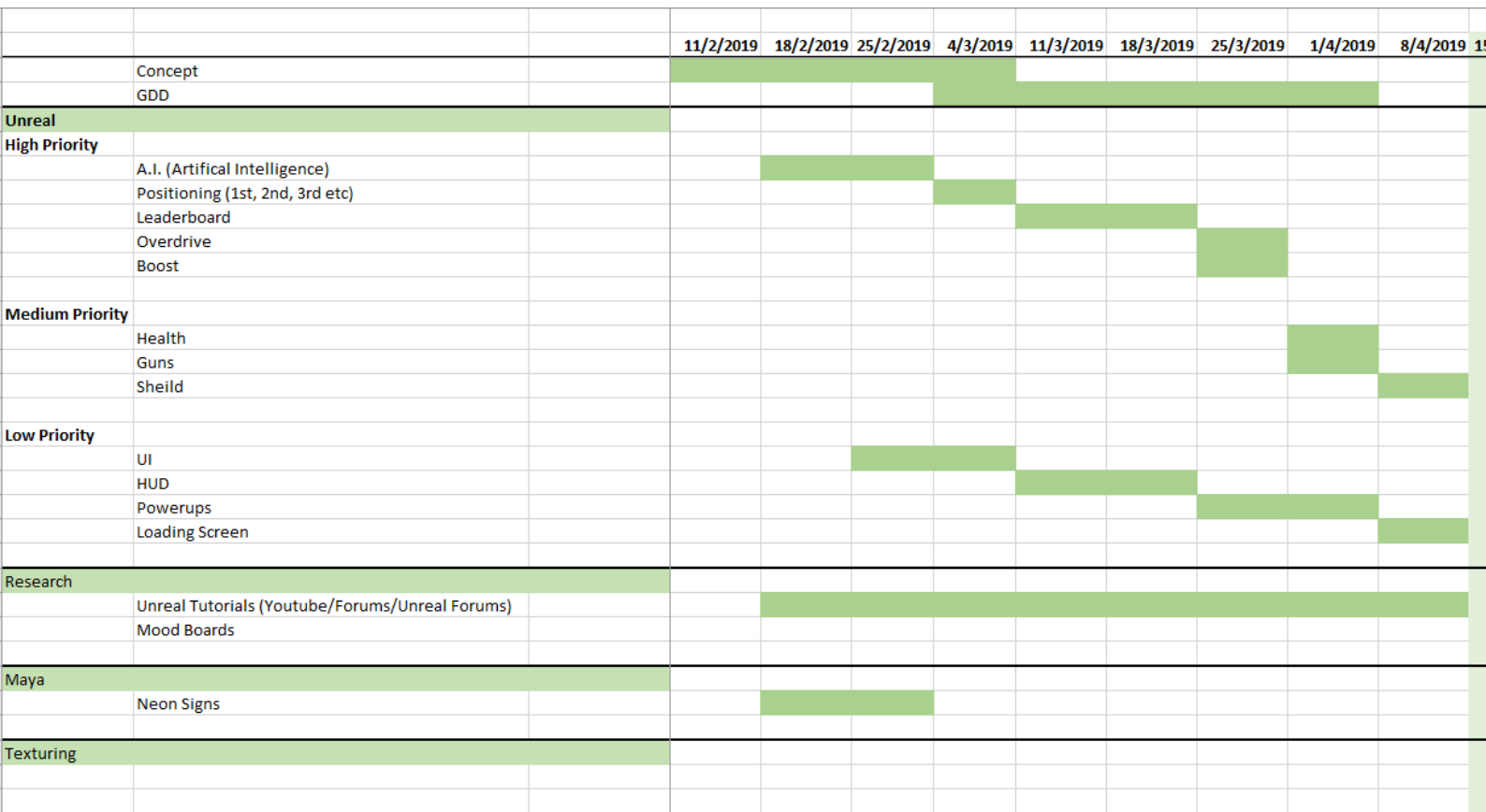
Similarly, to last year I have given myself two weeks at the end of the semester in the event that something bad happens along the way.

This way I will have some time to fix any mistakes or use them in the event that a task takes longer than originally expected. (See Figure D1/D2)

	B	C	D	E	F	G	H	I	J	K	L	M	N	O
2														
3				11/2/2019	18/2/2019	25/2/2019	4/3/2019	11/3/2019	18/3/2019	25/3/2019	1/4/2019	8/4/2019	15/04/2019	22/04/2019
4		Concept												
5		GDD												
6		Unreal												
7		High Priority												
8		A.I. (Artificial Intelligence)												
9		Positioning (1st, 2nd, 3rd etc)												
10		Leaderboard												
11		Overdrive												
12		Boost												
13														
14		Medium Priority												
15		Health												
16		Guns												
17		Shield												
18														
19		Low Priority												
20		UI												
21		HUD												
22		Powerups												
23		Loading Screen												
24														
25		Research												
26		Unreal Tutorials (Youtube/Forums/Unreal Forums)												
27		Mood Boards												
28														
29		Maya												
30		Neon Signs												
31														
32														
33														

‘Figure D1: First iteration of the Gantt Chart plan’

This is the first plan, although I fully expect it to change, with more tasks to added in when I'm told to do something.



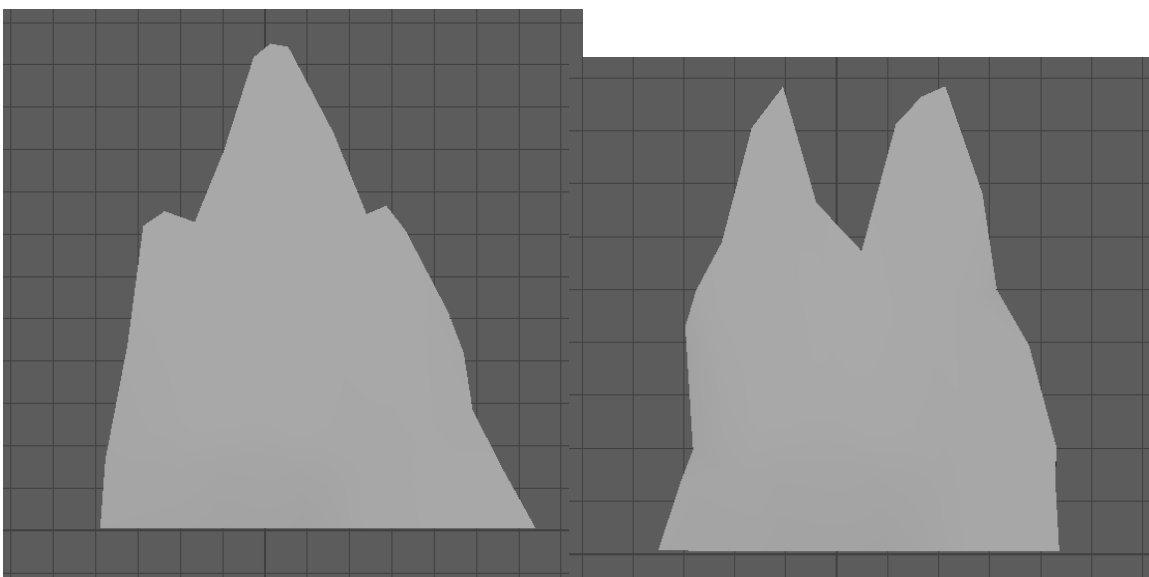
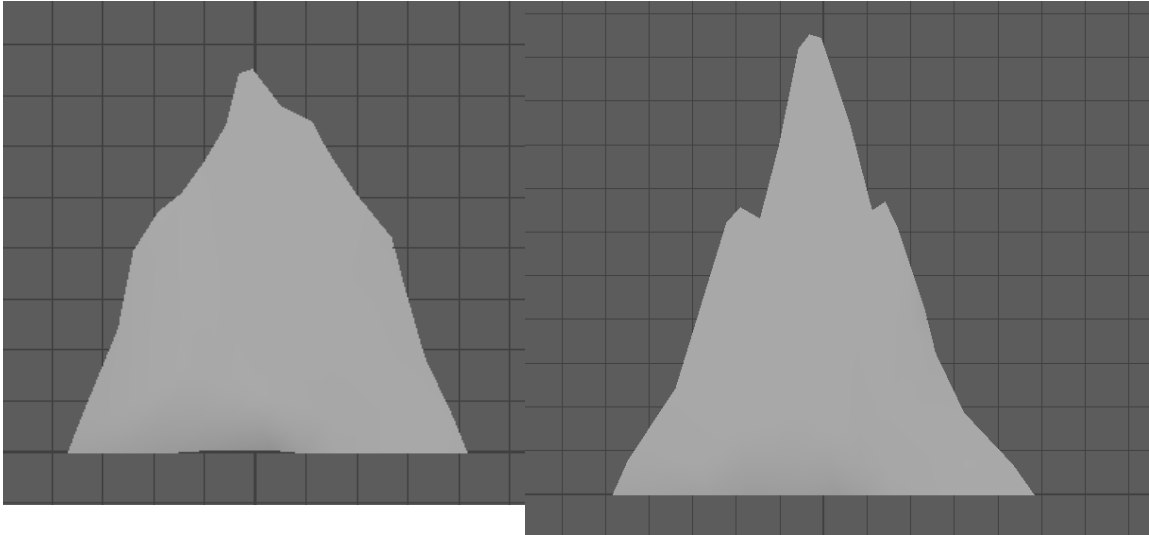
'Figure D2: Initial semester plan Gantt Chart'

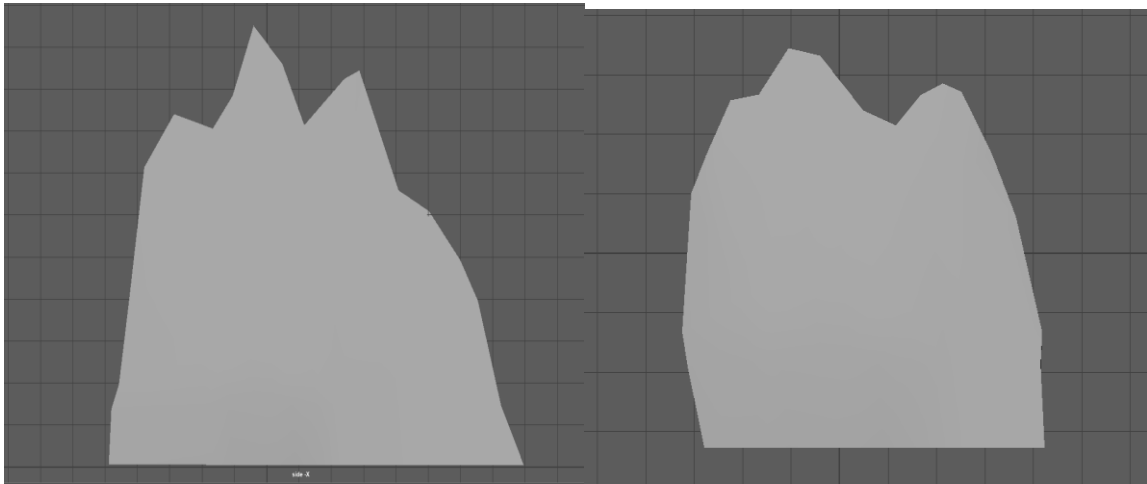
22.02.2019

Maya Spine Study

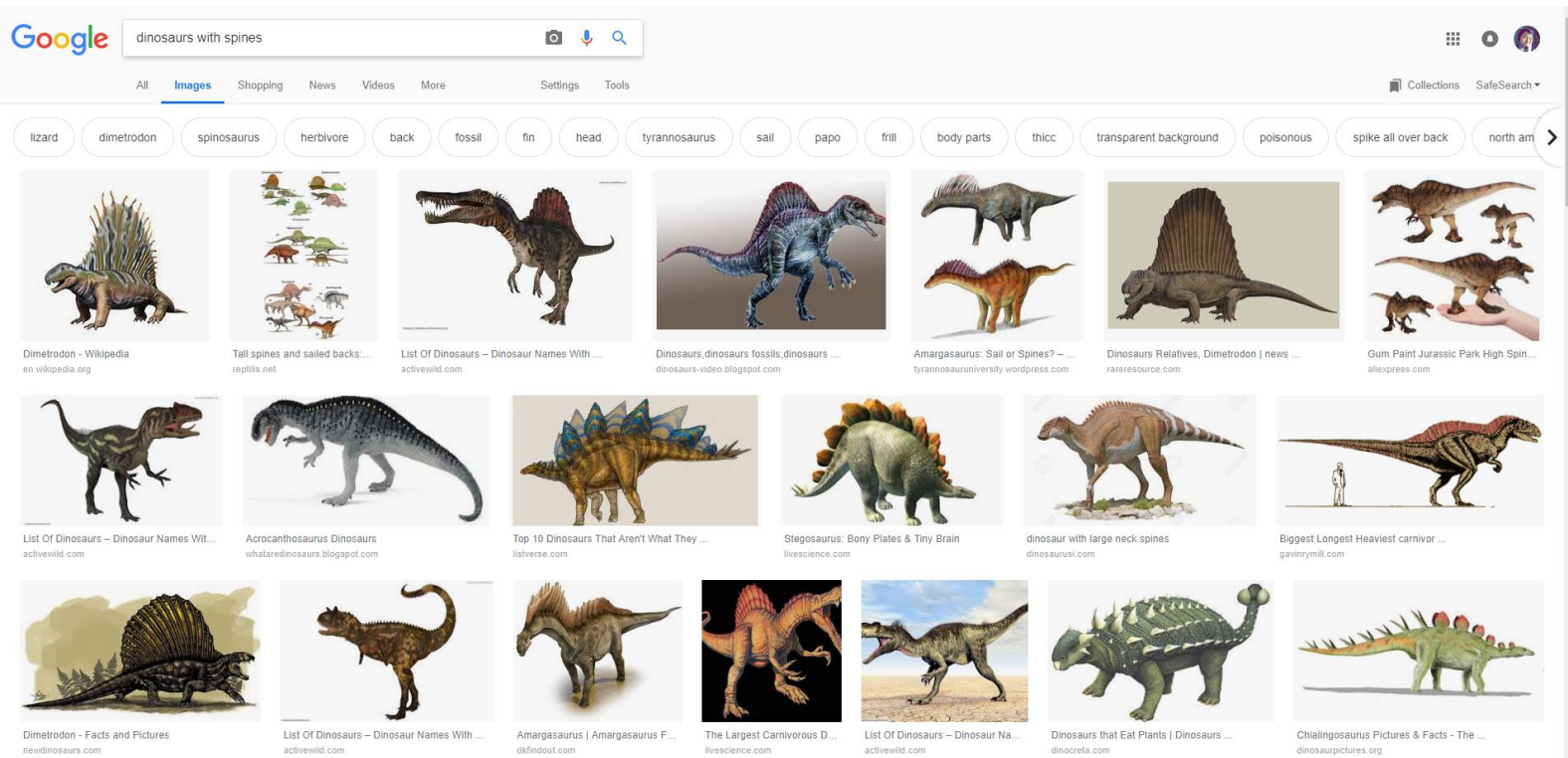
Today I was asked to quickly come up with some concepts for the spines for the mecha_zilla titan.

I used some google search terms for “dinosaurs with spines” for inspiration and completed them in around 30 minutes (See figure E1/E2)





'Figure E1: Spine Tests for the Mecha_zilla titan'



“Figure E2: Google images for “dinosaurs with spines” used as research for the quick study”

23.02.2019

Today I am working with A.I for Neo Drive.

I am going to try and use YouTube Tutorials for reference. Since I do not know how to work A.I I will try and learn from scratch.

After a few hours of searching through YouTube I could not find a tutorial that fits the artificial intelligence that I need for Neo_Drive. I will need to do more research into A.I to be able to continue.

24.02.2019

AI Analysis

I am concepting different methods that the AI can use today.

1- The AI can follow a spline that can be placed on the track.

2- The AI can follow a waypoint and target system. Where you place down multiple waypoints and a target. Then let the AI decide which path to take to make it seem more natural.

Both solutions are out of my current scope and I will need to talk to my lectures for any resources on Artificial Intelligence and how they can be implemented into Unreal.

25.02.2019

Starting Artificial Intelligence

Today during Jess's lesson, I asked for any helpful tips on making AI work. I was directed to a plugin for inspiration and also told to look into blackboards and behaviour trees in Unreal.

After looking at the free Plugin, I am going to try deconstructing the code and try to apply it to my project. In class the Overgrown team have reassigned jobs. Joe and Gareth are switching UV unwrapping and texturing with each other.

27.02.2019

I came into class today to work on A.I. I started by looking at the Plug In, realising how difficult it would be to use C++ in our project I will try use it as an example and reference, but I will not be using the code or plugin with our game.

I have decided to go right to the basics and learn as much as I can to do with Black Boards and behaviour Trees. (Wadstein, 2019), (Wadstein, 2019), (Wadstein, 2019), (Wadstein, 2019)

<https://www.youtube.com/watch?v=CSxL29dX4i8>

<https://www.youtube.com/watch?v=WFvG9wNOwoY>

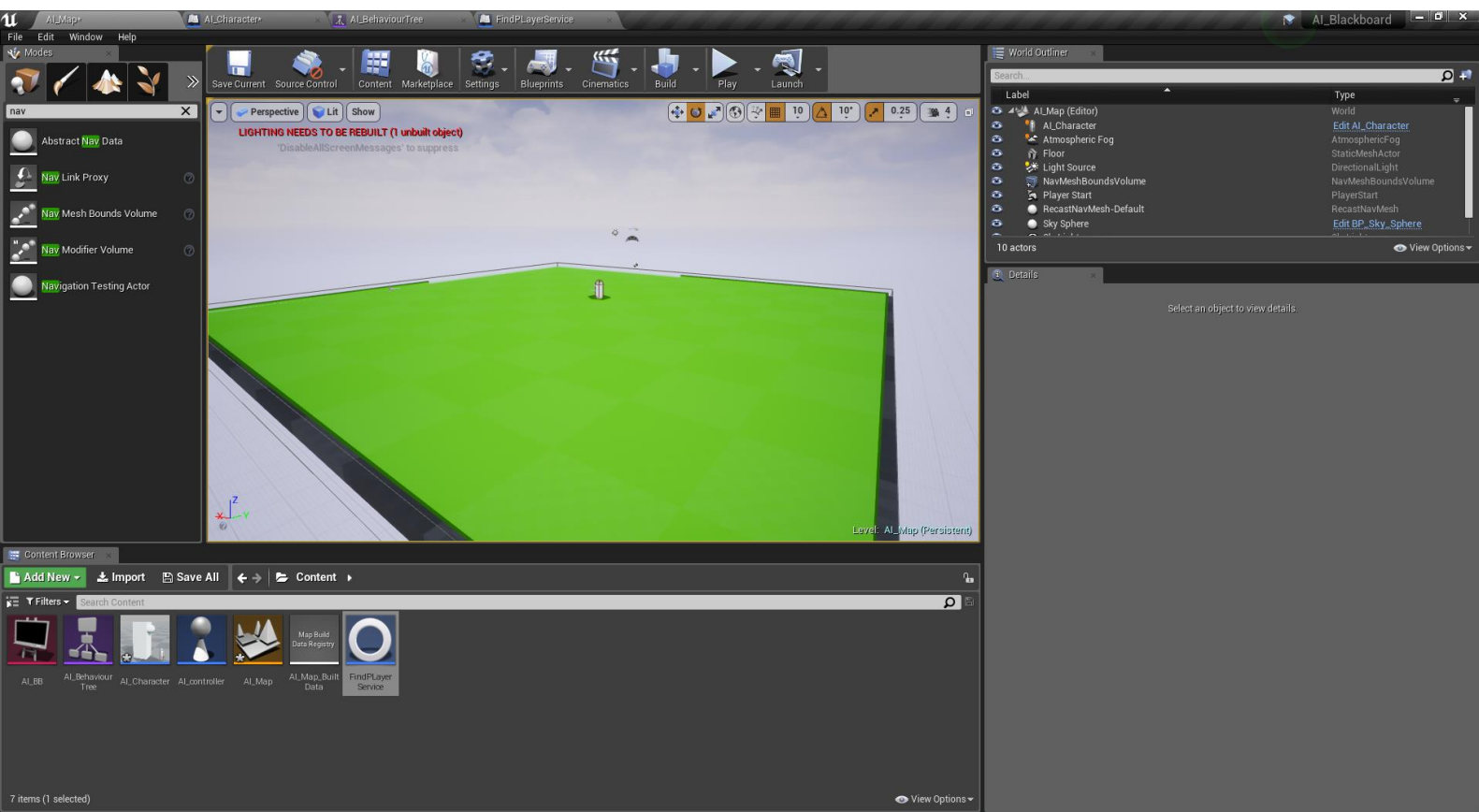
<https://www.youtube.com/watch?v=49Xub-taTig>

<https://www.youtube.com/watch?v=kEl4Ez-WnJQ>

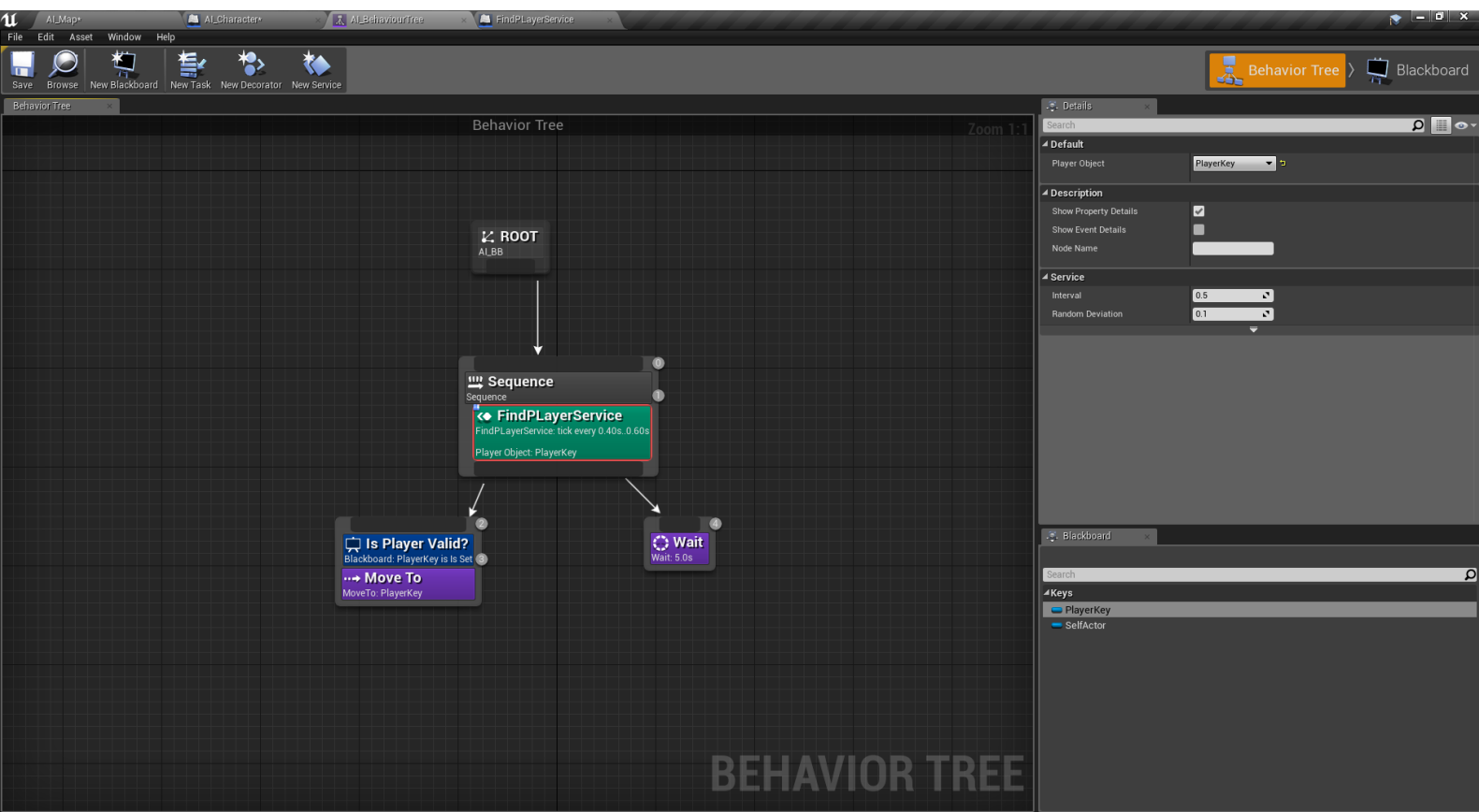
Using these tutorials from Mathew Wadstein I will try and make my own AI to work in the Neo_Drive Project. But I will first need to work out blackboard AI.

Following on from the “HTF do I? Basic AI from Scratch #1 in Unreal Engine 4” video I created a basic AI that follows the player and then waits 5 seconds before following again. (See Figure F1/F2/F3)

Basic A.I Blackboard Example



“Figure F1: My working Unreal AI project, with a character that follows the player”



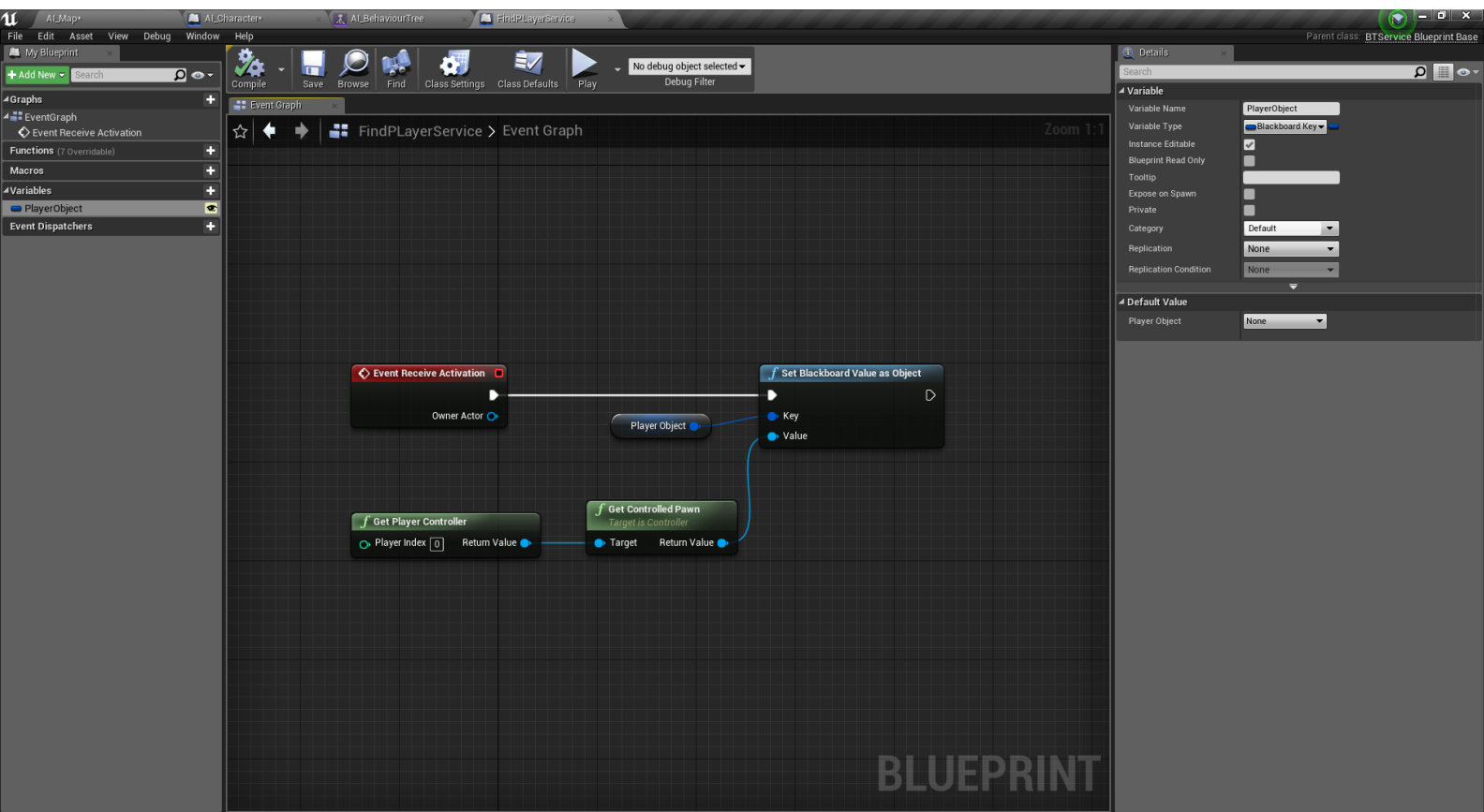
“Figure F2: The behaviour tree set up, as demonstrated in the tutorial video. The logic behind it is that after the first task on the sequence is done it will then complete the second task and loop. i.e.

Check if player is valid

Move to player

Wait 5 Seconds

Repeat”



“Figure F3: The FindPlayerService blackboard blueprint I created where the Player Object is set, so the MoveTo function can work on the behaviour tree”

01.03.2019

Waypoint system - AI track

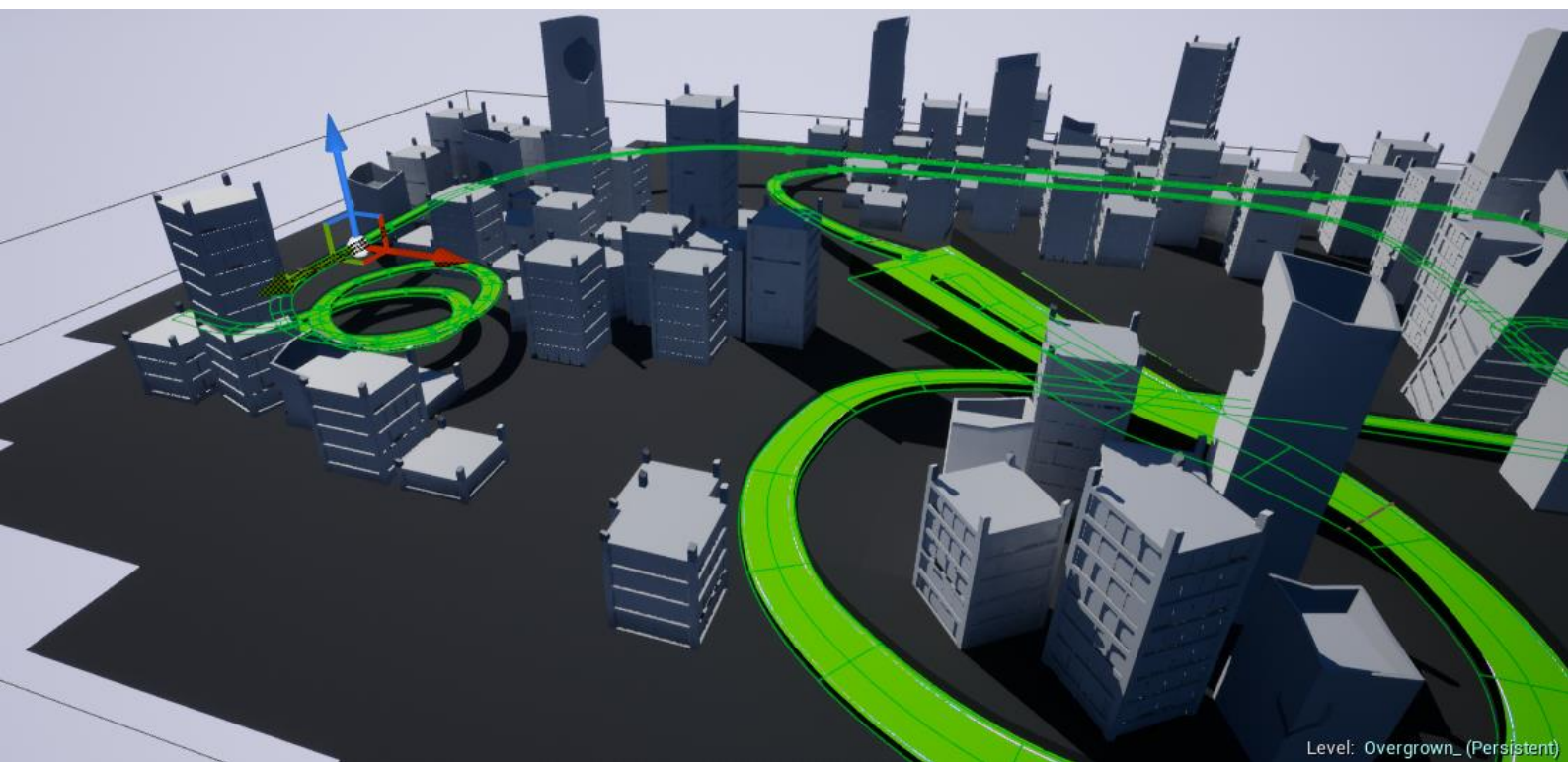
Today I am going to work on a waypoint system AI.

The reason I decided on this is because in the future I may be able to set up multiple paths in the track and have the AI follow different lanes on the road. Which may help with making the AI feel more natural to play with.

I am going to first add the navigation volume to the map so my AI knows where it can go.

I have realised that the massive navigation bound volume will be a problem for optimization. I will need to try find a way to attach a nav volume to a spline.

I have come up with one solution. it involves me setting the nav mesh across the entire map. Then to reduce the amount of mesh by giving the landscape and buildings no collision (See Figure G1).



'Figure G1: The Overgrown city map with the nav mesh only on the track'

03.03.2019

The closest tutorial on a waypoint system I can use is one on a patrolling guard which uses waypoints to navigate the map. I will need to remake it to fit our game.

(Laley, 2019), (Laley, 2019), (Laley, 2019), (Laley, 2019), (Laley, 2019)

<https://www.youtube.com/watch?v=zNJEvAGiw7w>

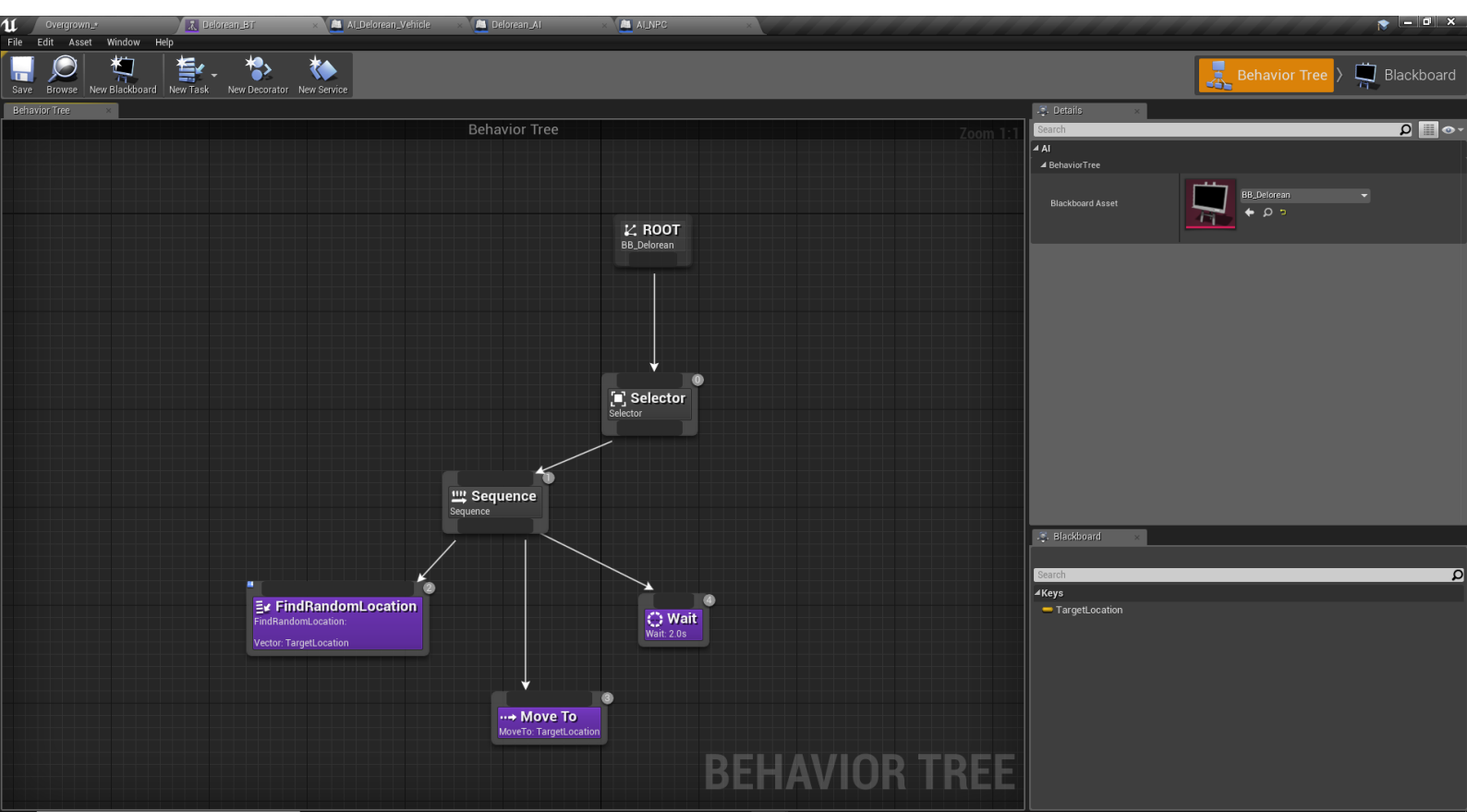
<https://www.youtube.com/watch?v=X5l0u7M-lLo&t=9s>

<https://www.youtube.com/watch?v=VPHKMawXlkA>

<https://www.youtube.com/watch?v=eLI6TOXaG5k>

<https://www.youtube.com/watch?v=bZPcWjyW9Ro>

I will go through the tutorial and try change it towards the end when I have a better idea on how it works (See Figure H1/ H2).

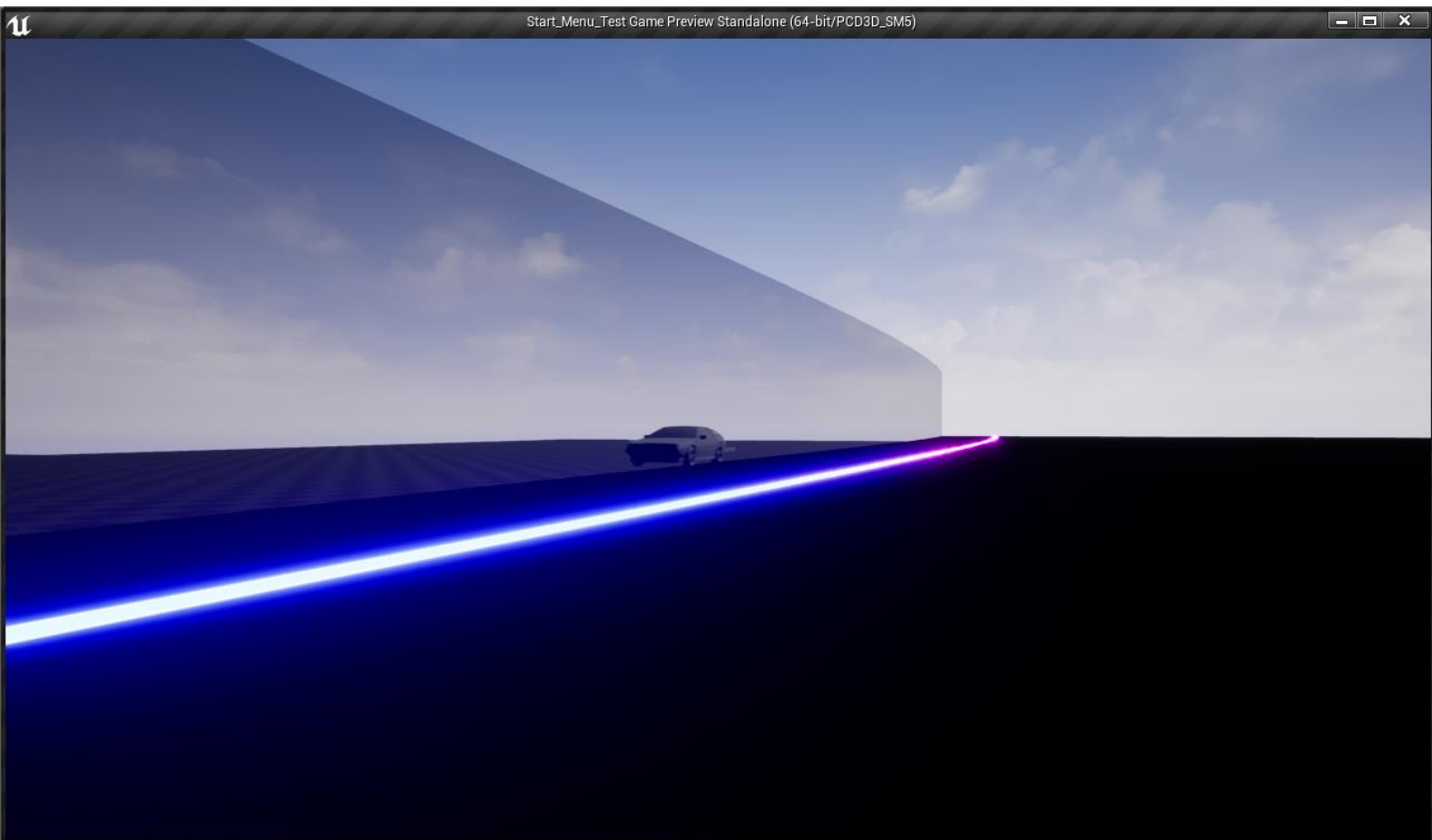


'Figure H1: Behaviour tree with each task in a sequence'

This tutorial introduced me to behaviour trees and tasks, I will need to do more research in the future.

Test - Failed

I then tested the game and now the AI moves in the level. I also changed the collision of the track and vehicle to the “Vehicle” collision present.



‘Figure H2: The AI moving in the Overgrown level’

04.03.2019

In today's lesson I sat down with Matt and our lecturer to look over our Gantt Chart. We also discussed some of the harder problems I was having with the program. This included the map which is unable to work when exported and also the problem with vertical track and how the nav mesh will not cover it.

I was told to look at Nav Link Proxy, for the issue with the vertical track.

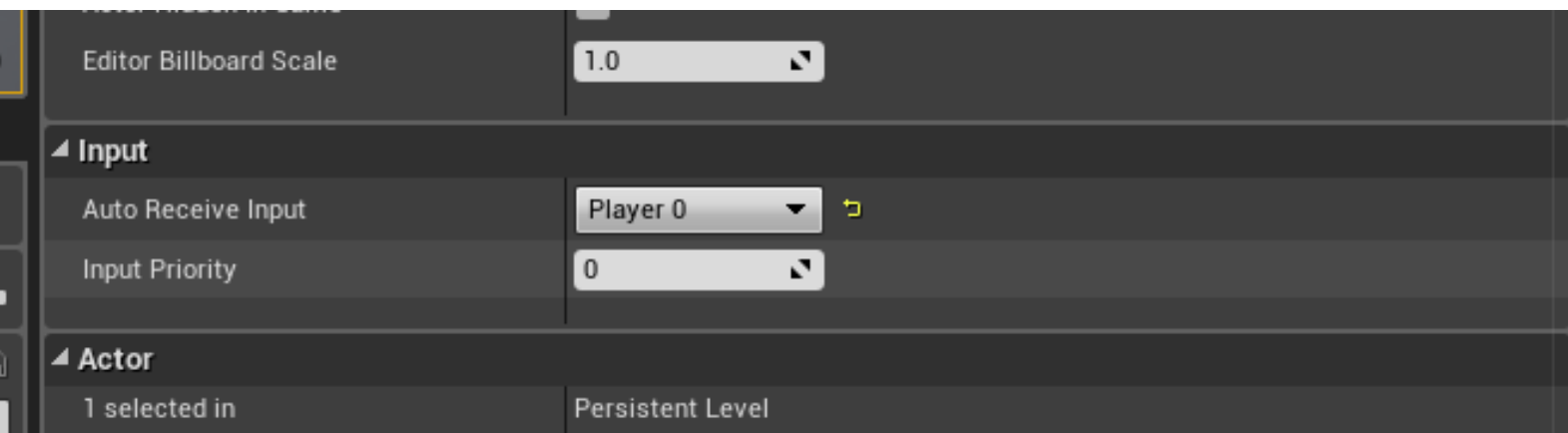
I was also showed a free plugin called "Spider Navigation". This has a new nav mesh coded in it so that the vertical and normally unable nav mesh can actually be reached. It works with the collision of meshes to plot its course around the level. I may need this later on.

Menu Export (Issue)

Another issue that was brought up was the issue from last semester, of the menu not working once exported. The problem was that the menu worked in the editor window but not in the actual exported game.

So, me and Matt both tried to figure out the problem during the lesson. We started by looking at the widget itself and Matt found the input window was set to “Disabled”.

So, after changing the widget we exported the game to test the issue. No change. A big setback is that the game takes at least 3-4 minutes to export each time, which can be a pain if we only change something small and need to test to see if it works. (See Figure I1)



‘Figure I1: The input window on the 3D widget changed to “Player 0” from “disabled” ‘

Another method we tried was to change the native parent class of the camera actor pawn. Our reasoning was that it might affect the way the mouse interacts with the level. After exporting, we realised this was not the solution either.

We tried a few more attempts before needing to ask Jess the best way of solving it. We know that the mouse can interact with the widget since I changed the colour of the button whenever the mouse hovers over the button.

As shown in Figure 12:



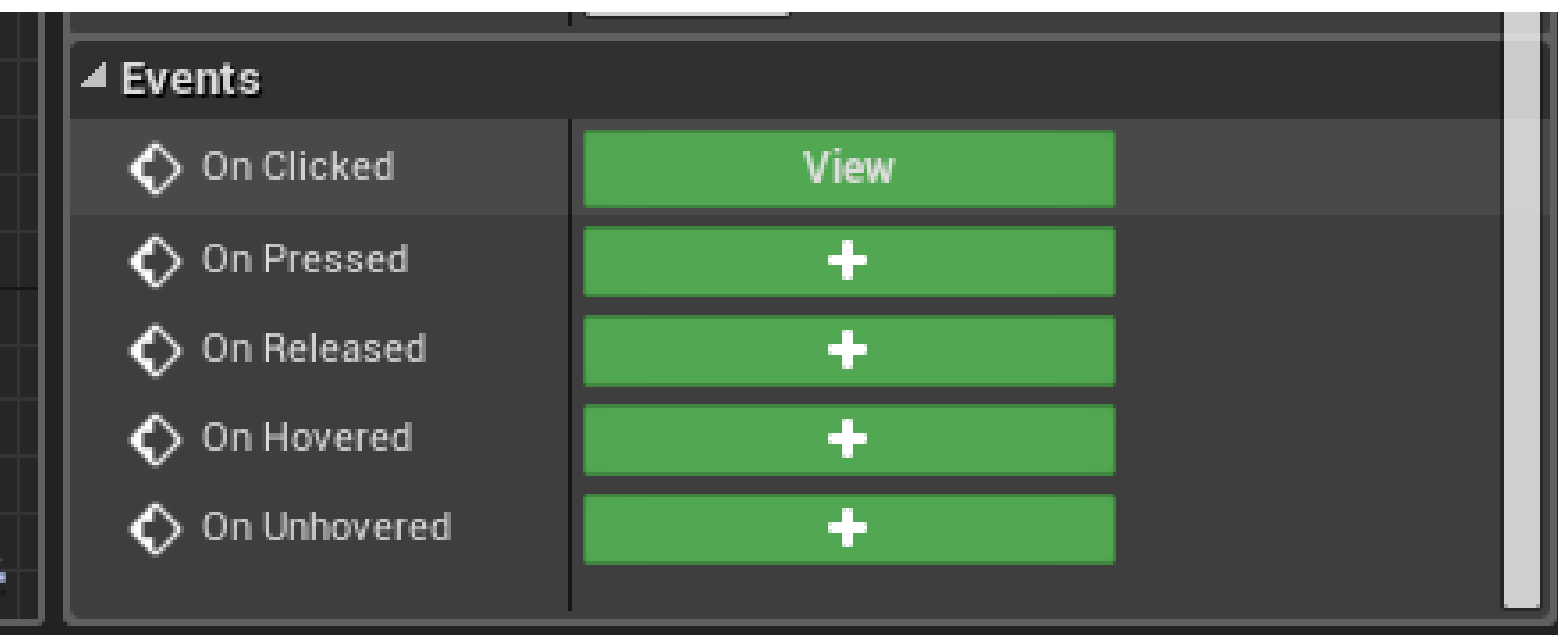
'Figure 12: The button changing colour while the mouse hovers over it'

Using this information, we tested each step of the process with the print string test. Firing off a print string at each part of the button press process. This way we can narrow down exactly which part of the code is not working. Although it should not be a code problem since it works in the editor. (See figure 13)

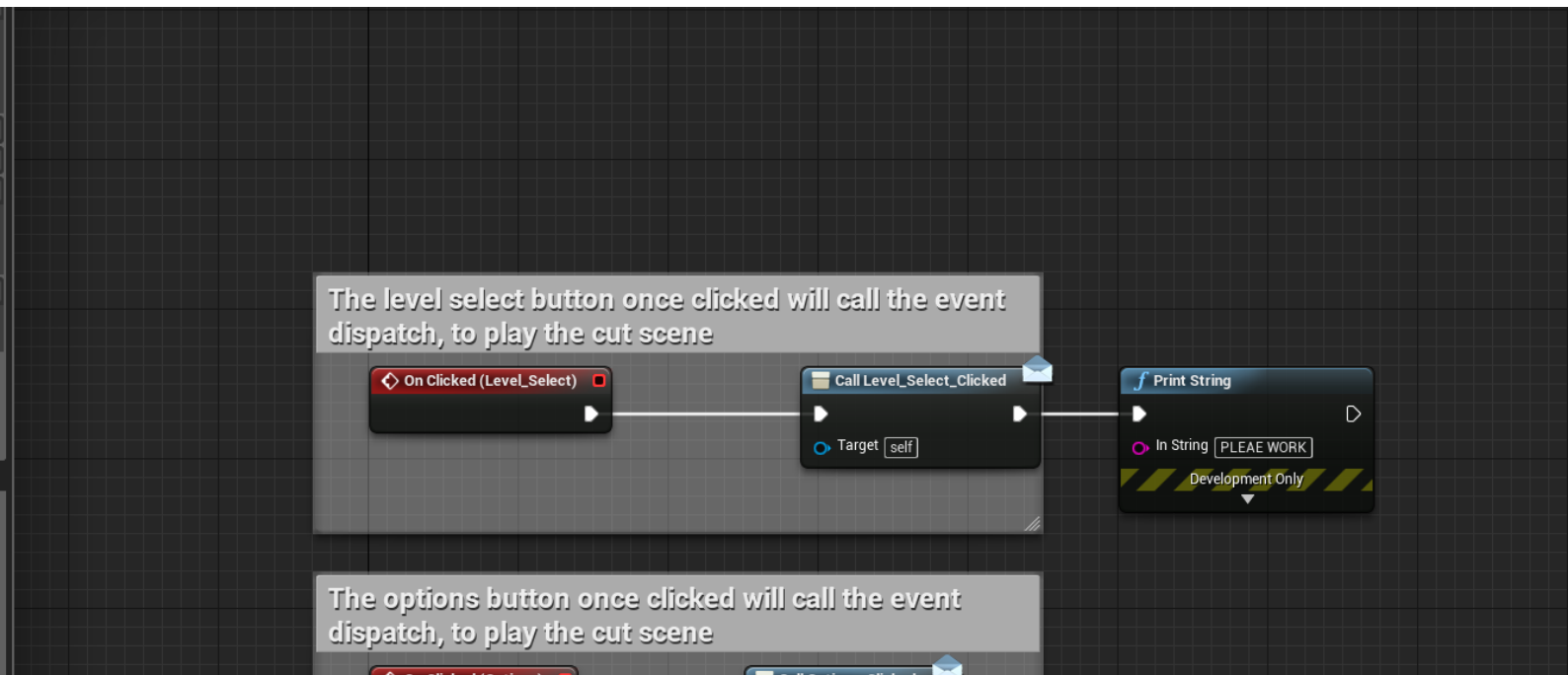


'Figure 13: Setting off a "true" statement showing that the "Set show mouse cursor" works once the program loads.'

We now wanted to test if the “onclick” event was working. (See Figure I4/I5)

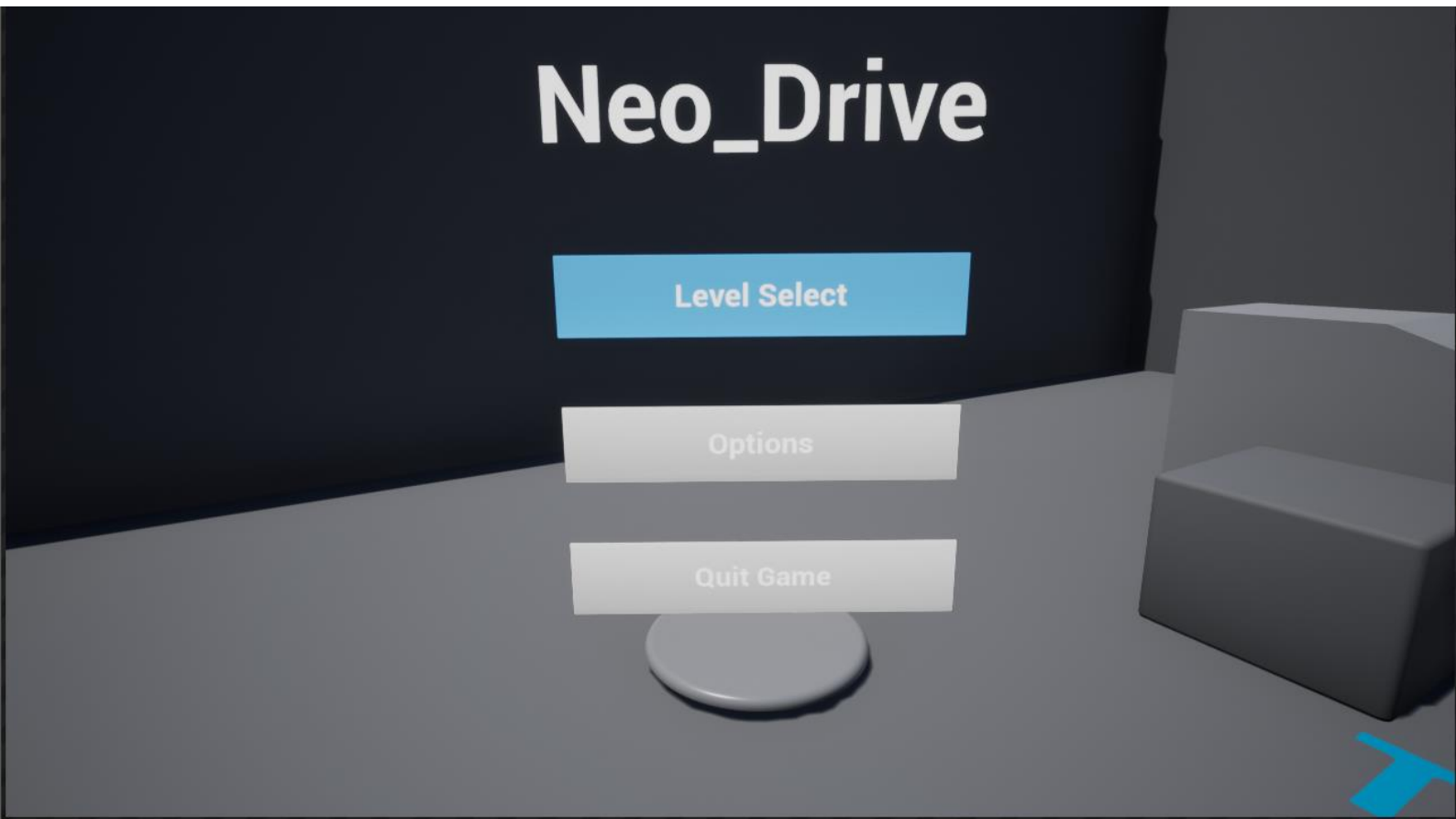


‘Figure I4: Showing that there is an on click event firing off the widget blueprint’

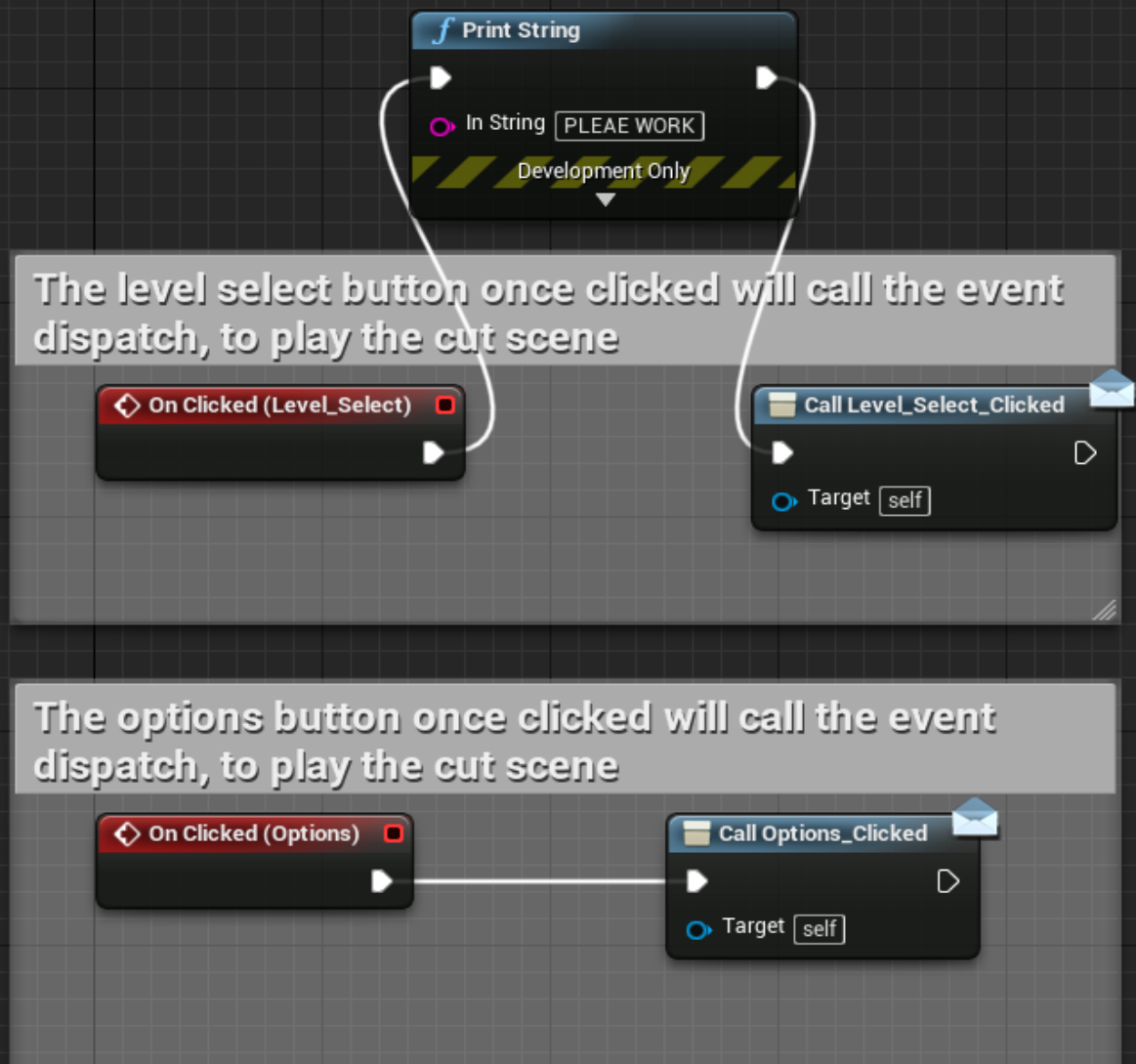


'Figure 15: Setting off a print string once the button has been clicked to see if it works. '

The print string test has shown that the button is not registering the event “onclick”. (See Figure 16/17)



‘Figure 16: The print string not showing up after clicking the button. ‘



'Figure 17: Now changing the print string a step back to find the source of the problem'

We had the same issue even when we moved the print string. This proved that the “on clicked” event was not working in the editor. (See Figure I8)



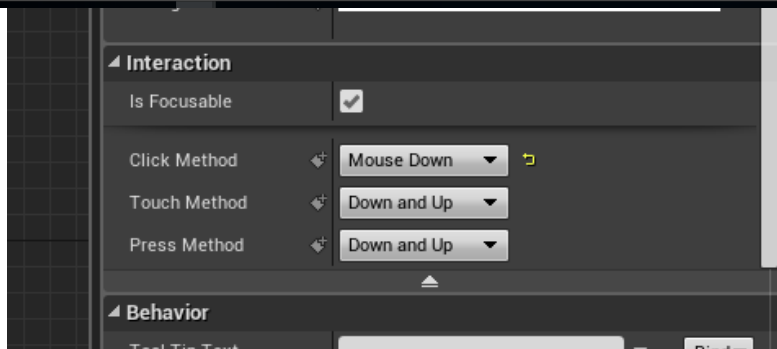
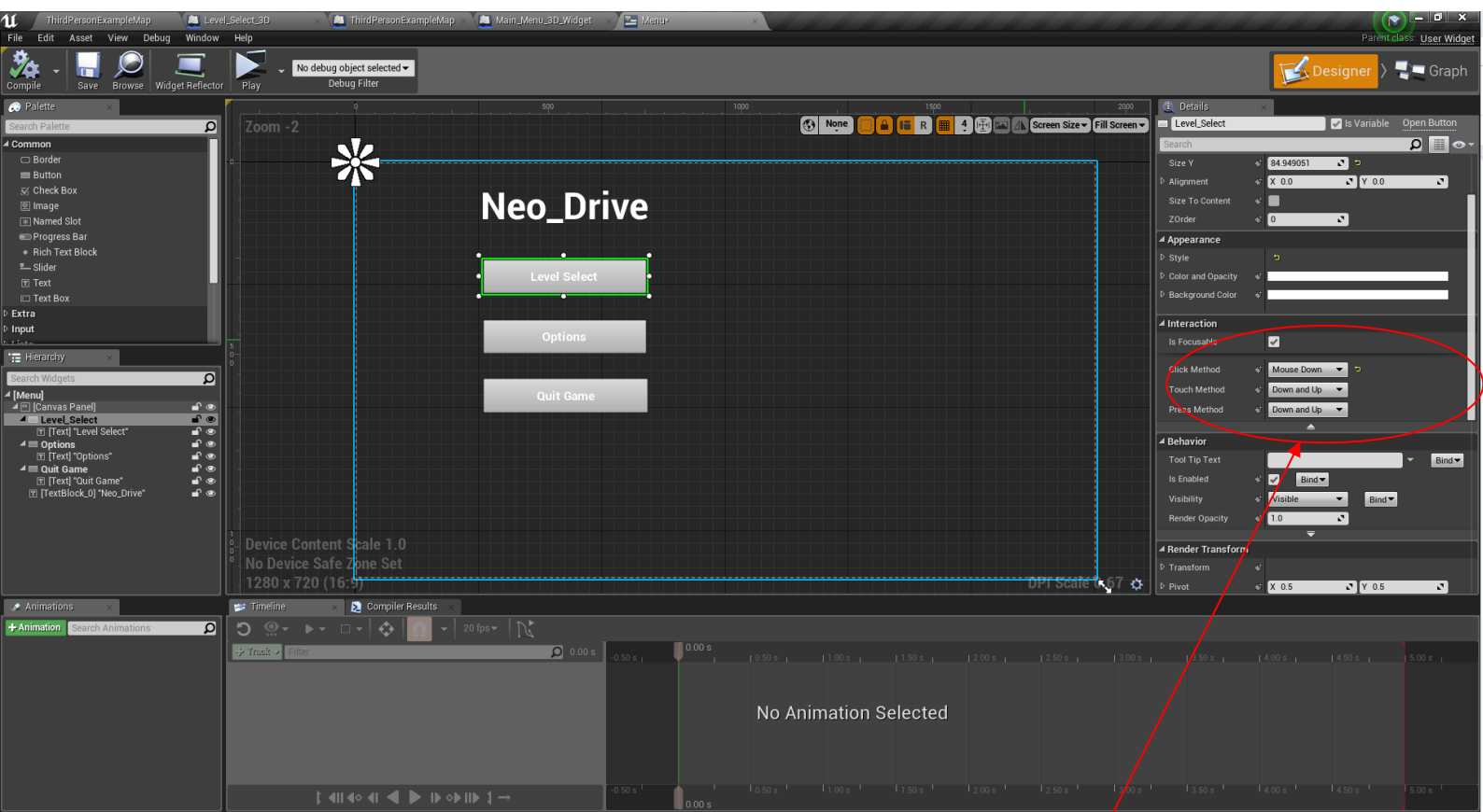
‘Figure I8: Still no print string after clicking it’

What this tells us is that the issue lies in the widget not being able to pick up the widget when the game has been exported.

Menu Export (Solution)

So, taking a look in the widgets details we tried and tested a few things in both the widget blueprint and the 3D widget asset. Both had an 'Interaction' menu, but the widget blueprint had advanced features.

So, we tested the "Click Method" drop down which was set to "Down and Up" and we changed it to a "Mouse Down". (See Figure I9)



'Figure I9: The "Click Method" changed to a "Mouse Down" in the interaction menu on the widget blueprint '

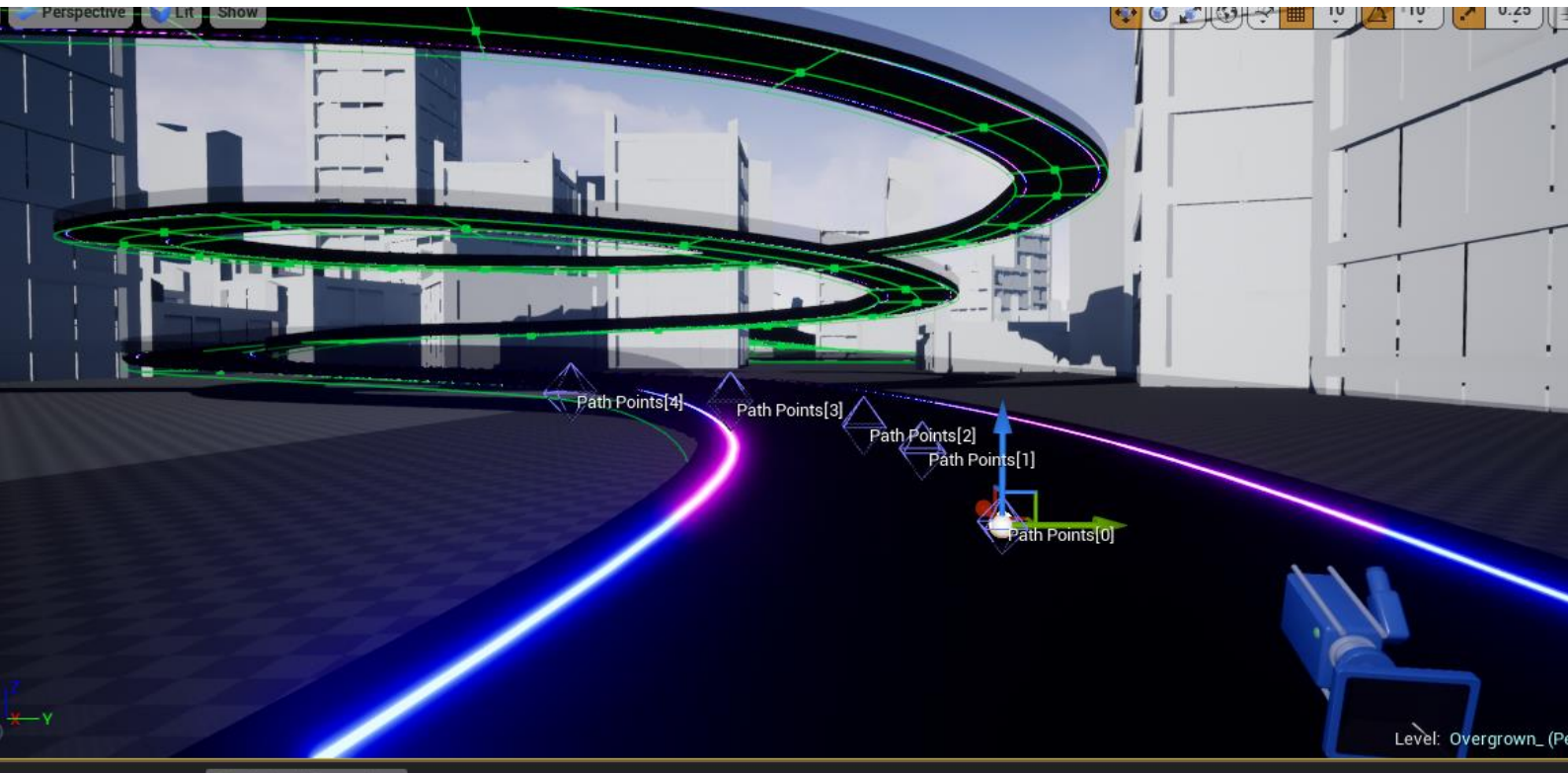
This worked after exporting the menu. Due to how the editor menu focuses the mouse click differently before exporting and after exporting the menu worked in the editor and not the actual exported product.

After changing every button to a Mouse Down setting, each button should work perfectly once exported.

08.03.2019

AI Continued pt. ii

Following from the last tutorial by Ryan Laley I will attempt to make the AI I have work better than it does. (See Figure J1)

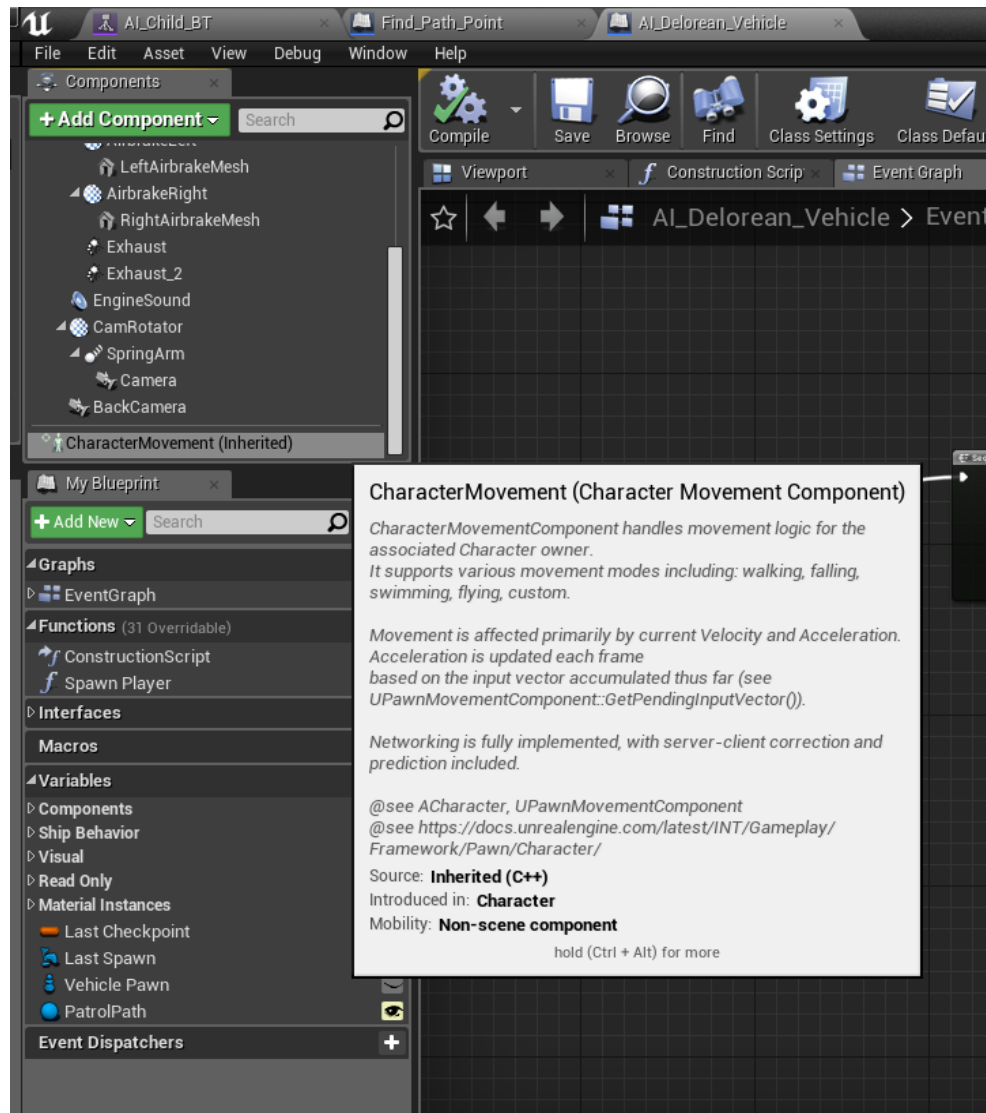


'Figure J1: The path point tutorial used on the AI for the overgrown level'

This was the continued tutorial on AI where the AI will follow a predetermined path. But after a test the AI car does not follow it. However, the character AI follows the path without a problem, but the movement of the AI car does not follow it. I will need to ask Jess for some help since I cannot figure out the movement problem.

11.03.2019

Today I asked Jess for some help with the AI. We started by looking at the character pawn, since I was told that the character can actually move while still being a pawn. Since I figured that the character pawn had the “CharacterMovement” node, I thought that was the only way to get a character to move. (See figure K1)



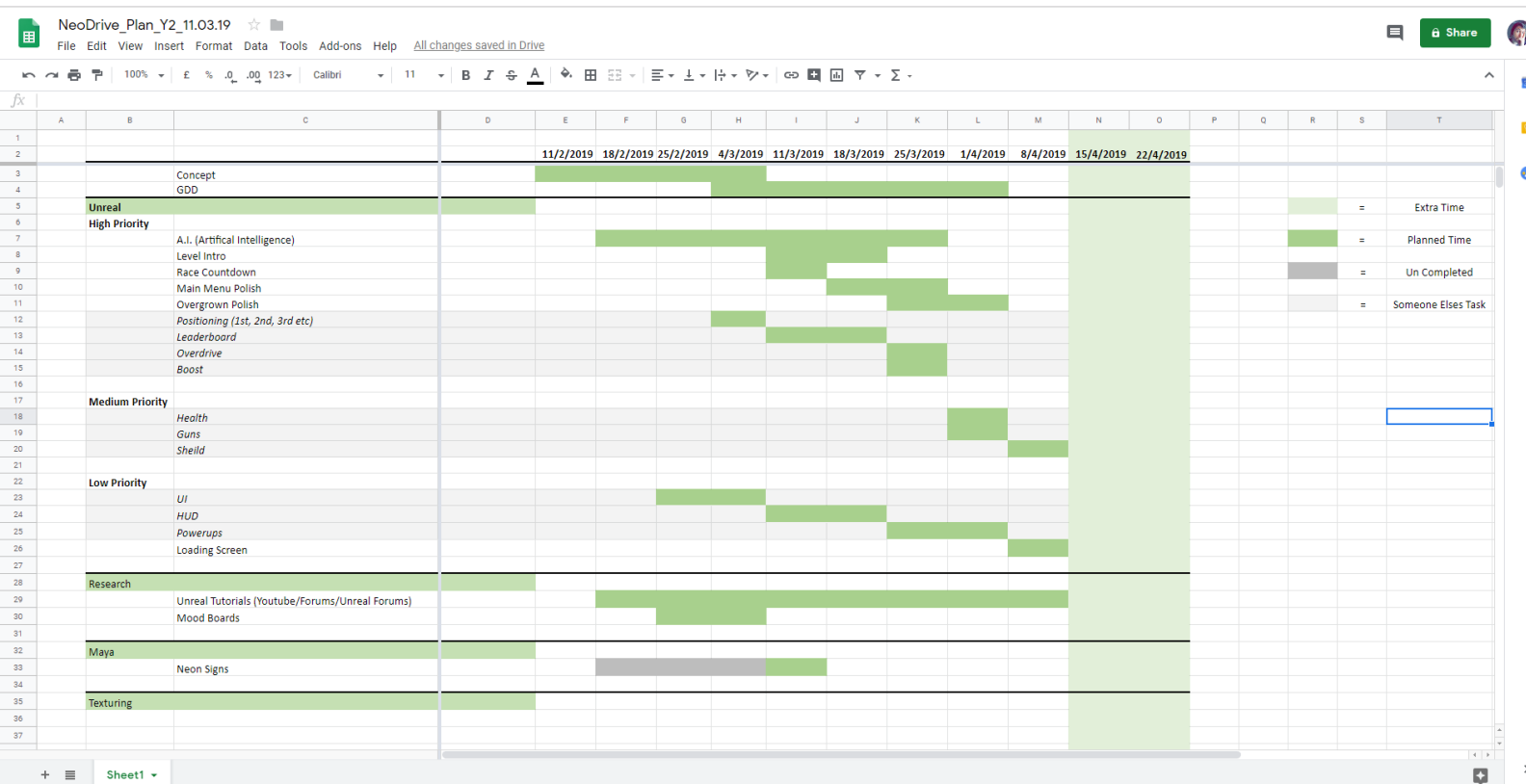
‘Figure K1: The “CharacterMovement” node’

The problem was that both the “CharacterMovement” and the ship behaviour controls were interfering with each other and making the character move unexpectedly.

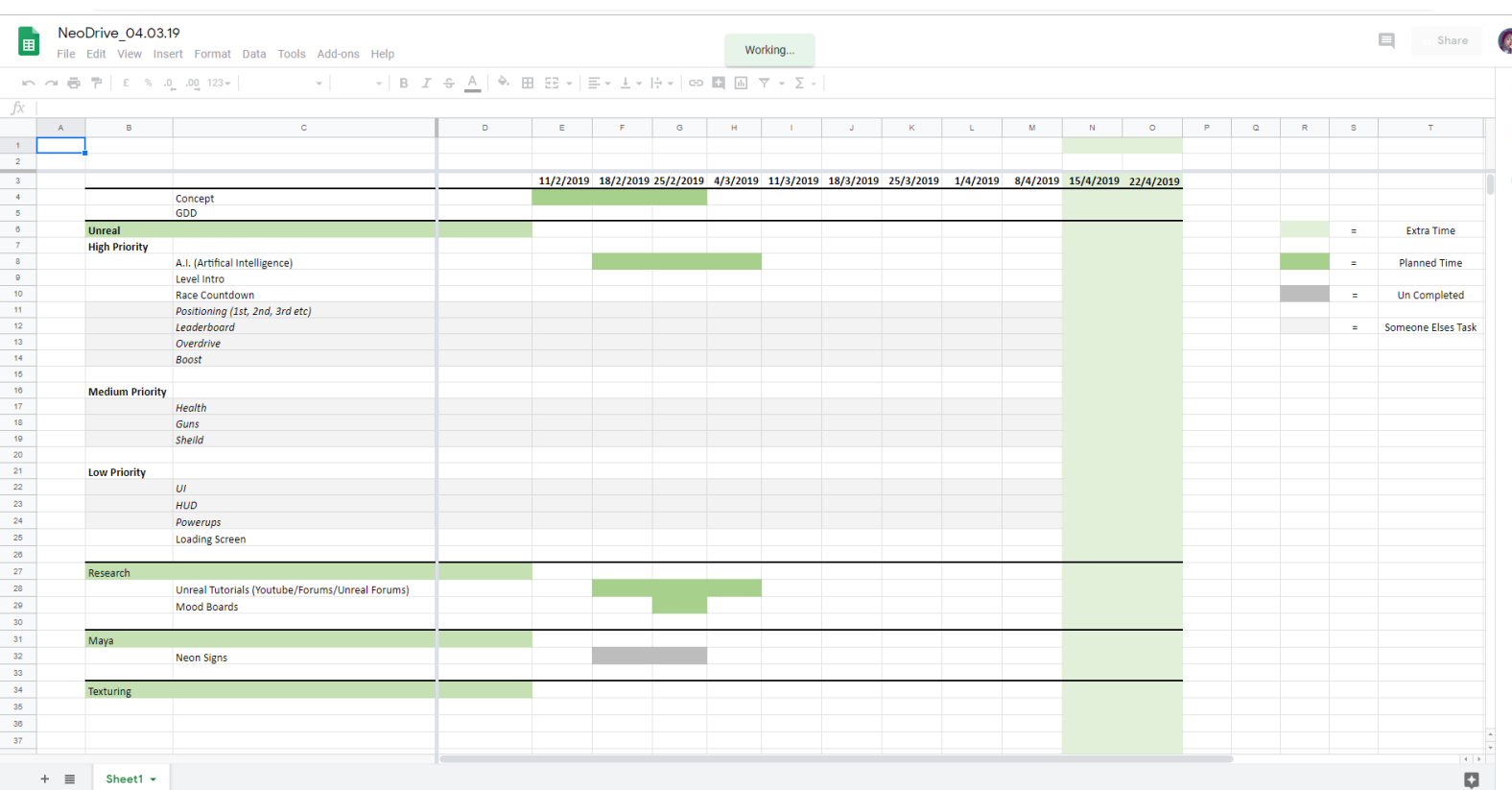
12.03.2019

Since there was a problem with uploading the zip file, I have only been able to upload it now, so I will need to wait some more time before working on AI again.

Gantt Chart 11.03.2019



'Updated 11.03.19 Gantt Chart Plan'



'What I did on the 04.03.19' week'

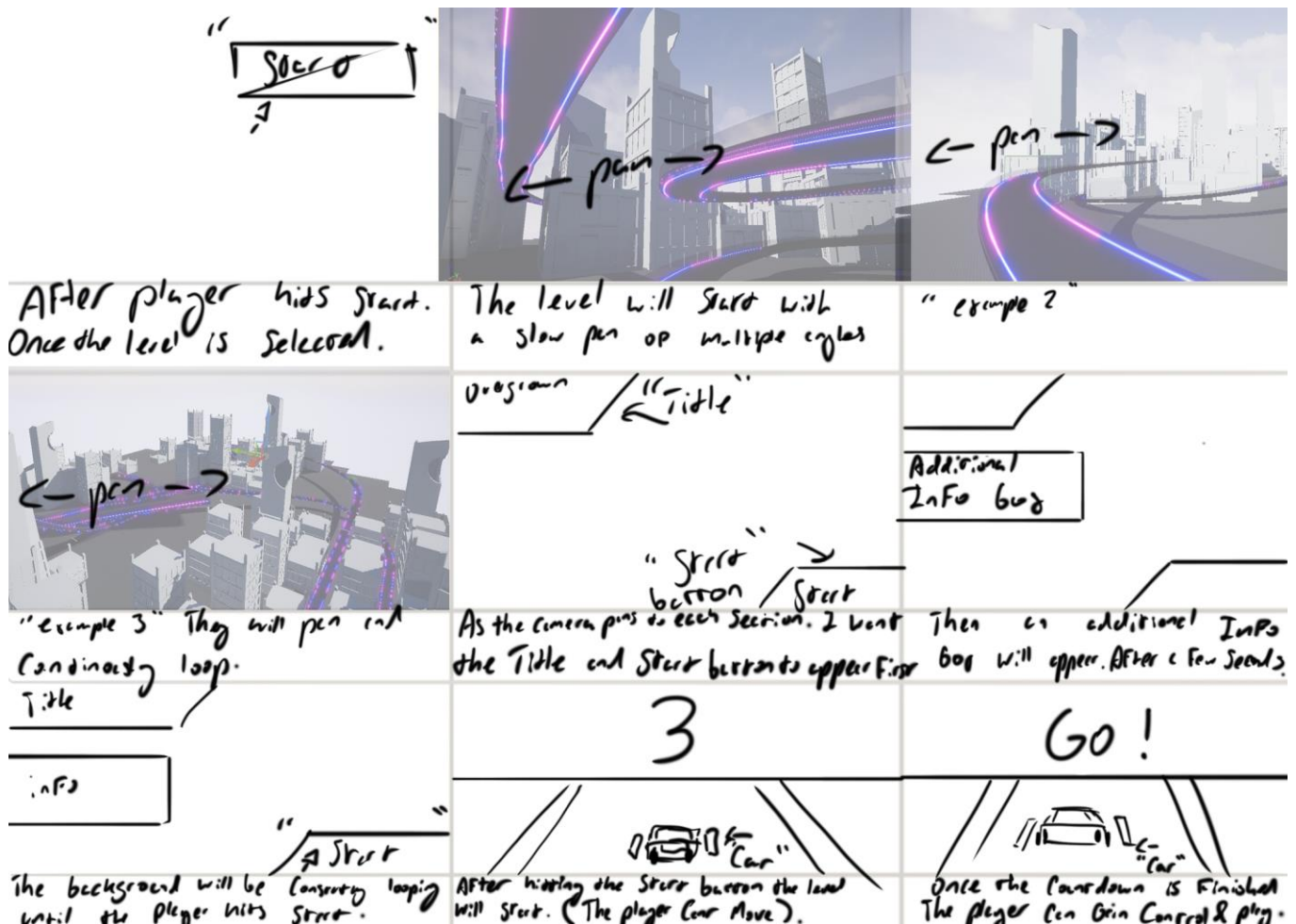
Comparing both what I did and what needs to be done this week. I have added in more tasks like the "Main Menu" and "Overgrown" polish tasks. I have also moved some tasks from next week to this week, so I have something else to work on while I wait for some feedback on the AI.

For instance, the "Level Intro" and "Race Countdown" have been pushed to this week.

13.03.2019

Storyboard Level Intro

I am going to use to use my day off to work on the Level Intro, or plan for the Main Menu Polish.
(See Figure L1)



'Figure L1: Start Level Intro storyboard'

(Transcription of the story board)

1:

'Start

After Player hits start. Once the Level is selected.

2;

<pan>

The level will start with a slow pan.

3:

<pan>

example 2.

4:

<pan>

example 3 they will pan and continuously loop.

5:

Overgrown, "Title", "Start Button", Start

As the camera pans to each section. I want the Title and Start Button to appear first.

6:

Additional Info Box

Then an additional info box will appear after a few seconds.

7:

Title, info, start

The background will be constantly looping until the player hits "start"

8:

3

After hitting the start button the level and countdown will start (The player can't move)*

9:

Go!

Once the countdown is finished the player can gain control and play '

I started today by creating a storyboard for a level intro. I figured this would be universal for each of the levels, but I can work with the Unreal Team, if they want to add in additional elements.

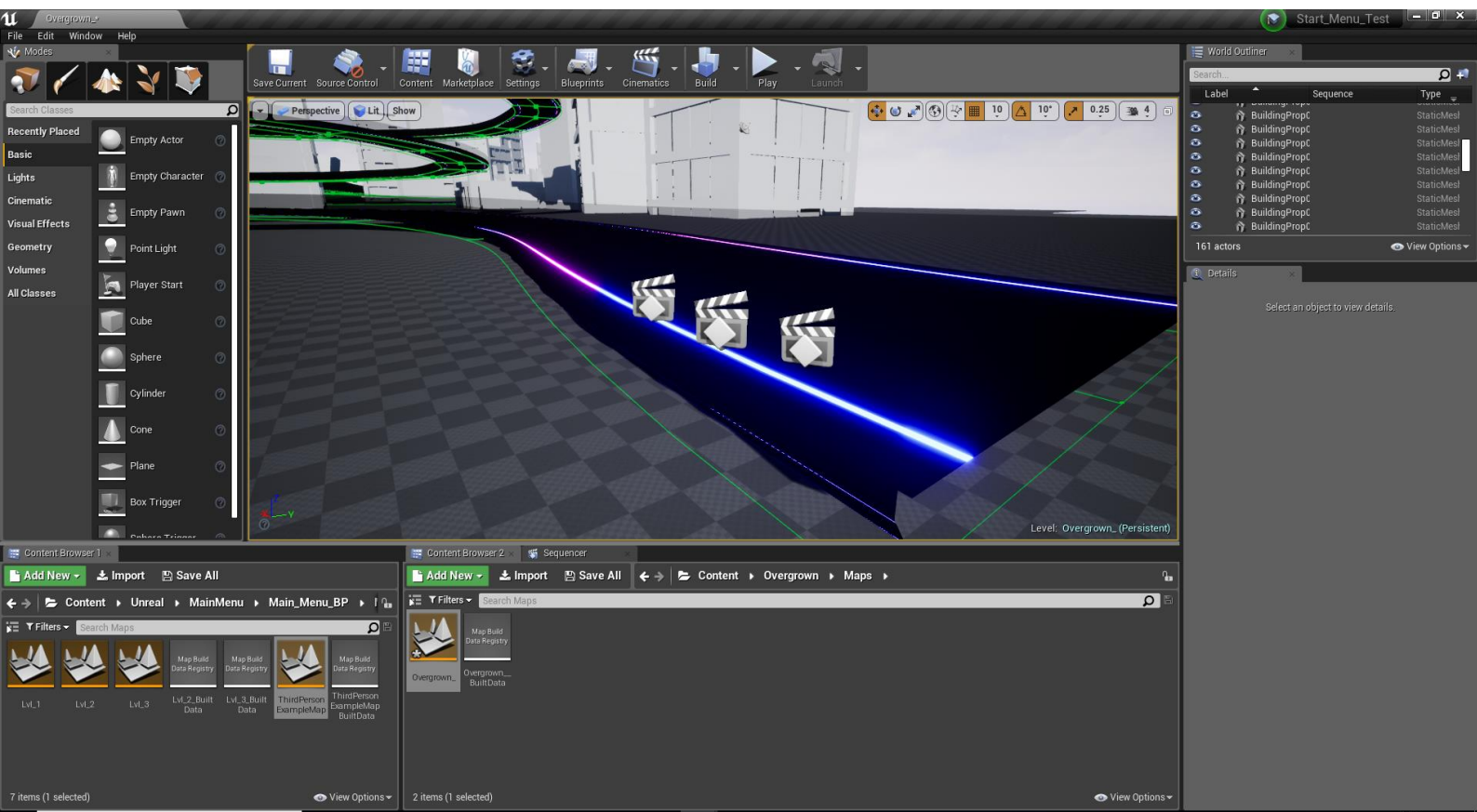
Now that I have a plan and a better idea of what I want I am going to try and set up the level intro.

Level Intro

Pseudo Code to set up the level sequences.

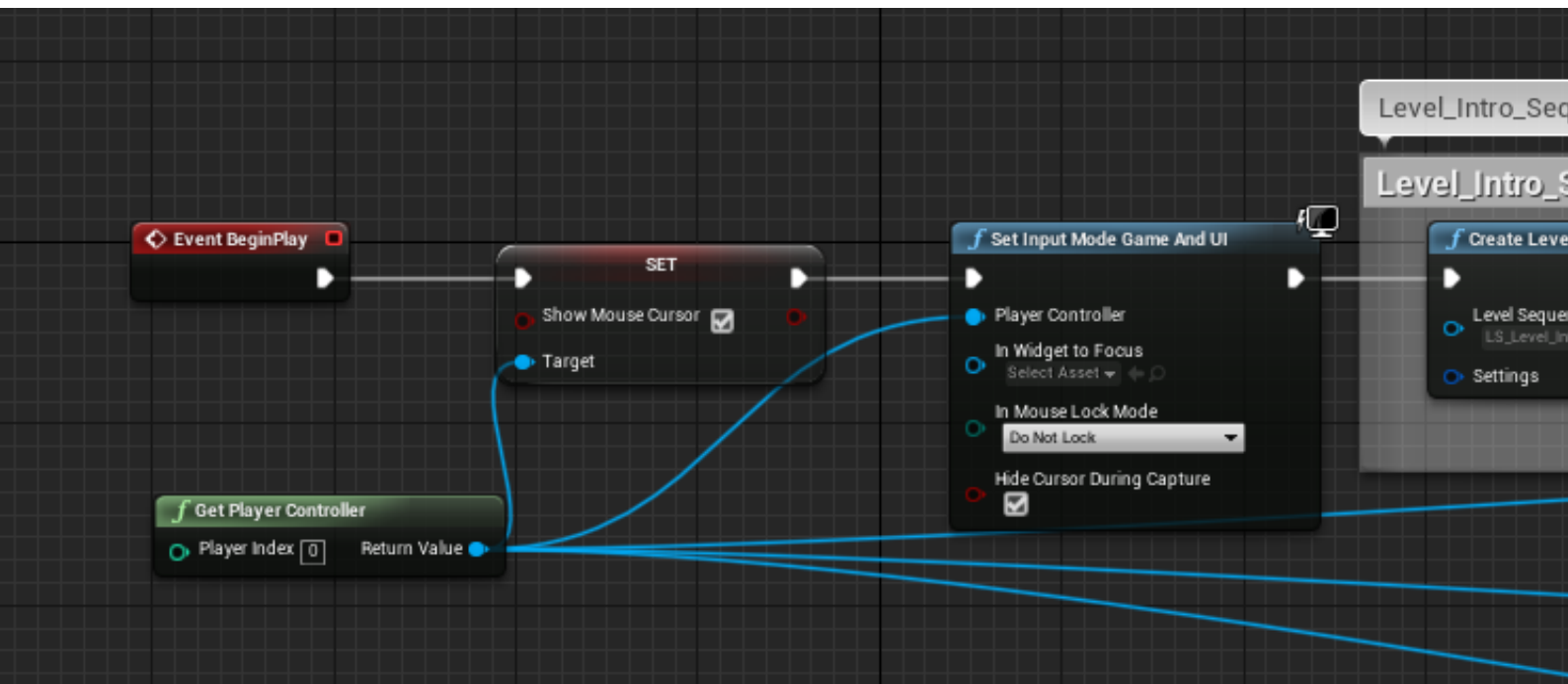
- 1, Level Blueprint > Cast to “Level Intro” widget > Create sequence Player > Set Level Sequence.
- 2, Create Variable - Variable Type “Level Sequence”
- 3, Set View Target with Blend of the Camera Actor on the specific Level Sequence
- 4, Play node of the Level Sequence Variable - This will play that level sequence
- 5, Repeat 3 and 4 for each sequence and loop back to the first sequence until the player hits start

Level Intro (Attempt 1)



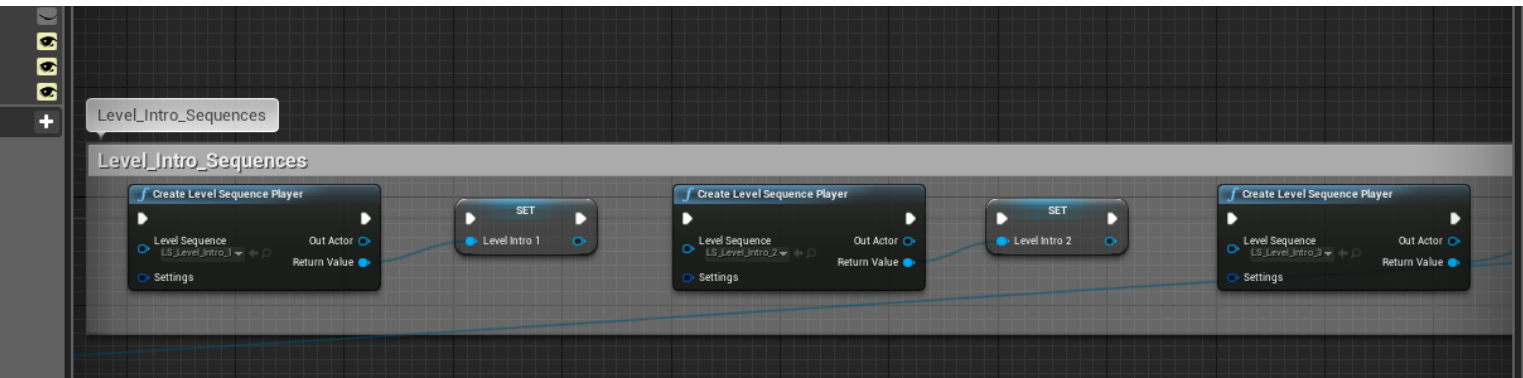
'Figure L2: Created level sequences'

I started out by creating three level sequences that will loop as the start menu will appear. These will be temporary for now and I will polish once I have created a working intro, similar to my story board. (See figure L2)



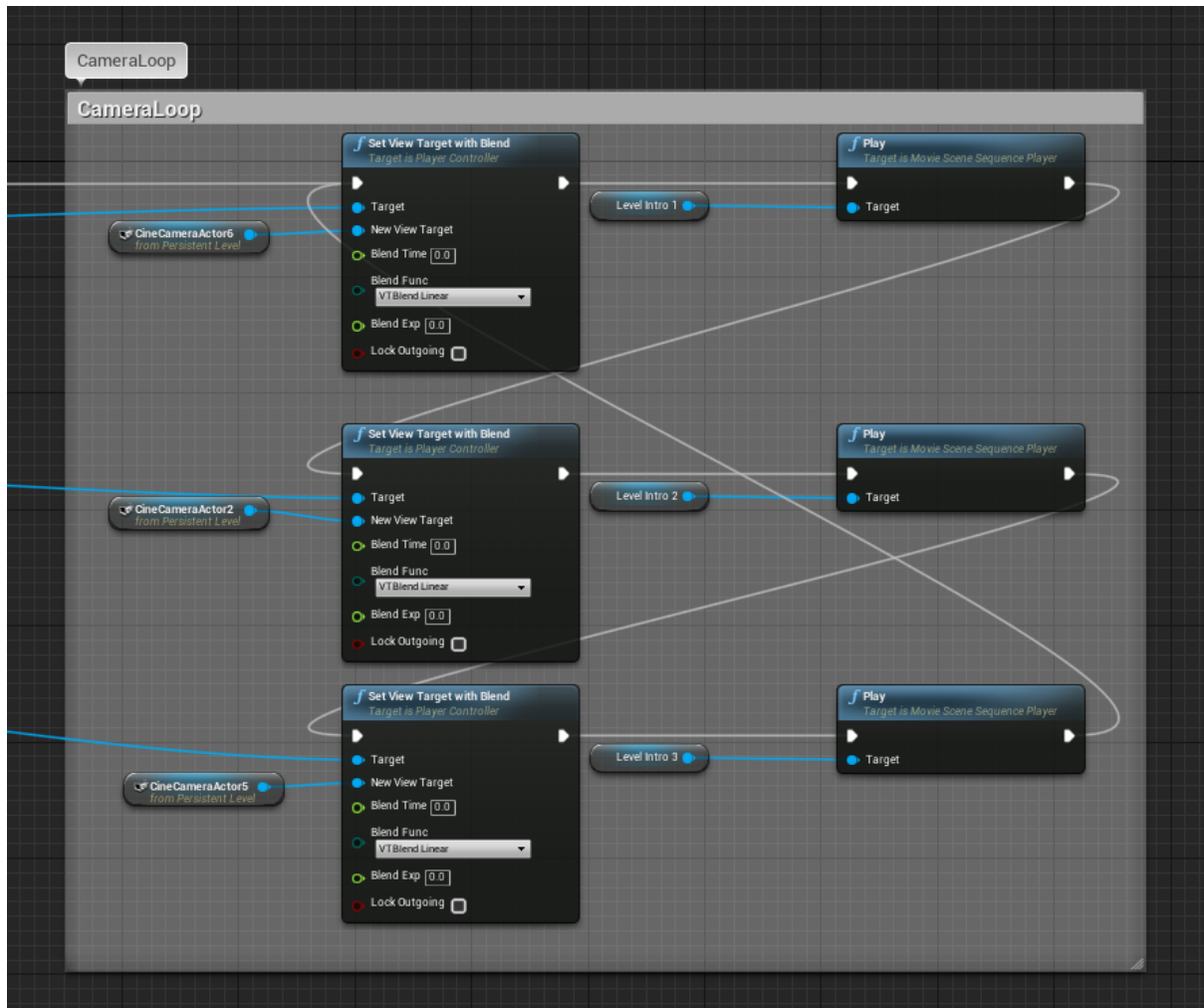
'Figure L3: In the Overgrown Level Blueprint'

From my Menu I created last semester, I took the same format and set the mouse cursor and setting the input mode of for the player at the start. (See Figure L3)



'Figure L4: Created Level sequences like my pseudo code and setting them as variables'

The next step was to create each level sequence and turn them into variables that I can use and call upon when I need them. (See figure L4)

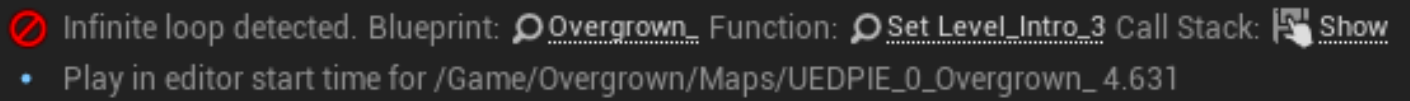


'Figure L5: A camera loop'

I then made each sequence play right after each other and put into a continuous loop. (See figure L5)

Test - Failed

However, when I tested it an infinite loop error came up. (See figure L6)

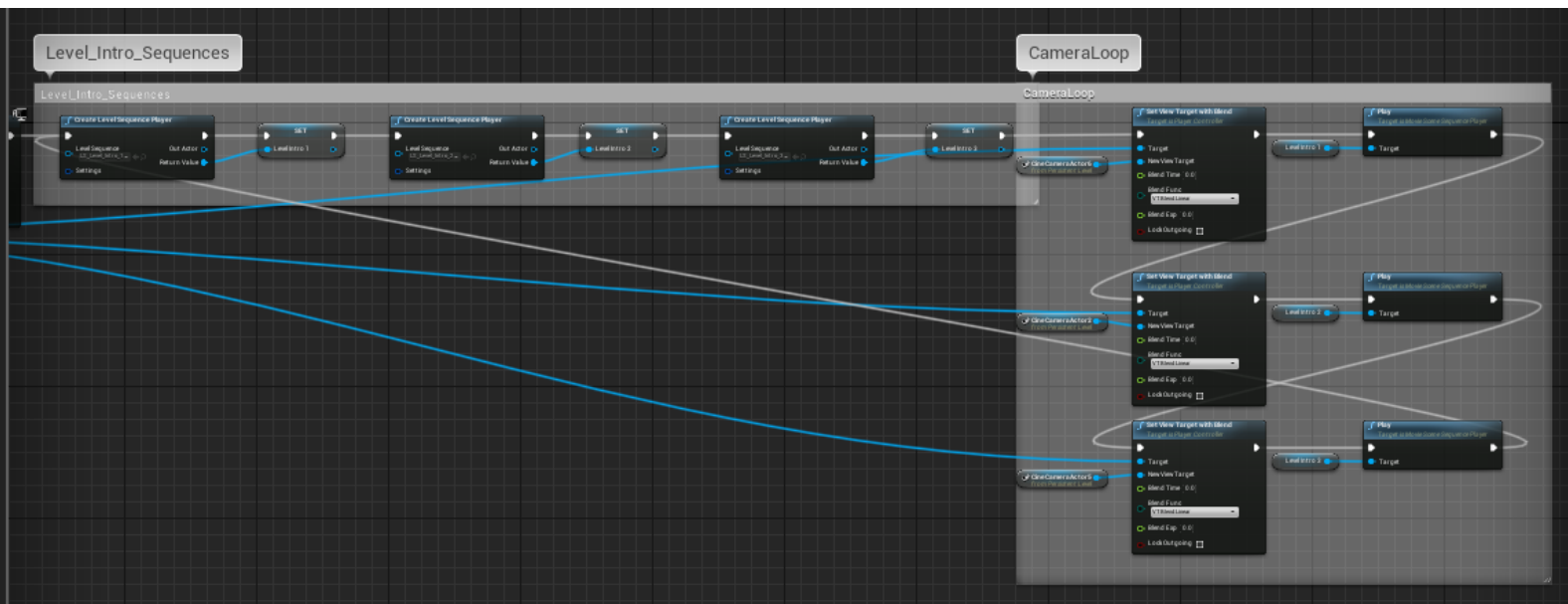
A screenshot of the Unreal Engine console showing an error message. The message is: "Infinite loop detected. Blueprint: Overgrown_ Function: Set Level_Intro_3 Call Stack: Show". Below this, there is a bullet point: "Play in editor start time for /Game/Overgrown/Maps/UEDPIE_0_Overgrown_ 4.631". The console background is dark grey, and the text is white.

⊘ Infinite loop detected. Blueprint: Overgrown_ Function: Set Level_Intro_3 Call Stack: Show

- Play in editor start time for /Game/Overgrown/Maps/UEDPIE_0_Overgrown_ 4.631

'Figure L6: Infinite loop error'

Level Intro (Attempt 2)



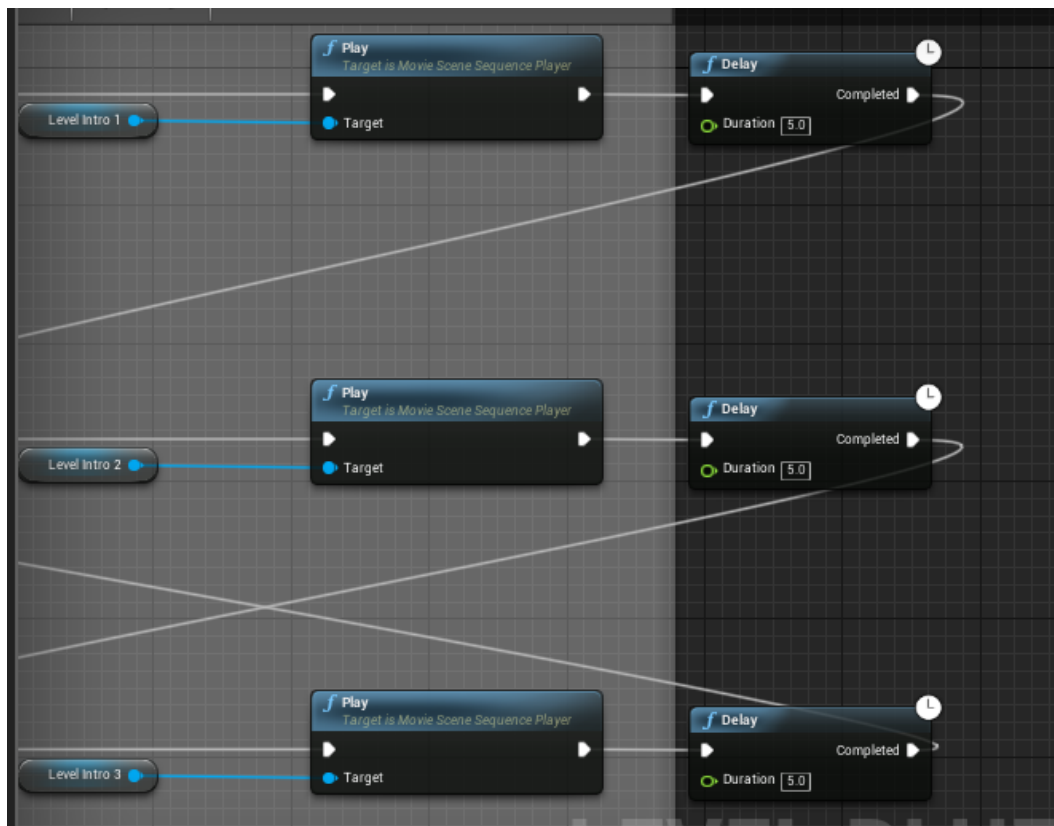
‘Figure L7: Attempt at fixing Infinite loop error’

I then connected the end of the “play” sequence to the start of the create level sequencers to try and fix the loop. Since the level sequence needs to be created each time you play it, this was a problem I faced last year, and I remembered the fix. (See Figure L7)

Test - Failed

However, now that I play the level the only sequence that plays are the third one.

Level Intro (Attempt 3)



‘Figure L7: Putting in delays since they all play at the same time without them’

I fixed the problem by putting in delays on the end of each sequence since they were all playing at the same time. (See Figure L7)

Test - Success

Now when I play the level it loops back each time as I want it too.

15.03.2019

Level Intro - Widget Menu

Today, I am continuing work on the Level Intro menu. I am going to implement the menu with the looping video. (See Figure m1)

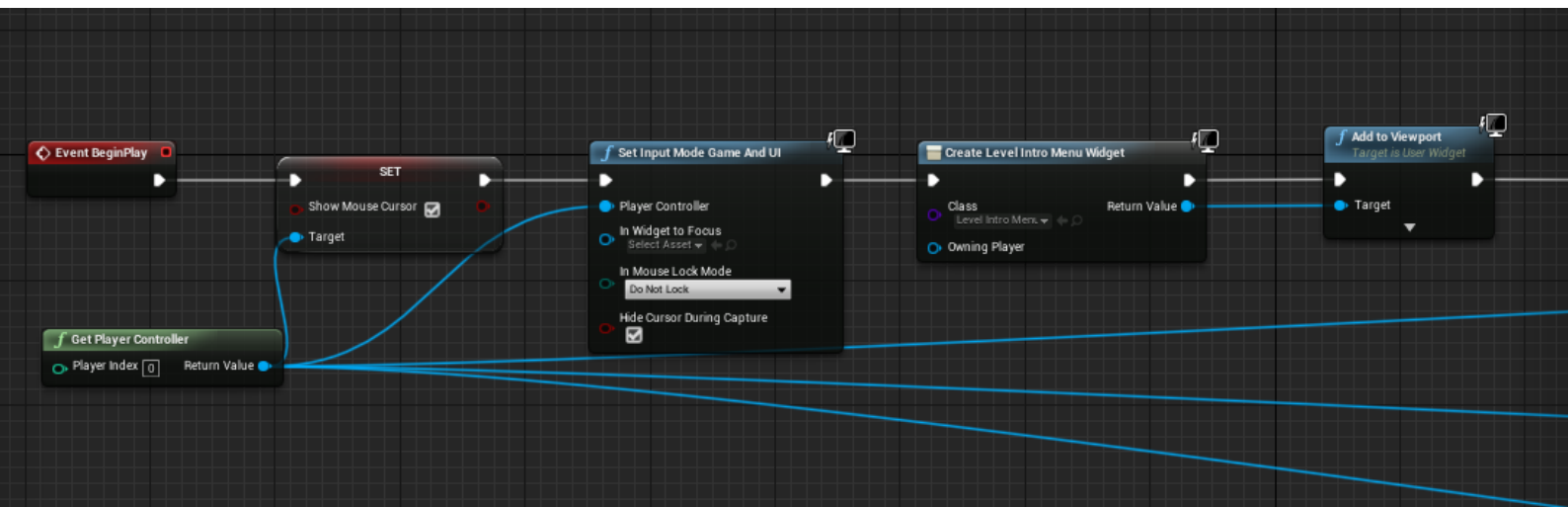
I'll be using a tutorial to freshen up on how the menu will work.

<https://www.youtube.com/watch?v=ulUO4EN8BG8> (Viper, 2019)



'Figure M1: Menu widget placeholder '

I have created the basic widget menu, which will be a placeholder for now. Just so I can test it working.



'Figure M2: Creating the level widget and adding to viewport'

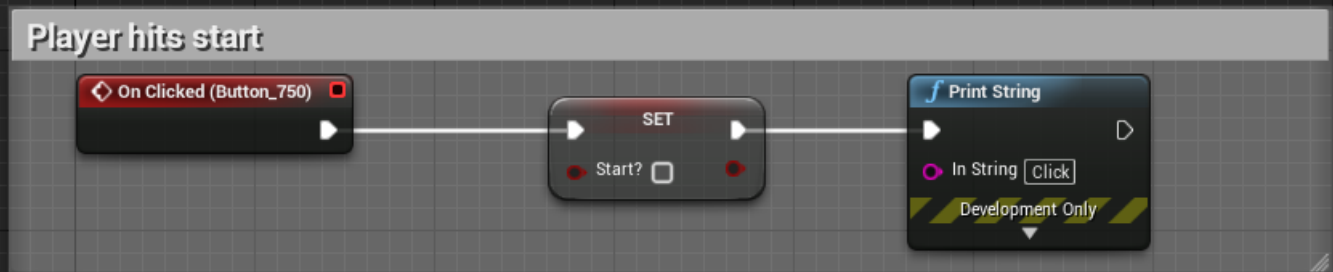
With the code at the start of the level blueprint, then going to the loop it should appear with the looping video behind it. (See figure m2)

17.03.2019

Level Intro - Transition (Problem but Progress)

Now that the level intro does what I want it to do, I now need to make the “start” button work.

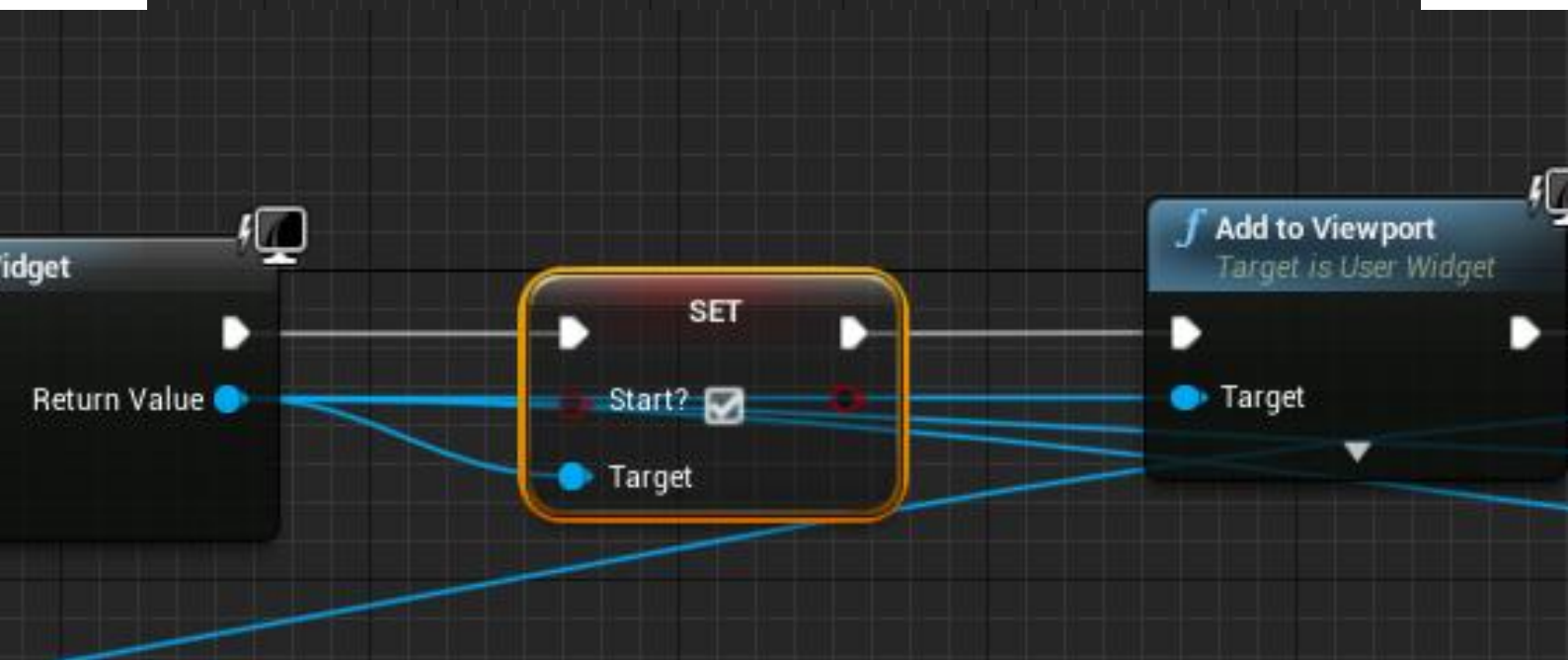
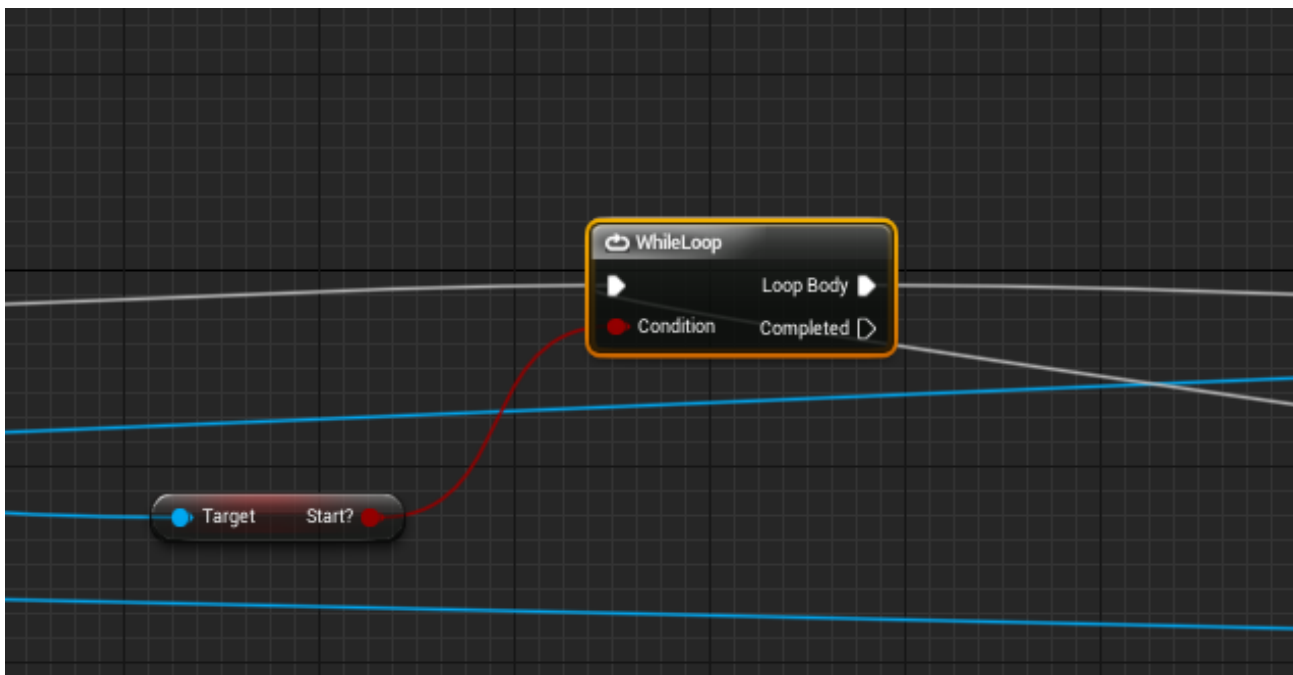
I started by adding in a Boolean called “Start?” on the start button. (See figure N1)



‘Figure N1: The on clicked event for the start button if clicked it will turn the “start?” variable false’

Task Manager					
File Options View					
Processes Performance App history Start-up Users Details Services					
Name	Status	29% CPU	96% Memory	51% Disk	0% Network
Apps (5)					
> Discord (32 bit) (6)		0.2%	90.5 MB	0 MB/s	0 Mbps
> Google Chrome (13)		0.3%	525.8 MB	0.1 MB/s	0 Mbps
> Task Manager		0.7%	24.4 MB	0.1 MB/s	0 Mbps
> Unreal Engine	Not responding	18.9%	4,202.9 MB	0.1 MB/s	0 Mbps
> Windows Explorer		0%	24.4 MB	0 MB/s	0 Mbps
Background processes (111)					
> 64-bit Synaptics Pointing Enhanc...		0%	0.1 MB	0 MB/s	0 Mbps
AcroTray (32 bit)		0%	0.2 MB	0 MB/s	0 Mbps
Akamai NetSession Client (32 bit)		0.1%	2.5 MB	0 MB/s	0 Mbps
Akamai NetSession Client (32 bit)		0%	0.3 MB	0 MB/s	0 Mbps
> Antimalware Service Executable		0%	84.9 MB	0.2 MB/s	0 Mbps
Application Frame Host		0%	2.7 MB	0 MB/s	0 Mbps
^ Fewer details End task					

I then added in a “while” loop and hooked up the “start?” variable. (See figure N2/3)

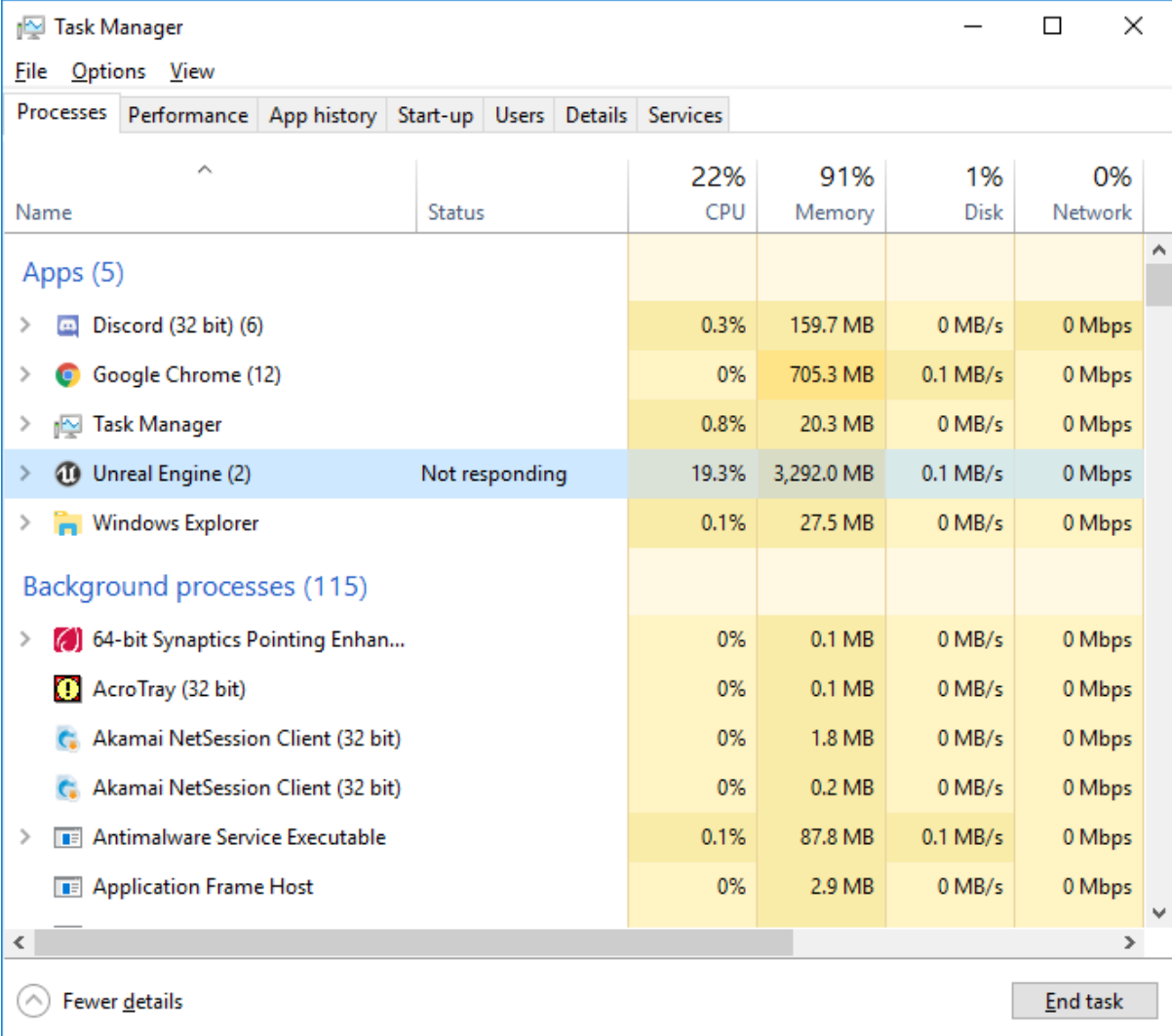


‘Figure N2/3: The true and false condition for the “while” loop.

If “start?” = true loop body

If “start?” = false complete loop.

The result froze the engine. I will need to change the code, so it does not crash next time. (See figure N4)



Task Manager		22% 91% 1% 0%			
File Options View					
Processes Performance App history Start-up Users Details Services					
Name	Status	CPU	Memory	Disk	Network
Apps (5)					
> Discord (32 bit) (6)		0.3%	159.7 MB	0 MB/s	0 Mbps
> Google Chrome (12)		0%	705.3 MB	0.1 MB/s	0 Mbps
> Task Manager		0.8%	20.3 MB	0 MB/s	0 Mbps
> Unreal Engine (2)	Not responding	19.3%	3,292.0 MB	0.1 MB/s	0 Mbps
> Windows Explorer		0.1%	27.5 MB	0 MB/s	0 Mbps
Background processes (115)					
> 64-bit Synaptics Pointing Enhanc...		0%	0.1 MB	0 MB/s	0 Mbps
AcroTray (32 bit)		0%	0.1 MB	0 MB/s	0 Mbps
Akamai NetSession Client (32 bit)		0%	1.8 MB	0 MB/s	0 Mbps
Akamai NetSession Client (32 bit)		0%	0.2 MB	0 MB/s	0 Mbps
> Antimalware Service Executable		0.1%	87.8 MB	0.1 MB/s	0 Mbps
Application Frame Host		0%	2.9 MB	0 MB/s	0 Mbps
Fewer details		End task			

‘Figure N4: Task manager showing the not responding unreal engine’

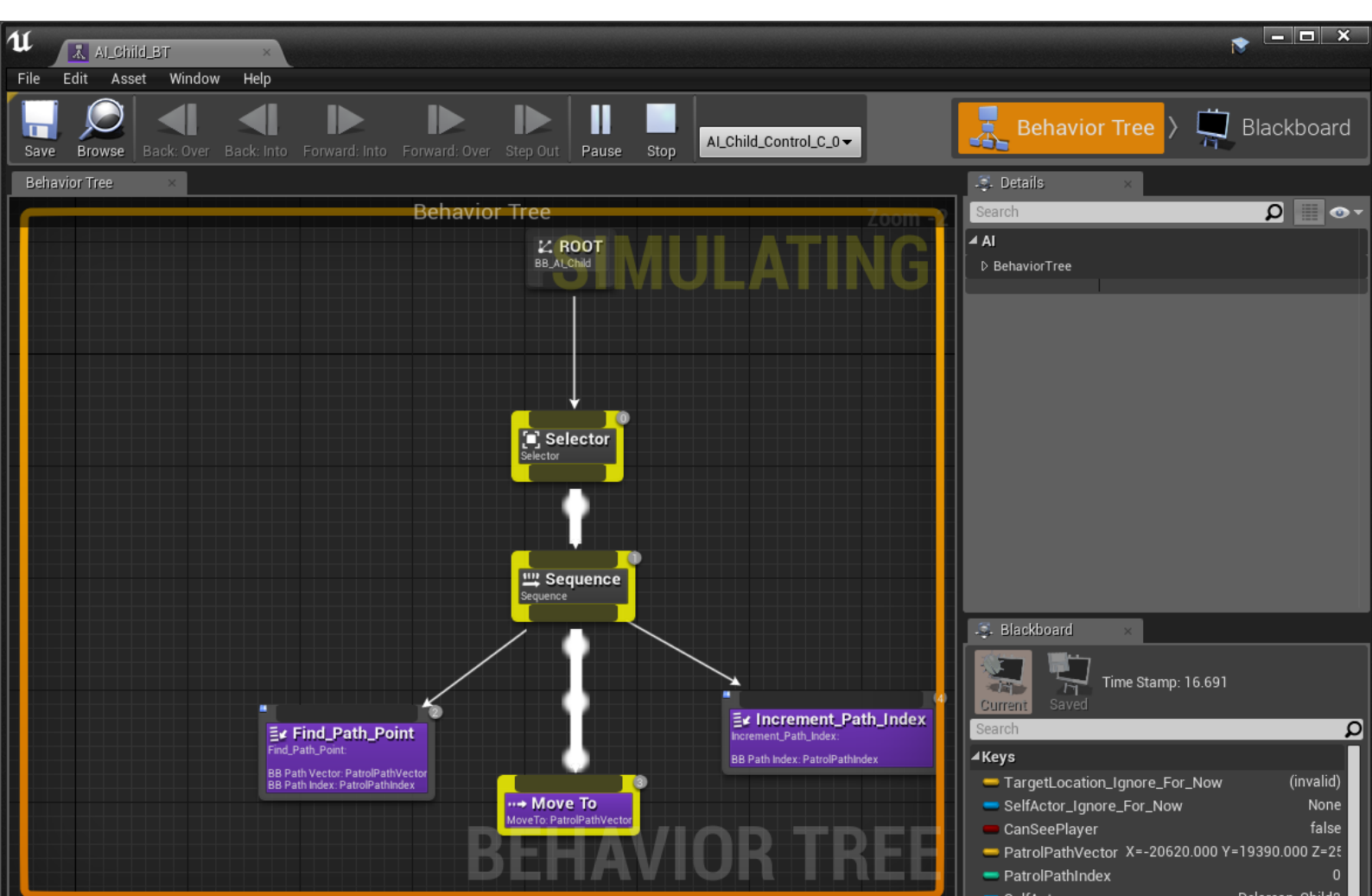
18.03.2019

AI Vehicle not moving (Issue)

Today I was working on AI, since my lecturer has had a look at the project.

After realising that the level that was being worked on was not the right level. We went through all the code step by step in order to figure out the issue as to why the vehicle was not moving.

The vehicle was taking the input from the patrol path, after simulating. (See figure O1)



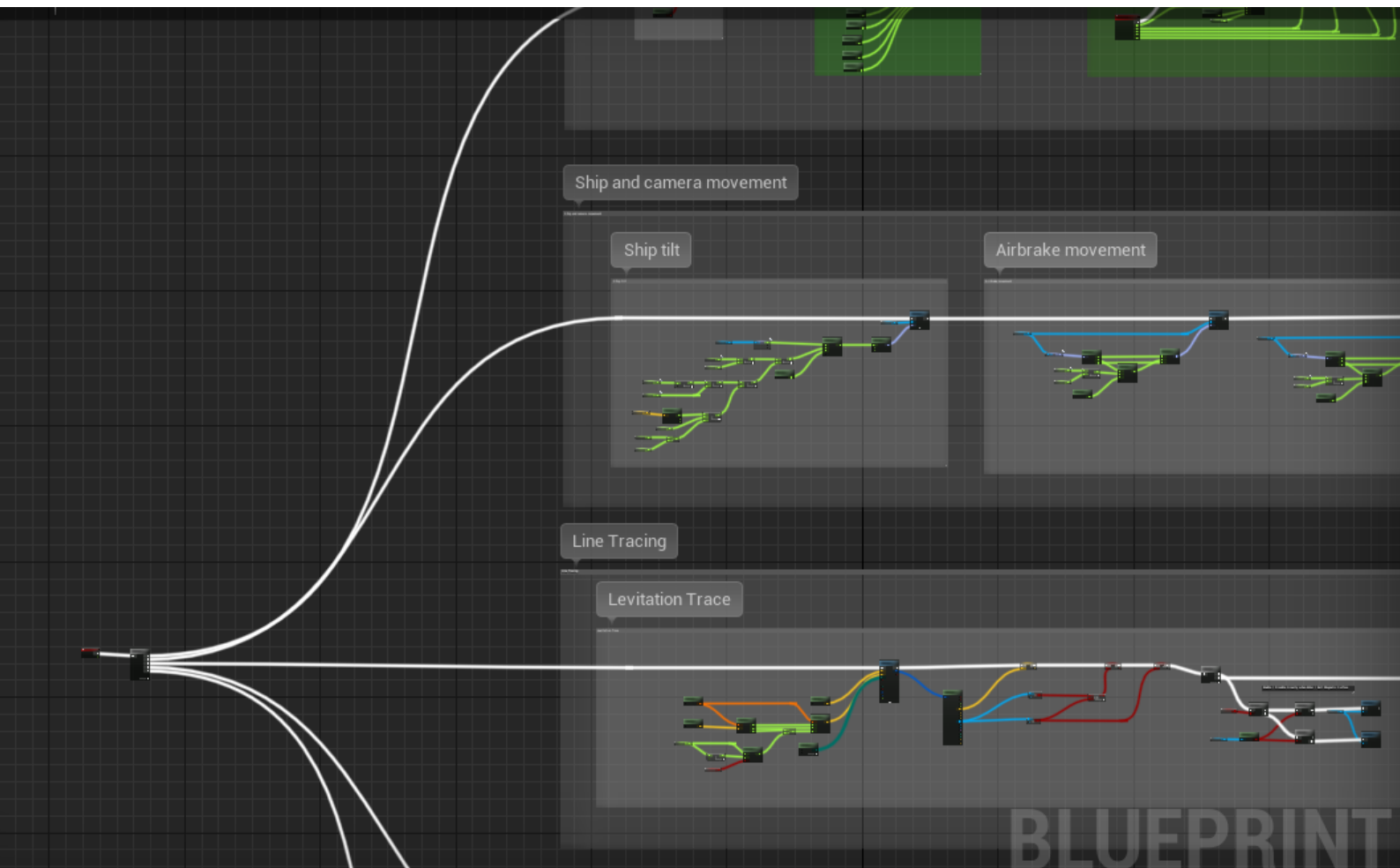
'Figure O1: Simulating the behaviour tree of the vehicle'

Using the tutorial, I followed, the code was identical and appeared to work. It was the vehicle itself that was the problem.

AI Vehicle Not Moving (Solution!)

After realising that the problem was the vehicle, we had a look at the character movement itself.

(See figure O2)

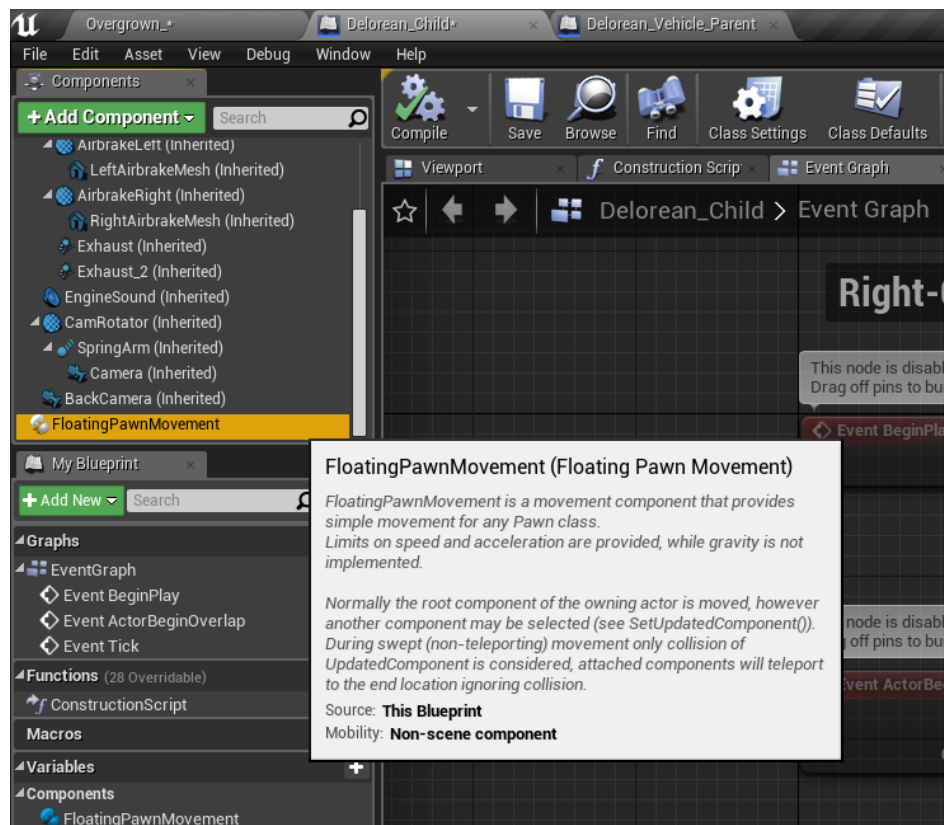


'Figure O2: Inside the AI vehicle blueprints event graph'

Since the movement is handled by a tick event inside the blueprint graph, the AI's blackboard has no idea where to find the movement.

Since the movement is handled inside the tick event, the solution is to add in a movement component to the vehicle (So the blackboard knows where to look to get a character's movement).

(See figure O3)

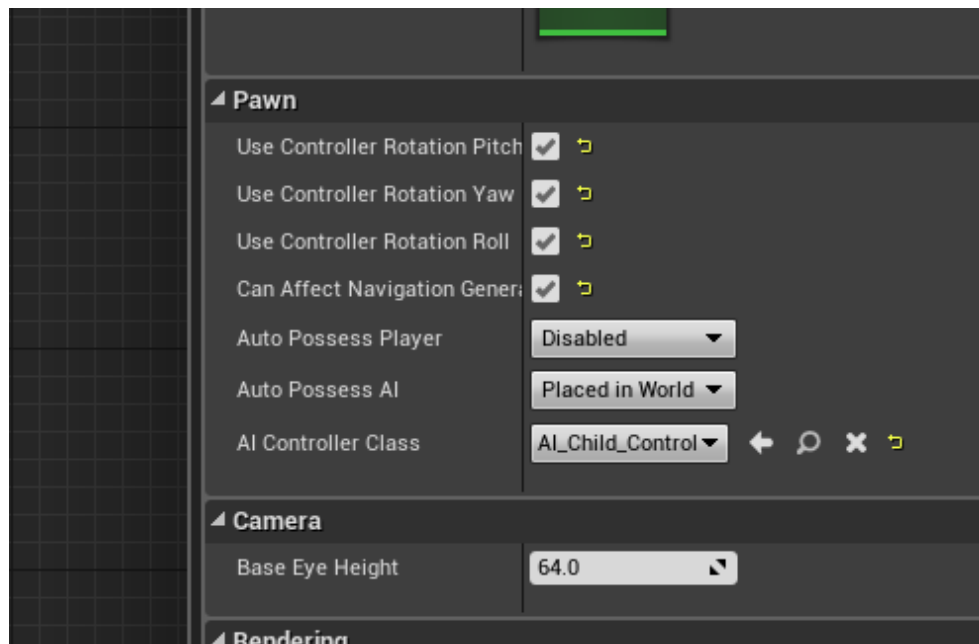


'Figure O3: Adding in a FloatingPawnMovement component to the vehicle'

Now that Unreal knows that the blueprint has a movement component, it can use the "MoveTo" command in the blackboard.

However, this raises the issue of making the vehicle replicate the exact movement of the hover vehicle inside the movement component.

I tested the vehicle movement and now it moves to the patrol path that I set. One issue is that the static mesh does not move left or right and stays in the same spot when it moves. (See figure O5)



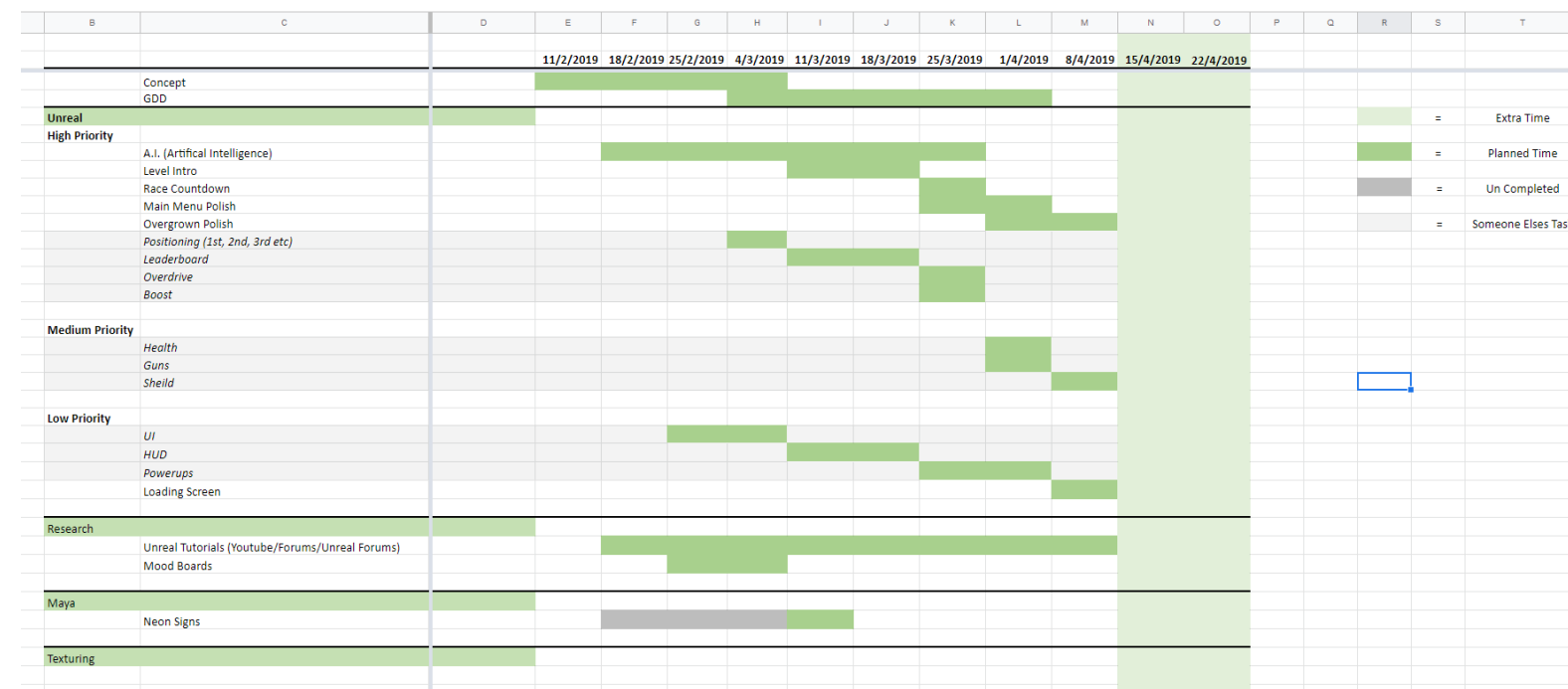
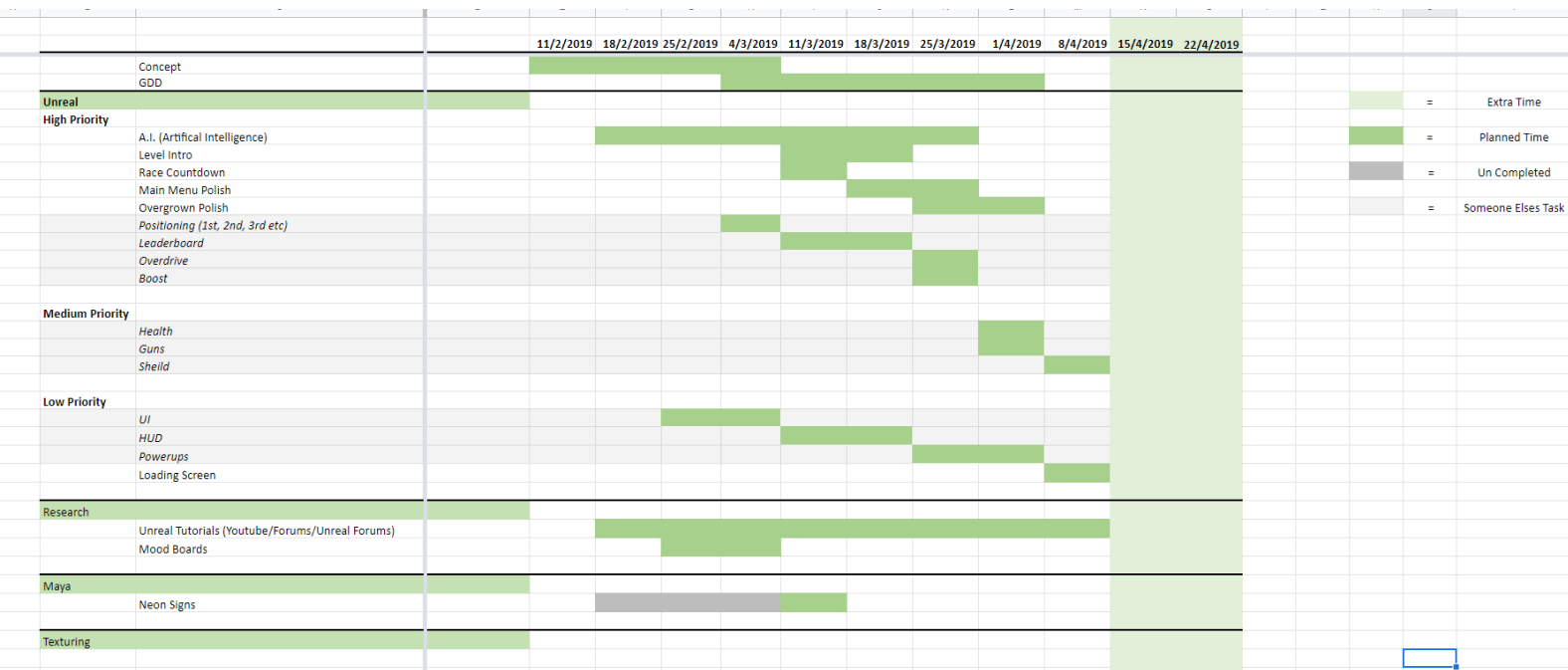
'Figure O5: Inside the AI vehicle details'

The solution was to use the controllers pitch, yaw and roll to make the mesh stay forward when moving.

19.03.2019

Gantt Chart 19.03.2019

These images are of the Gantt Chart plans and how the 11th (first image) and 19th (Second image) plans have differed due to the change of plans made this week.



20.03.2019

AI - Path Points (Issue)

After working on setting up a path for the AI to work from I realised that it is difficult and time consuming to place down each path point individually.

Since the path points are connected to a single object, I need to select the object and add in a new path to the array. This is too time consuming.

This proves to be quite time consuming and I wanted to have multiple paths in each level. What I have in mind for a solution is to convert each path point into actual objects. This way I can spline out a path in minutes.

I am not entirely sure on whether it is too late to remake the path point system, or whether to keep it how it is.

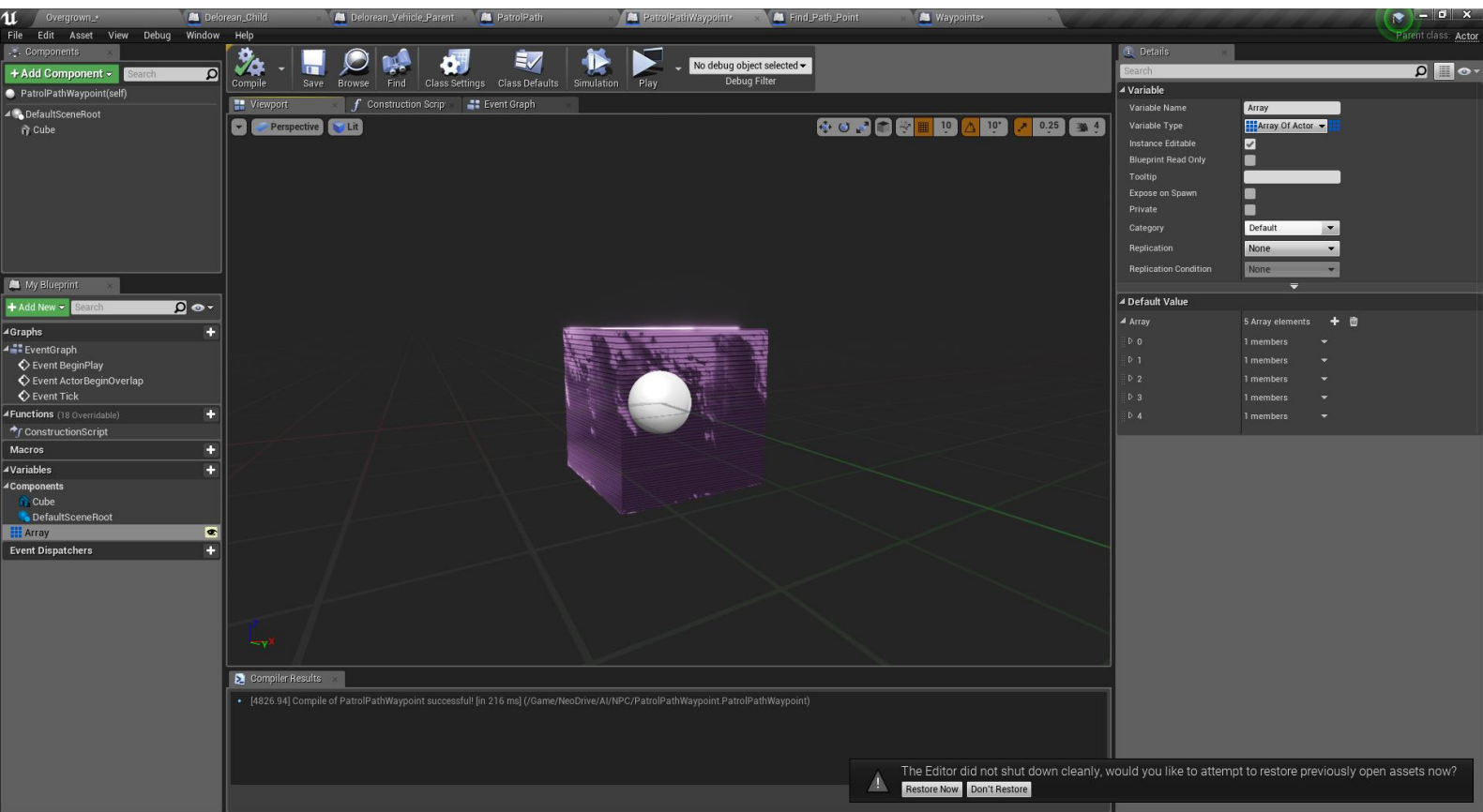
AI - Concerning “Smart” Artificial Intelligence (Issue)

Another issue that will come up is turning the AI smart. Since at the moment the AI will follow the path exactly the same way every single time. I feel that with the lack of Unreal Knowledge that I have, that AI will not feel good to play with.

AI - Path Points (Attempt 1)

First, I am going to try and tackle the path point problem that I had mentioned earlier.

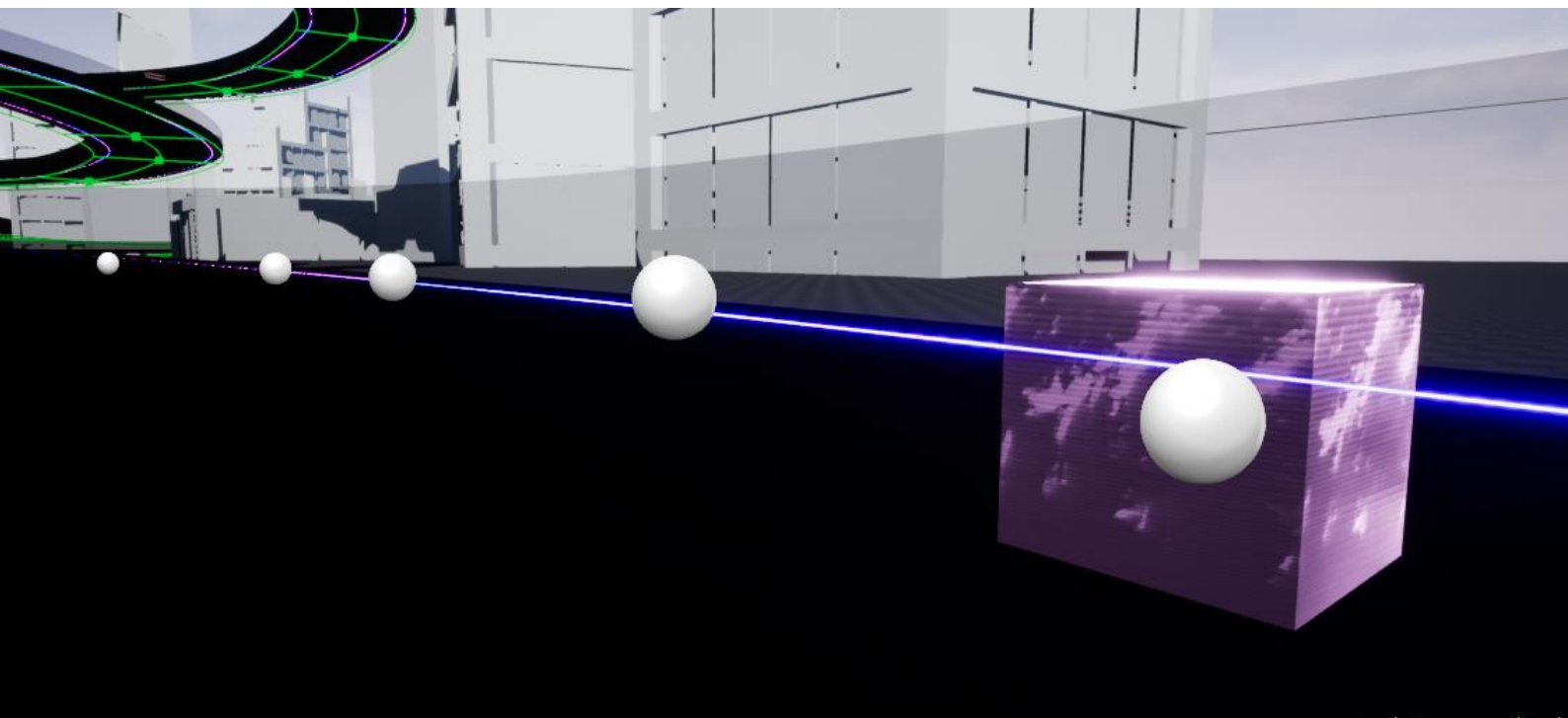
My end goal is to try and get a different way of setting up the path points and try turn them into actors that can be freely manipulate and controlled. Having an array of actors for each path that will be in the level.



'Figure P1: A created actor that has an array inside'

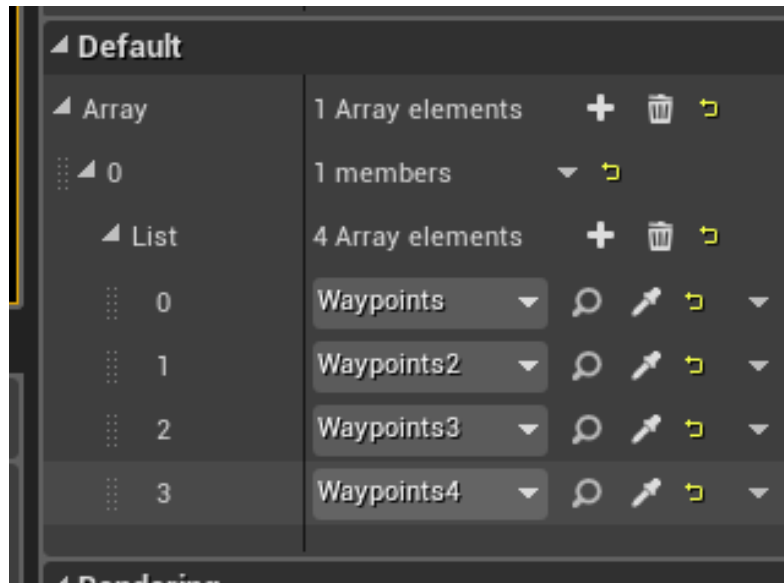
I started by adding in something similar to the patrol path I currently have. To have one actor hold each path, so I can differentiate between each path I set in the world. I then added in a variable called "Array" that is an "Array of Actors" variable. I am unfamiliar with how it works but I think it's what I need. (See Figure P1)

I also turned it into a cube and put a material on it so I can tell that it is the actor with the path attached to it.



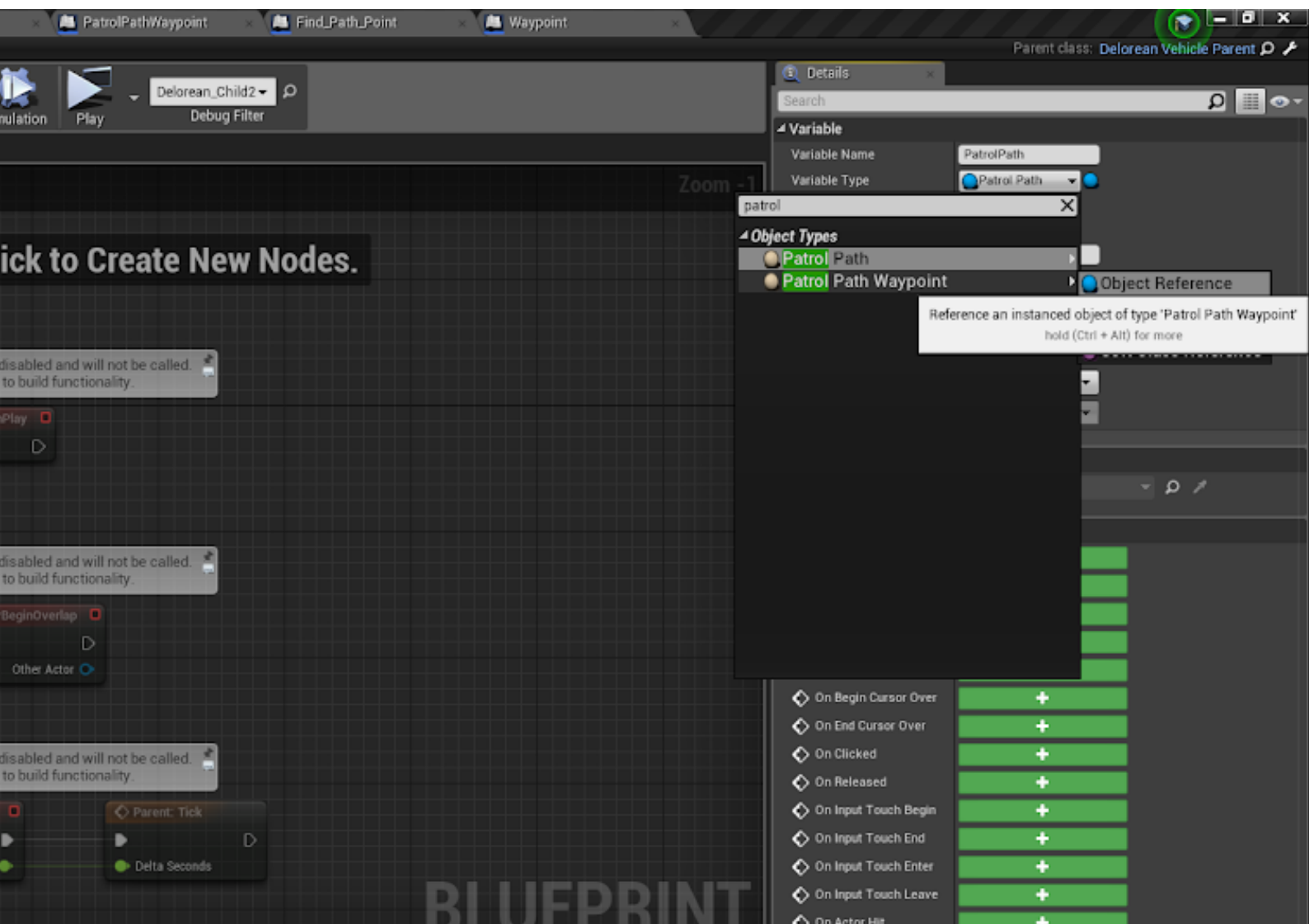
‘Figure P2: Inside the game world with the “PatrolPathWaypoint” and multiple set “Waypoints”’

I then created the “Waypoint” actor and placed a few in the game, adding the set waypoints in the “Array” variable I set earlier. (See Figure P2)



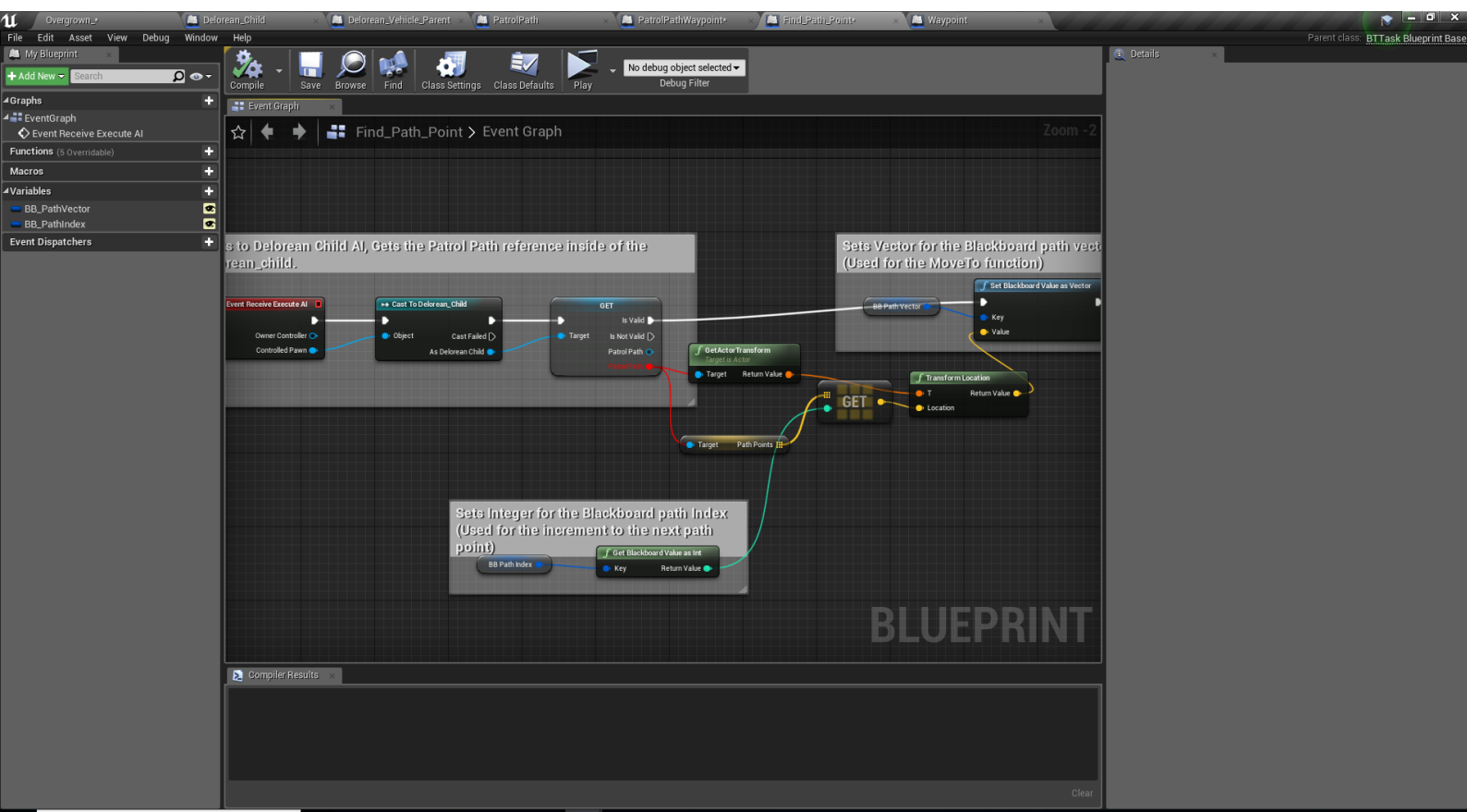
'Inside the created "PatrolPathWaypoint" with the set waypoints in the game.'

The next step is to now convert the "waypoint" actors' individual locations. I think I will try to reuse the code that was inside the original patrol path code. (See figure P3)



‘Figure P4: Inside the AI Vehicle Variables’

I started by changing the “patrol path” currently set to the newly created “Patrol Path Waypoint”.
(See Figure P4)



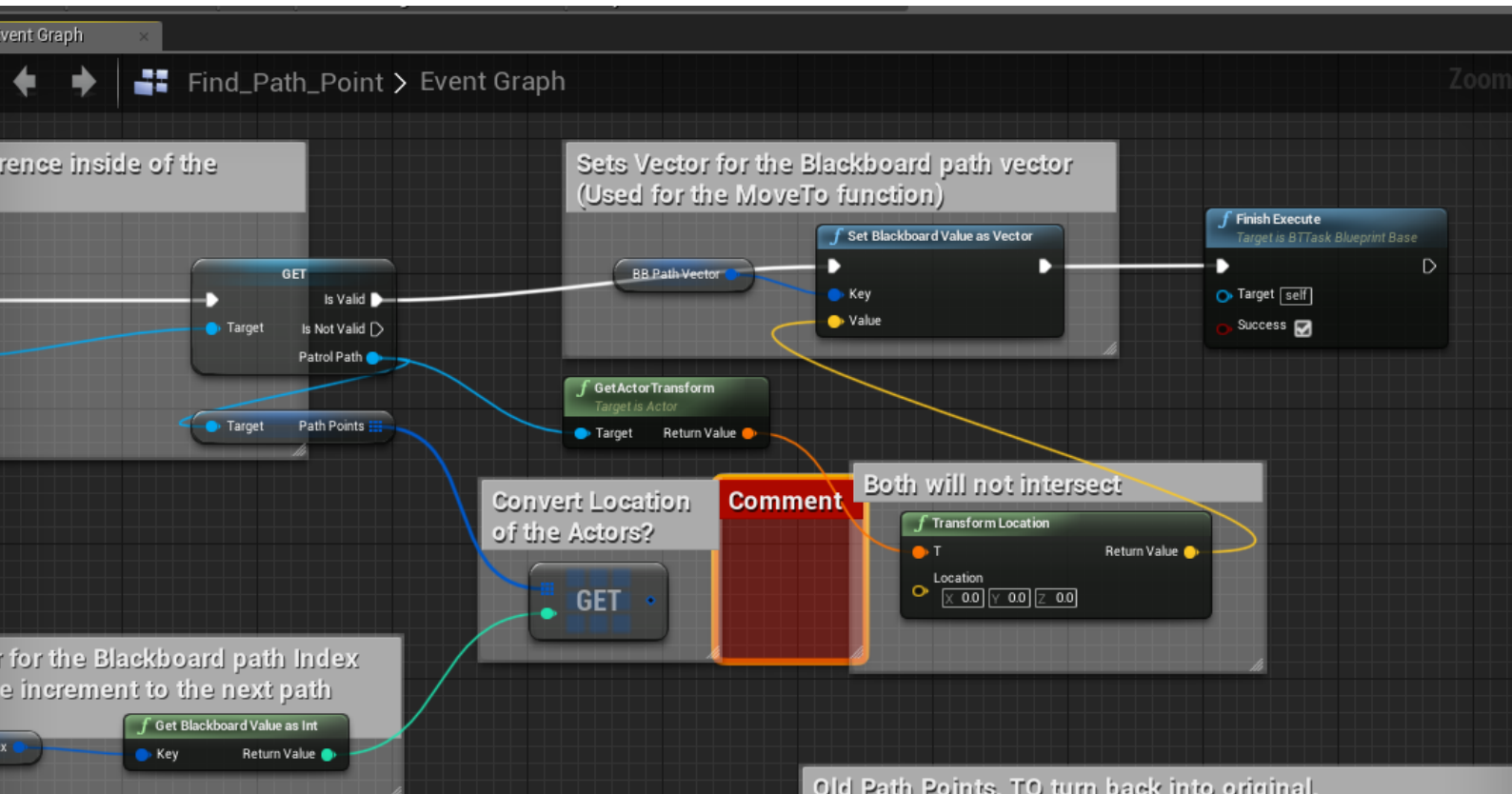
'Figure P5: Error inside the Blackboard Code'

I have realised that the code I have set does not get the vector location of the actors. (See Figure P5)

21.03.2019

AI - Path Points (Attempt 2)

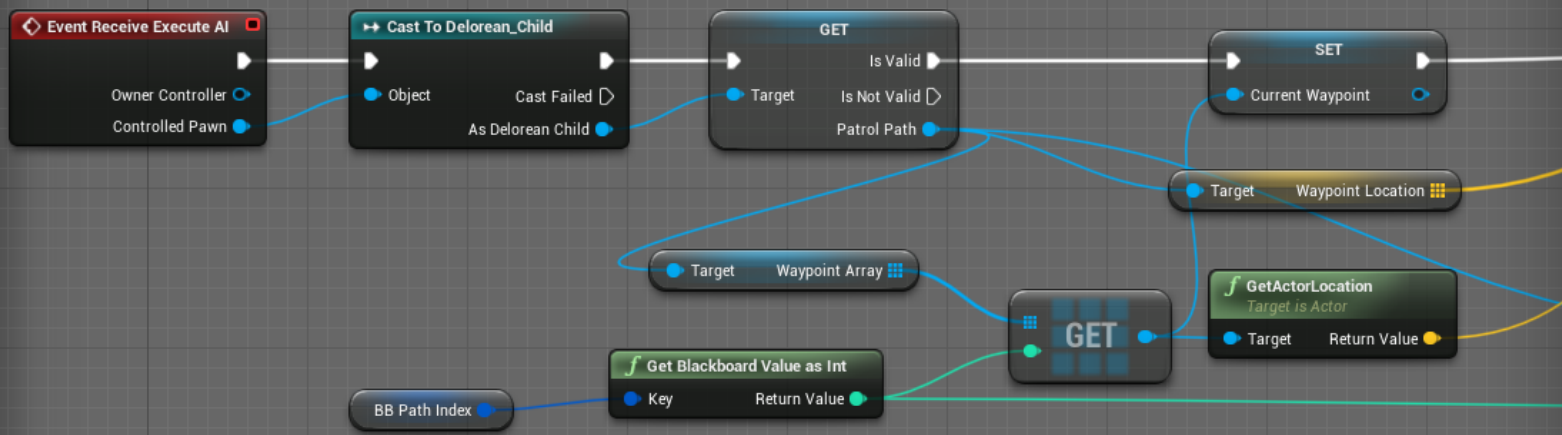
Today I will be continuing with the problem I had yesterday with the path point location.



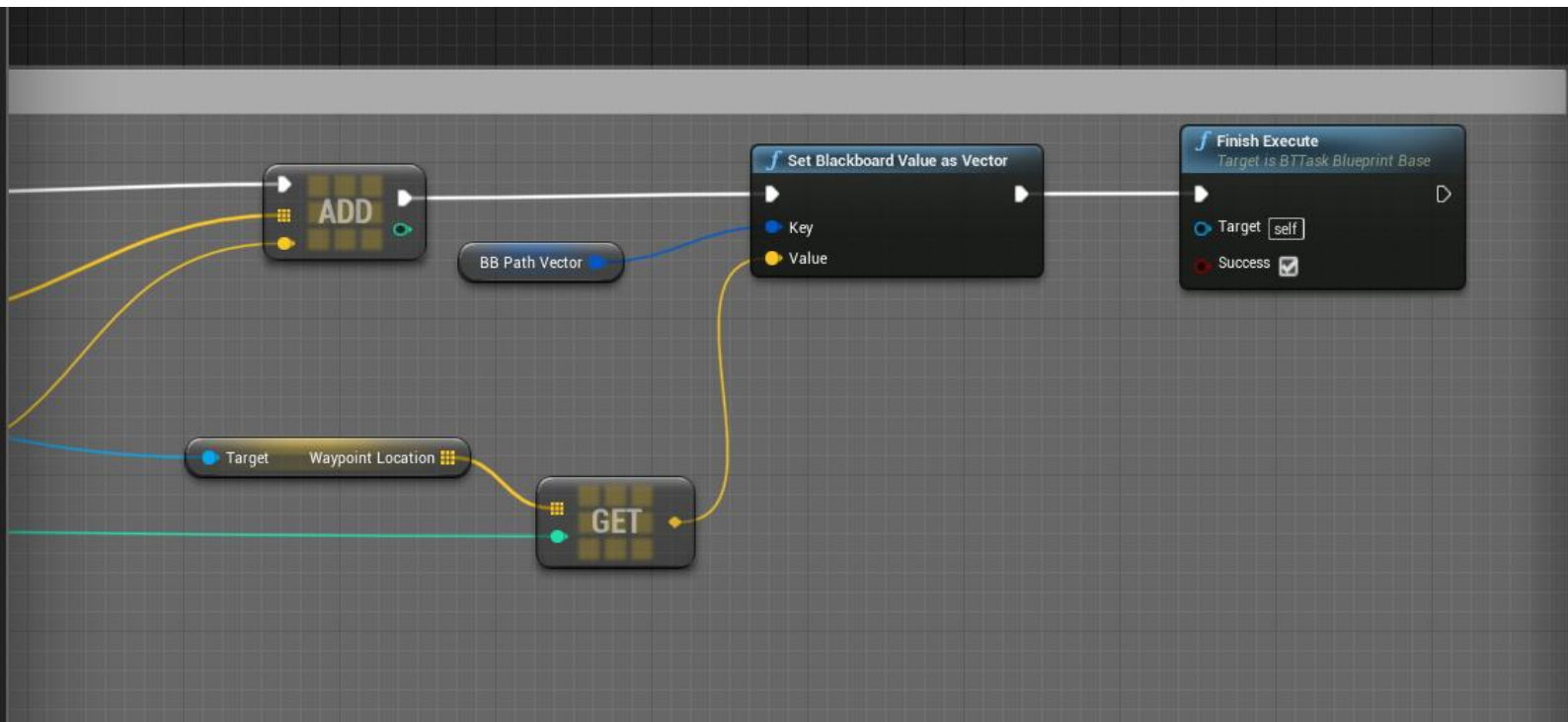
‘Figure Q1: Inside the “Find_Path_Points” task for the AI vehicle blackboard’

I have left a comment in red to remind me where I think the problem is. Since the “Get” node does not have any value I can use for the location, I will need to find a way to get it in another variable. (see Figure q1)

Task_2



'Find_Path_Point_2 - Part 1'



'Find_Path_Point_2 - Part 2'

This was my first attempt at making it work. I changed the variable “path_Points” to an actor array and renamed it “Waypoint_Array” to store each actor in it.

I then created a second variable called “Waypoint_Location” where I planned to store each actor in “Waypoint_Array’s” location. I would then set the blackboard variable “BB_Path_Vector” to hold the waypoint location.

This code did not work I now need to try another method.

Pseudo Code

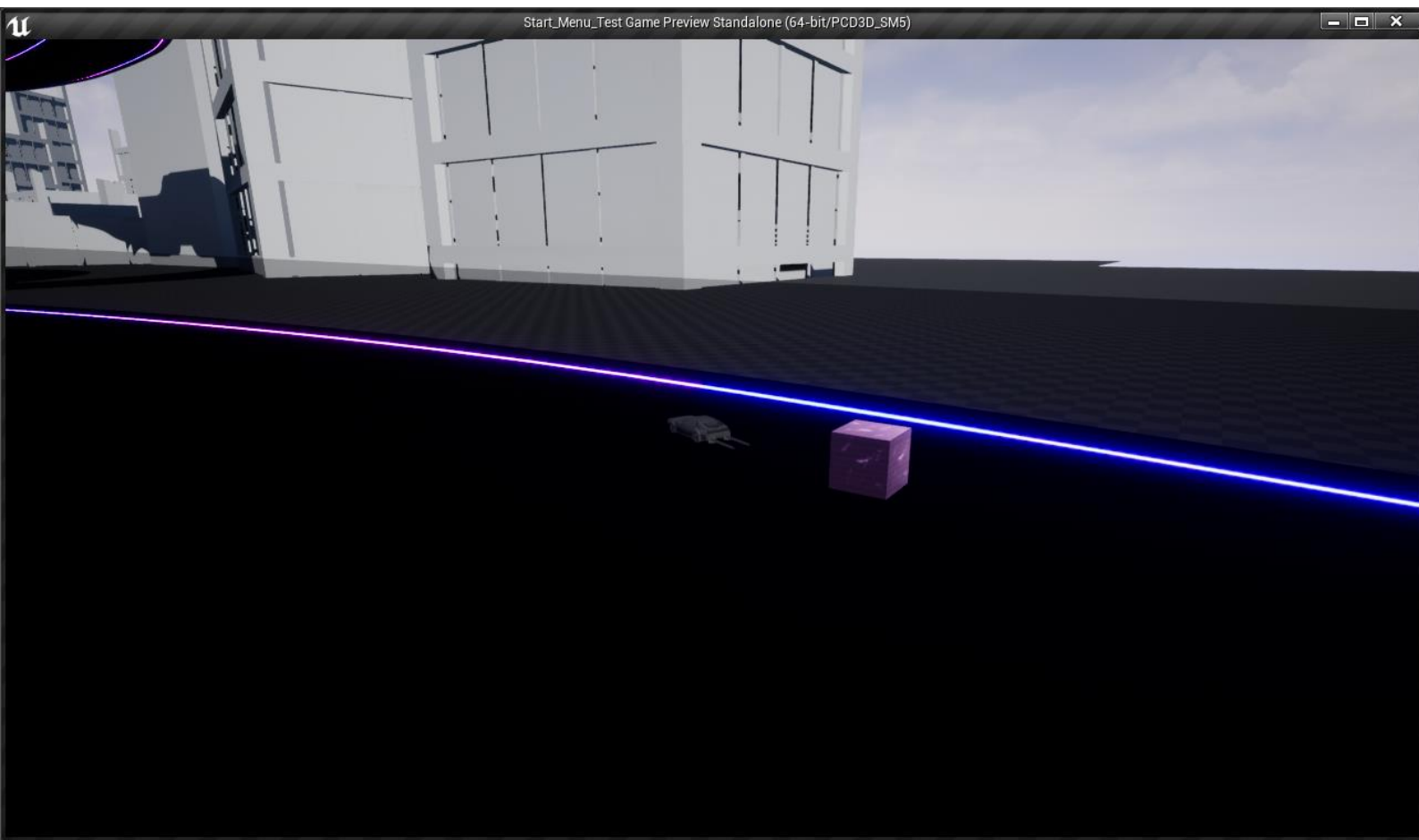
The logic behind this code is to get the patrol path waypoint variable inside of the AI vehicle. I then want the stored variables inside of “Patrol_Path_Waypoint” - “Waypoint_Array” and “Waypoint_Location”.

Both variables are arrays and I want the first one in the list, so I use the blackboard variable “BB_index” (Which by default is set to 0, the same location as the first waypoint)

I then “Get” the first actor inside of “Waypoint_Array” (Set up already in the engine) and “GetActorLocation”. After I have it, I want to add it to the “Waypoint_Location” variable.

I would then set the new blackboard variable “BB_Path_Vector” to the same location as the “Waypoint_Location”.

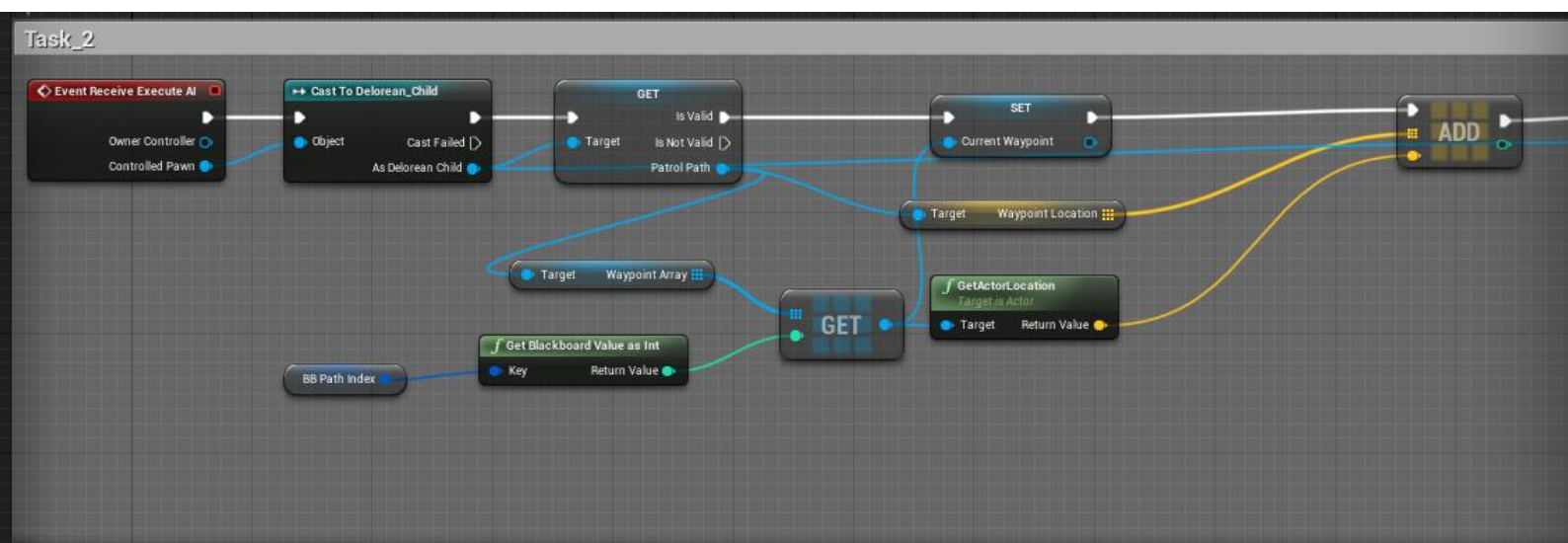
AI - Path Points (Attempt 2) Progress!



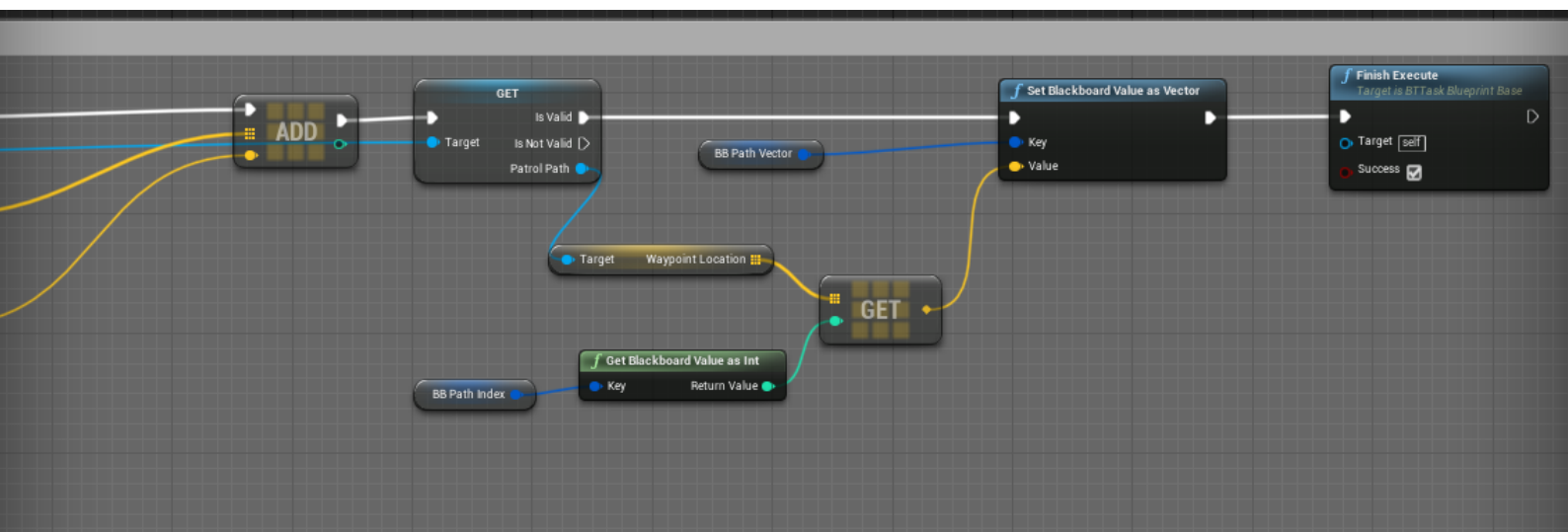
‘Figure Q2: The moved AI Vehicle’

I moved around some of the code and the vehicle actually moved to the first waypoint. (See figure Q2)

After simulating it I realised that the next problem is an issue with the current “increment_Path_Index” task in the blackboard.

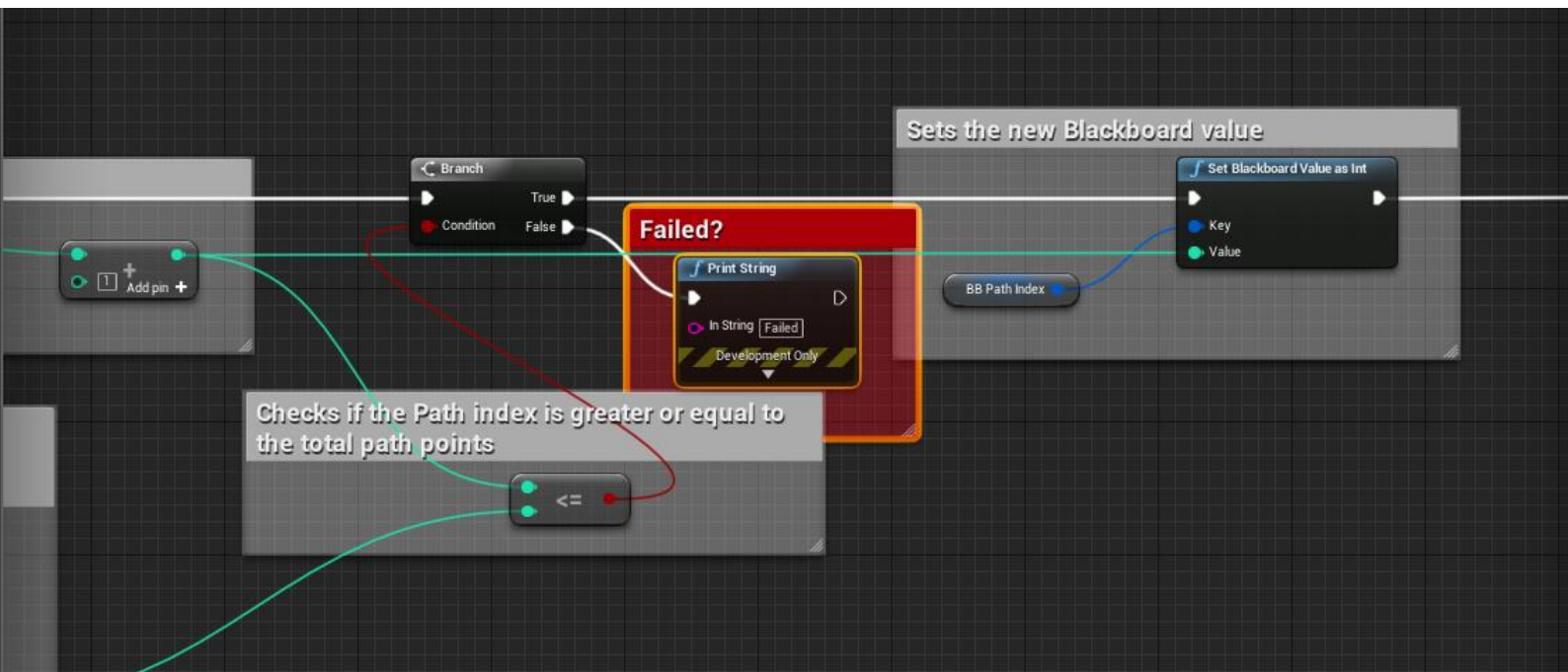


'Figure Q3: Find_Path_Point_3 - Part 1'



'Figure Q4: Find_Path_Point_3 - Part 2'

The problem was that it was too much coming off one node, so that I could not keep up and update the next node. So, the solution was to separate each task more properly. (See figure Q3/4)



‘Figure Q5: Inside the “Increment_Path_Index” task inside the AI Blackboard’

I added in a print string to see if this was where the problem was. (See Figure Q5)



'Figure Q6: The "failed" print string firing off'

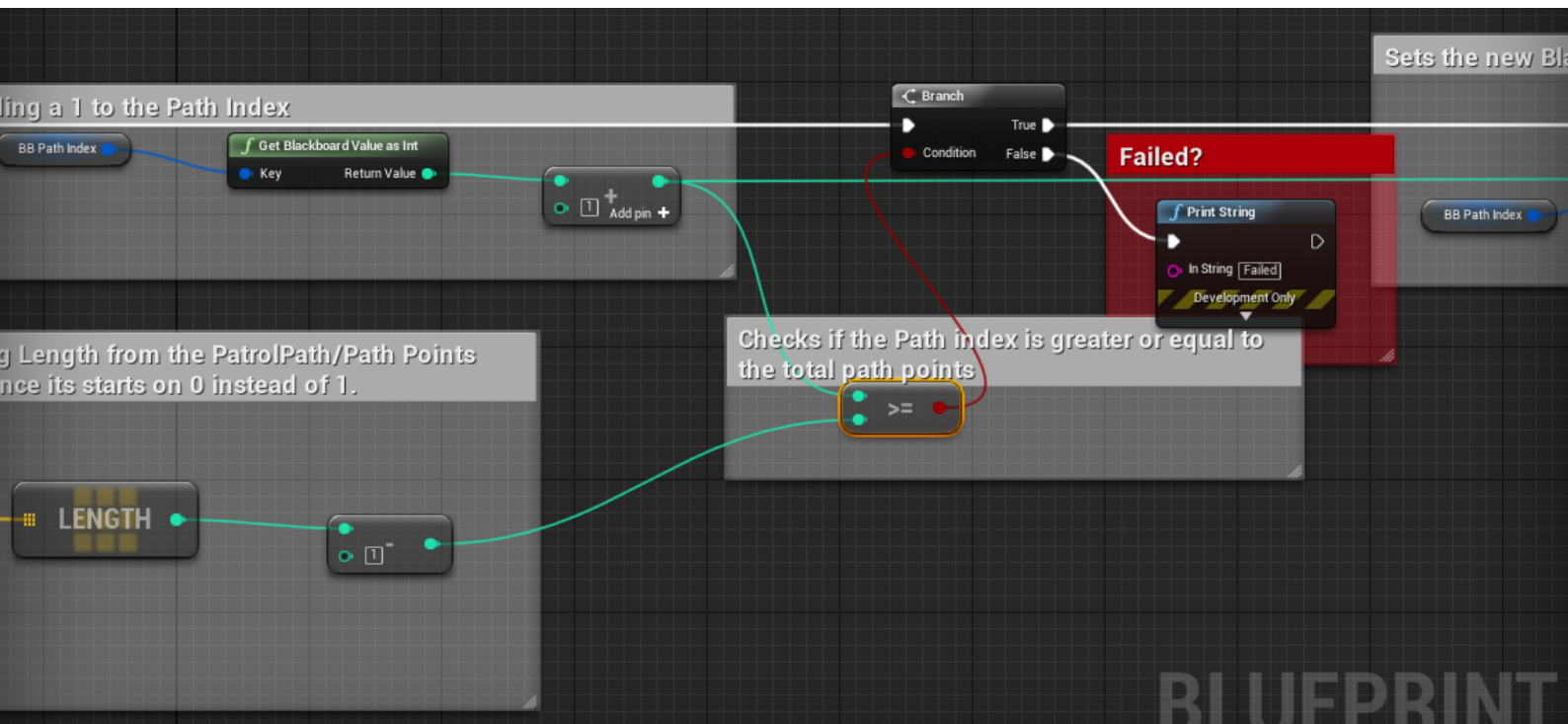
As expected, the print string has shot off to tell me that the logic behind the incrementing has failed.

Although it worked for the other waypoint system, it does not seem to work with my system. (See Figure Q6)

22.03.2019

AI - Path Points (Attempt 2) Progress!

Today I am working on my version of path points again.



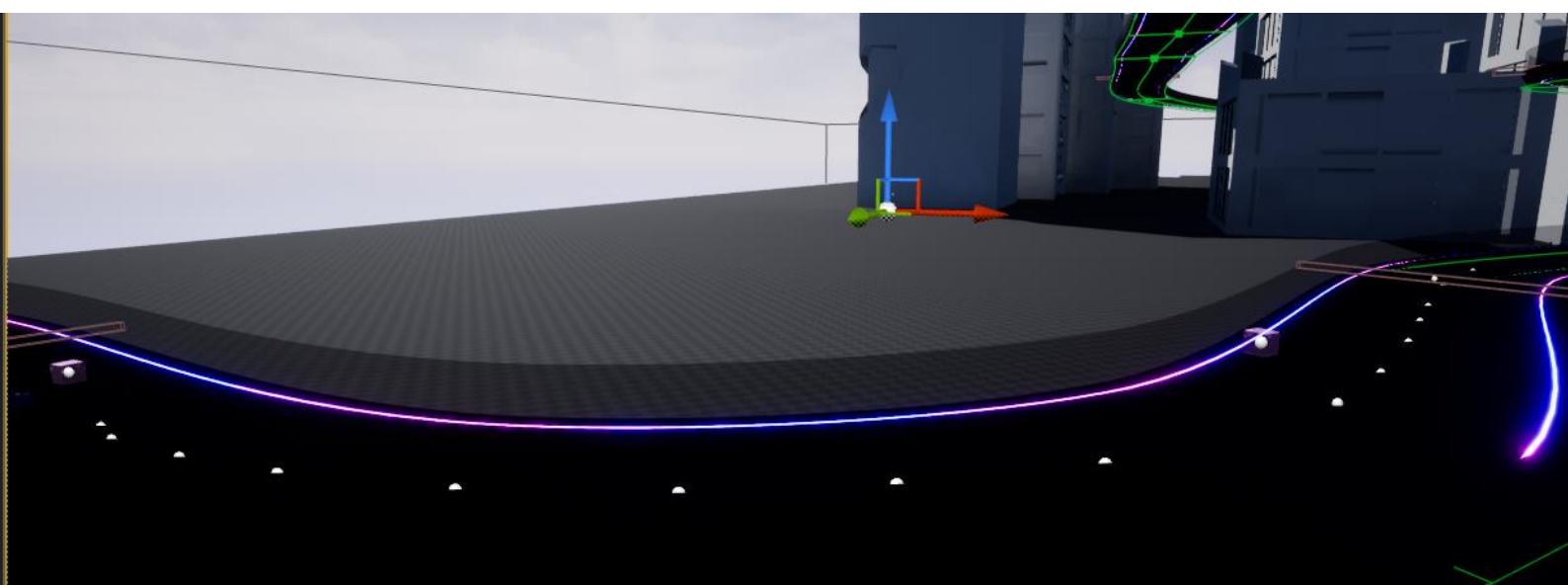
'Figure R1: Inside the Incremnet_Path_Index blackboard for the AI_Vehicle'

I changed the " $\leq$ " to a " $\geq$ " node and it fixed the increment task. (See Figure R1)

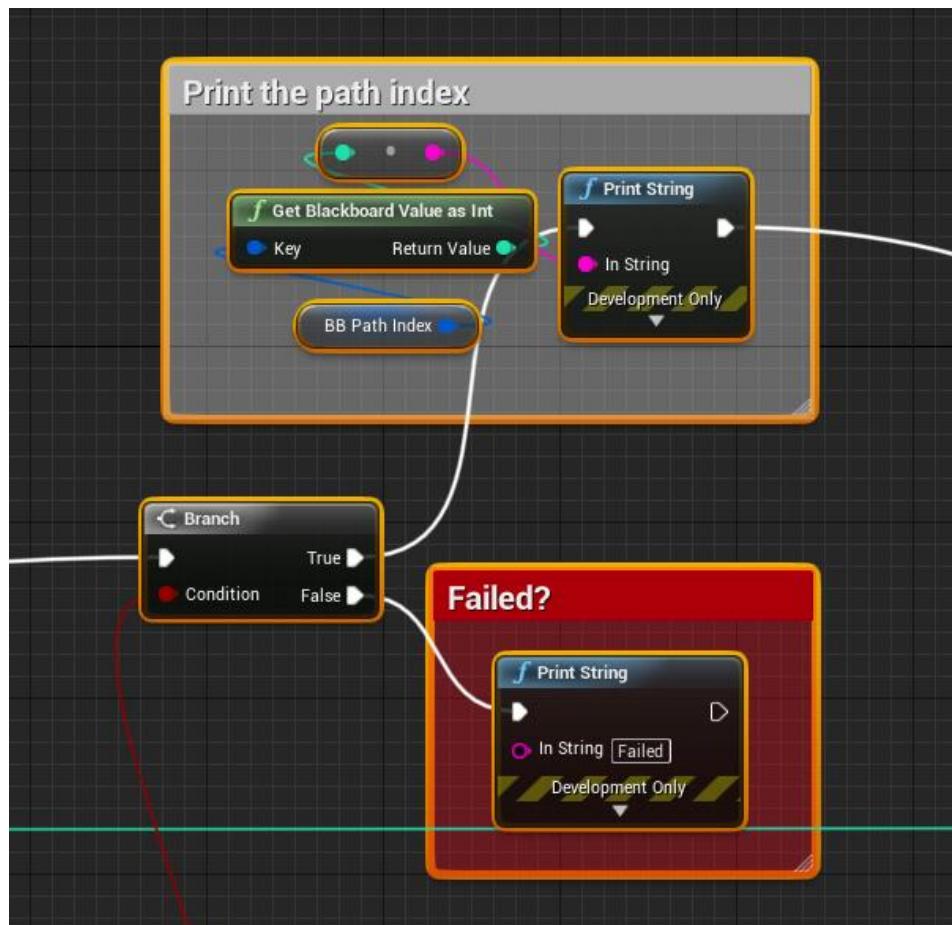
AI_Path Points Multiple Routes (Issue)

Now that I have the vehicle moving along the spline, I need a way for it to change between different paths.

To test this, I have added in another Patrol Path (Figure R2) I have also added in some code to see how the vehicle behaves after it gets to the end of the Patrol Path (Figure R3).

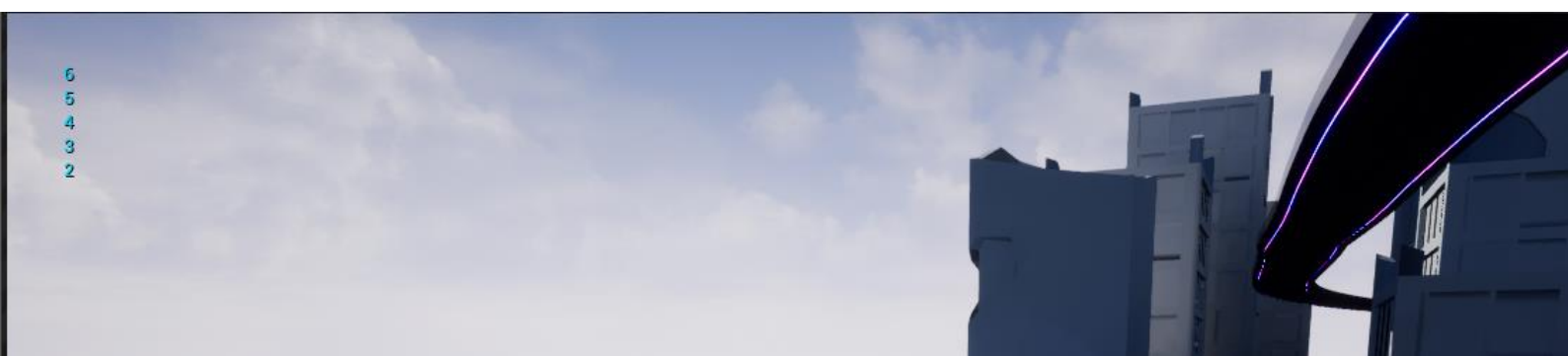


‘Figure R2: Example of the track with two paths’

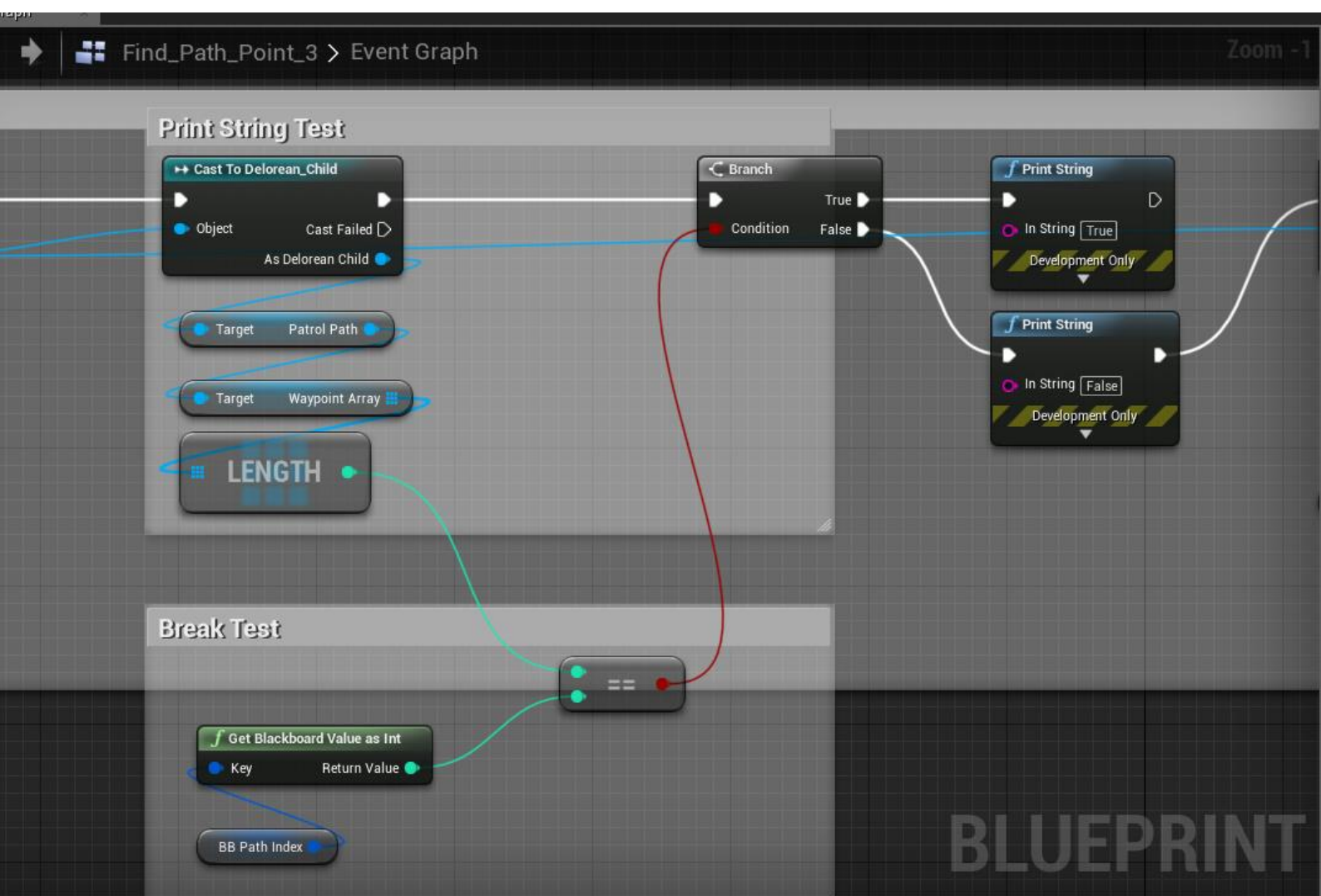


‘Figure R3: Inside the Incremnet_Path_Index task’

After testing my theory, it looks as if the vehicle stops and stays on the increment task. But the “Failed?” print string (in Figure R2) does not fire at the end of the run. (See Figure R4)

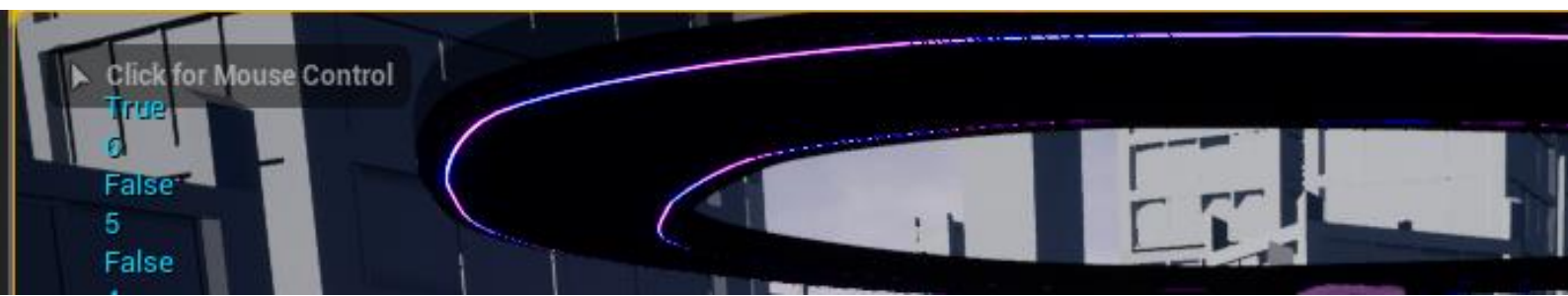


‘Figure R4: Print String in game’



‘Figure R5: A branch added in to stop the loop in the Blackboard’

I added in some logic code to stop the blackboard from running as soon as the end of the path index is equal to how many waypoints in the patrol path. (see figure R5)



‘Figure R6: The print string showing that the loop has ended.’

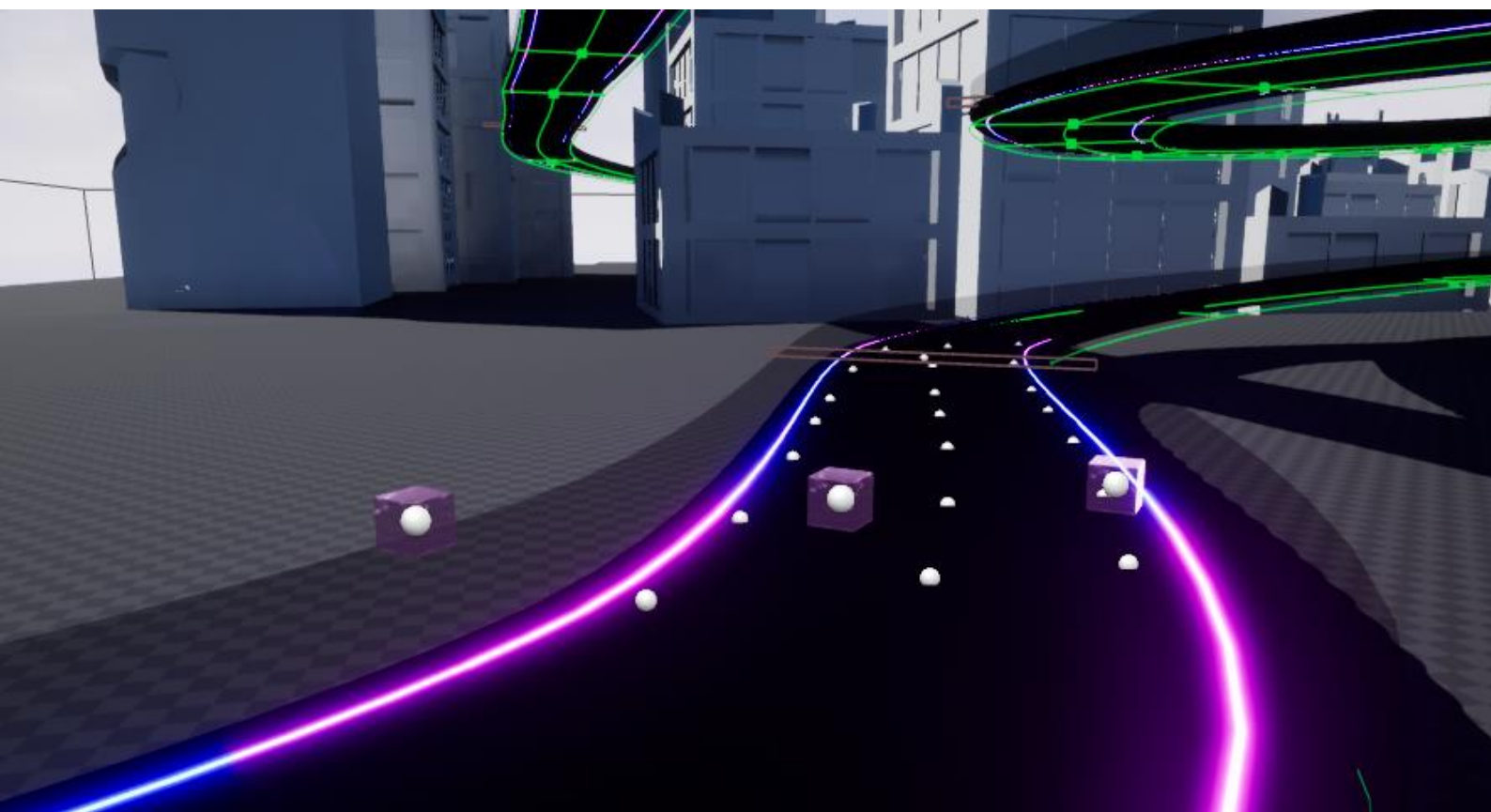
As tested the loop now ends when I want it too (See Figure R6). Here is where I will need to add in the code to find the next patrol Path.

AI_Path Points Multiple Routes (Attempt 1)

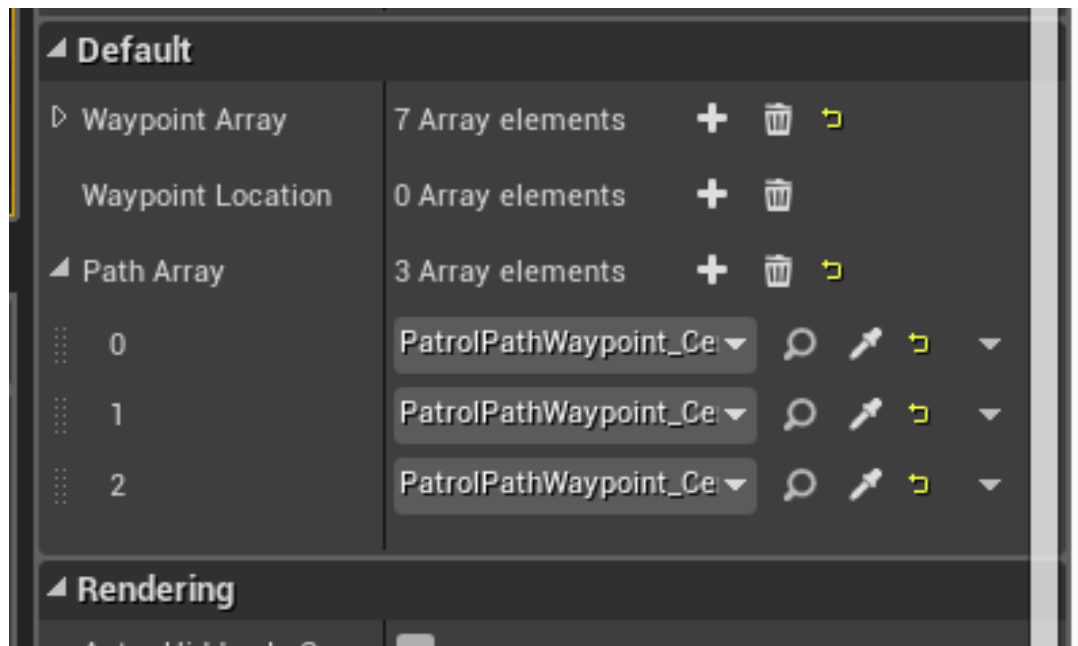
Now that I have a break for the code, I can work on having the AI choose another path.

I started by adding in a new array inside the patrol path called the “PathArray”. Inside of this will be the other paths that the AI can choose.

Ideally, I want three lanes of patrol paths to choose from once the vehicle has reached the end of the path. The vehicle should then choose randomly which one to follow.

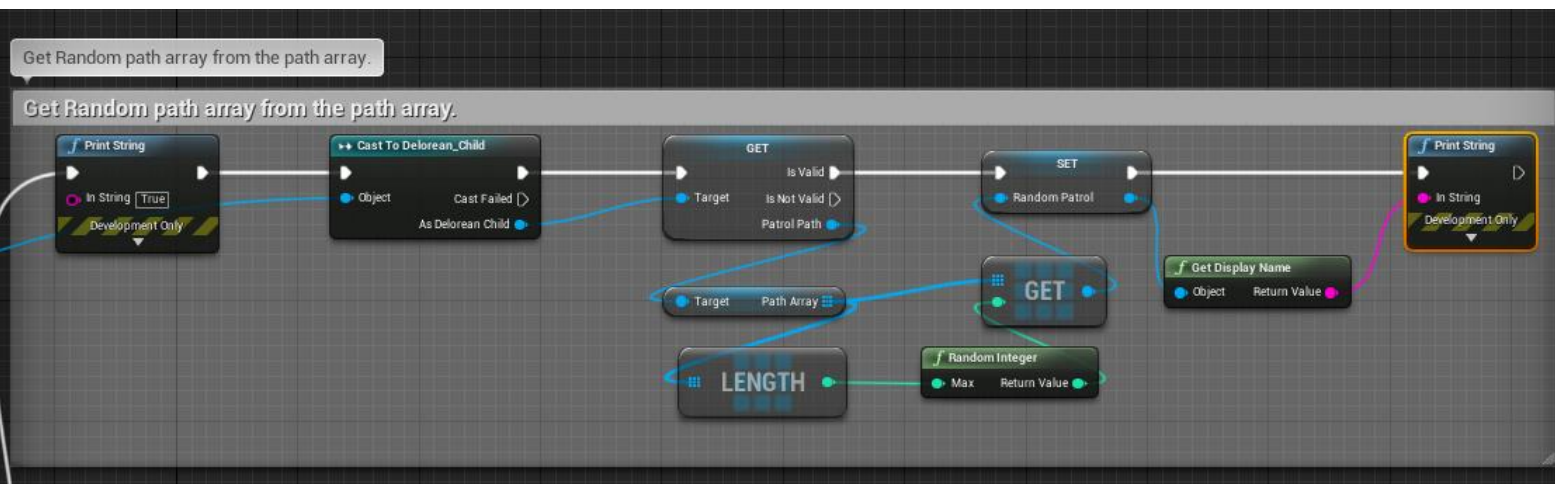


‘Figure R7: Three separate paths’



‘Figure R8: The added paths from FigureZ.6 in the first patrol path’

In figures R7 and R8 I have added three more paths and put them in the original patrol path.



‘Figure R9: Inside the true statement at the end of Find_Path_Point task’

I made some code to try and get the three random paths (See Figure R9) and return it with a print screen.



‘Figure R10: First attempt. Print string reading “PatrolPathWaypoint_Centre4”



‘Figure R11: Second attempt. Print string reading “PatrolPathWaypoint_Centre2”

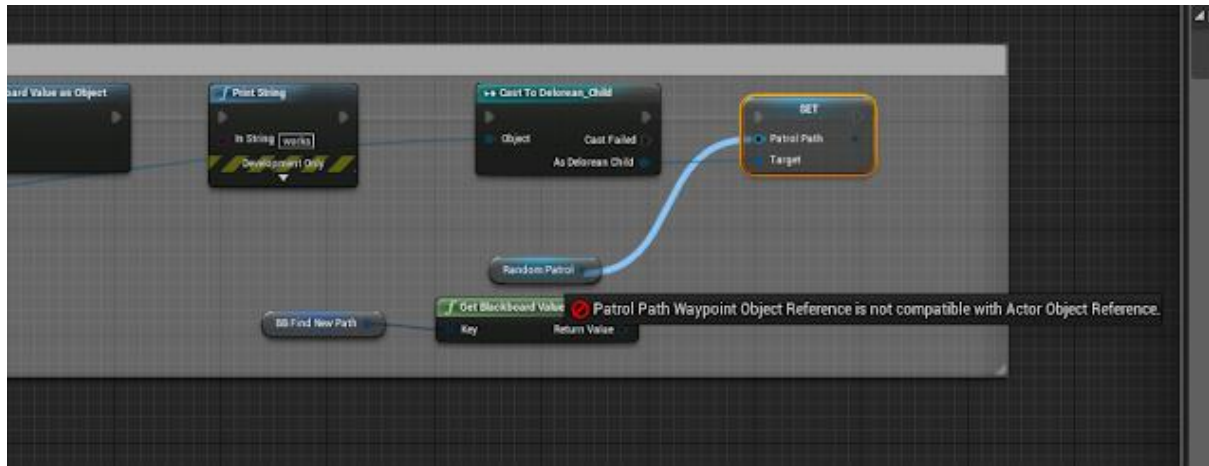


‘Figure R12: Third attempt. Print string reading “PatrolPathWaypoint_Centre3”

Figures R10/R11/R12 shows that the randomizer code I created worked.

My next step is to make the randomly generated path the new path for the vehicle to follow.

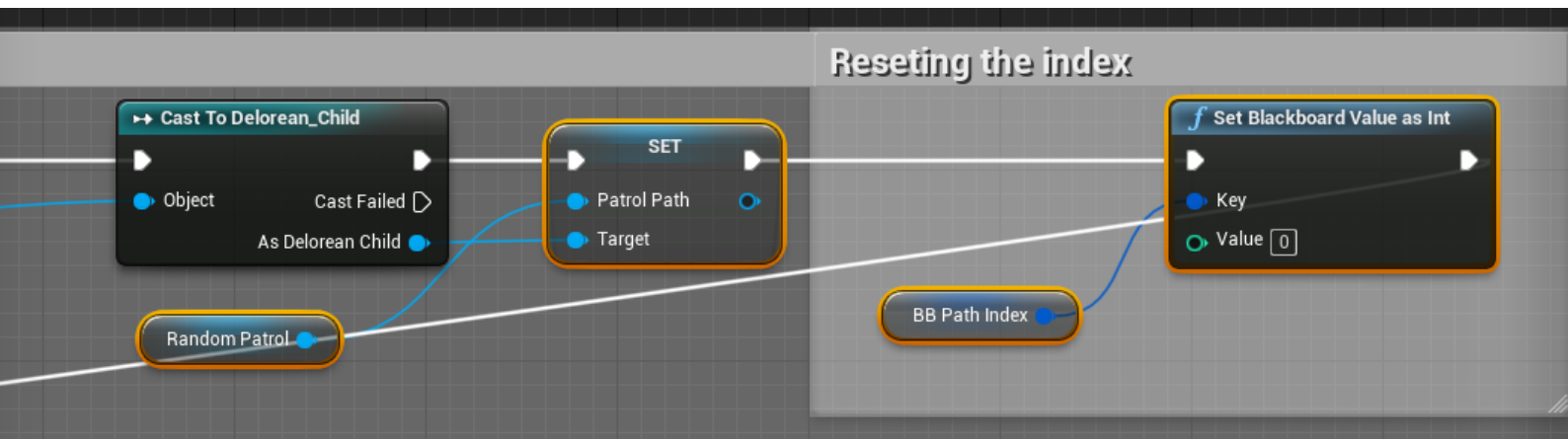
I have encountered an issue where the newly set “Random_Patrol” does not mix with the “Patrol_Path” variable and cannot be overwritten by it (See Figure R13).



‘Figure R13: The Random_Patrol Variable not responding to the Patrol Path Variable’

I have realised that the object type of the “Random_Path” variable is not a “Patrol_Path_Waypoint” type variable.

I also changed the “PathArray” inside the patrol path waypoint to the same variable. This way it can only store those types of objects. I have now got it working (See figure R14)



‘Figure R14: The newly set patrol path and index reset’

I also realised after testing that it would not continue from the first reset. I then realised that the index has not changed since the last patrol path so it cannot find the next waypoint.

Now to test the end result.

AI_Path Points Multiple Routes (Attempt 1) Progress!

It works. It chooses a random route to take once it gets to the end of the path and is easily set up to do multiple routes at a time.

Now I feel as if it can be implemented with multiple AI. Which I will cover another time.

24.03.2019

AI - Smart Path Points (Issue)

Now that I have a better waypoint system that works, I want it to work so that once you have set the Patrol Path on the waypoint in editor it will automatically add it to the waypoint array of the selected patrol path.

This way I should be able to spline out an entire track and quickly set it to a patrol path. I feel if I have this done, I can then work on the movement of the vehicle and set up multiple AI in the level. Then my AI should be complete enough to work for our game.

However, since we are getting closer to the deadline it will be a push to get it all working with a leader board working for Matt to work on. Since he has had to put out doing it until I have it complete.

25.03.2019

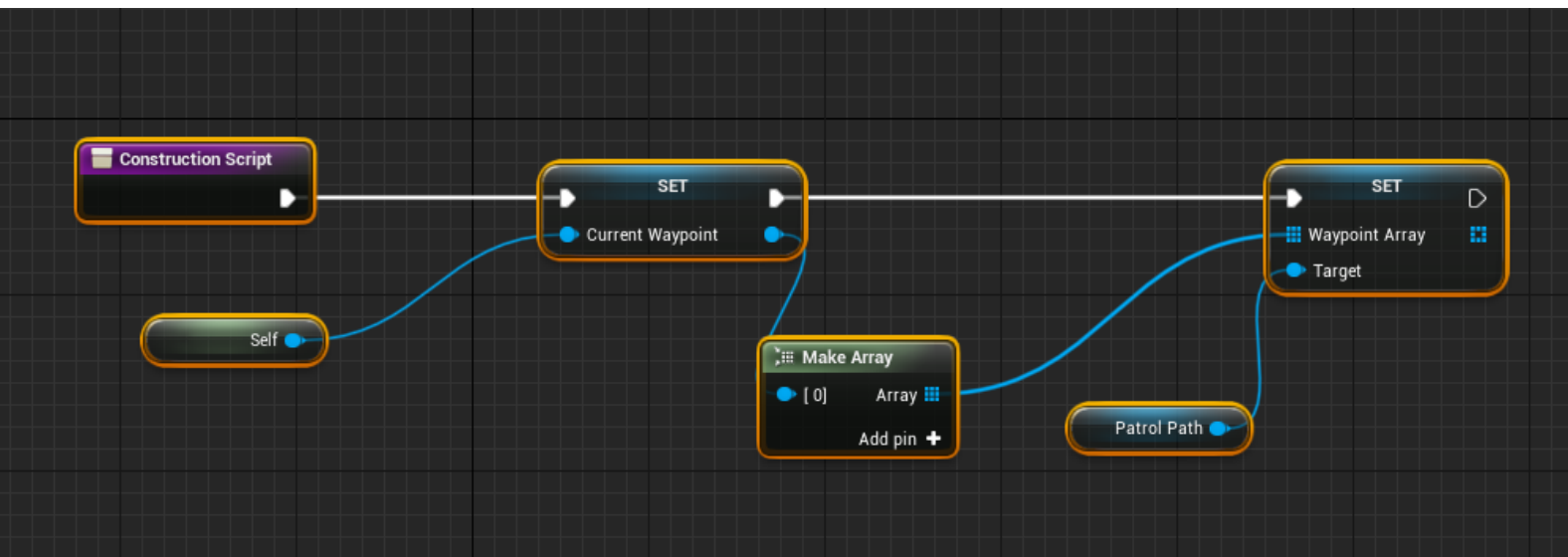
AI - Smart Path Points (Attempt 1)

Today I am going to start work on the smart path points.

I started by making a new patrol path and new waypoint. Duplicating the old waypoint to make sure I do not break the game.

I started with some trouble trying to find an event that works when the object is placed in the level.

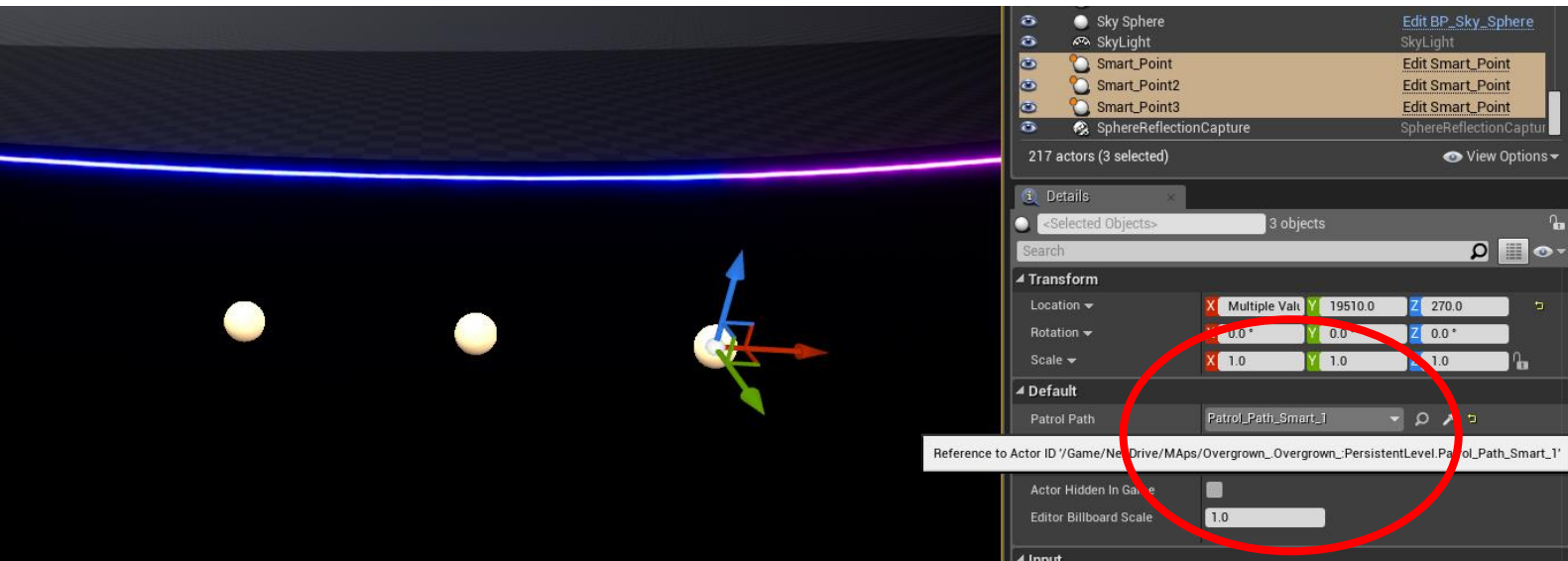
I then did some research and found that the “construction script” tab is where you can add code to newly placed and created blueprints. I made some simple logic code to put the waypoint in the array once it’s been spawned. (Seen in Figure S1)



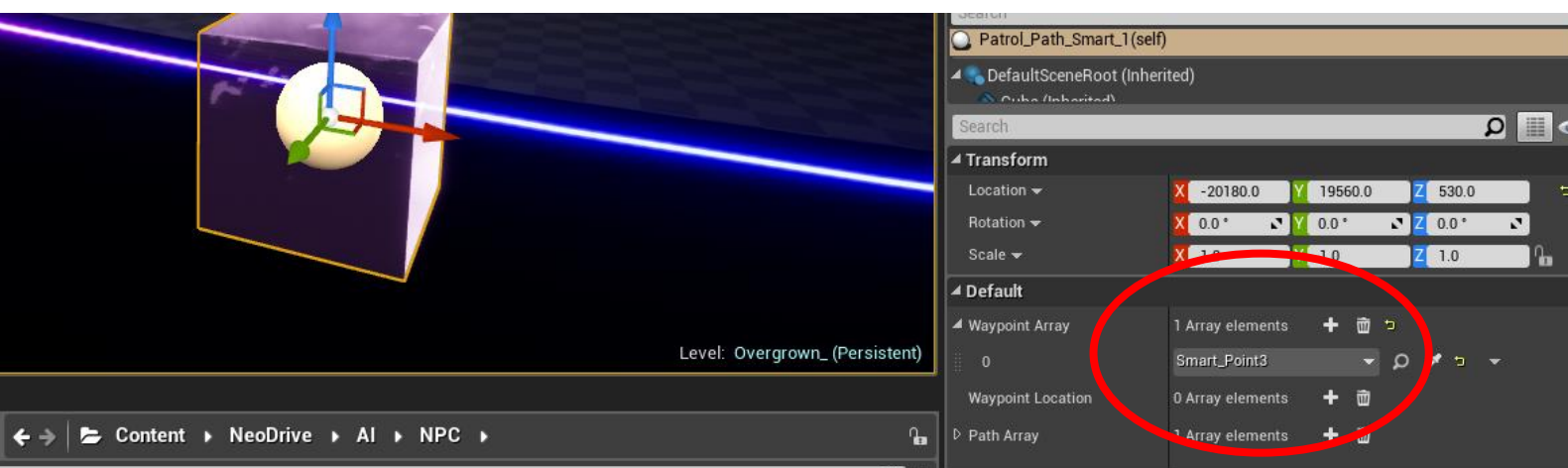
‘Figure S1: First attempt at the created construction script’

AI - Smart Path Points (Problem but Progress)

However, I have encountered a problem where the array in the patrol path only replaces the one waypoint with the last selected one. It does not add more to the array and only replaces the one waypoint. (See Figure S2/3)



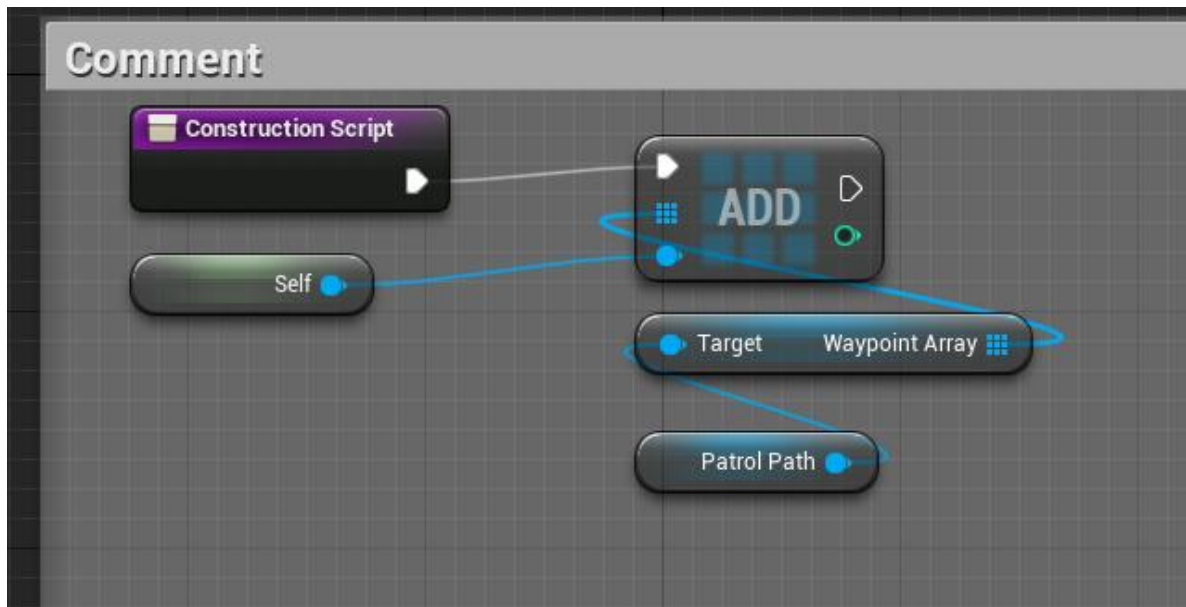
'Figure S2: Selecting the three path points and setting their patrol path (On the right)'



*'Figure S3: The patrol path with the **single** waypoint in the array (On the right)'*

AI - Smart Path Points (Attempt 2)

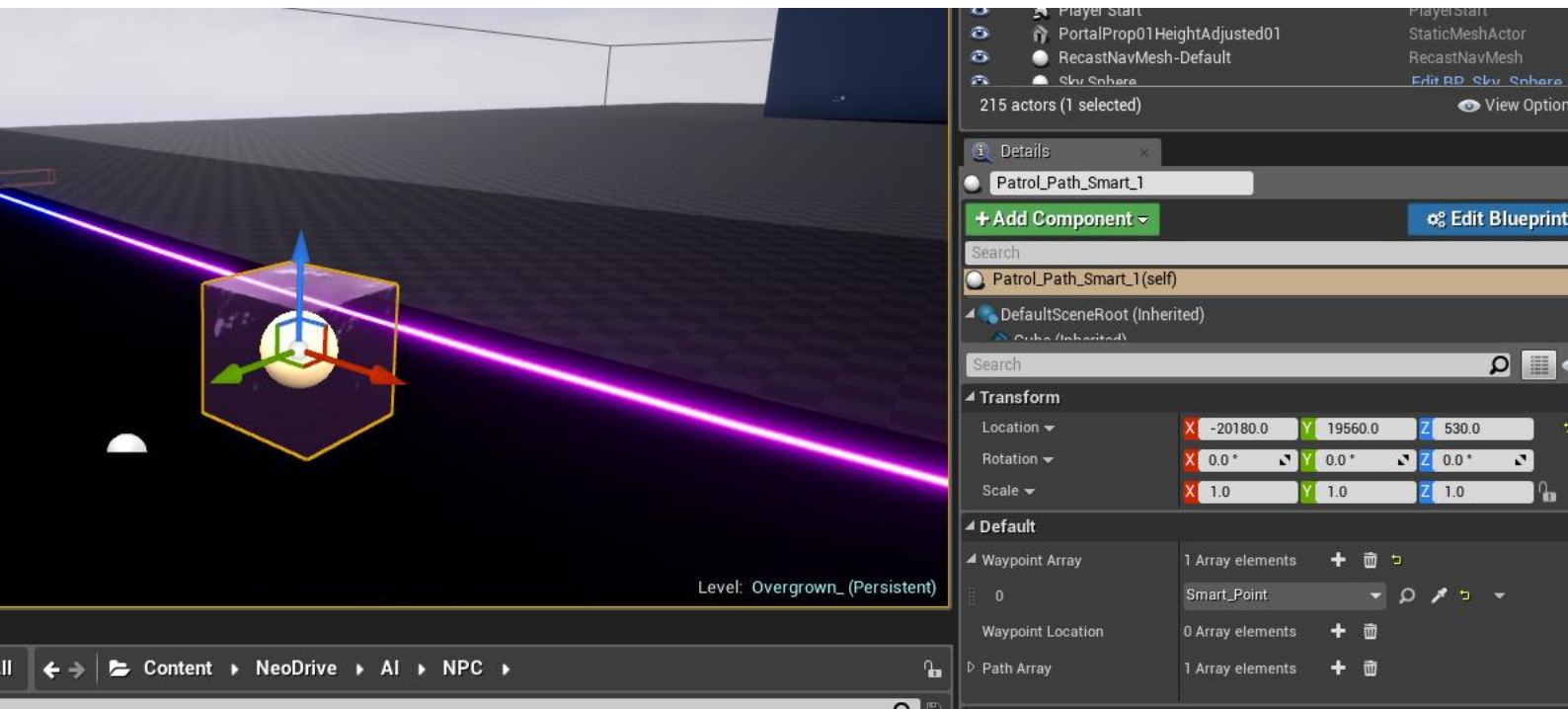
What I want is it to add to the array once the patrol path has been set, so I changed the construction script code (See Figure S4).



‘Figure S4: Changing the construction script code’

Test - Success

My first test was to add in a single waypoint and set it. This test worked (See Figure S5)



‘Figure S5: The single waypoint showing up once selected.’

AI - Smart Path Points (Problem but Progress)

Through more testing I think I got it to work the way I want it to some extent. If the waypoints are not assigned ("None" in the patrol path) you can select all of the paths and it will add them in.

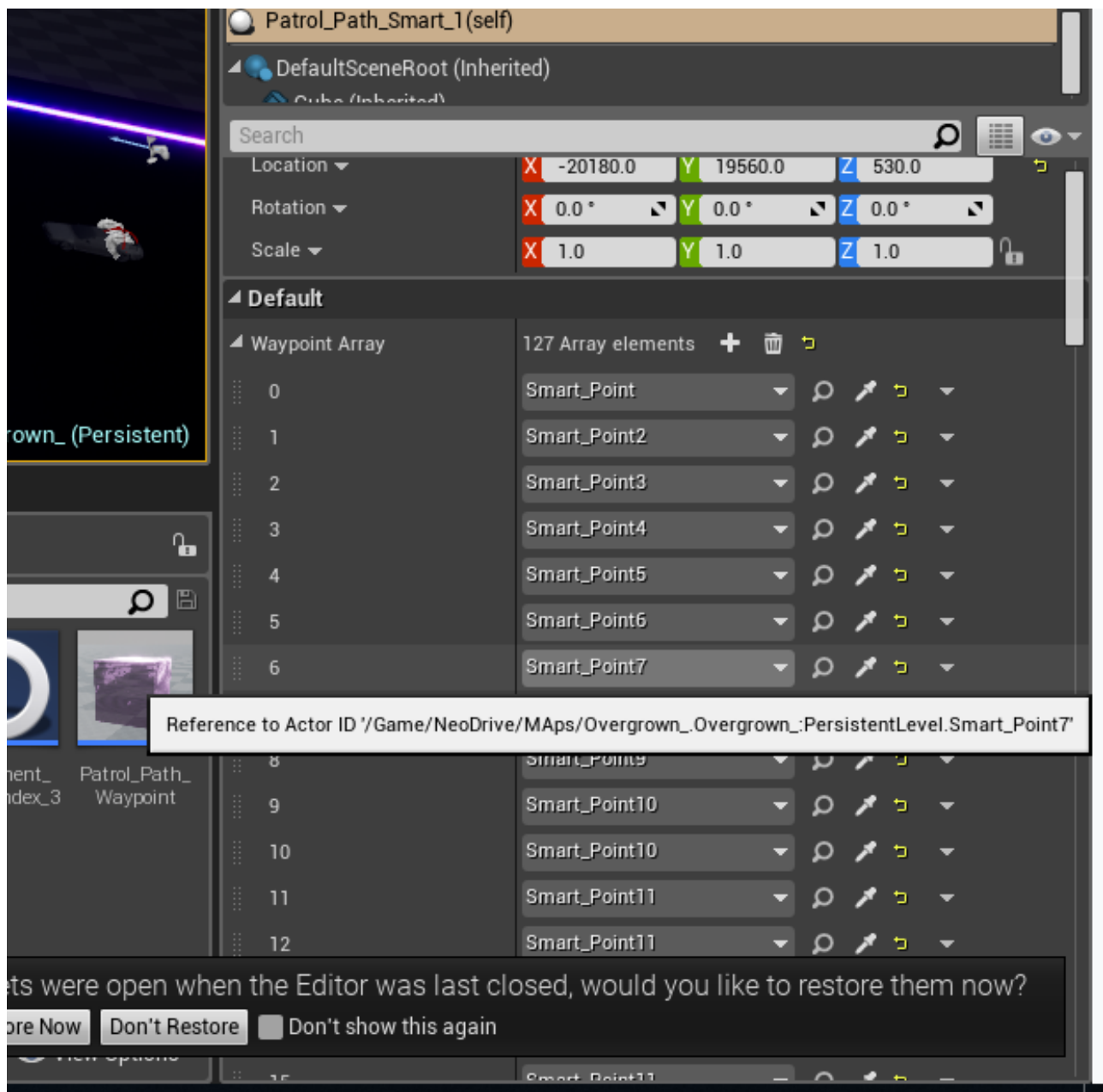
So, the problem was that they were already assigned from previous tests. However, this makes this code very fragile and prone to error. Since you could quite easily copy and paste a single waypoint that is already assigned, and it will mess up the entire array.

But it is an easy enough fix, but it is tedious. I am taking time into a factor and since I cannot stay to long on a single problem, I am going to leave a quick "how to" fix. Either for myself or one of my teammates that are changing their level.

To Fix a Broken Patrol Path (A “How To” for the Unreal Team)

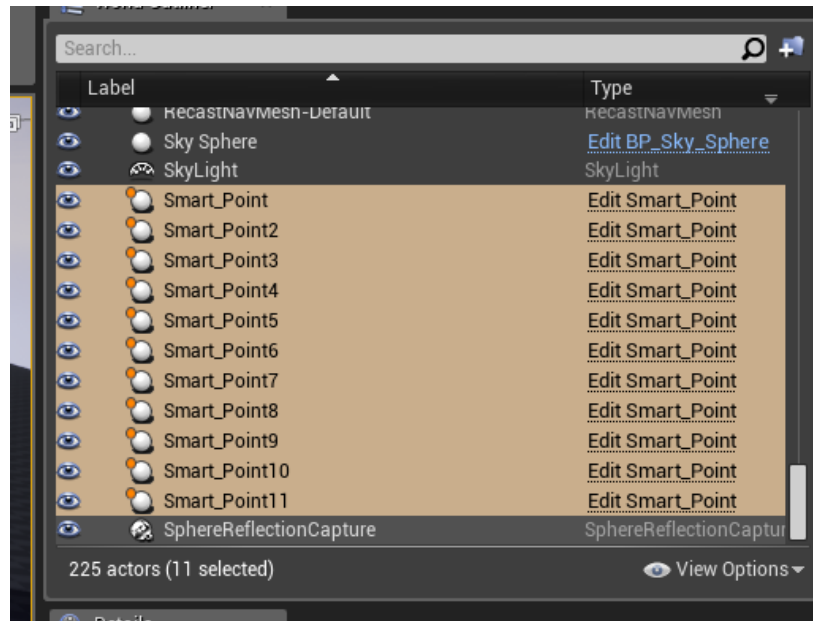
If the selected patrol path has more values than it should, this is how you would fix it.

1. You start by deleting the broken array in the **broken** patrol path. By selecting the trash bin next to the **Waypoint Array**. Example below:

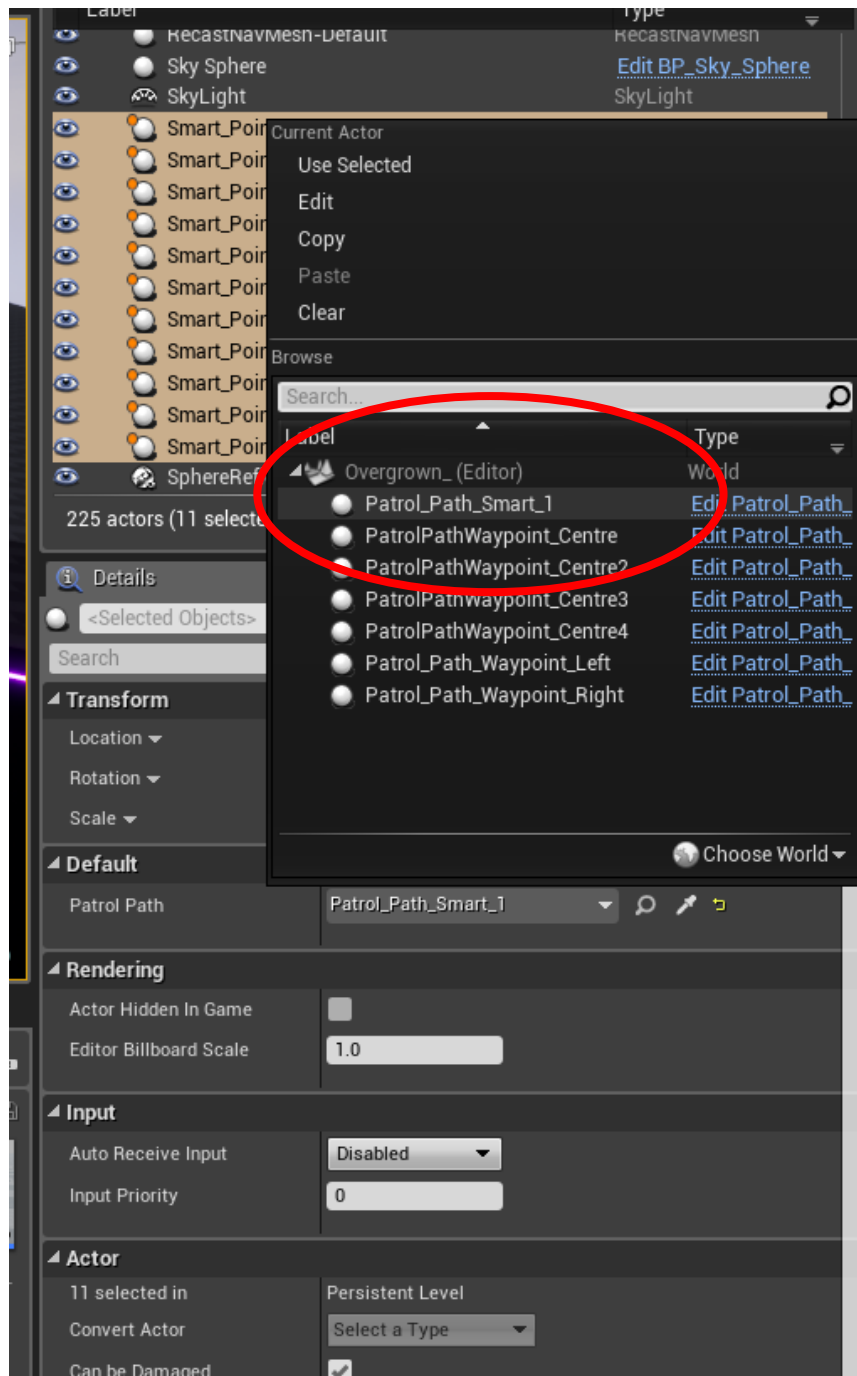


2. Now that you have a free waypoint array, provided that the waypoints are arranged nicely in folders in the “**World Outliner**”, you can now reselect the waypoints you want assigned to the patrol path and change the “**Patrol Path**” variable to the desired path.

Example Below:



‘select the waypoints you want’



'Change to the desired patrol path'

Side notes

Please keep in mind the paths will go in ascending order, depending if you select the path points from the world outline.

To bypass if necessary,

You can select each individual path point in the order you want the vehicle to go to.

Any problems or issues please email:

1701744@student.uwtsd.ac.uk

or contact me through the Facebook messenger boards. "Neo_Drive" / "Overgrown_Level" if you have me connected.

Future Developing (For Smart Path Points)

Also, for future development I plan on making the waypoint system more robust.

For example, I could find a way to delete any duplicating waypoints in the system or try fixing it by making the code only pick up the selected waypoints that are not already in the array.

Current Tasks

From my understanding the current A.I. tasks I have that need doing (in order) are:

- Spline Path Points
- Multiple A.I.
- Have a certain number of AI based on what level has been selected
- Better Vehicle movement (if I have time?)
- Smart(er) A.I (if I have time?)

26.03.2019

AI - Splined Smart Path Points (Attempt 1)

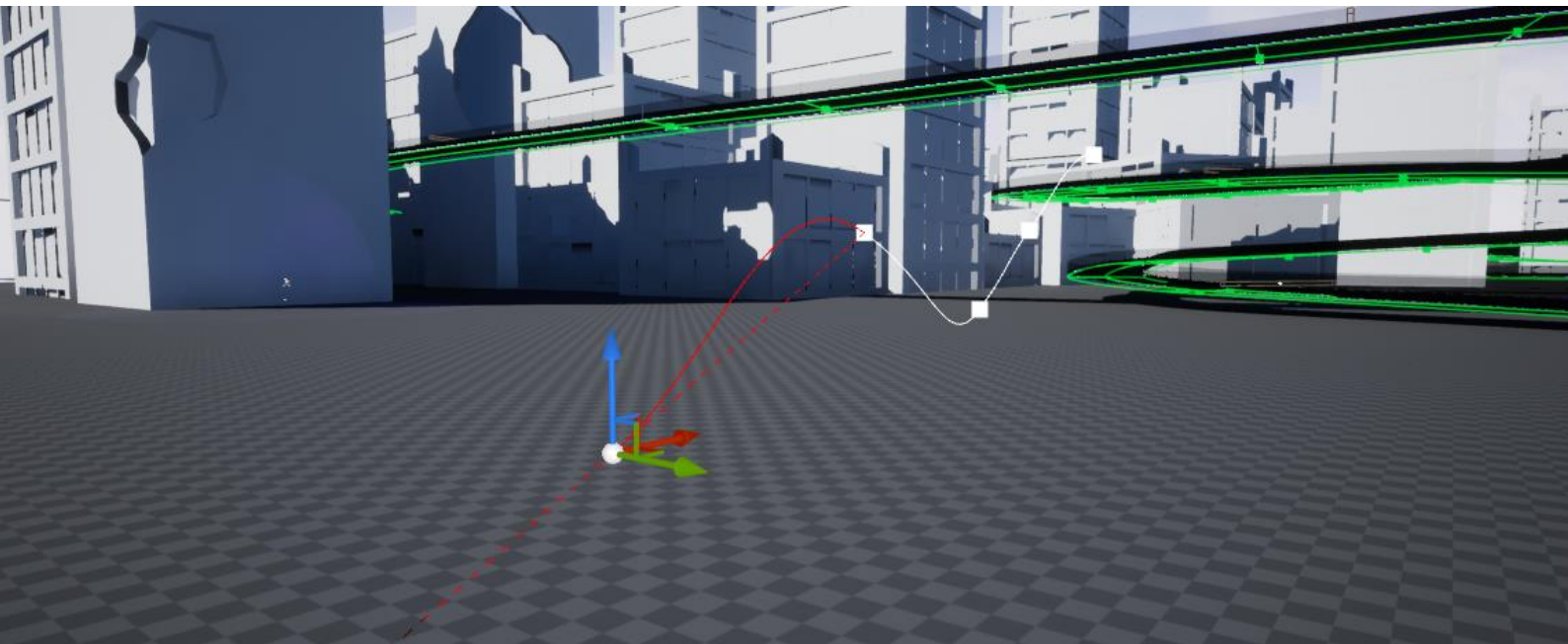
Today I plan on working on the splined smart path points. I started by researching “blueprint splines” and what I got were some Unreal documentation tutorials. (Docs.unrealengine.com, 2019), (Docs.unrealengine.com, 2019)

<https://docs.unrealengine.com/en-US/Engine/BlueprintSplines/HowTo/AddSplineComponent>

<https://docs.unrealengine.com/en-US/Engine/BlueprintSplines/HowTo/EditSplineComponentInEditor>

I then added a spline component to the smart waypoint (See Figure T1) to hopefully get it to duplicate across the spline.

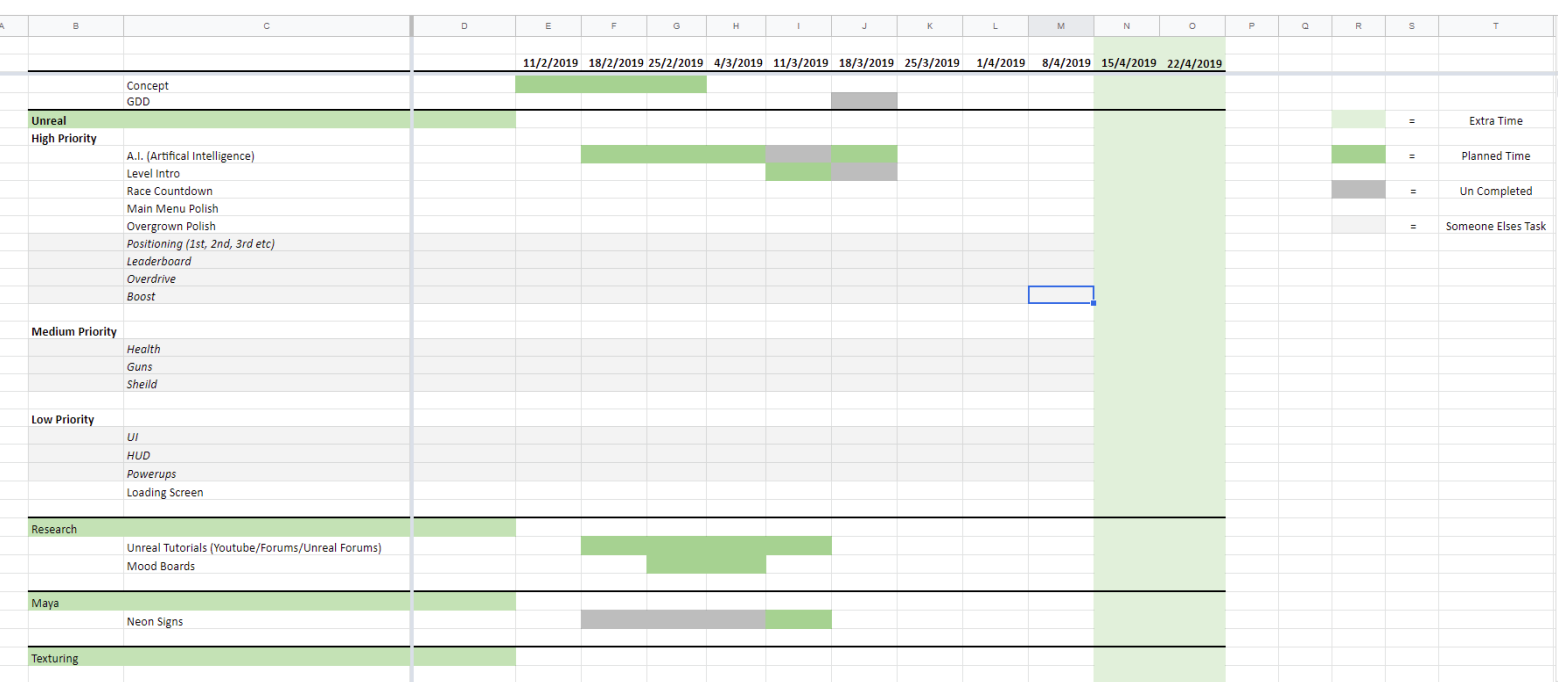
Test - Failed



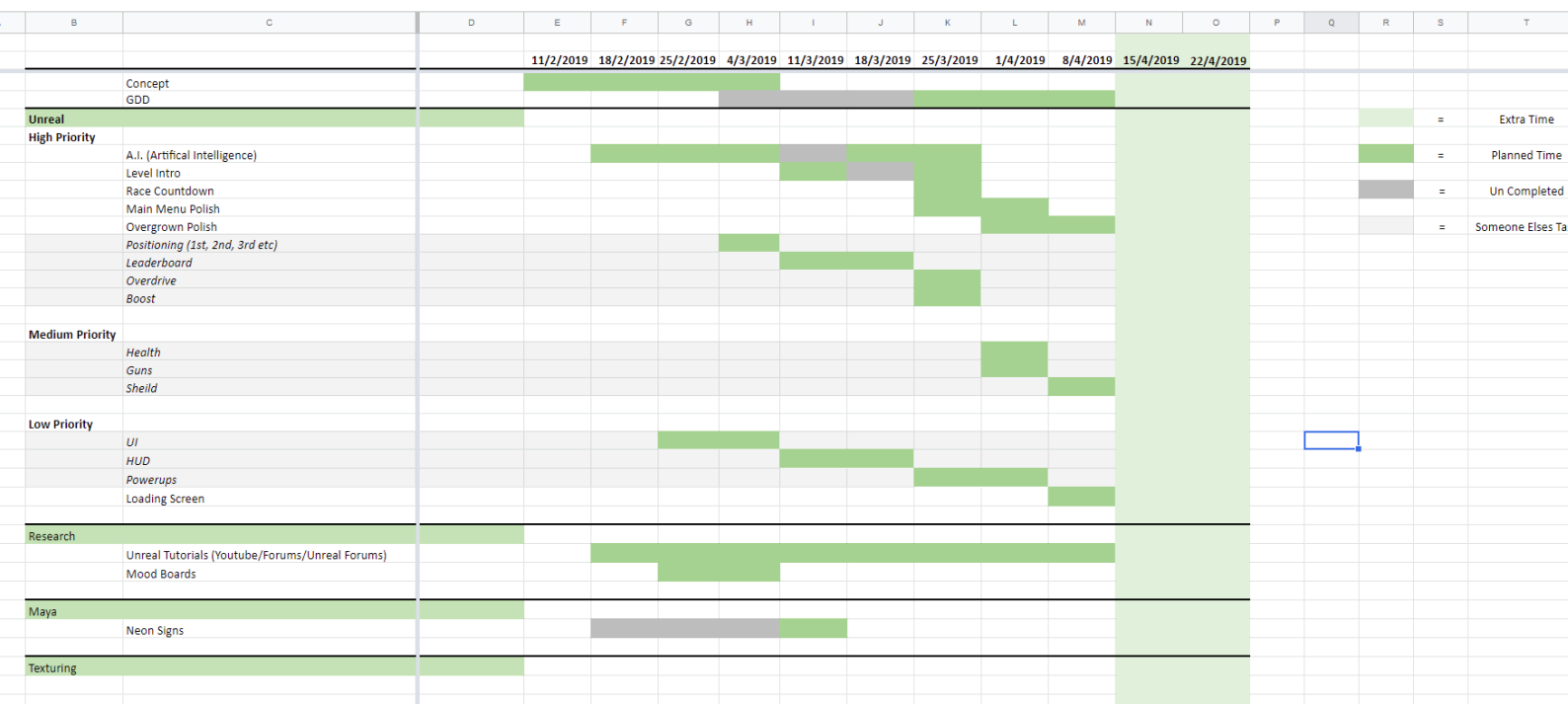
‘Figure T1: The waypoint with the spline component attached’

However, after attaching the component I realised it did not duplicate it the way I want it to. Since the object is still the single object with a spline

Gantt Chart 25.03.2019



‘This is what I completed for last week. I did not work on the level intro as planned and will need to be pushed forward for this week.’



‘This is the adjusted Gantt Chart plan for up until 01/04/19. Which should have the level intro, race countdown and main Menu polish. This is a lot of tasks, but I have been putting them back due to most of my time being put in for the A.I. for our level.’

Main Menu Concept

Me and Nathan both worked on ideas for the Main Menu and what we want it to look like. I gave him sketches and an asset list for him to work on when he can.

I did a few minutes sketch on the main menu, level select and vehicle selection screen.

(Insert Sketches)

Spline paths Issue

Since we do not have much time to work with, I am thinking just keeping the smart points as they are so I can work on multiple AI (So Matt can work on a rank system).

It took me 20 minutes to set out half the map, with some distractions. I think I can handle the full three maps if I was given the day to do it.

27.03.2019

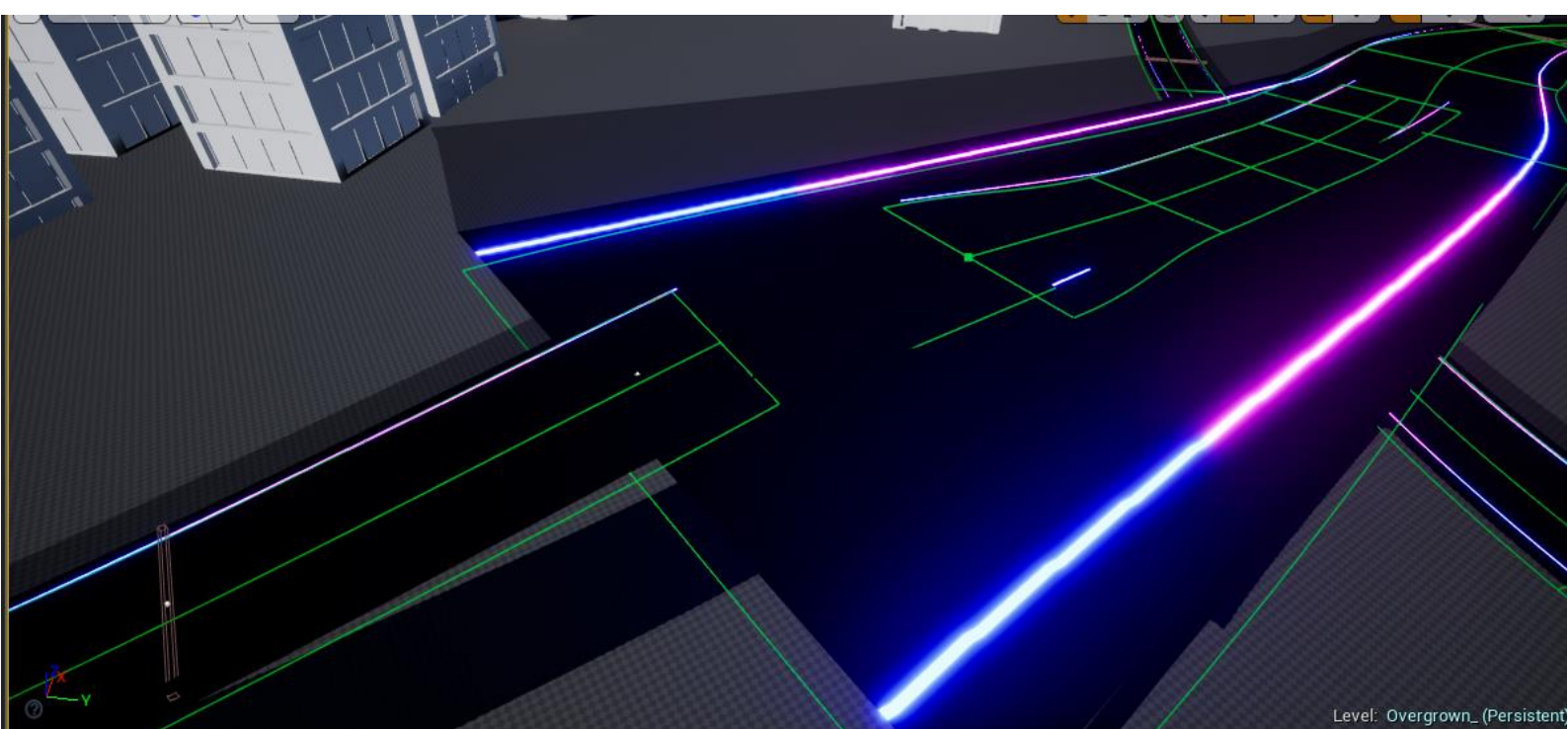
AI - Smart Nav Link (Issue)

I had an issue when placing the rest of the waypoints today. The vehicle does not like jumps in the road, so I will need find a solution to this.

So, I started researching nav link proxies, the unreal engine class that is used to link multiple navmesh areas together. (BlackDragon, 2019)

<https://www.youtube.com/watch?v=wW4t5QxOQaE&list=PLBVI4Go887ji5vcfLH2csCMC1Z0zW2oO&index=2>

Using this tutorial, I will attempt to create multiple routes for the AI to follow for the jump I have in game (See Figure U1).



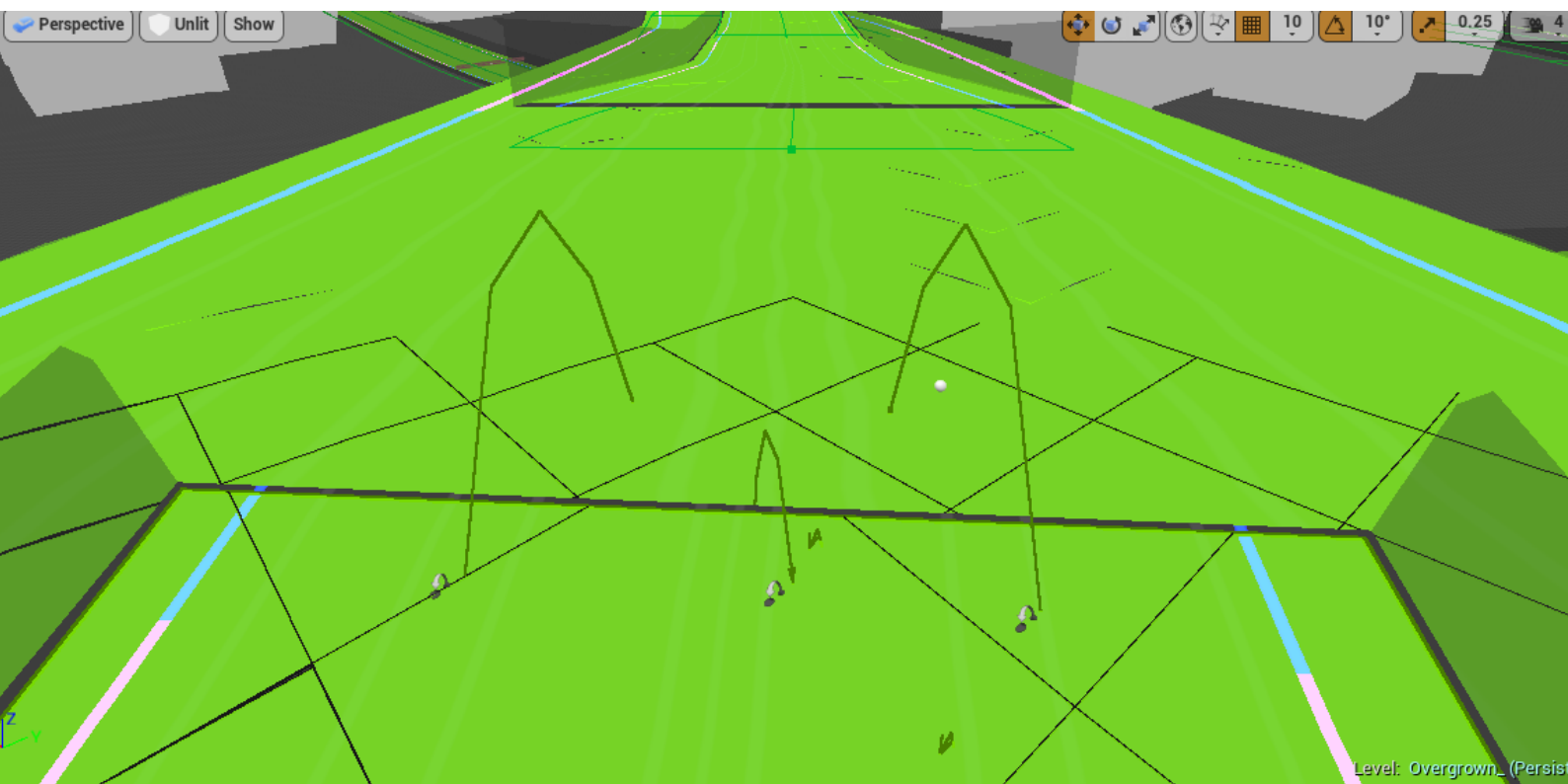
‘Figure U1: The jump in the overgrown level’

Hopefully this tutorial will be able to help me when I create the paths in the other levels for Neo_Drive.

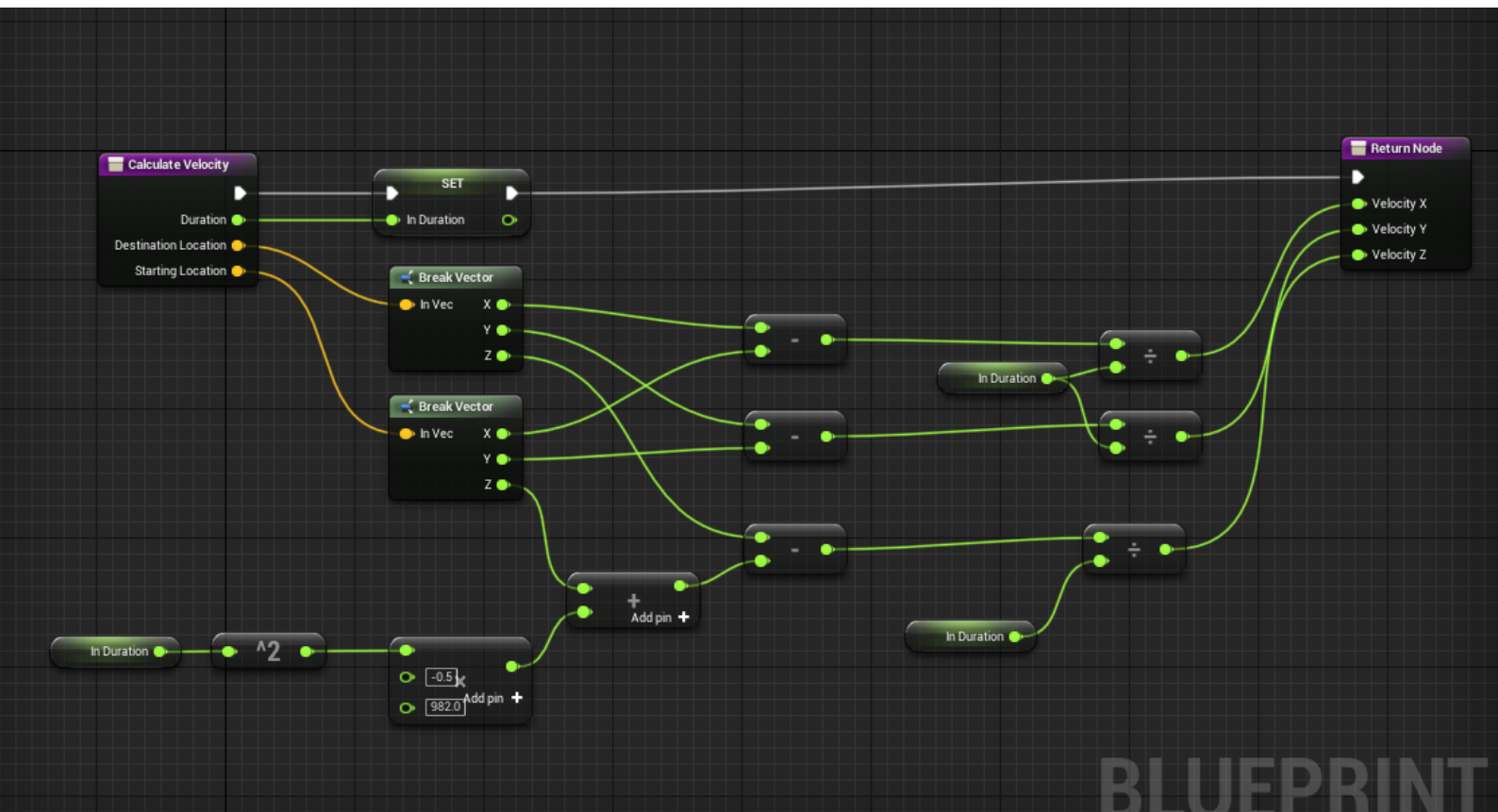
AI - Smart Nav Link (Attempt 1)

I added in a new blueprint called the “Nav_Link_BP”

I then moved the smart and simple links to the place I want the AI to jump too. (See Figure U2)



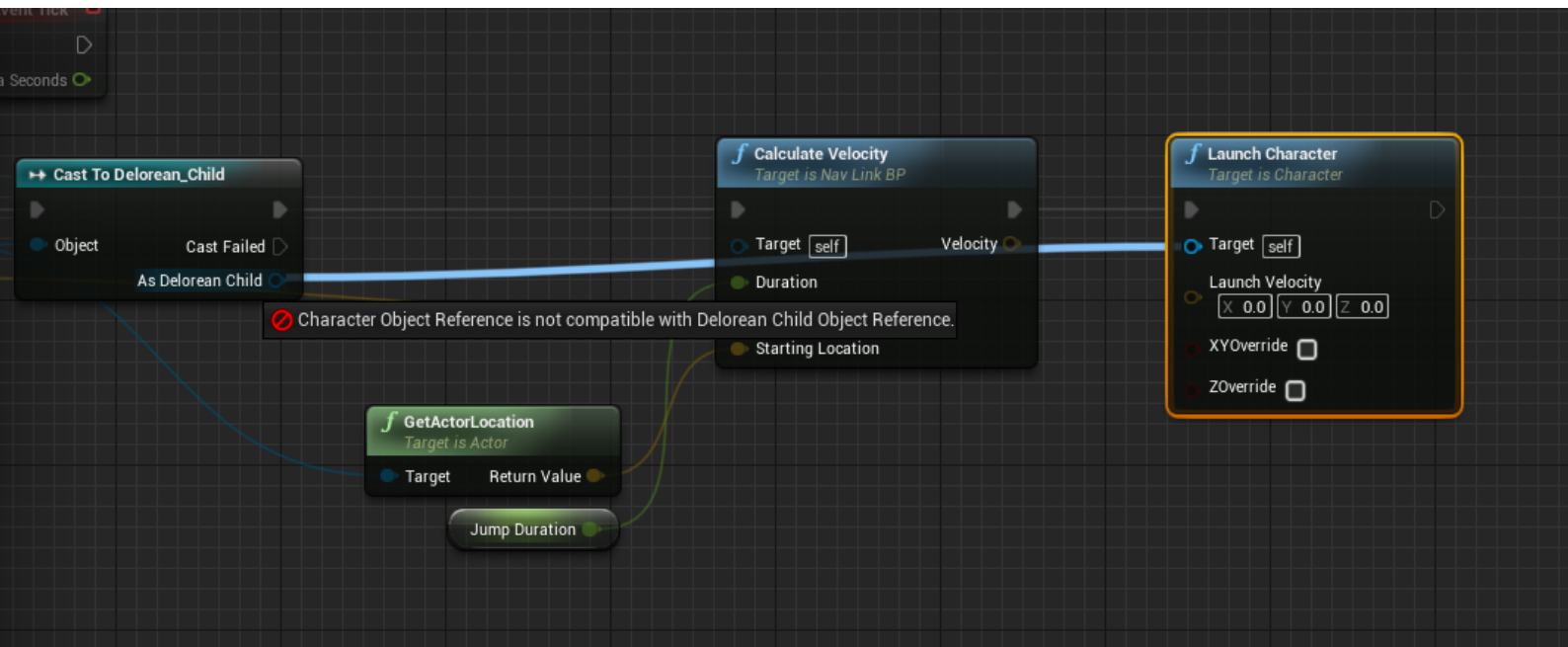
‘Figure U2: The nav link proxies on the edge of the jump (With unlit enabled)’



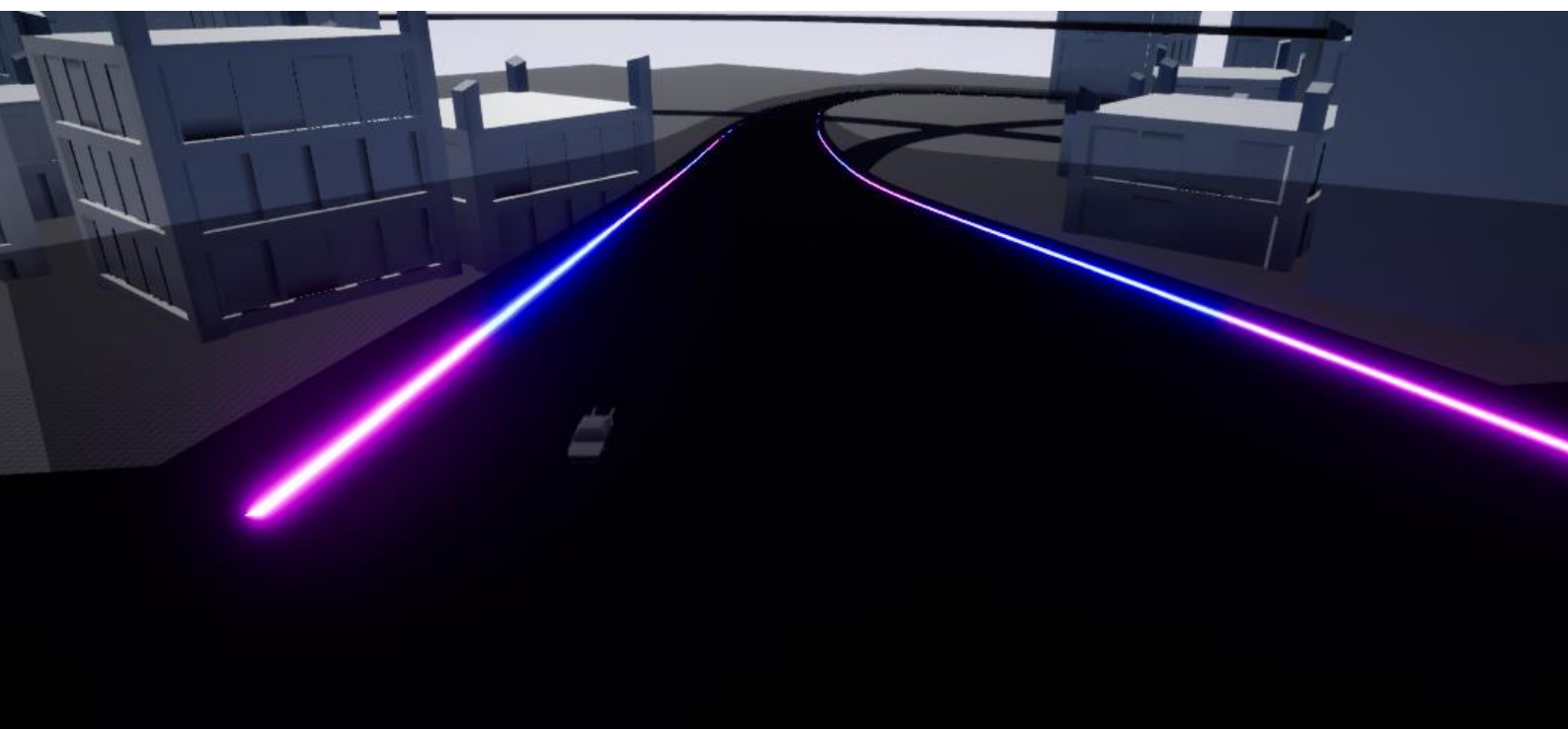
'Figure U3: Calculating velocity, used to launch the AI'

Test - Failed

However, I encountered an issue with the tutorial I was using. The “Launch Character” node was needed so I could add the velocity needed to the character itself. (See Figure U4/U5)



‘Figure U4: The “Launch Character” node not fitting to the AI Pawn’



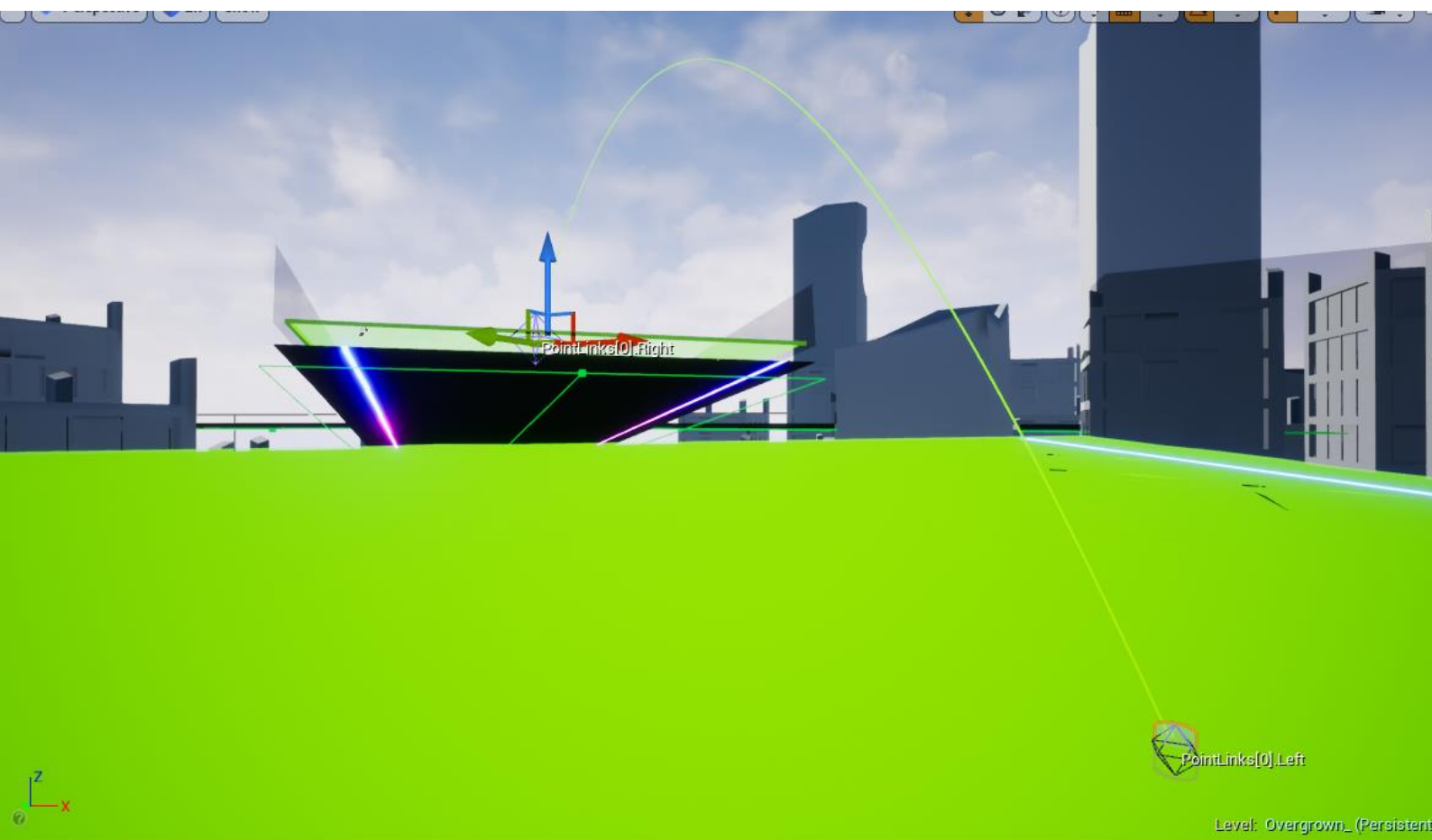
‘Figure U5: The AI vehicle not moving from the nav link proxy’

29.03.2019

AI - Smart Nav Link (Issue)

Today I am trying to redo the Nav link proxy with no tutorial.

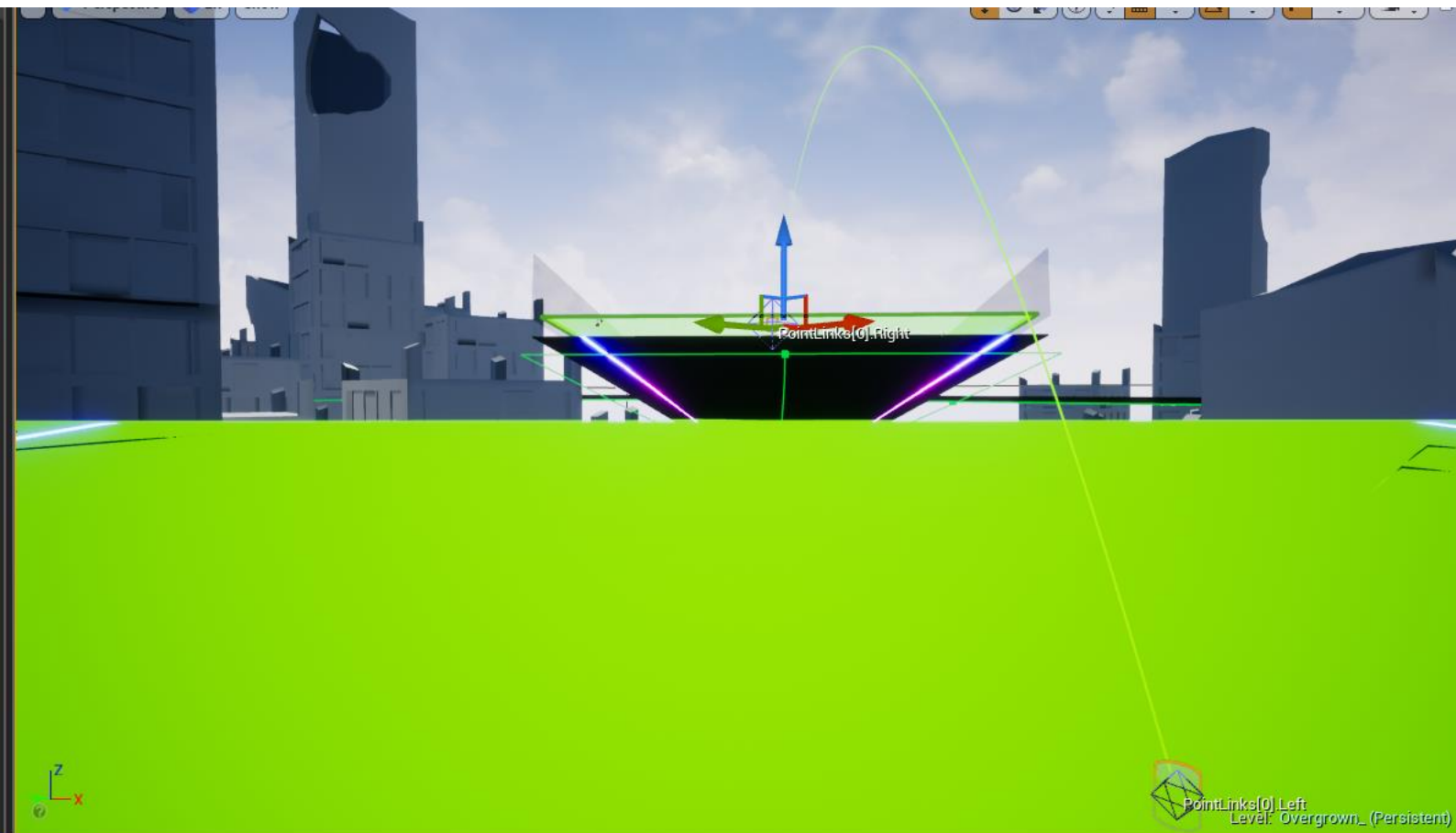
I came across the problem where the nav link does not go as far as I want it to. The link is shown but the navigation links are not connected. (See figure V1)



‘Figure V1: the nav link not connecting the two nav meshes together’

AI - Nav Link (Issue)

However, the last issue of the nav links not connecting shows up again. (See figure V2)

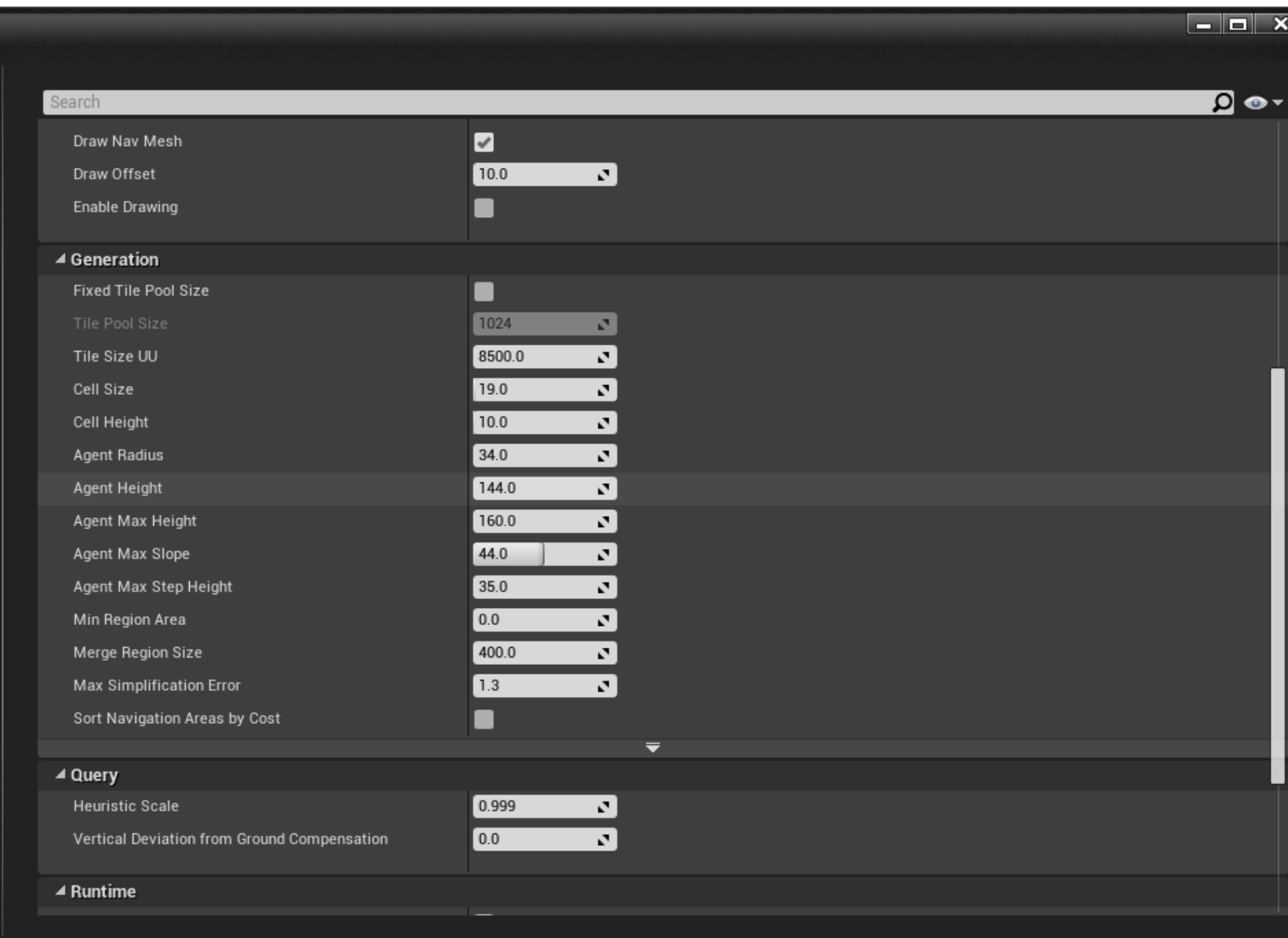


‘Figure V2: The nav link still not connecting’

AI - Nav Link (Solution)

<https://answers.unrealengine.com/questions/522507/nav-link-proxy-broken-on-high-distances.html>

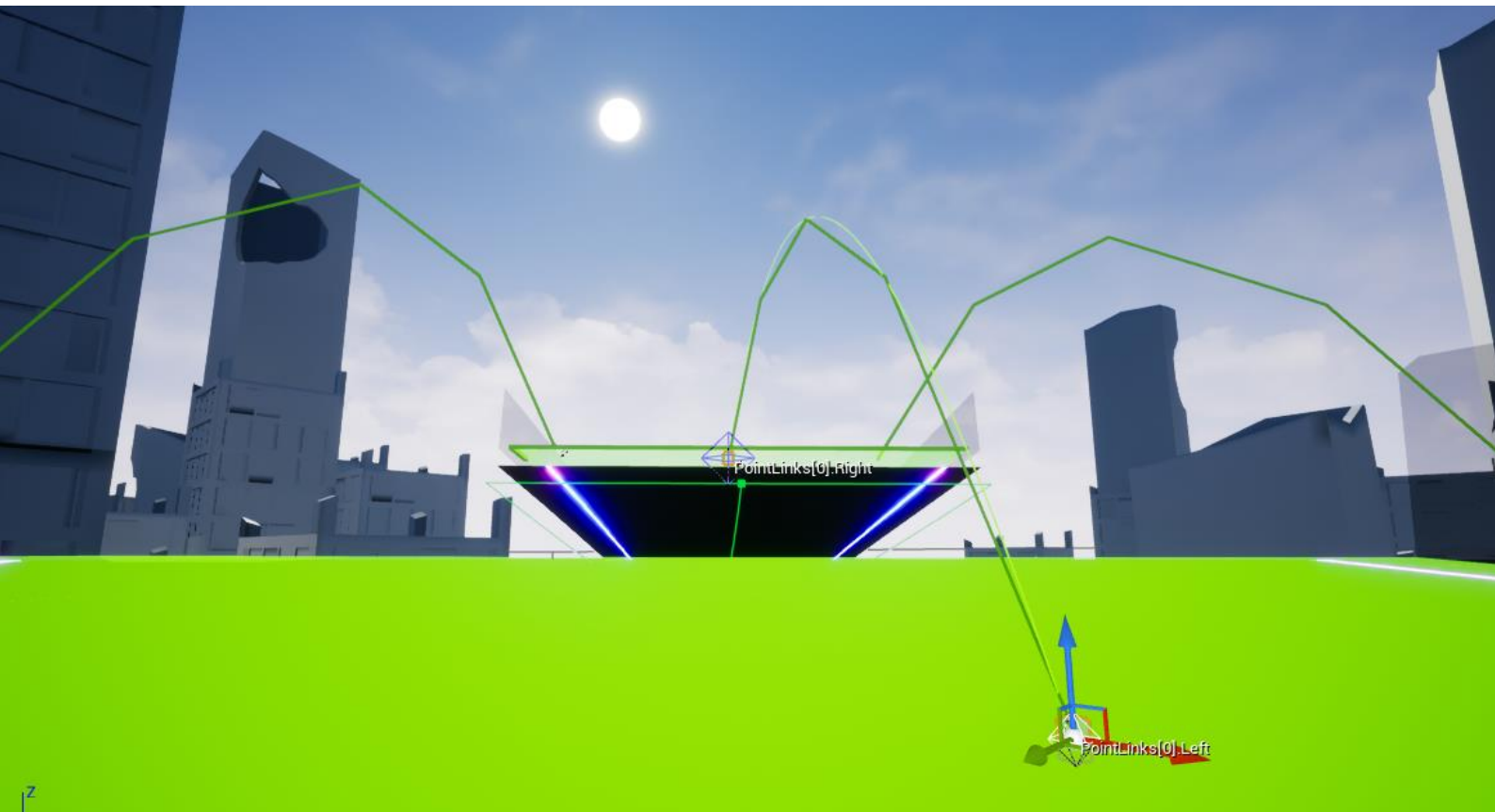
After some googling I came across an answer from the ue4 forums, showing he had a similar problem. The solution was to increase the tile size of the navigation meshes inside the Project Settings. (See figure V3)



‘Figure V3: Inside the Project Settings >Engine>Navigation Mesh> Generation

where I change the “Tile Size UU” from 1000 to 8500.’

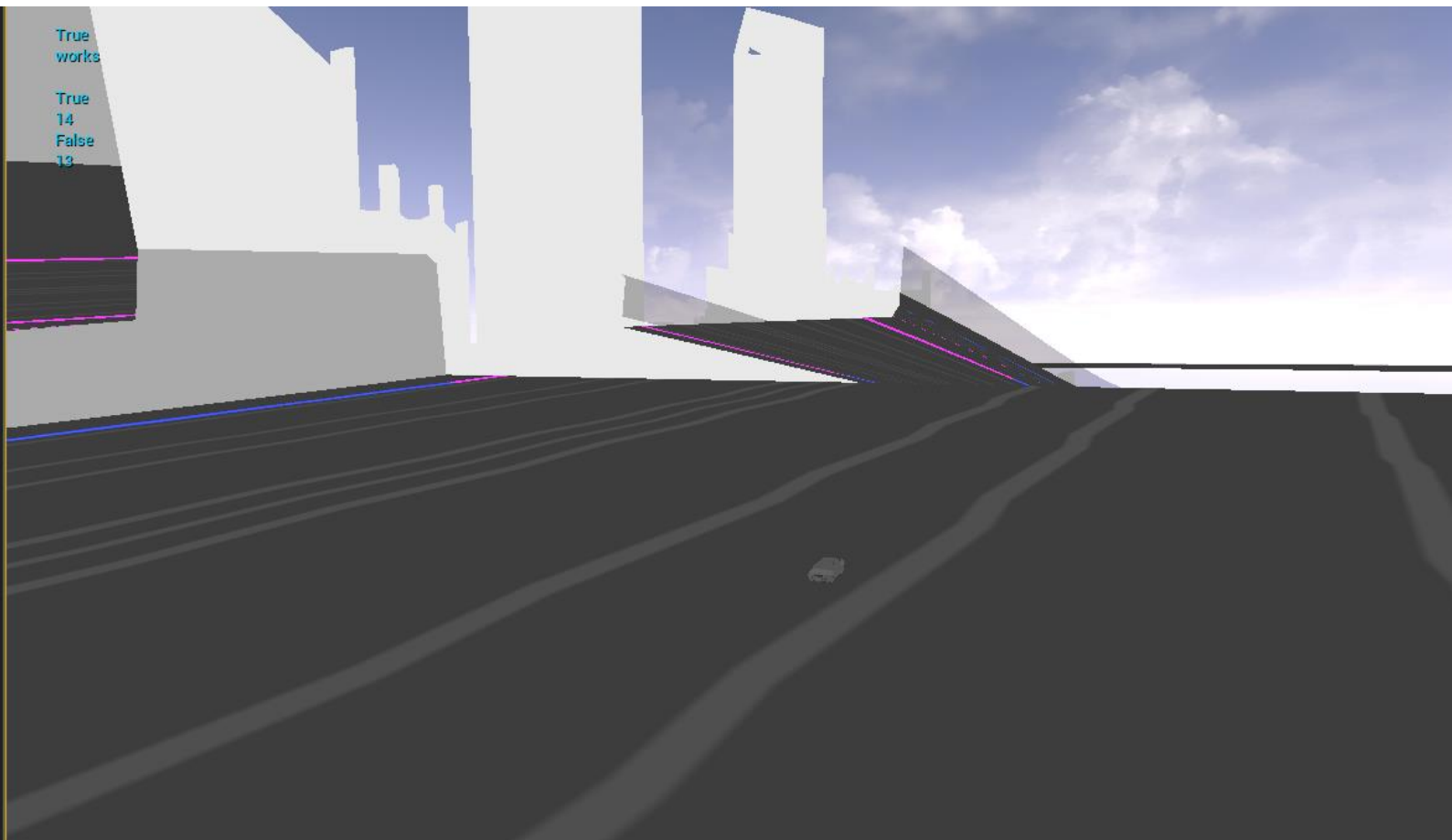
This fixed my problem, now I can test the waypoint system (see figure V4).



‘Figure V4: The nav mesh link now connecting the two meshes together.’

Test - Success

Now I will test if the vehicle will jump from the navmesh to the desired location at the end of the waypoint path. (See Figure V5)



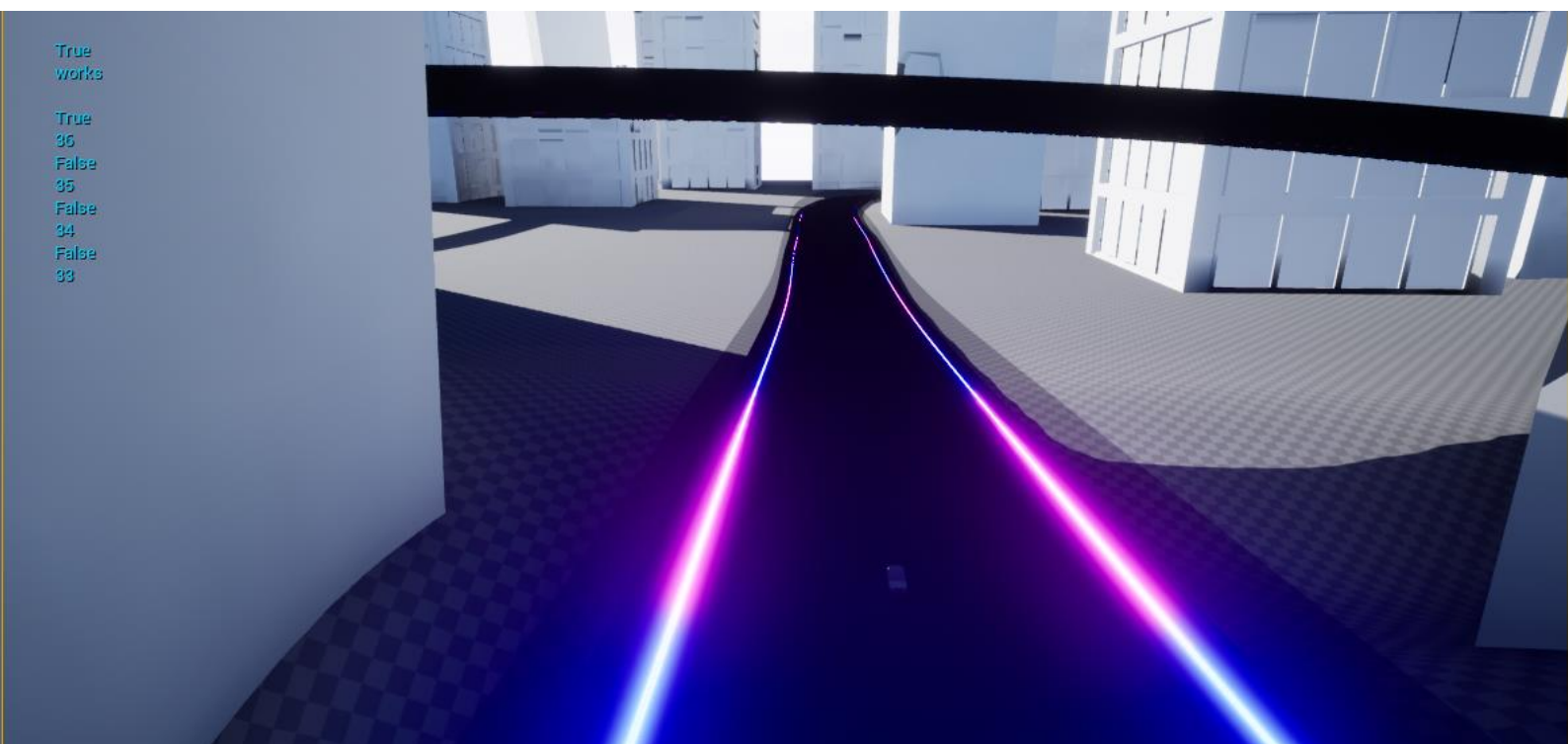
‘Figure V5: The AI vehicle switching nav meshes’

AI - Full Track Test

Now that the Nav link is working, I will now finish the layout of a test run of the track for the AI.

Test - Success

I attempted to get the AI to go across the entire track (One Waypoint) from start to finish without me interrupting anything. It was a success and the AI managed to finish the track. (See Figure V7)



‘Figure V7: The AI vehicle completing the entire track’

Level Intro - Menu to Game

Now that I have something to show for the AI, I am going to start work on the Level Intro, that is set to be completed this week.

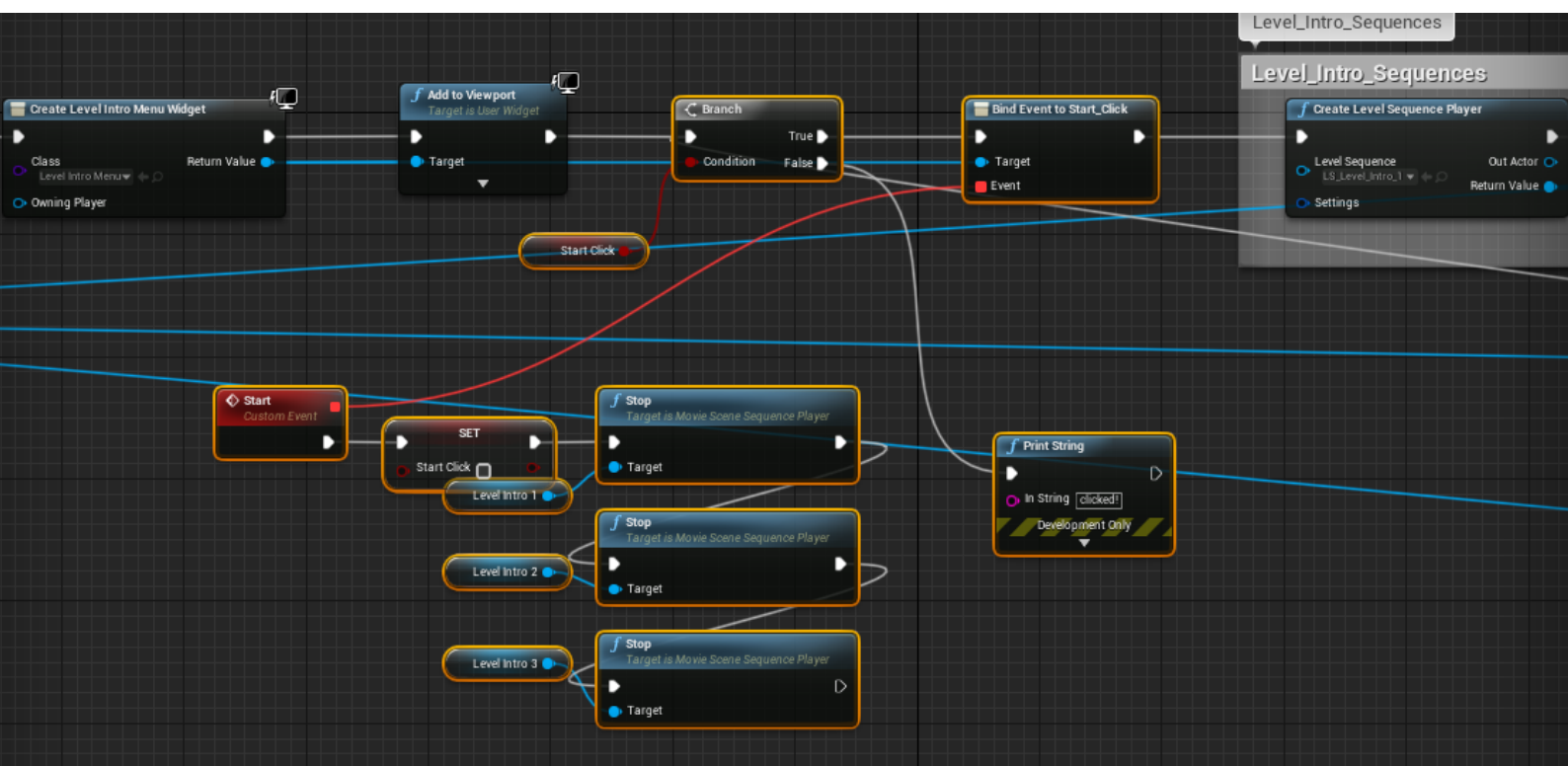
The current issue with the project is the ability to destroy the menu once we are done with it and start our game.

30.03.2019

Level Intro - (Attempt 4)

For my next attempt I will try use the variable method again, although it has not worked in the past.

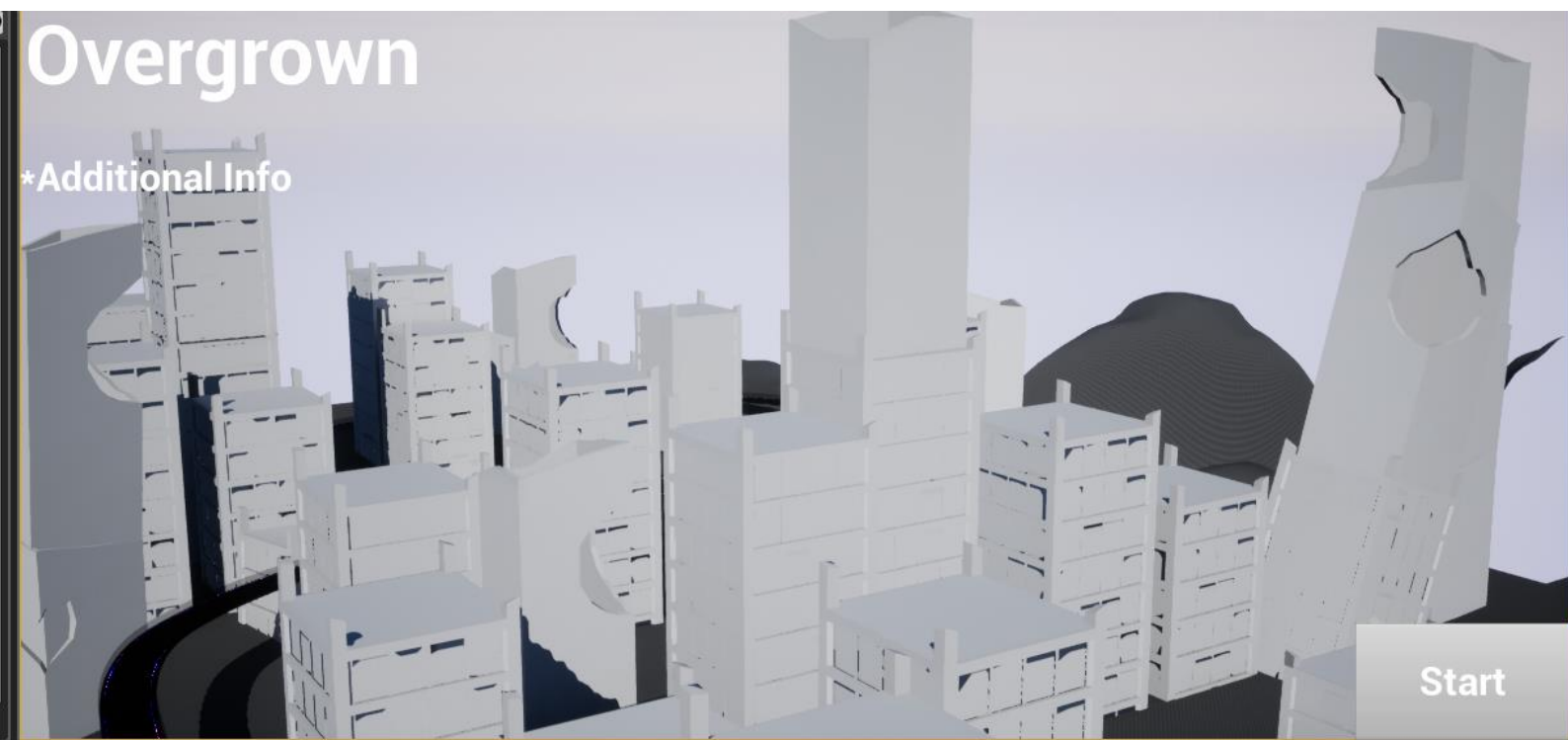
I am going to give it another go. (See Figure W1)



‘Figure W1: The added “Branch” and code to stop the level sequences’

Test - Failed

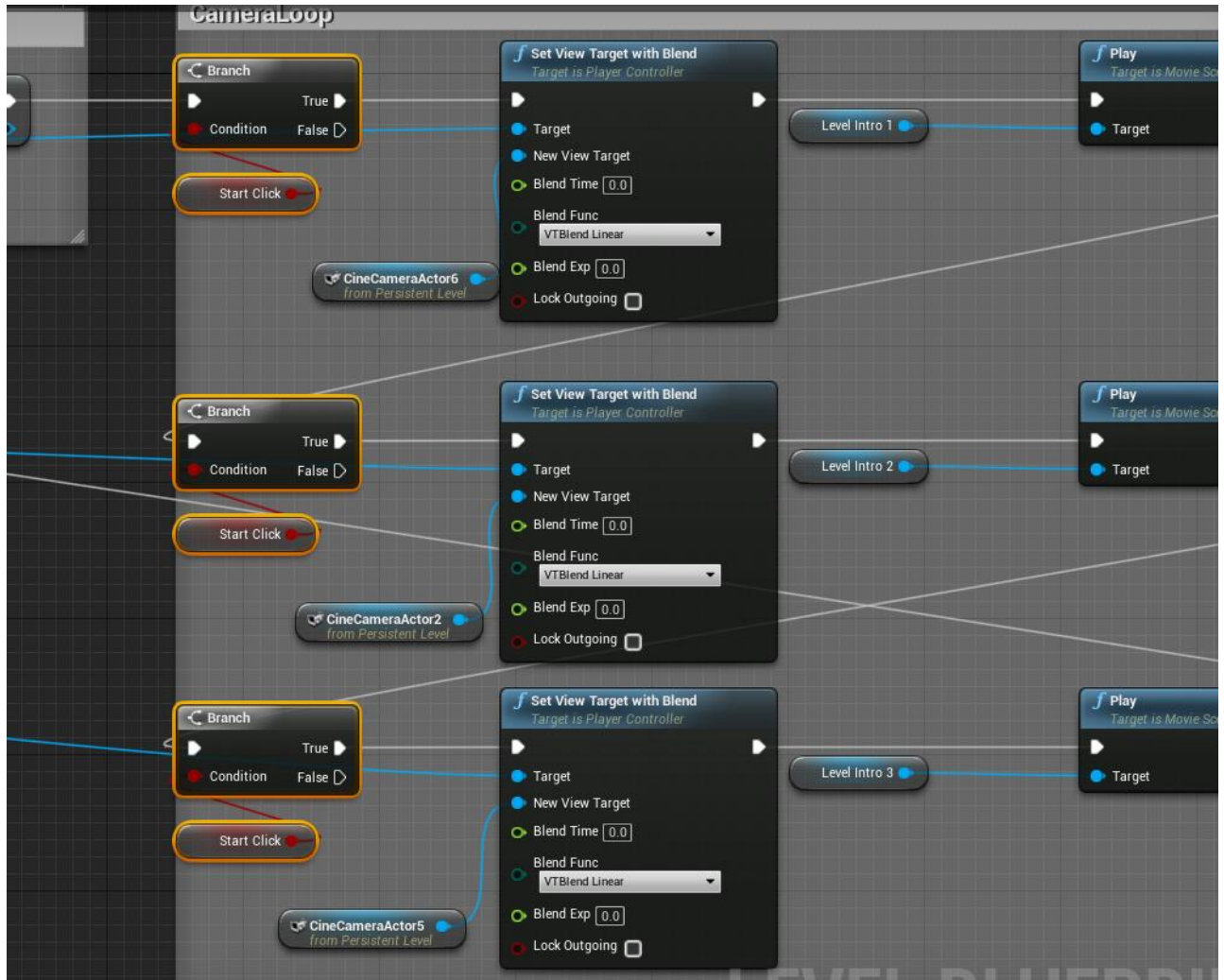
After you hit start the level sequence you are on stops for a small time, then goes to the next sequence and finishes on the last one before stopping completely. (See figure W2 below)



'Figure W2: An image of the last sequence stopping and not moving from here'

Level Intro - (Attempt 5)

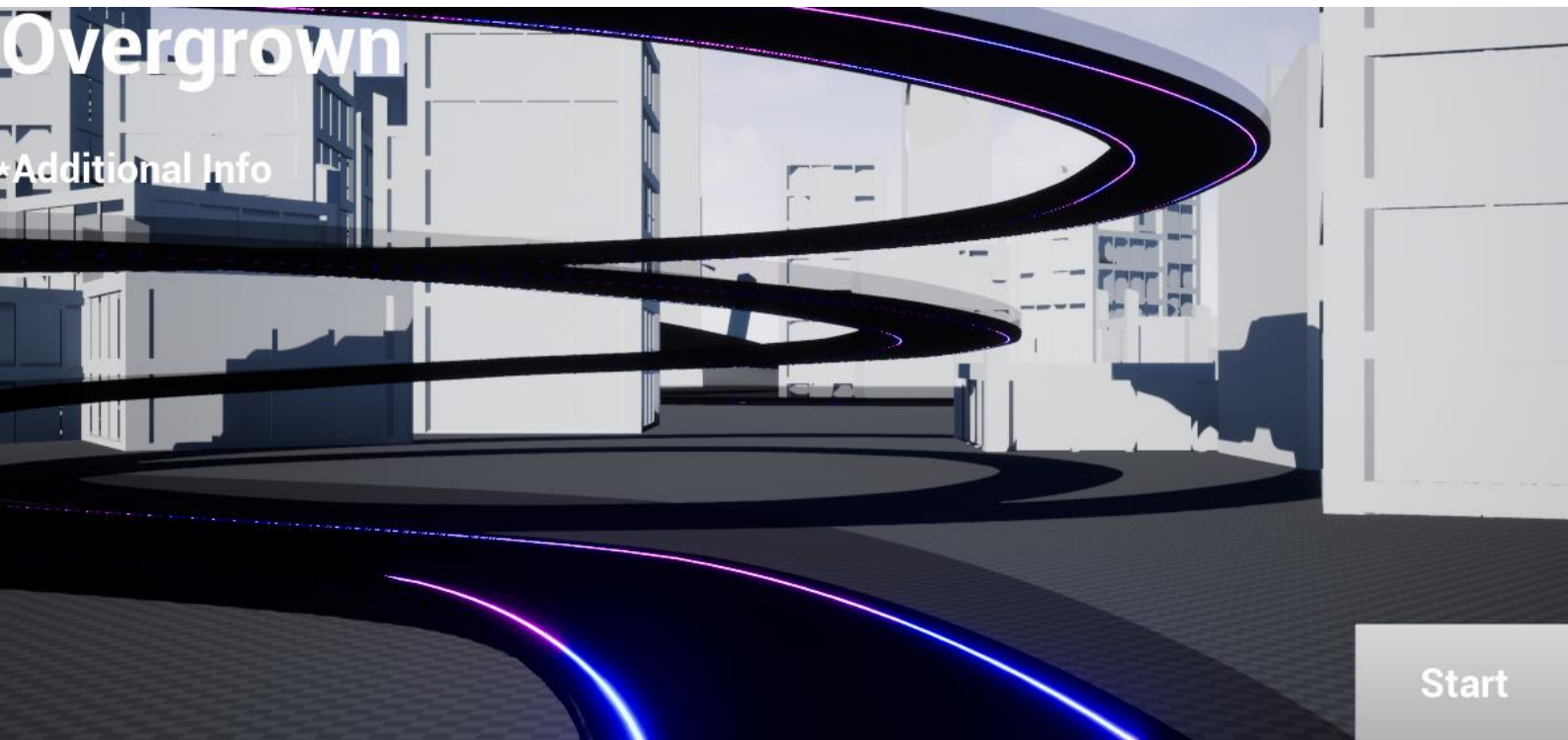
I need to try and stop the other sequences from playing (See Figure W3 below)



'Figure W3: This shows the branches at the end of each play sequence'

Test - Success (Problem but Progress)

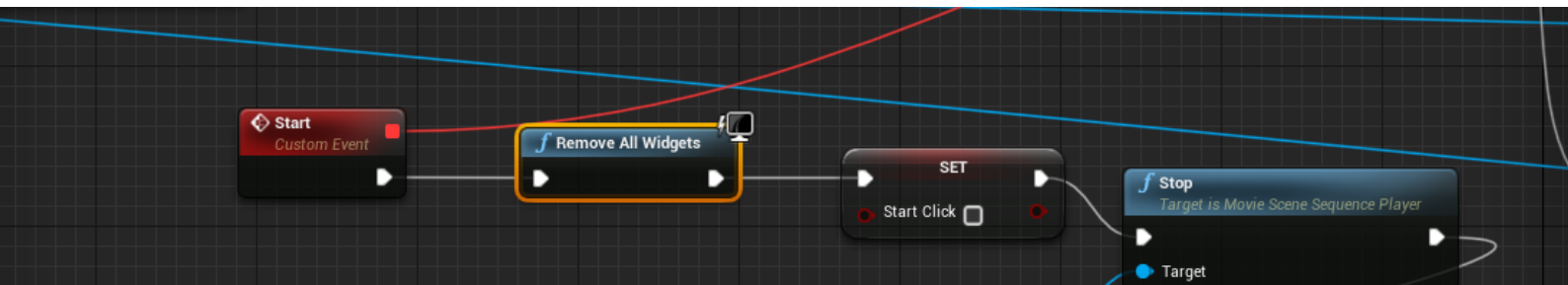
The level sequences stop once I have hit the “Start” button. Now I need the player to possess the vehicle once it’s been clicked and also remove the widget from the screen. (See Figure W4)



‘Figure W4: The “Working” start button, stopping the level sequence once clicked.’

Level Intro - Tidy Up

Now that the main issue has been covered, I am now adding in smaller tasks to be completed once the start button has been clicked. Like removing the widget menu once it's been clicked. (See figure W5)



'Figure W5: Removing the menu widget'

Level Intro - Repossess the player character (Issue)

Now the next issue I have is how to repossess the players camera. Since I tested that after you have hit the start button you can control the character, but not if the level intro is playing.

So, the only issue I have now is finding a reference to the players camera.

Level Intro - Repossess the player character (Attempt 1)

The set view target node test with player controller, test fail

Level Intro - Repossess the player character (Attempt 2)

With the player pawn node, test success

01.04.2019

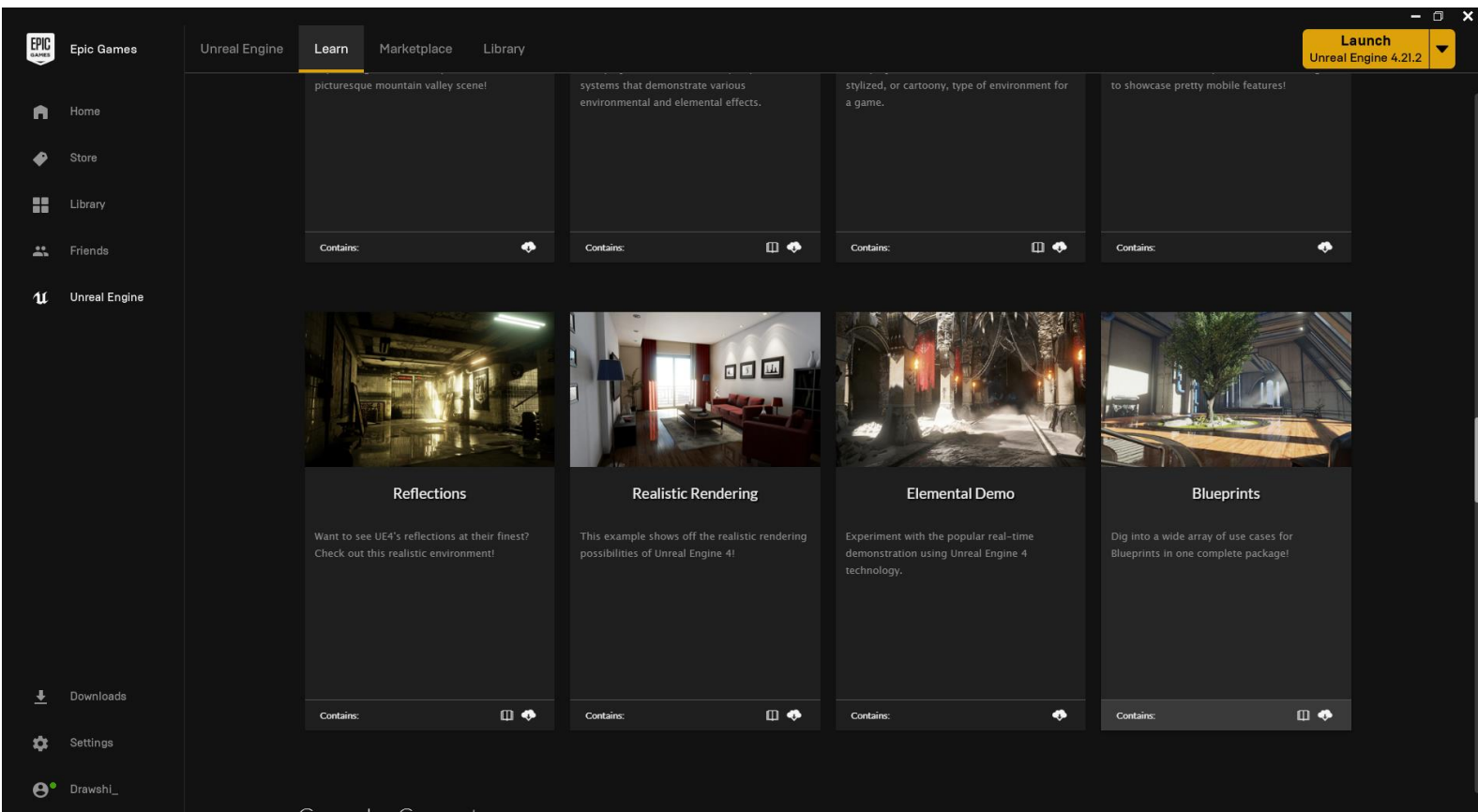
Today I worked with Matt to get both our level sequencers and his start countdown and Leaderboards to sync up.

So, we attempted a merge and both our projects did not work with each other. So, we spent the better part of the lesson trying to find a way to make both work at the same time.

02.04.2019

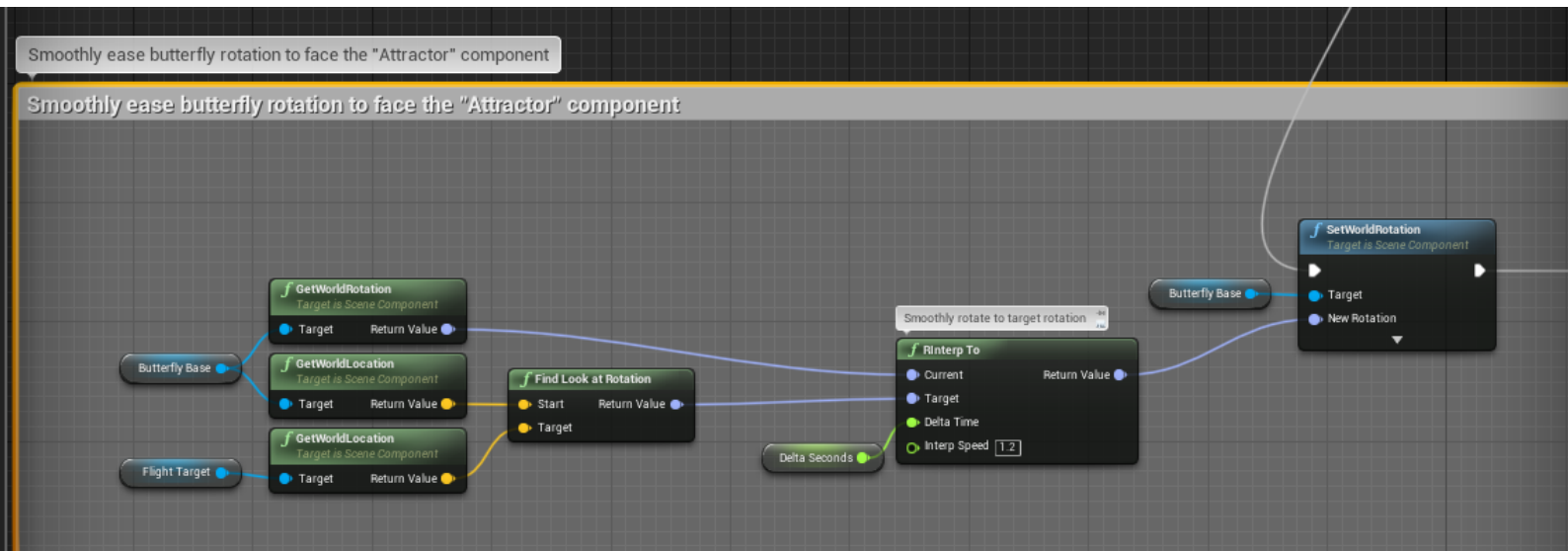
Learn Blueprint

Today I have been working on getting the character movement to move more smoothly. So, I used the “blueprint” project on the learn tab of the ue4 site. (See Figure X1)

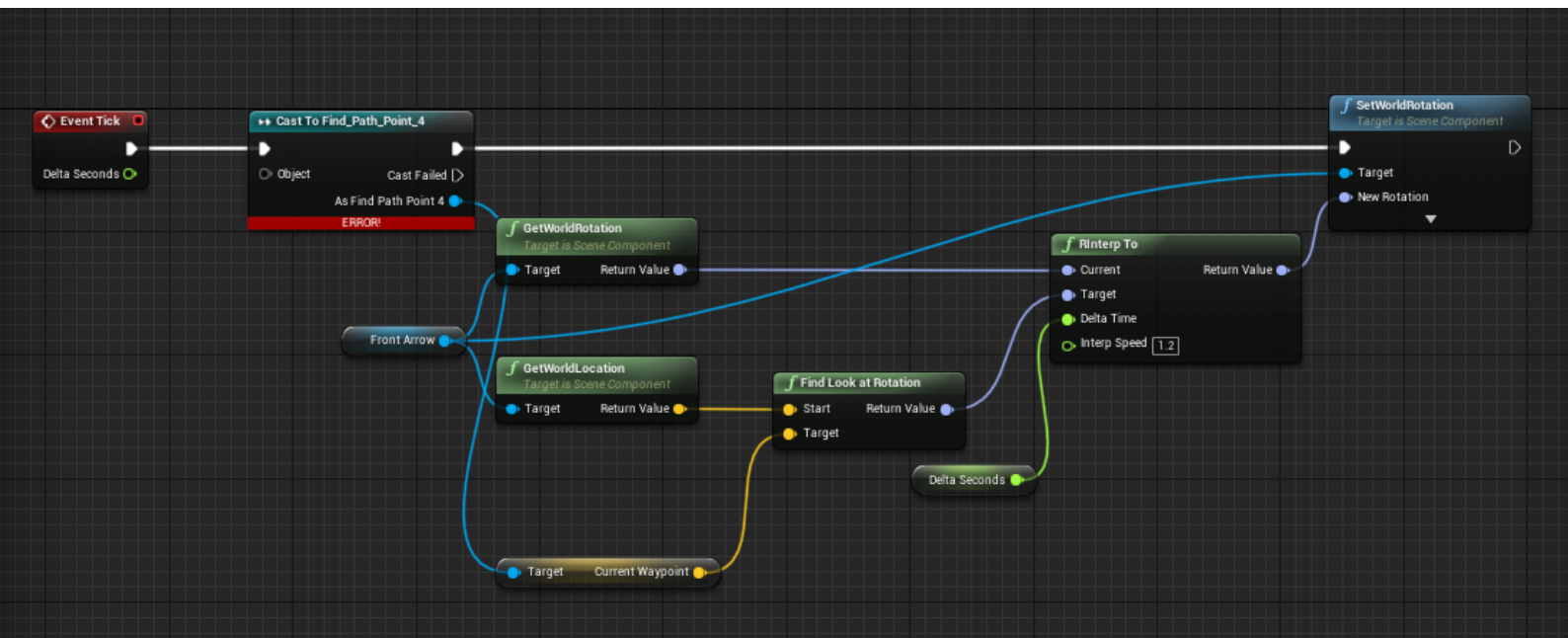


‘Figure X1: The learn tab in the epic games, learn tab’

It has a butterfly AI that changes its rotation as it moves forward. I am going to try and recreate this with my AI (See Figure X2)



‘Figure X2: Rotator code that moves the butterfly (Inside the learn blueprint)’



‘Figure X3: The extracted code from the blueprint.’

I have tried recreating this in the DeLorean child AI the only issue I came across was being able to reference the “Current_Waypoint” variable in the blackboard task. (See Figure X3) I will need to ask Jess for help.

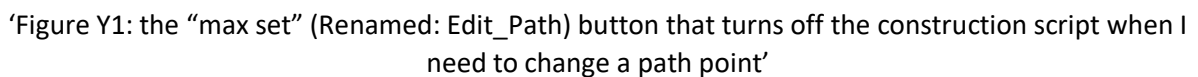
04.04.2019

AI - Splined Smart Path Points (Attempt 3)

Today I am working on the waypoints. Since I came across an issue earlier, the waypoints will increase in size whenever it played, or you are come out of the editor and come back in.

Basically, since I put code on the construction script, it kept doing that code every single time it was moved or edited, or the game was played. I will need to try change the script code.

I created a Boolean to turn the construction script on and off when I need it. Having an on and off “Edit” button so I can create my desired waypoint path and then turn off the edit, so it keeps it. (See figure Y1)



138

08.04.2019

I am working on the vehicle movement and speed. After playing with the settings, these were the ones that felt good with the vehicles current speed. However, since I have not introduced the boost, the speeds may change.

Floating Pawn #1

This one felt as a good last place speed. The acceleration was fast enough to quickly pass the player at the start, but the max speed makes it easy to pass at the start.

MS: 3000

A: 500

D: 8000

TB: 8

Floating Pawn #2

MS: 3500

A: 500

D: 8000

TB: 8

Multiple AI - (Attempt 1)

Test - failed

I started by duplicating the Blackboard and the tasks and put it in its own folder.

However, this turned into an issue since I had to change the “cast to” nodes to the new AI and also change every variable since it was interfering with the first AI.

I am not entirely sure what the problem is, so I will need to test and find out.

09.04.2019

Multiple AI - (Attempt 2)

Today I worked on multiple AI again. I had a problem yesterday where the car would not move past the first checkpoint.

So, in an attempt to fix this, I will try redo it again.

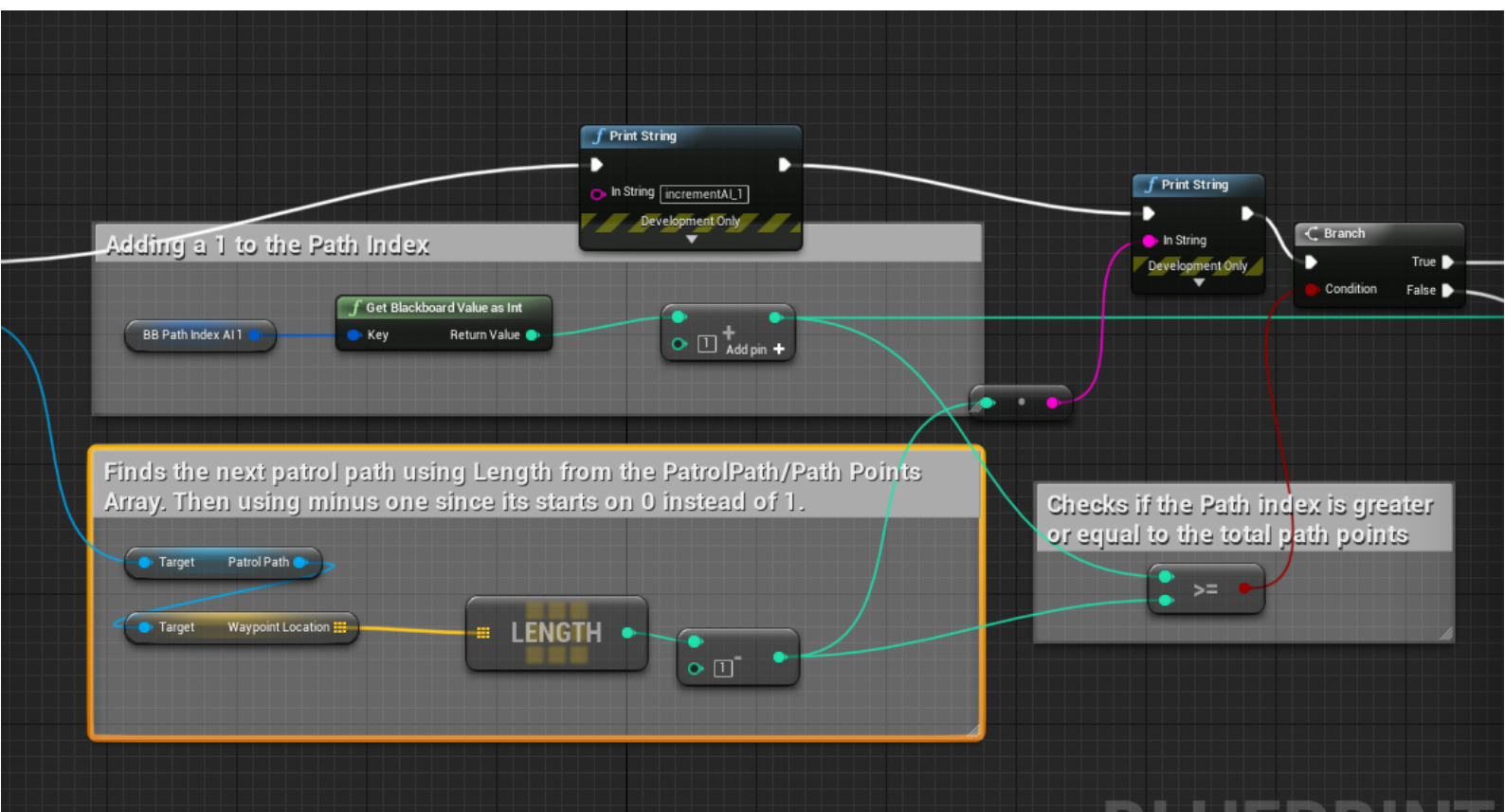
I have deleted the 2nd AI vehicle and made it as a direct child of the parent. Since last time it was a copy paste of the first AI child.

Test - failed

This proved to have the same issue as before.

Multiple AI - (Problem but Progress)

After using multiple print strings, I figured that the issue lies in the "increment" task (See figure Z1).

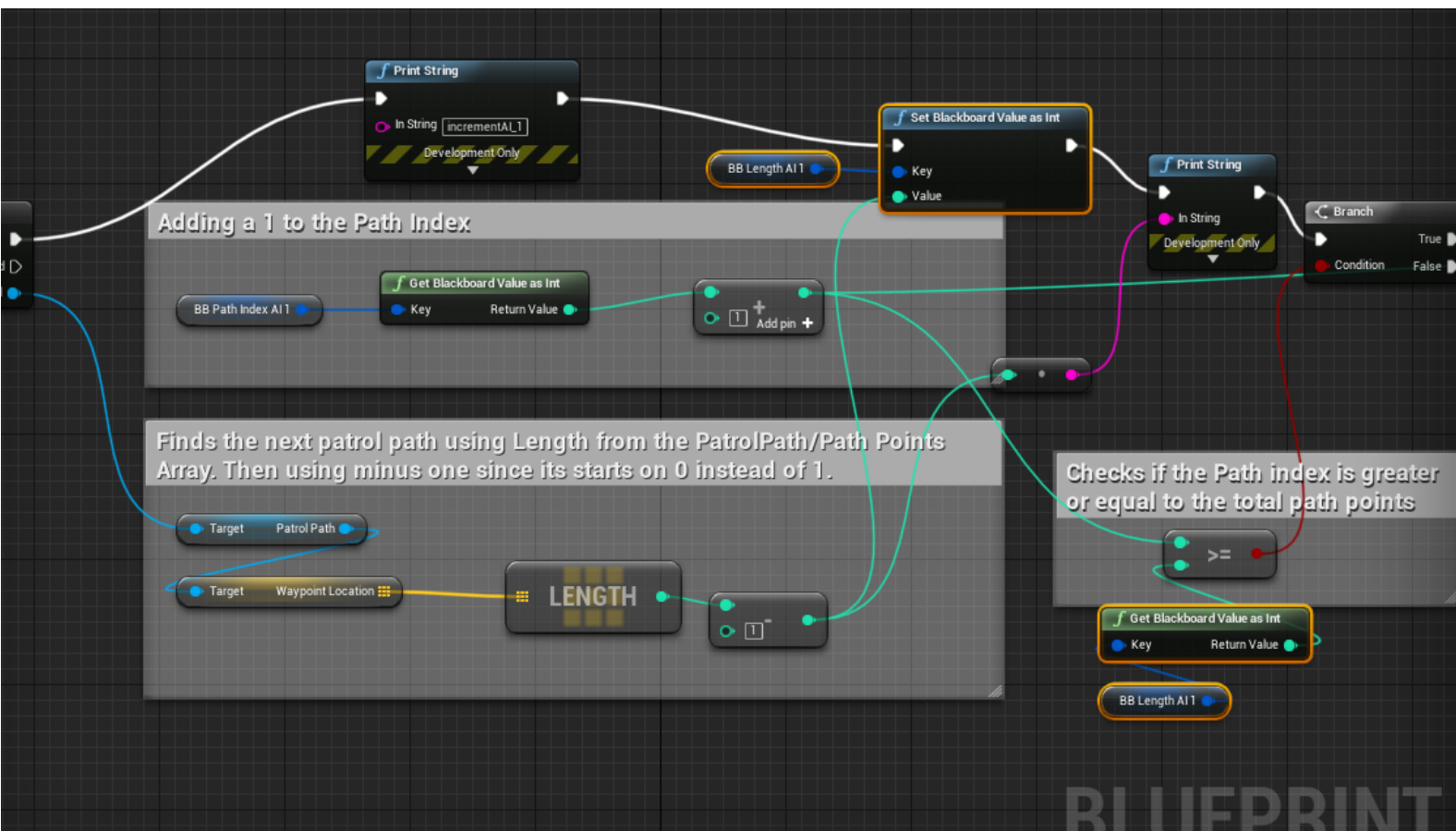


‘Figure Z1: The multiple print strings showed that the “patrol path/waypoint location length” code were both being used by the AI at the same time.’

Now I know that the length is being taken away on both AI at the same time I will need to find a way around it.

Multiple AI - (Attempt 3)

To try counteracting the previous problem I have tried to put the value of the “waypoint length” code into a variable. (See figure Z2)



‘Figure Z2: The newly added variable to hold the value’

Test - failed

The same issue still persists.

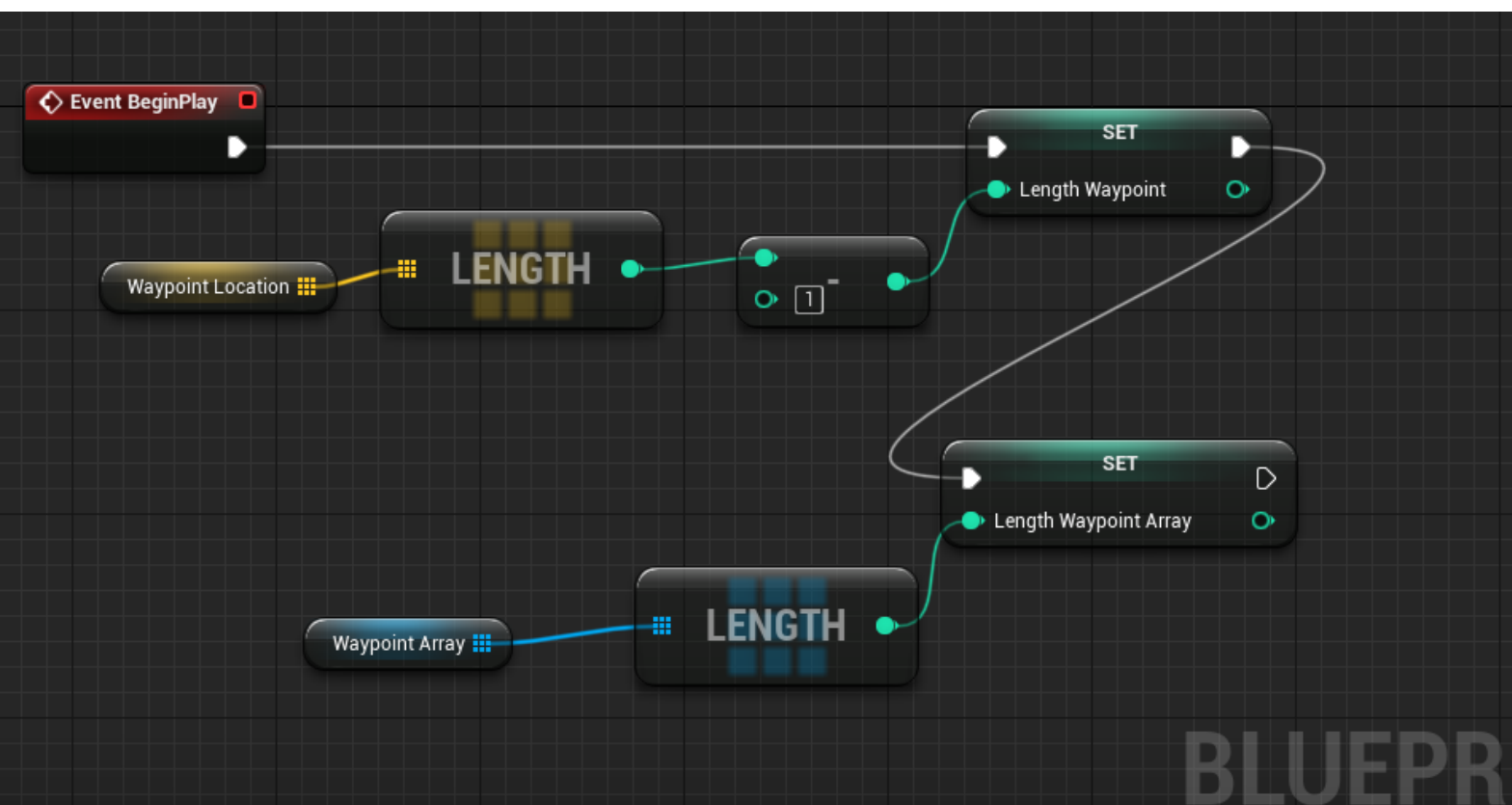
If I cannot get a fix soon, I may need to scrap AI, since the deadline is approaching fast.

10.04.2019

Multiple AI - (Attempt 4)

Since the problem yesterday was that the variables were changing for both AI, I need to find a way to delegate these variables and set them somewhere else, instead of on the fly.

So, I set the waypoint length and the waypoint array length inside of the path at the start of the game (See Figure AA1).



‘Figure AA1: The added variables at the start of the game’

Test - Success (Problem but Progress)

Both vehicles now move across the track, however it seems the path index is still being shared across the vehicles.

I need the index to be on the vehicle since it needs to change on the fly, once it gets to each waypoint.

11.04.2019

Main Menu

Today I am working on the main menu polish.

Using the assets that Nathan created for me after we planned out how the main menu will look, I started placing the models.

This means I will need to redo the level sequencers since the camera angles and transitions are going to change. (Liaret, 2019)

<https://www.youtube.com/watch?v=KHIZfy5OI08>

Using this tutorial, I want to create a neon floor for the landscape.

Unreal Crash

after working on the landscape and the material the engine crashed and I was forced to a previous save and lots of the work needs to be redone.

I need to save often in Unreal.

Post-Crash

After I had re done most of the work which thankfully was not too much, I came up with these menus (See Figure AB1/AB2 Below).



‘Figure AB1: Start menu and Level Select’



'Figure AB2: Vehicle Select'

12.04.2019

Today I have been working on the main menu. I will work on the next task of setting up the TV monitor screens to show a preview of the next level once hovered.

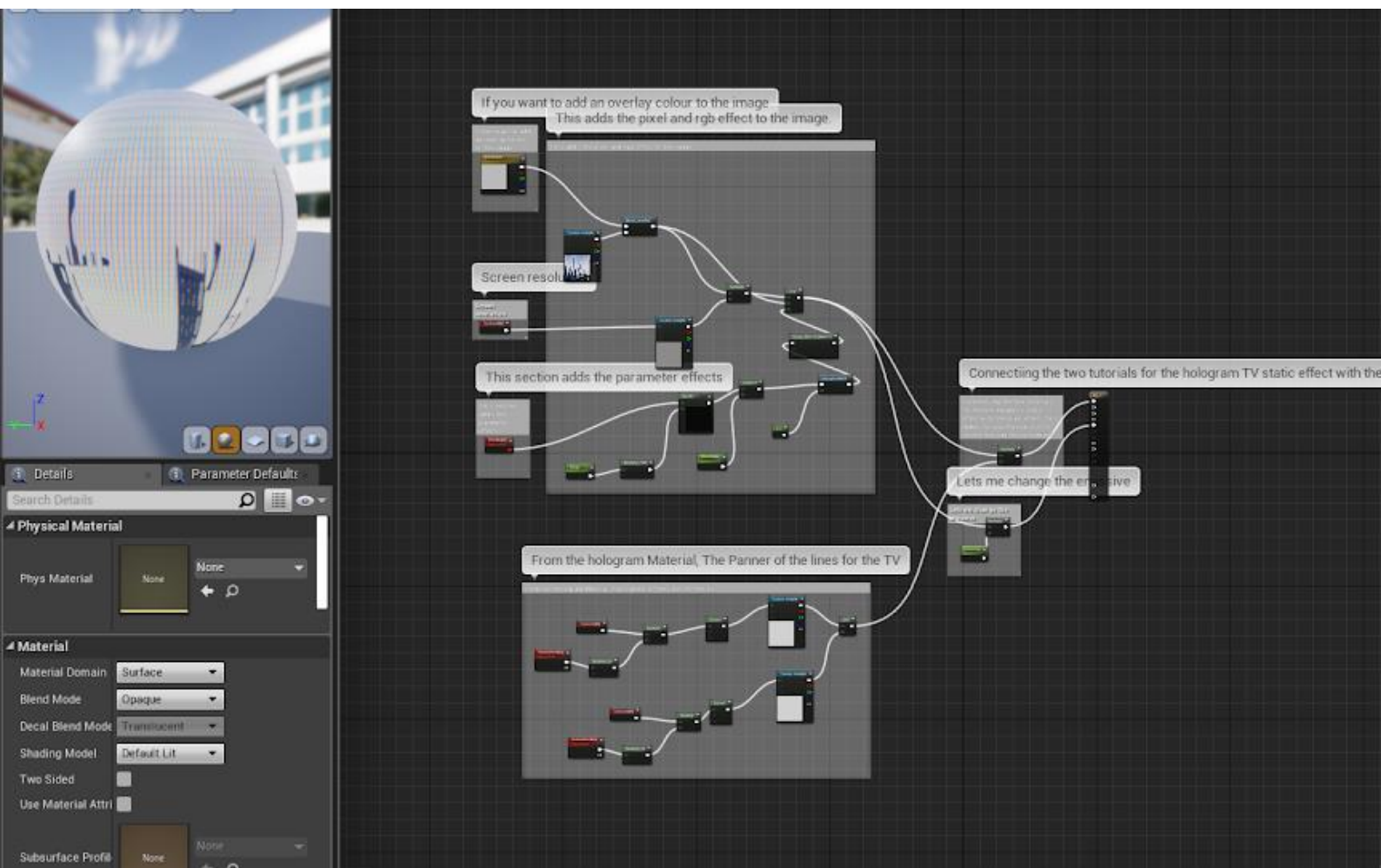
TV Screen Tutorial

I worked on a tutorial that I found that had the right material I wanted, so worked off that. (Steve's Tutorials, 2019)

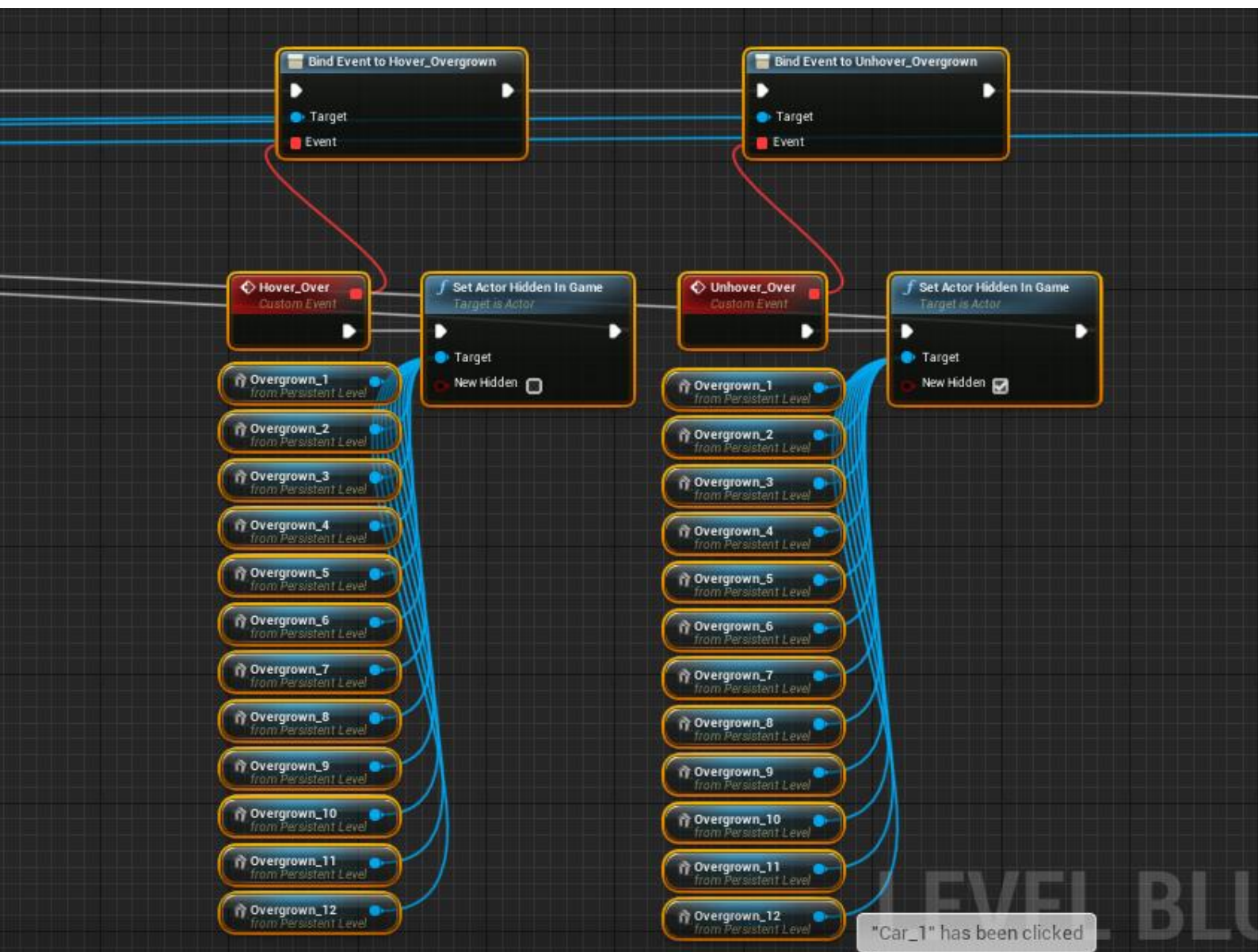
<https://www.youtube.com/watch?v=84Gx9yEKzLg>

I then multiplied the hologram from the start of last year to the TV pixel effect to make a more retro feeling TV. (See Figure AC1)

I then coded in the "Hover" and "Unhover" bits of code to show the actor. (See Figure AC2)



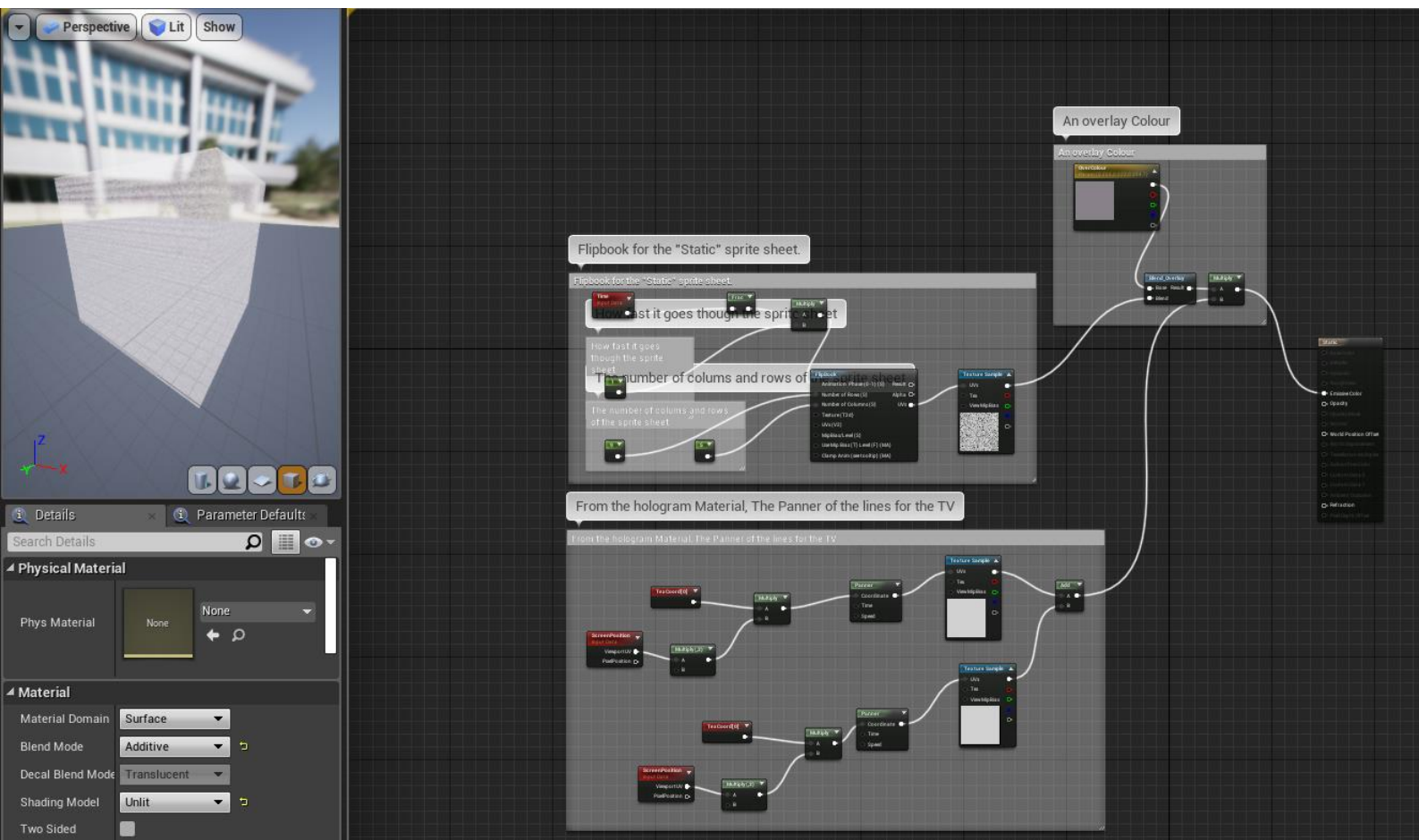
'Figure AC1: The coded material, with material instances so it can be changed on the fly in the engine'



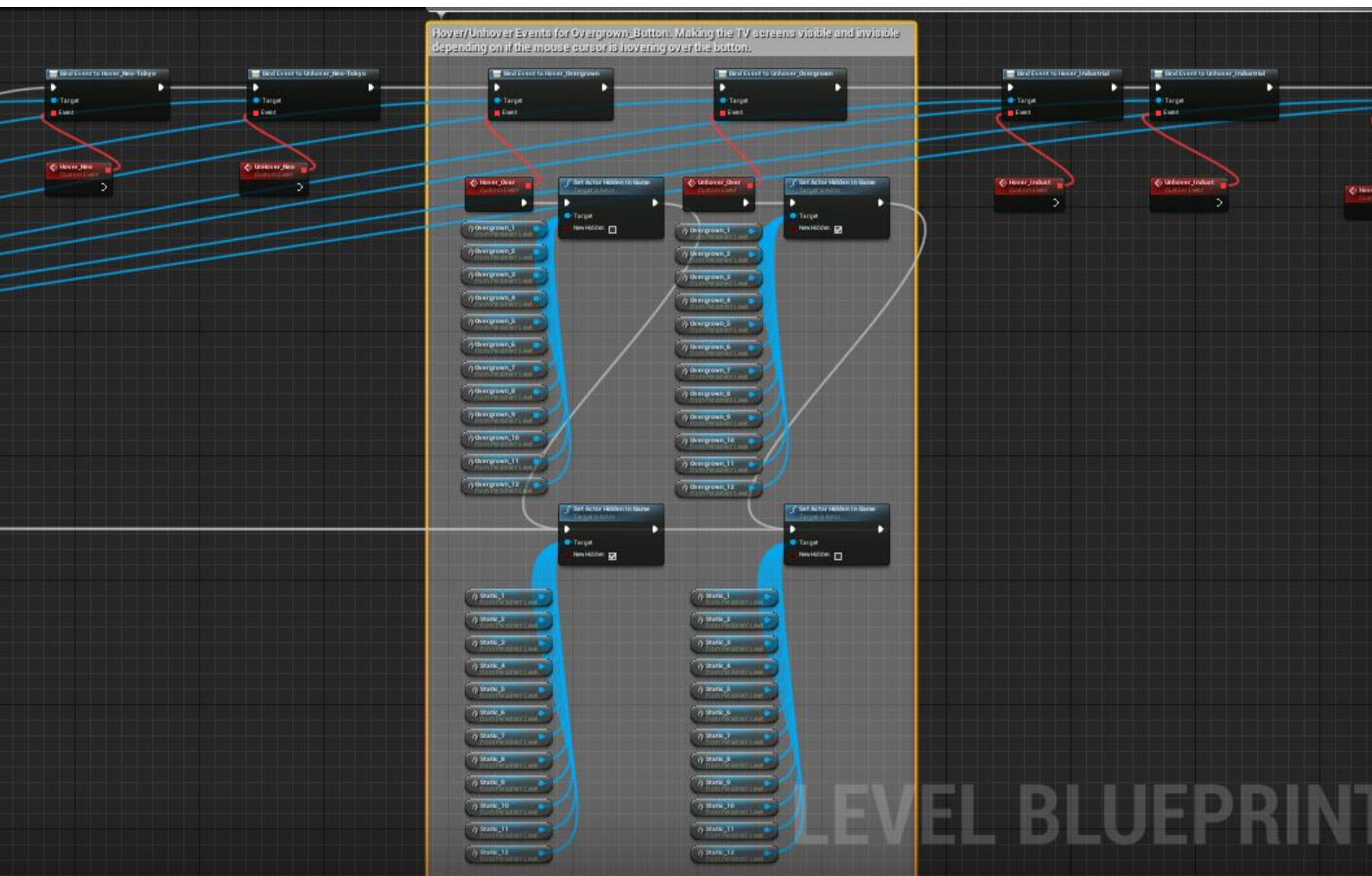
‘Figure AC2: The added event dispatcher for the hover and unhover events, so it will replace the screens with new images depending on what level is being hovered over.’

13.04.2019

Today I made a default TV static Material for the screens. (See Figure AD1/AD2)



'Figure AD1: TV Static Material with an overlay colour and panner lines from other materials.'



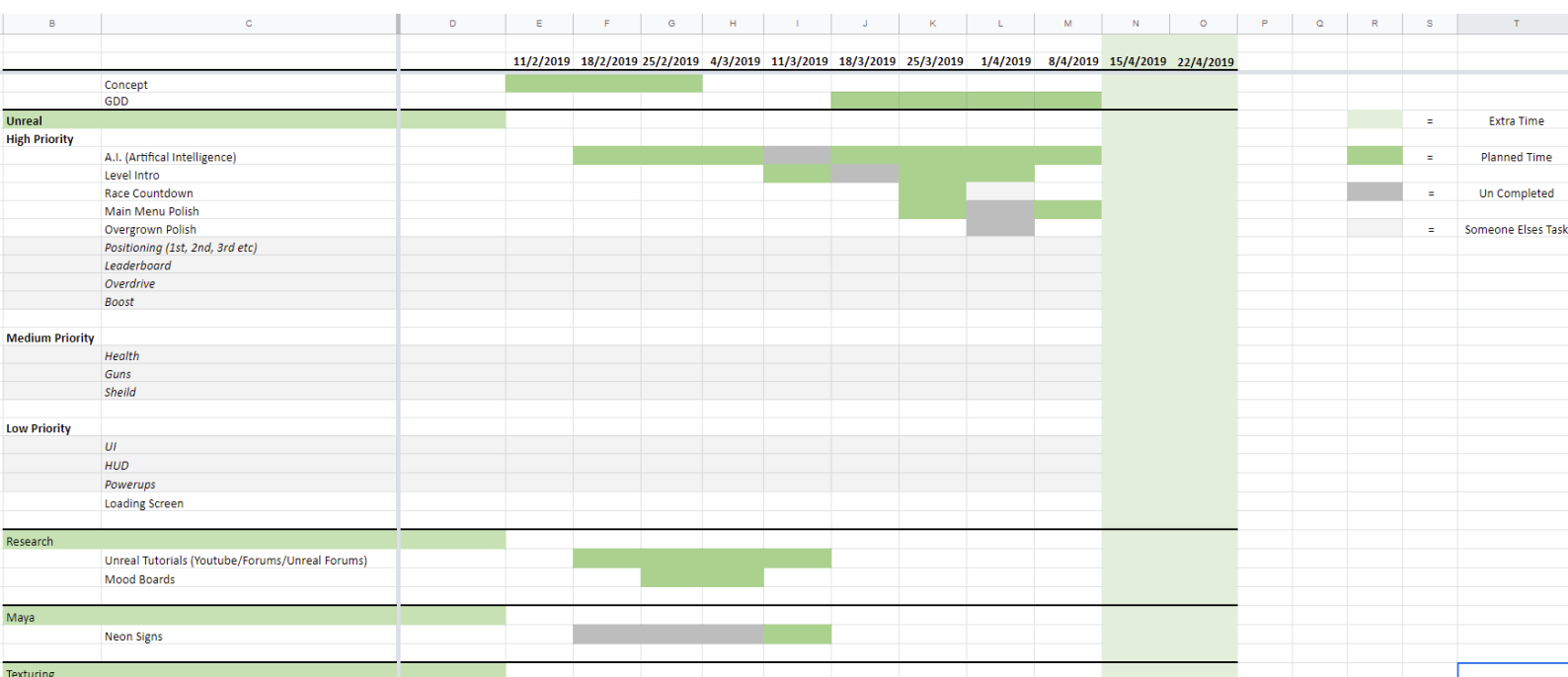
'Figure AD2: Added code to level blueprint, to turn the visibility off and on'

I will add in the other buttons at a later date since the levels are not complete yet.

15.04.2019

Gantt Chart 15.04.19

Reviewing my Gantt Chart from last week, from what I have completed I will have to go into my extra weeks to complete the AI and the Overgrown Level Polish. Aside from these tasks I do not think I will much to do. I am hoping that both tasks will be complete this week.



'This shows what was completed last week'

B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
			11/2/2019	18/2/2019	25/2/2019	4/3/2019	11/3/2019	18/3/2019	25/3/2019	1/4/2019	8/4/2019	15/4/2019	22/4/2019					
	Concept																	
	GDD																	
Unreal																		
High Priority																	=	Extra Time
	A.I. (Artificial Intelligence)																=	Planned Time
	Level Intro																=	Un Completed
	Race Countdown																=	Someone Elses Task
	Main Menu Polish																	
	Overgrown Polish																	
	Positioning (1st, 2nd, 3rd etc)																	
	Leaderboard																	
	Overdrive																	
	Boost																	
Medium Priority																		
	Health																	
	Guns																	
	Sheild																	
Low Priority																		
	UI																	
	HUD																	
	Powerups																	
	Loading Screen																	
Research																		
	Unreal Tutorials (Youtube/Forums/Unreal Forums)																	
	Mood Boards																	
Maya																		
	Neon Signs																	
Texturing																		

‘This shows what was planned for last week’

B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
			11/2/2019	18/2/2019	25/2/2019	4/3/2019	11/3/2019	18/3/2019	25/3/2019	1/4/2019	8/4/2019	15/4/2019	22/4/2019					
	Concept																	
	GDD																	
Unreal																		
High Priority																	=	Extra Time
	A.I. (Artificial Intelligence)																=	Planned Time
	Level Intro																=	Un Completed
	Race Countdown																=	Someone Elses Task
	Main Menu Polish																=	
	Overgrown Polish																=	
	Positioning (1st, 2nd, 3rd etc)																=	
	Leaderboard																=	
	Overdrive																=	
	Boost																=	
Medium Priority																		
	Health																	
	Guns																	
	Shield																	
Low Priority																		
	UI																	
	HUD																	
	Powerups																	
	Loading Screen																	
Research																		
	Unreal Tutorials (Youtube/Forums/Unreal Forums)																	
	Mood Boards																	
Maya																		
	Neon Signs																	
Texturing																		

‘This is the new plan for this week’

The main menu needs some minor changes mostly textures, the overgrown level still needs to be started and multiple AI will need to completed this week.

Multiple AI - (Attempt 5)

Current AI Analysis

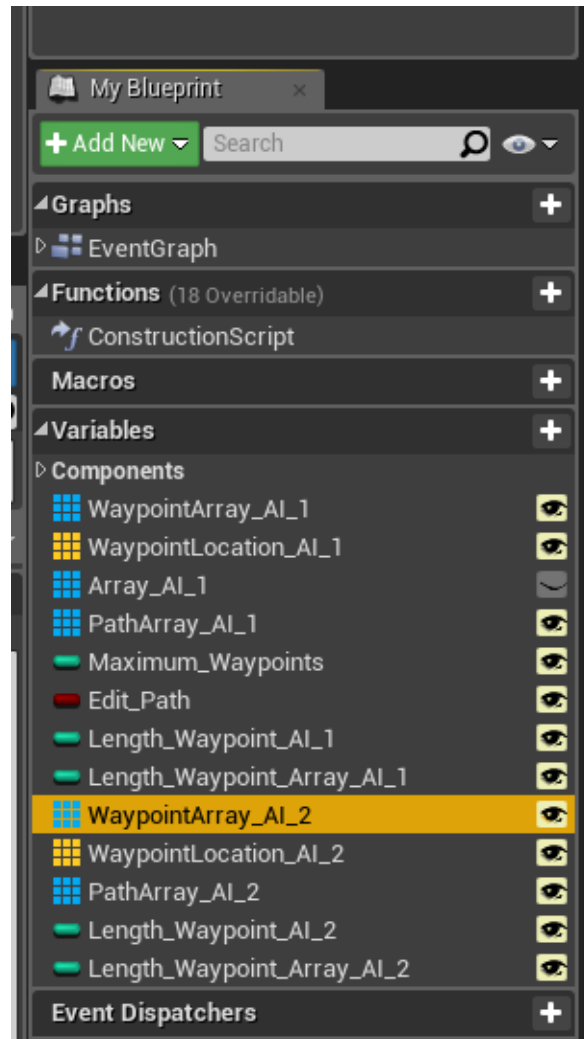
Today I am going to re attempt the multiple AI after having a break from it the last few days.

There were two methods I came up with to try fix the AI.

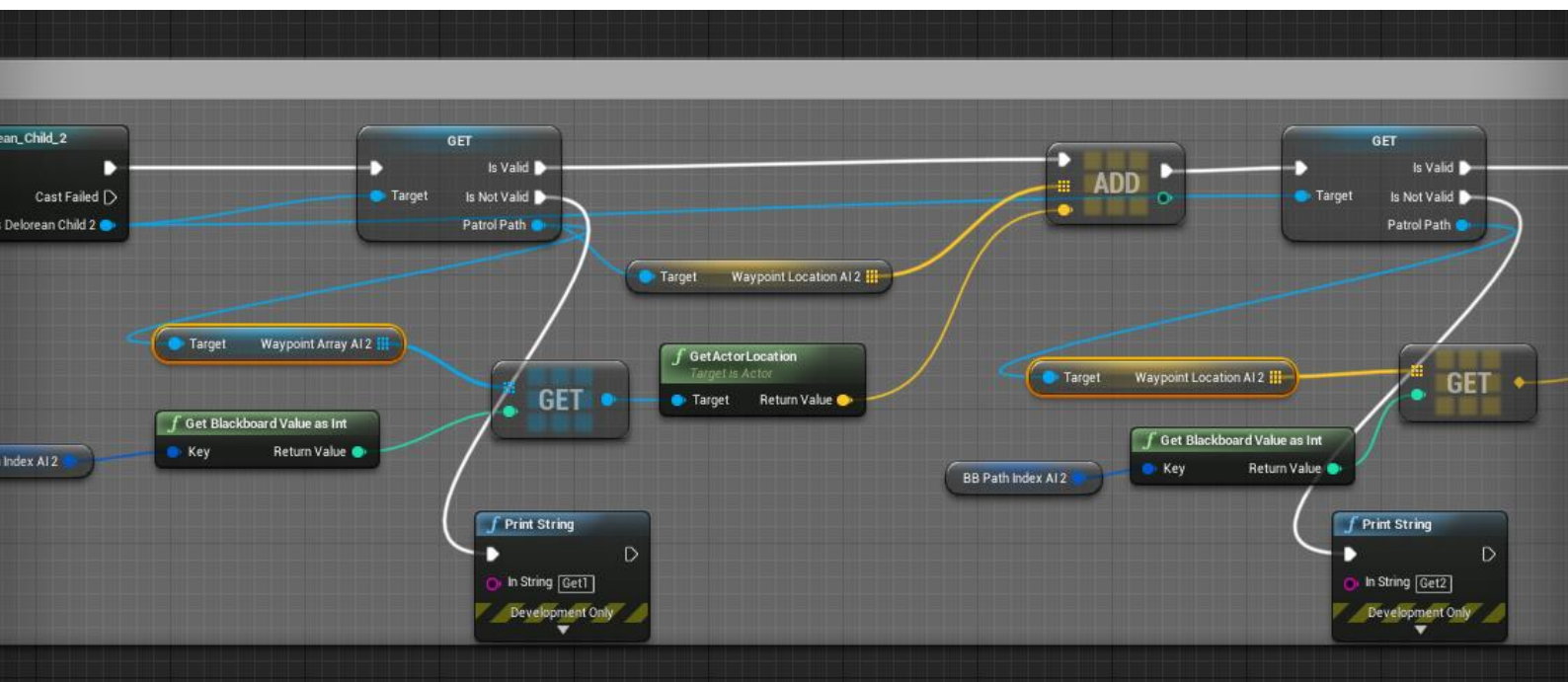
1- Going into the patrol path and duplicating all the variables inside of it for every AI. Then setting it up the tasks with correct variables respectively. (Most Tedious)

2- Last resort. Duplicating the waypoints for every AI. This one is the most fragile method since I am still not sure how taxing it will be on the game to have hundreds of waypoints set for every single AI. (Least tedious).

So, my plan is to start with the first method and hopefully see if this works out (See figures AE1/AE2)



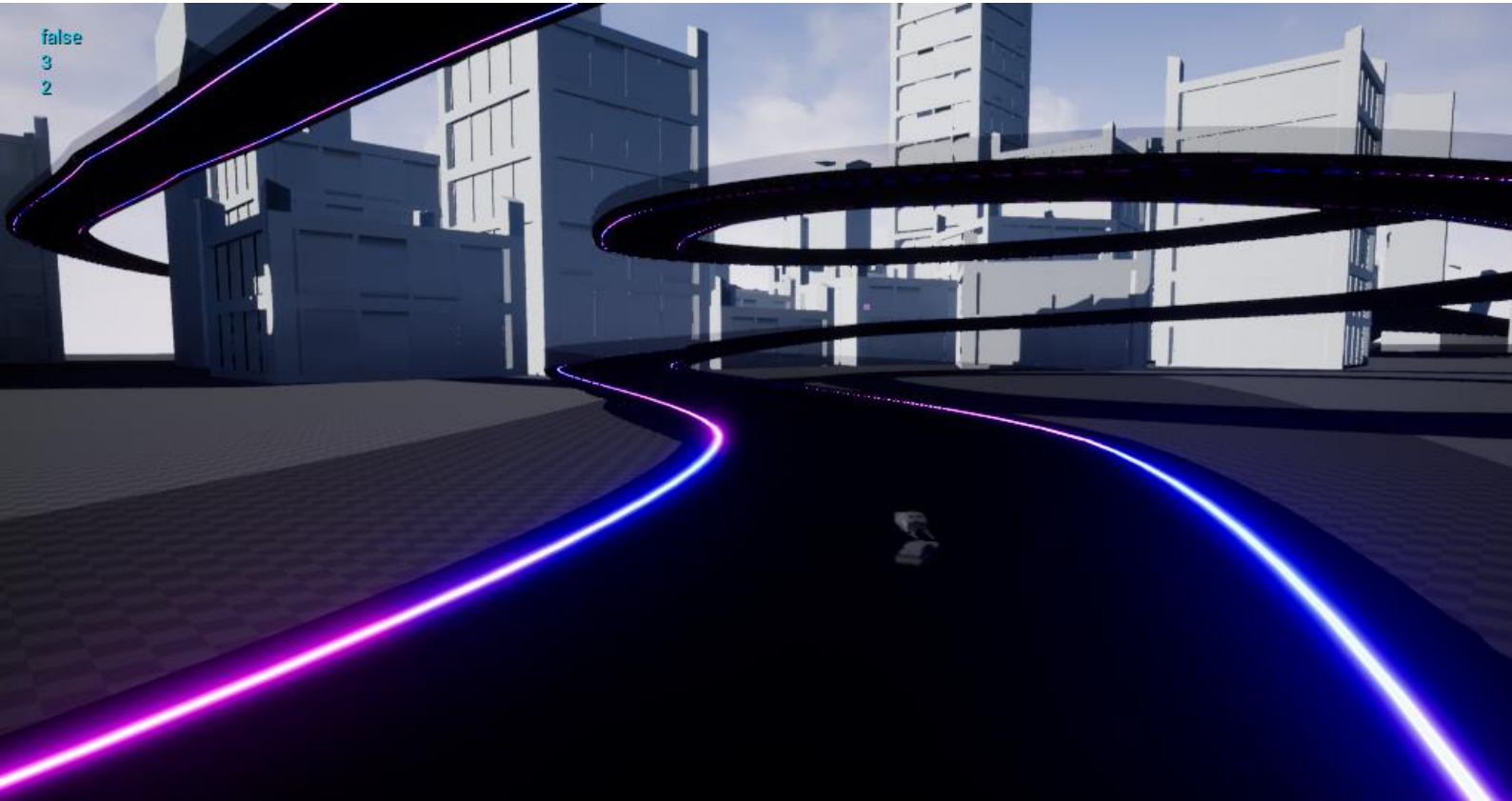
‘Figure AE1: duplicating the variables for a second AI in the patrol path.’



‘Figure AE2: Changing the variables in the blackboard task appropriately.’

Test- Success (EUREKA)

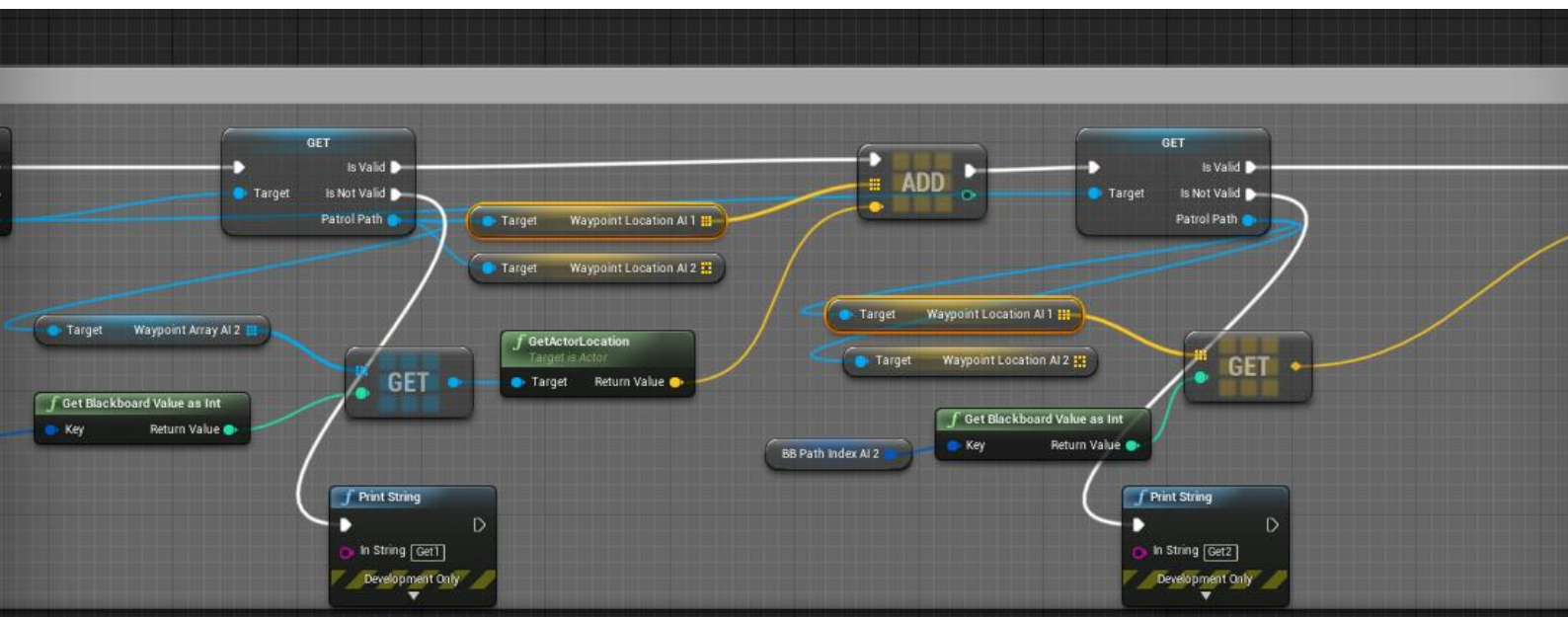
It worked, both AI follow their own paths and do not change each other's index. (See Figure AE3)



‘Figure AE3: Both AI working without issue’

Now I know it works I am going to delete some of the variables until I find the source of the problem.

I found out that the (Waypoint_Location_AI_1) set for both vehicles makes them go back on themselves. (See figure AE4)



‘Figure AE4: Replacing the variables’

I can now delete the second Waypoint array since it is not needed, and all the AI can read from the same one without issue.

16.04.2019

AI_Speeds

I spent a part of today testing the speeds for the AI, for my own track.

Since I do not have the boost on the vehicle that I am testing they will need to be altered at some point.

(MS = Max Speed)

#1

MS - 5000

#2

MS - 4700

#3

MS - 4500

#4

MS - 4400

#5

MS - 4400

#6

MS - 4200

#7

MS - 3900

#8

MS - 3500

I need to set up AI for each level and change how many spawns based on what level was chosen.

If the player hits "Play All" I want them to play the campaign, have 9 players reduced to 6 then 3 on each race.

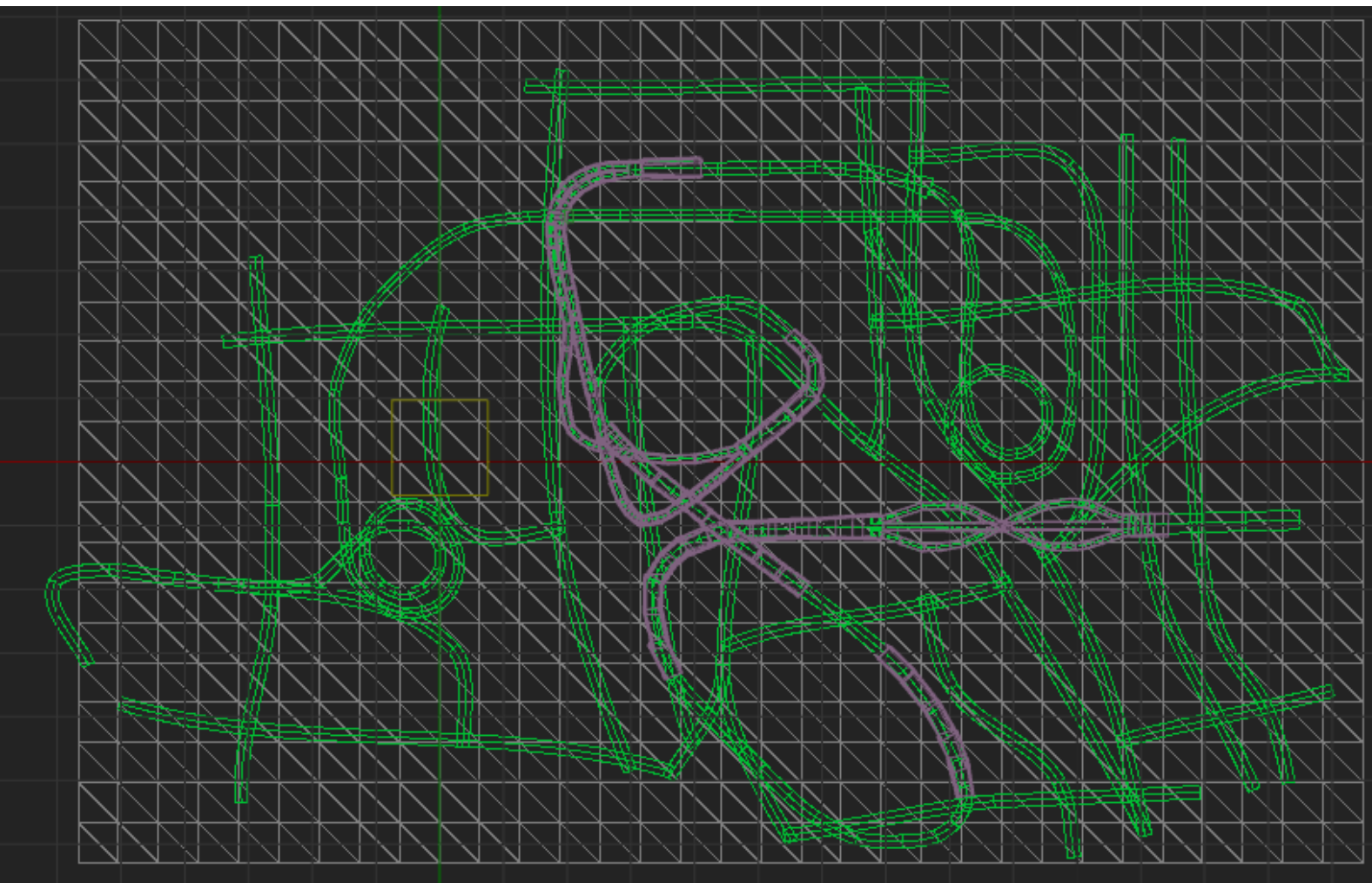
If the player just wants to play a single map, 6 will spawn instead.

23.04.2019

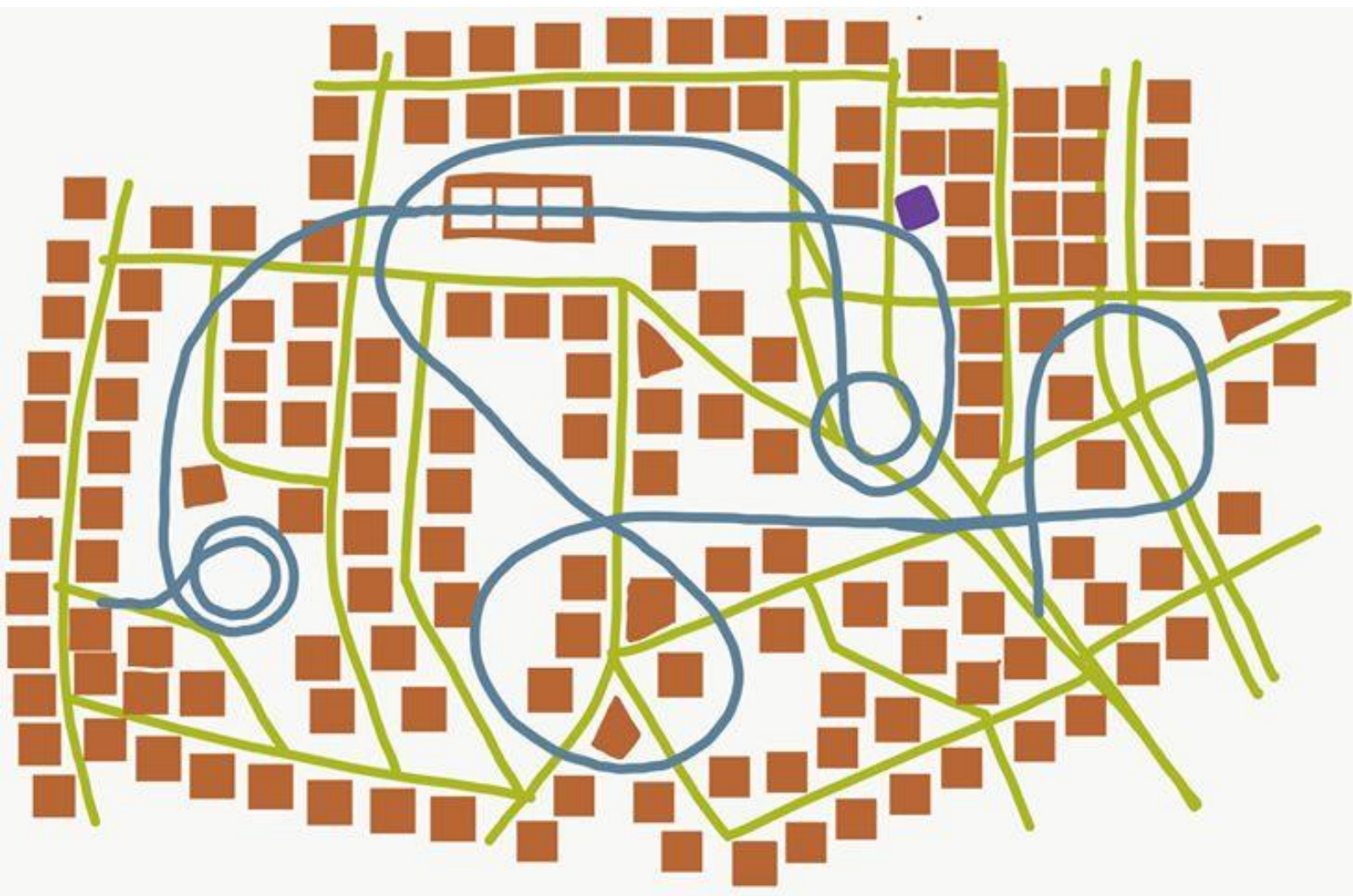
Overgrown Level Polish - Tracks

Today I worked on the polishing of the Overgrown Level

I added in the new track for Overgrown. (See figures AF1/AF2 below to see comparison between my track and Joe's concept.)



‘Figure AF1: Showing a top down of my map’

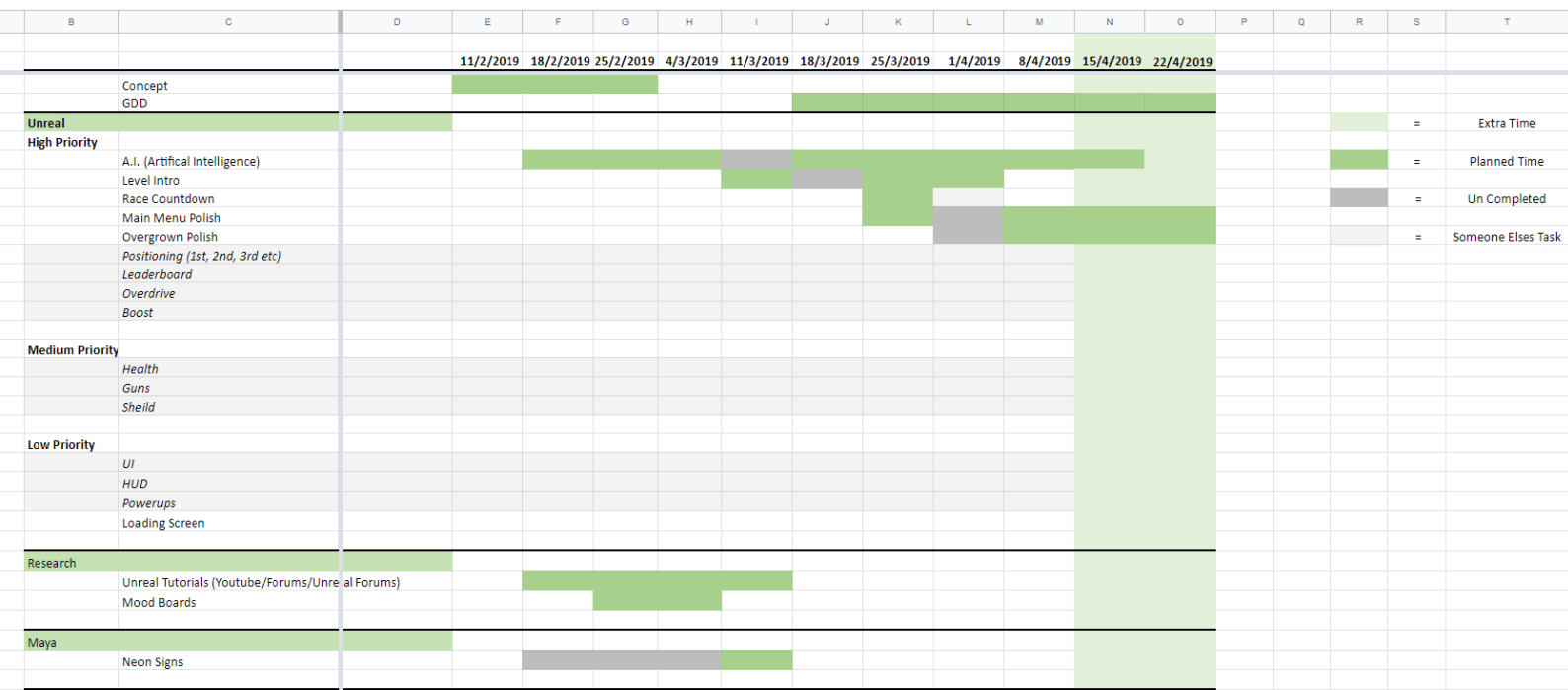


‘Figure AF2: Showing Joe’s concept for the track’

I have altered the track slightly and moving the very last loop (from the right side) to the centre.

Gantt Chart 22.04.2019

I am up to my last extra week of time that I had allocated at the start. I believe I can finish the level by this week, and I should have completed the Game Design Document.

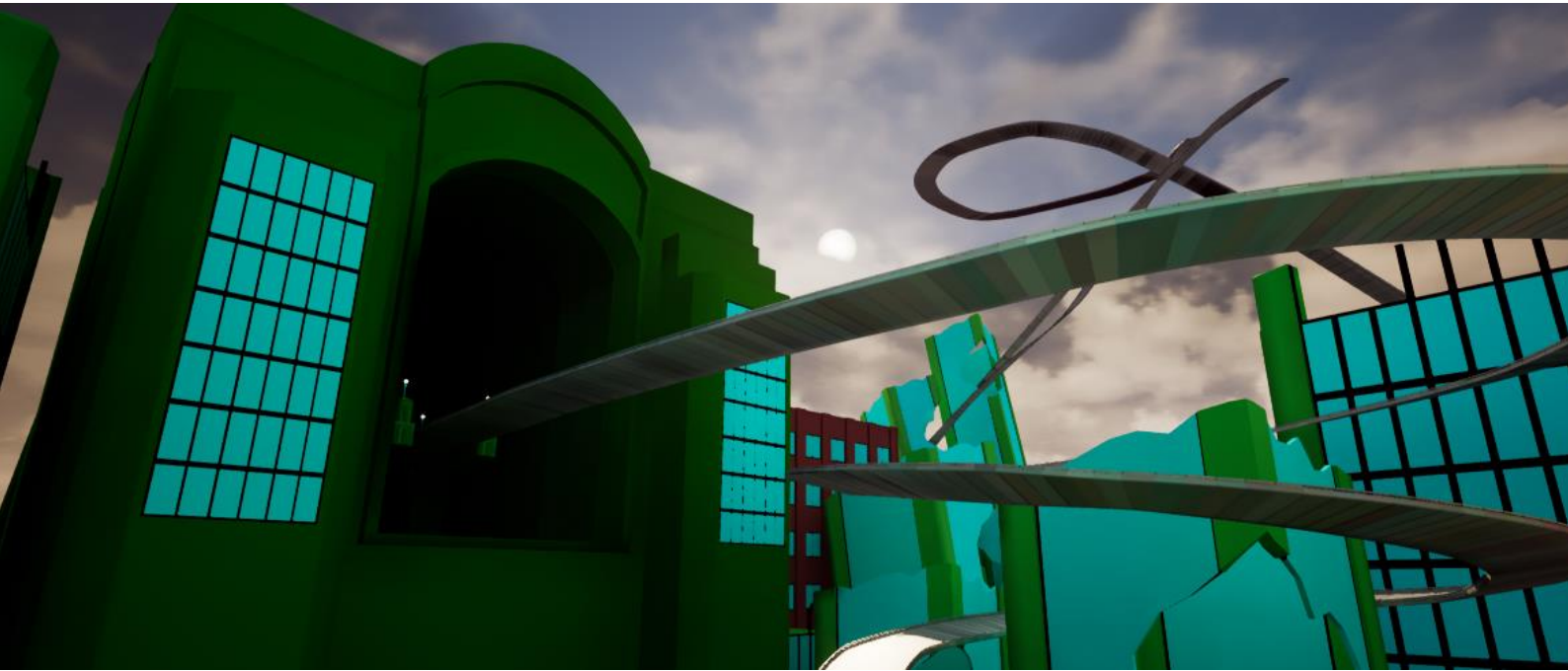


‘new plan for this week, I need to extend the tasks that I set myself for completion last week’

25.04.2019

Overgrown Level Polish - Buildings/lighting

Today I worked on lighting the Overgrown level and adding in buildings. (See figure AG1)



‘Figure AG1: Buildings added, and lighting introduced in the scene.’

I also introduced some of the environmental props to the scene like the lights and road pillars.

I added in the new models and most were out of scale, I will need to contact Gareth or one of the team members to replace it.

30.04.2019

Merge (HUGE PROBLEM)

Today I attempted to merge my current AI project with the other Unreal Engine artists projects. However, there was a problem with different versions of the Unreal Engine.

I spent the day attempting to recreate the A.I in 4.21, but to no avail. If I do not have a fix to this problem, the AI I worked on for the entire semester will be for nothing.

I have also gone over my two weeks of extra time that I had planned for problems like this in my Gantt Chart.

01.05.2019

Merge (Another Problem)

I realised another problem with the project, the game does not export with the working menu. So, the 3D menu widgets do not work again.

Almost all the work I spent doing this semester will be for nothing. I am under the impression that with other modules due in the coming weeks I may not have time to work on AI for a fix. I will need to inform the rest of the unreal team.

I will attempt to recreate what's left of my level so it can be added into the final game, but there will be no A.I in the coming exhibition project.

Conclusion

Despite the last problems I have faced with merging the working AI file to the new engine. I believe I have learnt a lot from my mistakes this semester as to not ever make the same ones again in future projects.

My project management has fallen short this semester and could have prevented the problems I faced in the last weeks of the term. Despite thinking I had a solid time management throughout the semester using the Gantt Charts, I still went over the limit of time I allocated myself and I will need to take this into consideration next time.

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