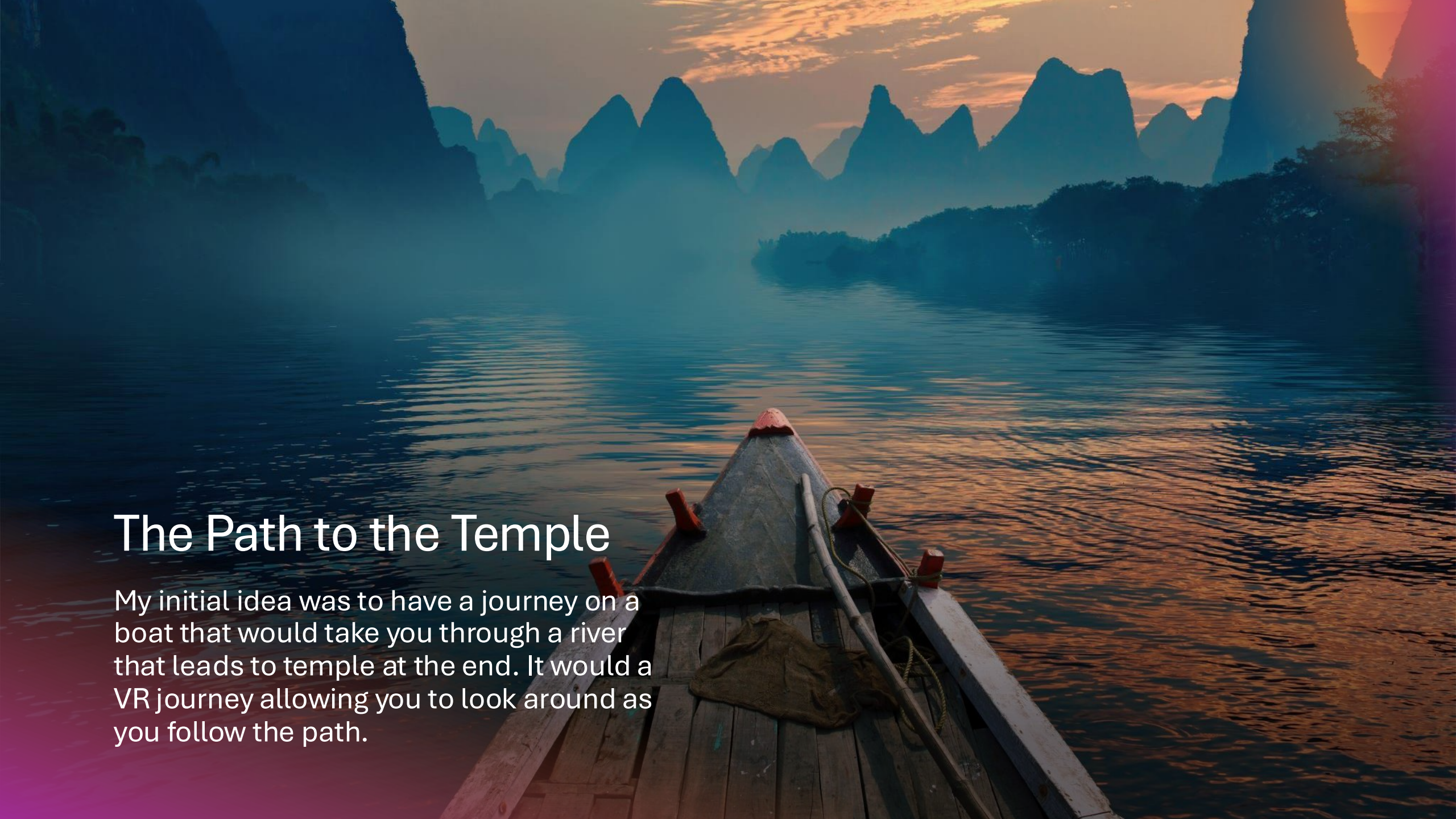




Immersive Worlds

Luke Penhalagan

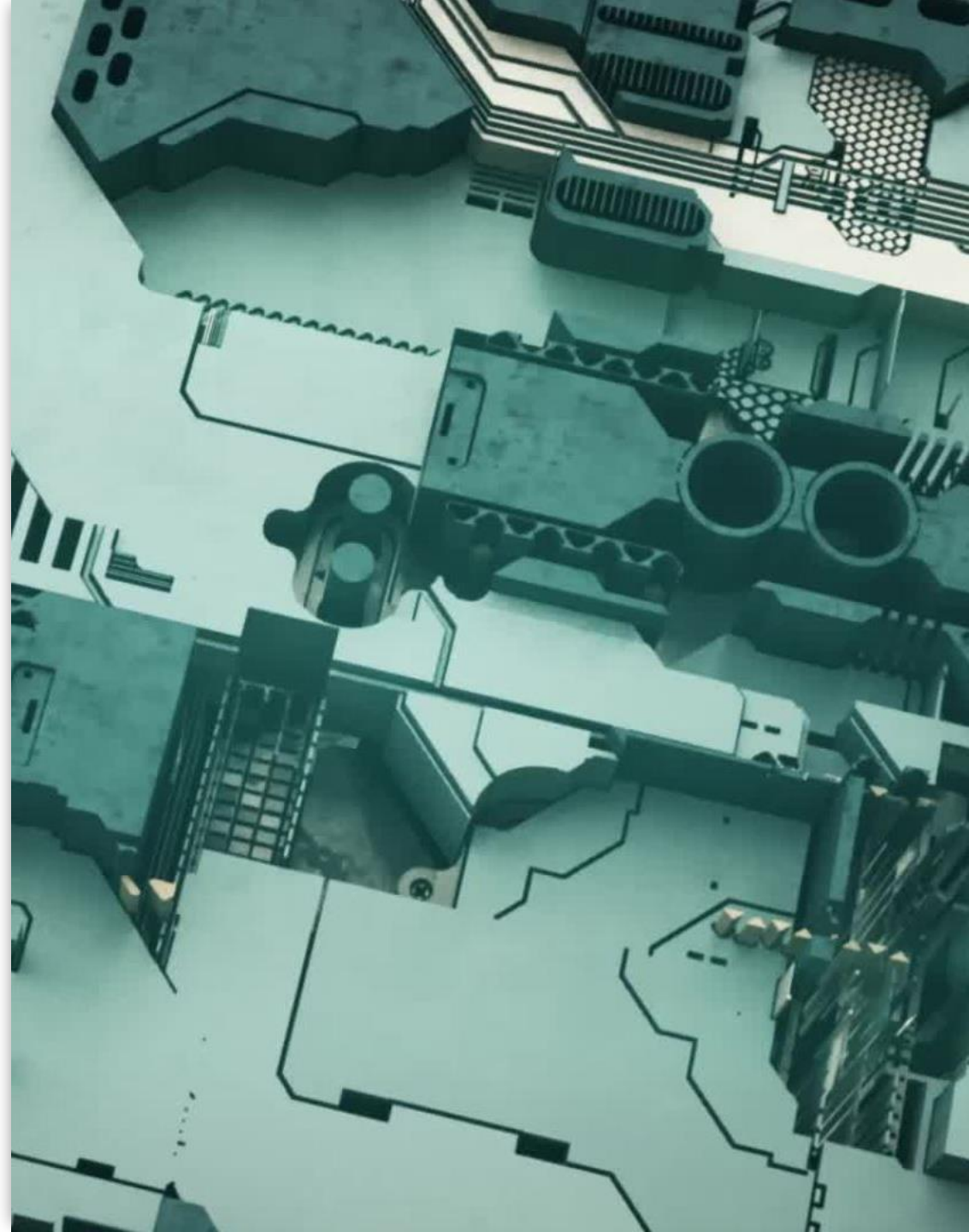


The Path to the Temple

My initial idea was to have a journey on a boat that would take you through a river that leads to temple at the end. It would a VR journey allowing you to look around as you follow the path.

Virtual Production Within Unreal Engine 5

- As I didn't have access to VR set, I had to pivot the idea slightly.
- I looked if I could use a phone or IPAD as an alternative but the closest to this I could find was using my device to control a Virtual camera within Unreal Engine.



Making the scene

- Before applying the virtual camera, I needed to build the environment.
- I utilized a couple coastal environment packs to make the cliffs and terrain
- Used the inbuilt water system to make the river
- Finally, used another model pack for the temple entrance



Setting up the Vcam



Before adding a Vcam to the scene there were a few plugins I had to add to the project.



Virtual Camera, the main plugin needed to add a Vcam.



Remote session, allows devices to connect and stream the viewport.



Take recorder, allows you to record the Vcam footage.

Setting up the Vcam

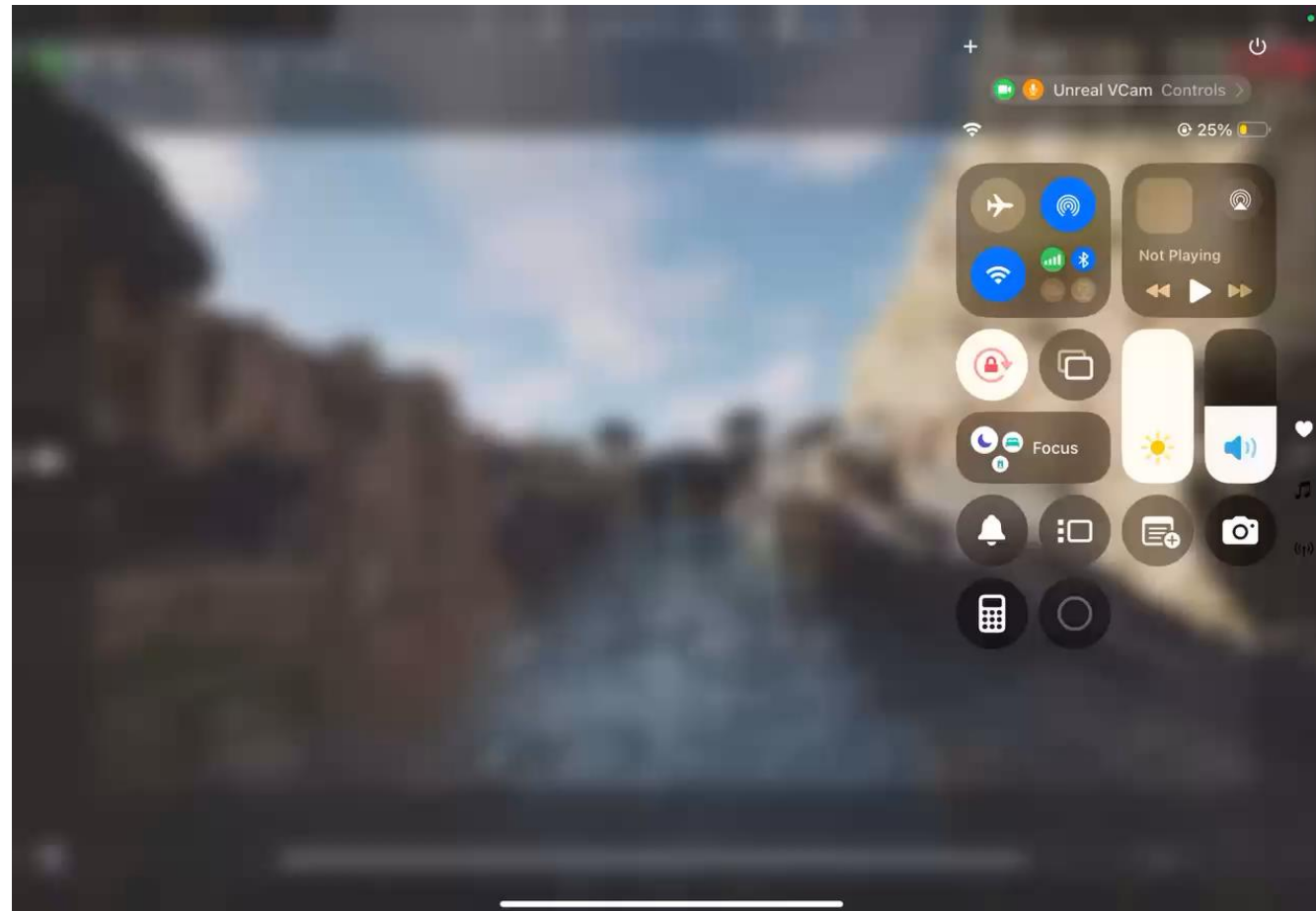


Once the plug-ins were added, I simply needed to restart the program to activate them.



When the Vcam was placed into the level, I then took note of the Ip address which was needed to access the project on my IPAD.

How it looks on the IPAD





Test Run

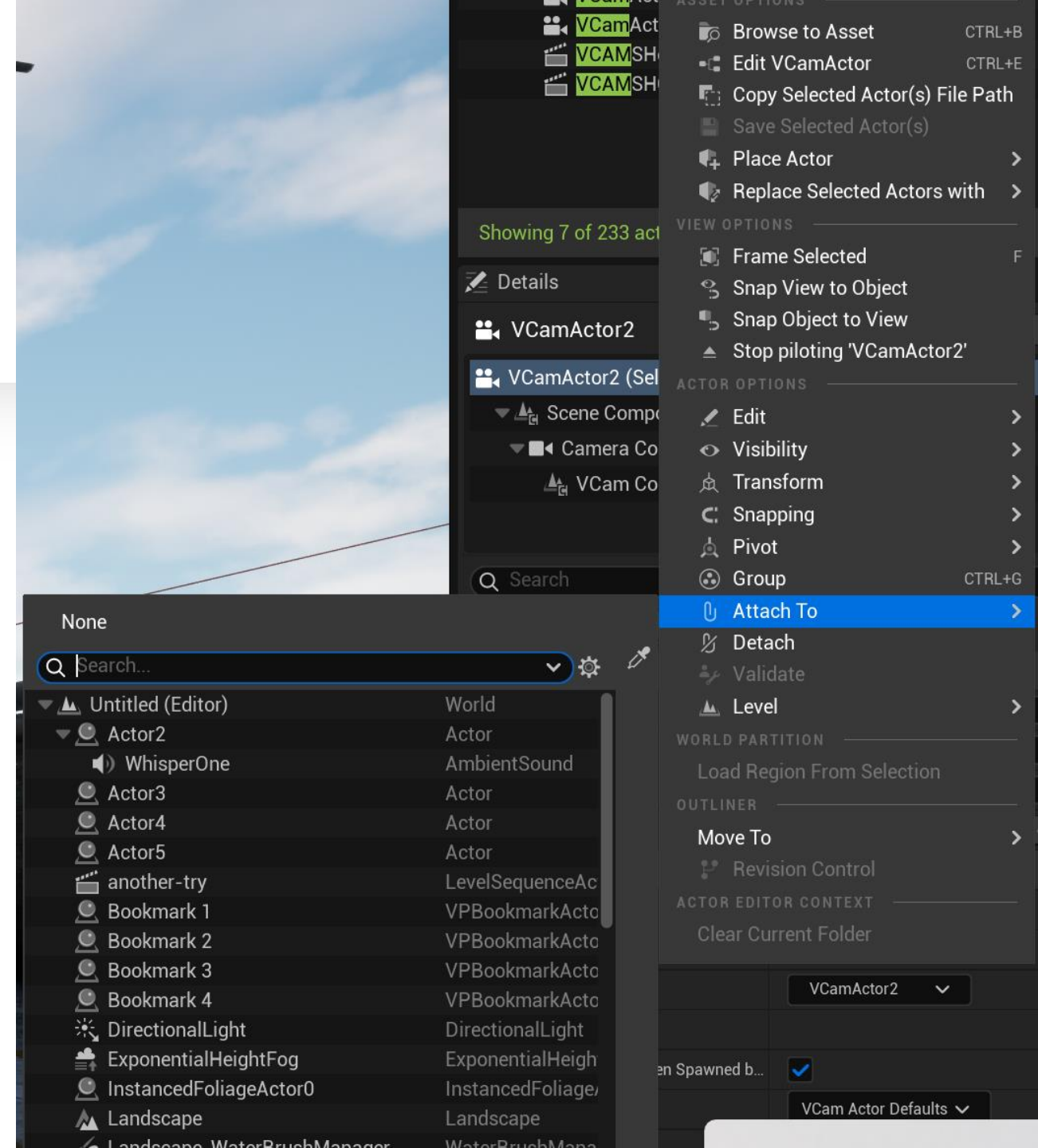
First Person Perspective

- I wanted the experience to be more immersive so elected to mimic a first-person perspective with the Vcam.
- The first step was to attach the camera to the boat, in a position that mimics a sitting down perspective.

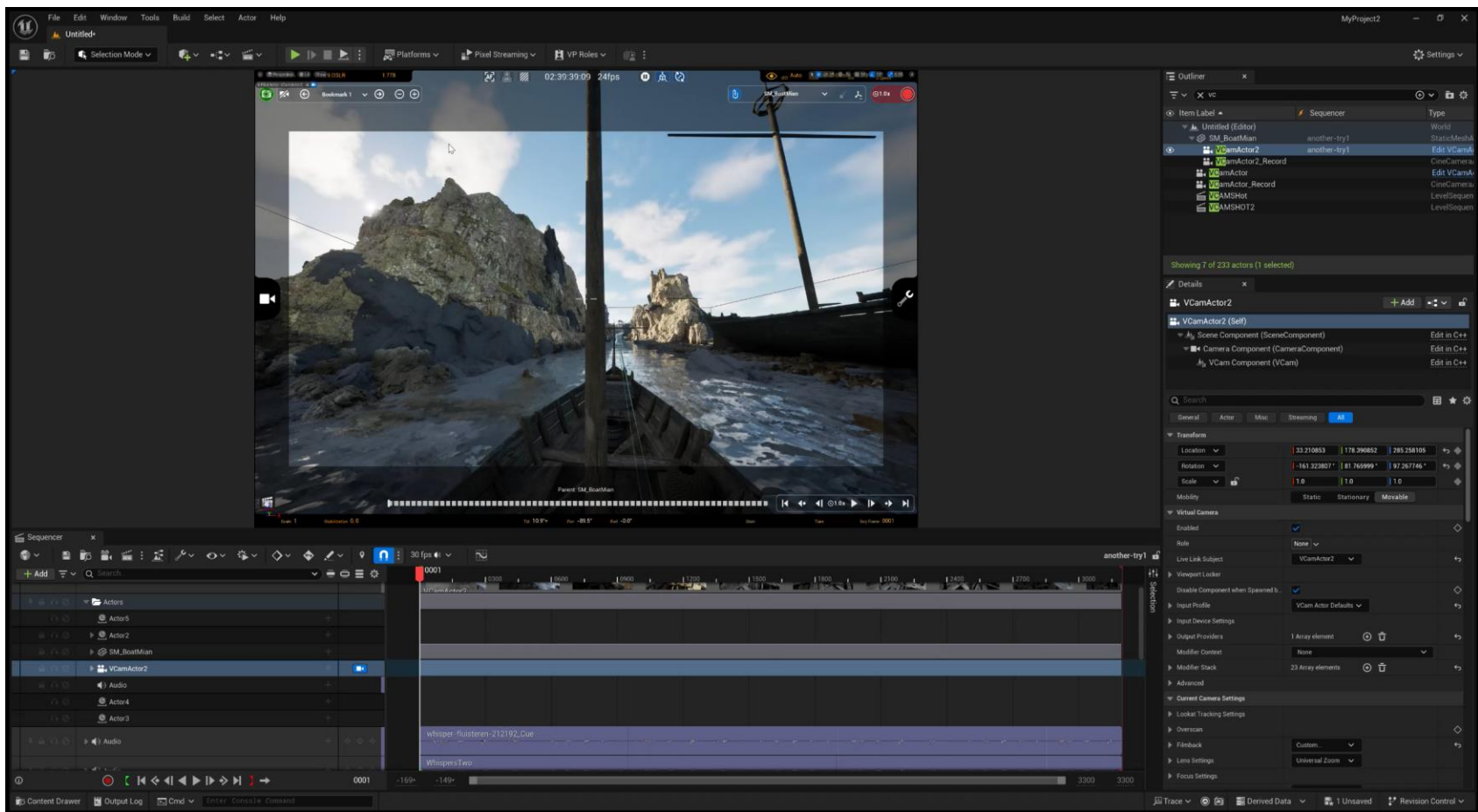


First Person Perspective

- I needed the Vcam to follow the boat in the exact position whilst still enabling me to look around the environment as I pass through.
- To do this, I simply right clicked the Vcam in the outliner and attached it to the boat in the dropdown menu.
- This meant that when I moved the boat the camera followed.

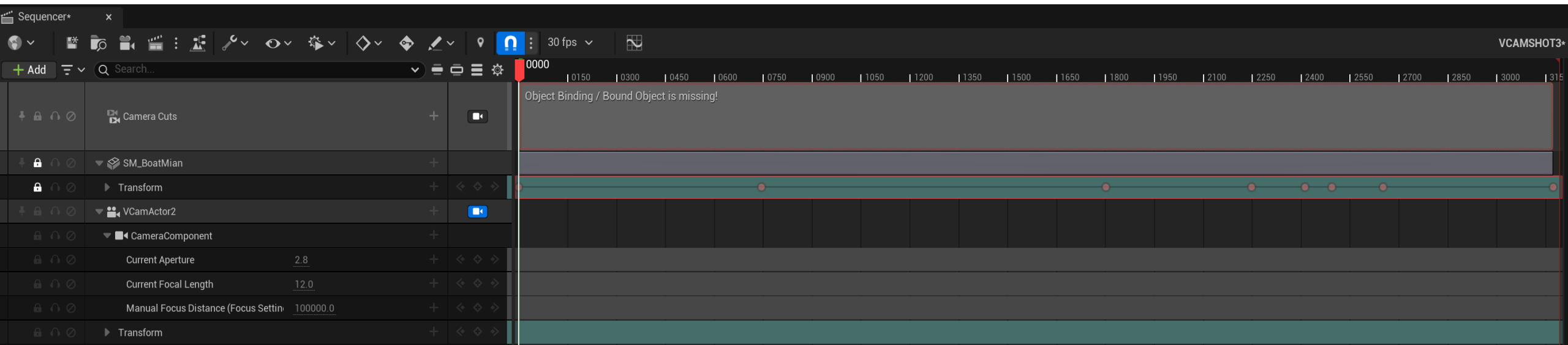


How it looks



Animating The Boat

- I animated the boat within a level sequence animator, by key framing it in the certain places along the river. Taking into account the angle of the boat when turning and moving upwards.



First Problem Faced



In my first attempt at filming the journey to the temple, I faced my first real problem.



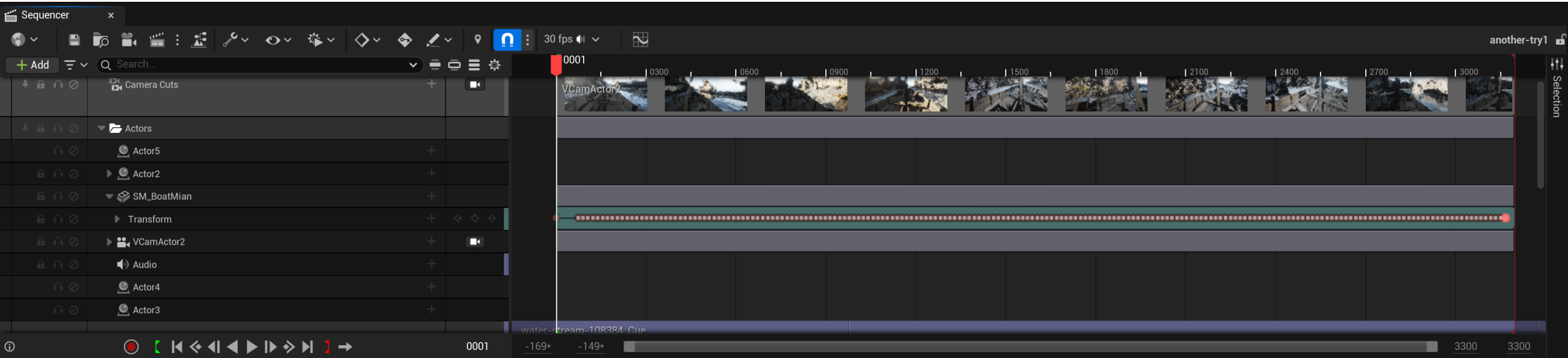
When I started the record in the take recorder, the boat wouldn't move along the path I animated.

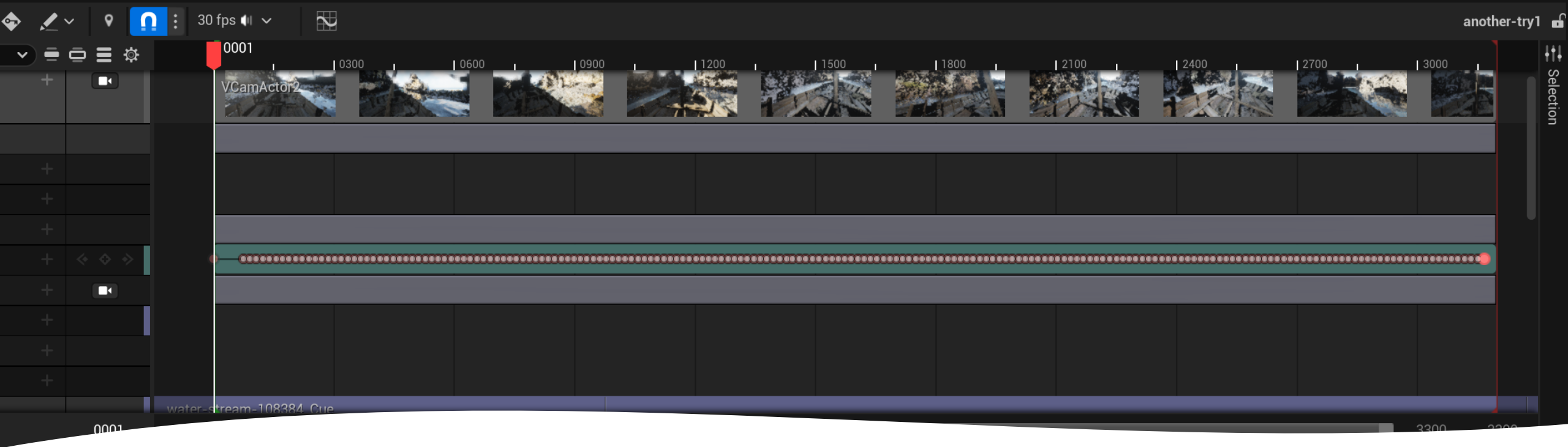


Instead, it would remain still whilst the Vcam would be allowed to look around.

The Solution

- I did some research and found the best way to fix this was to bake the boats animation in a separate level sequence.
- I would then bring that level sequence into a new sequence, which would "bake" the boats animation.
- Doing this meant that the take recorder would ignore the boat and simply play its animation.





First Successful Take

- After that fix, I could film my first take.
- I played the sequence, started the record, and then began to film the surrounding environment, with my IPAD, as it moved along the river.
- Once the record was finished, the camera movements were saved at the top of the sequence editor, allowing me to make alterations to the environment without affecting the camera movements.

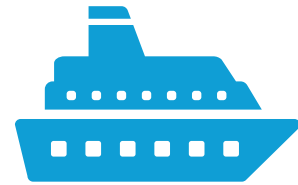
Adding 3-Dimensional Sounds



Once the record and environment was set, I needed to add sound effects to the scene.



As the main goal of this assignment is immersion, having 3D sounds is very necessary.

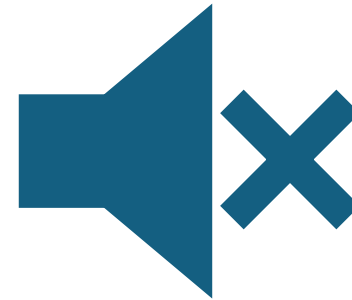


The idea being that sounds would fade in and out depending on where the boat is on the path.

Water Sounds



The first sound I placed was a water sound, that mimicked the boat breaking through the river and waves.



I found a free sound online, brought it into Unreal Engine and converted it into a sound cue.

Volume Multiplier 0.904667

Pitch Multiplier 1.0

Class  SFX  

▼ Attenuation

Override Attenuation ☐

Attenuation Settings None None  

▼ Memory

Prime on Load ☐

Disable Random Branch Culling ☐

▼ Effects

▼ Source

Enable Bus Sends ☒

Source Effect Chain None None  

Post-Effect Bus Sends 0 Array element  

Pre-Effect Bus Sends 0 Array element  

▼ Submix

Enable Base Submix ☒

Base Submix None None  

Enable Submix Sends ☒

Submix Sends 0 Array element  

▼ Voice Management

Virtualization Mode Restart ▼

▼ Priority

Subtitle Priority 10000.0

Bypass Volume Scale for Priority ☐

Priority 1.0

▼ Concurrency

Override Concurrency ☐

Concurrency Set 0 Set elements  

▼ Concurrency Overrides



Water sounds

Reverb Time 0.0

Volume Scale 1.0

Volume Scale Mode Default ▼

Duck Time 0.01

Recover Time 0.5

Water Sound



Now, that the sound was spatialized I attached it to the boat so that it would be constant throughout the clip.



If I filmed the boat passing by, you would only hear it while it passes.

Creepy whispers

Throughout the path I added three distinct whispering sounds.

Unlike the water sounds, these whispers were intended to fade in when the camera was close enough to certain parts of the path.

The first step was the same, I turned the sounds into sound cues and added an attenuation node.

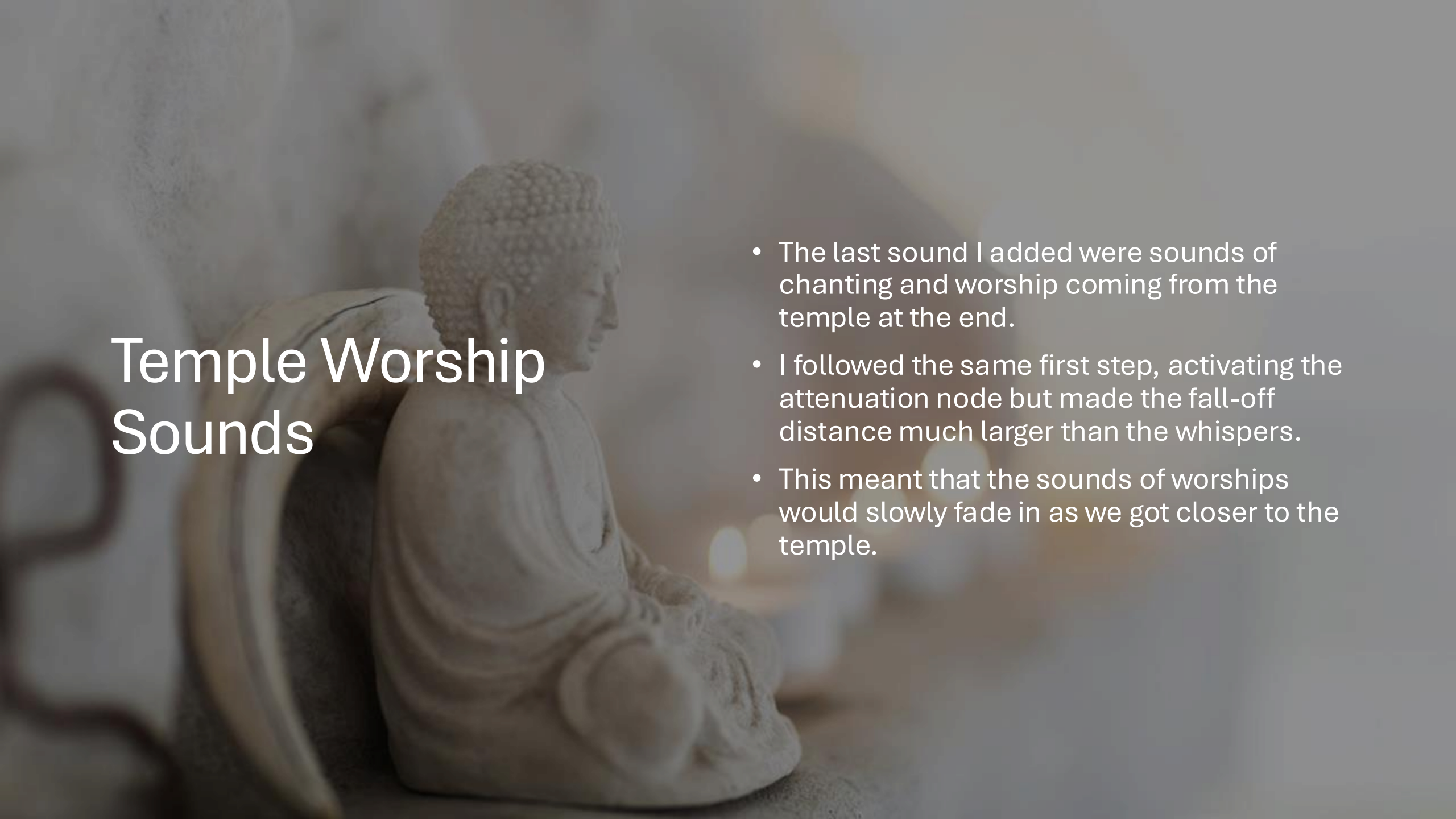
Creepy Whispers

▼ Attenuation (Volume)	
Enable Volume Attenuation	☒
Attenuation Function	Linear ▼
Attenuation Shape	Sphere ▼
Inner Radius	400.0
Falloff Distance	3600.0



Creepy Whispers

- After making the sounds 3D I placed them along the path and put them to side.
- Putting them to different sides meant that the sound would be directed to one ear, again adding to the immersion.
- I aligned these whispers to certain points of the path, where statues stood, giving the piece a creepy atmosphere.

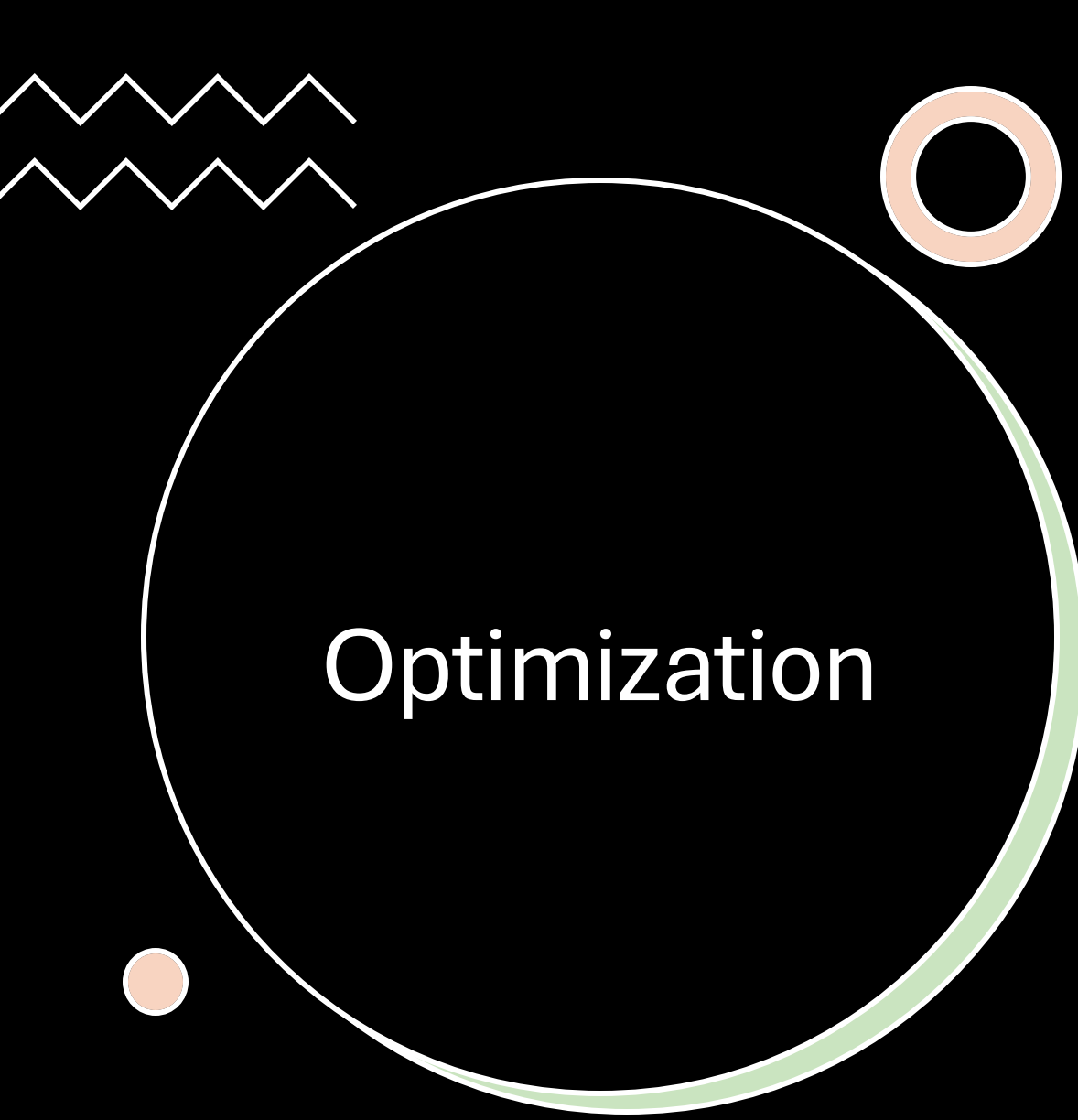


Temple Worship Sounds

- The last sound I added were sounds of chanting and worship coming from the temple at the end.
- I followed the same first step, activating the attenuation node but made the fall-off distance much larger than the whispers.
- This meant that the sounds of worships would slowly fade in as we got closer to the temple.



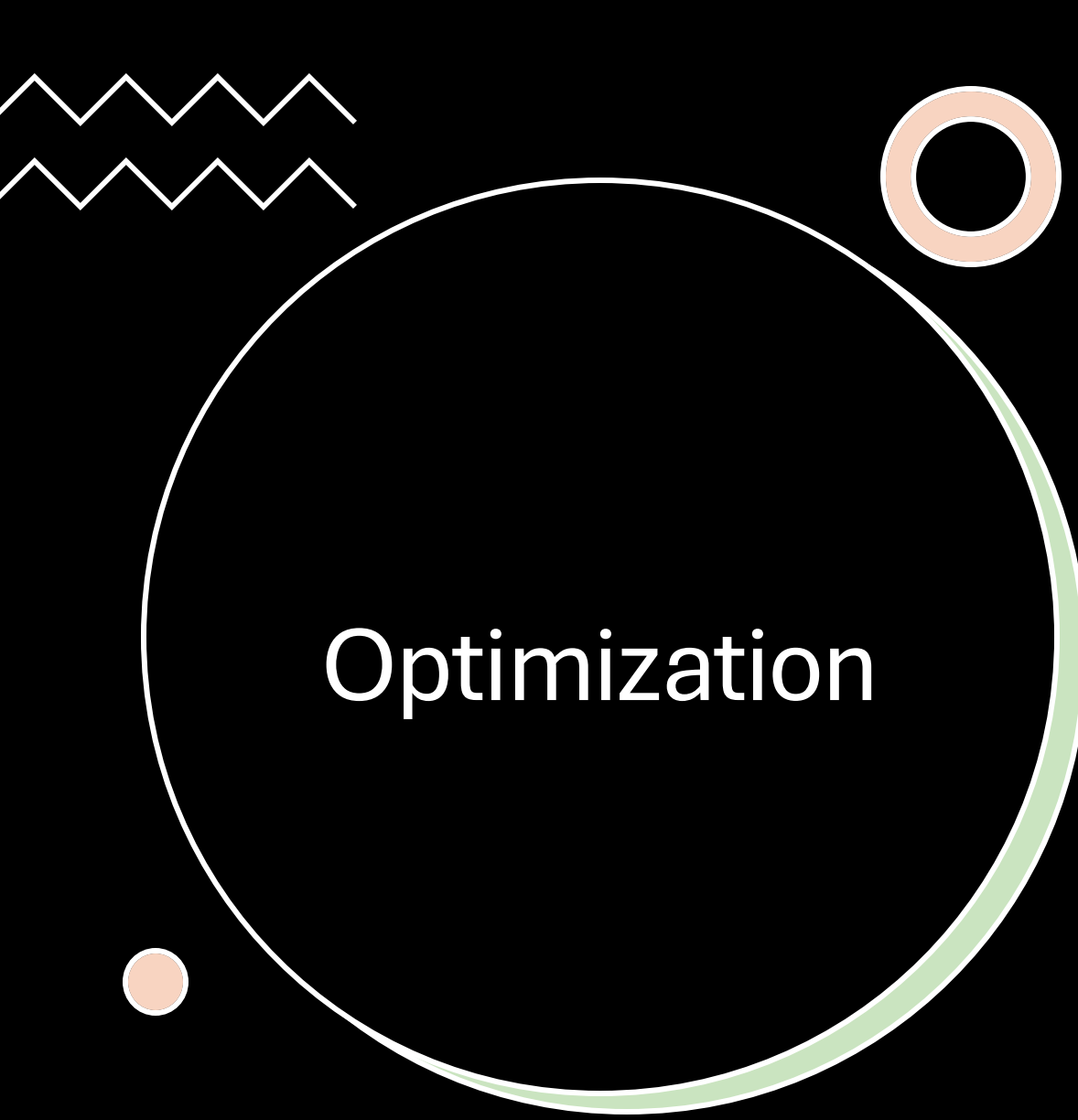
Render and Optimization



Optimization

- The first attempt at rendering crashed and I realised I hadn't optimized the textures in the scene.
- To do this I opened all the textures, that were in use in the level and altered the maximum texture size on their Normal, Albedo and roughness maps.
- The maps were all originally 8K.





Optimization

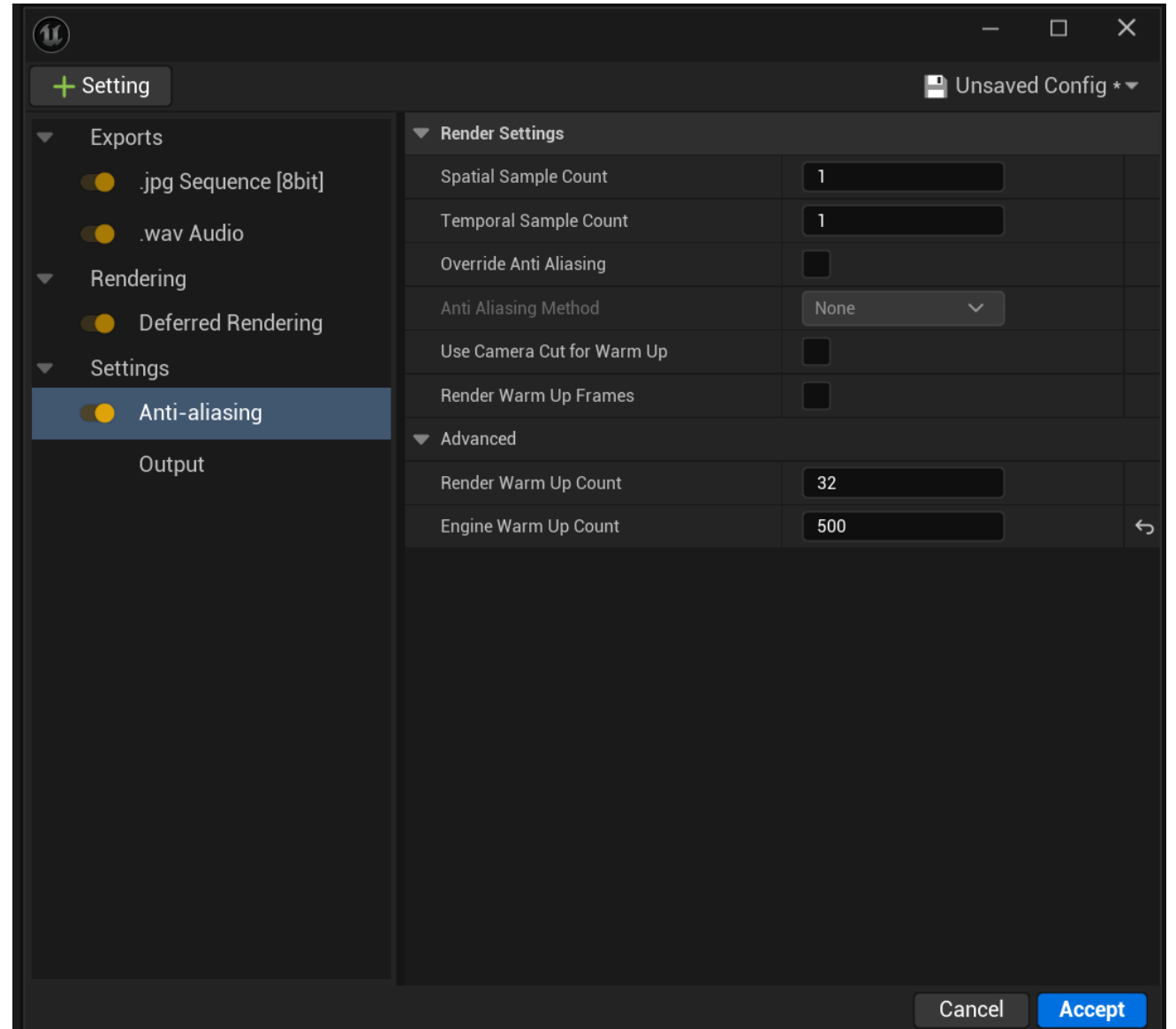
The basic rule for optimization is that:

- Normal maps should be half the size of the Albedo
- And the Roughness should be half the Normal maps

These were the settings I chose:

- Albedo – 2048
 - Normal – 1024
 - Roughness - 512
- 

Rendering



Final Outcome



The End

Thank You