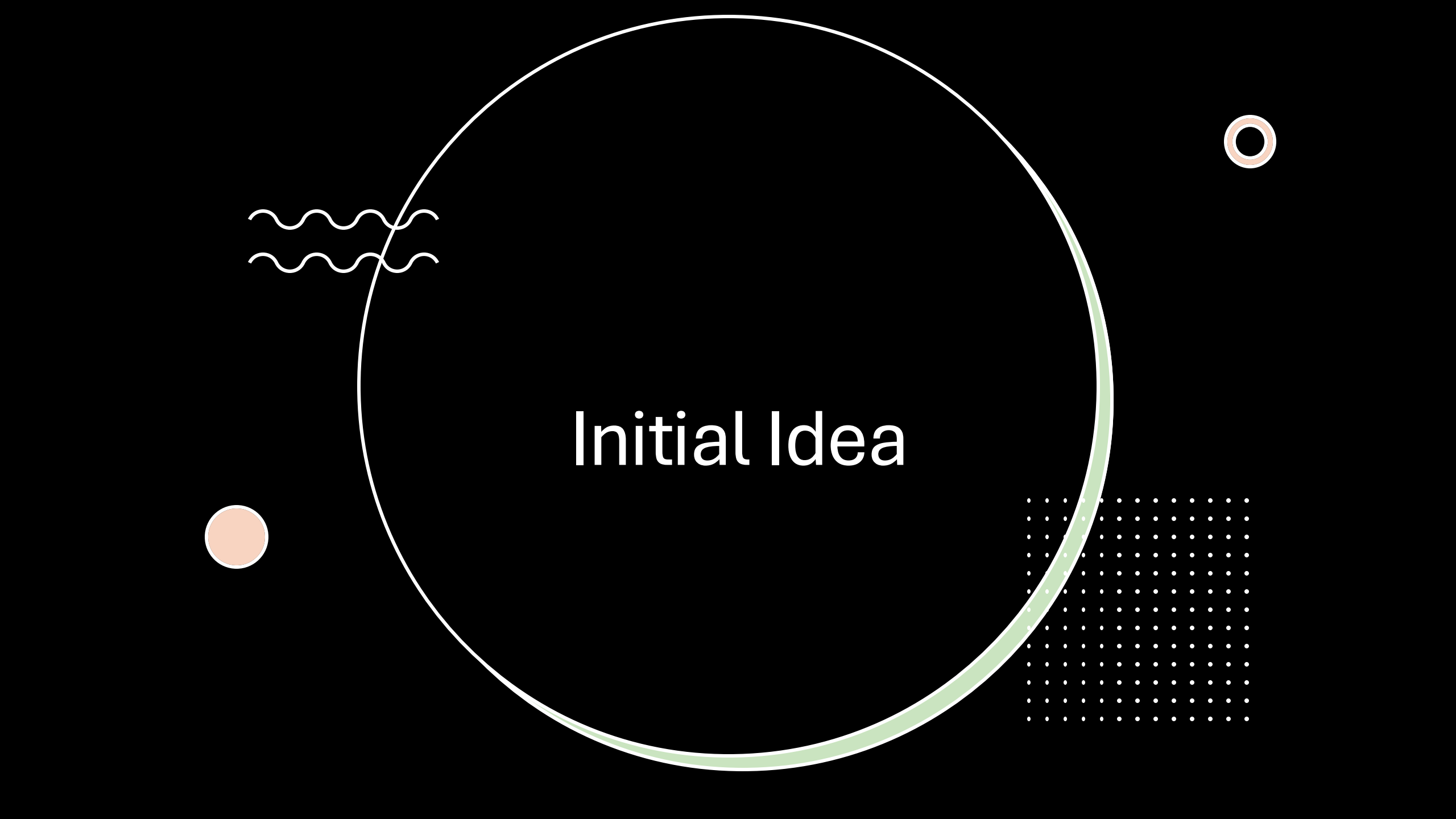




MA Final Presentation

Luke Penhalagan

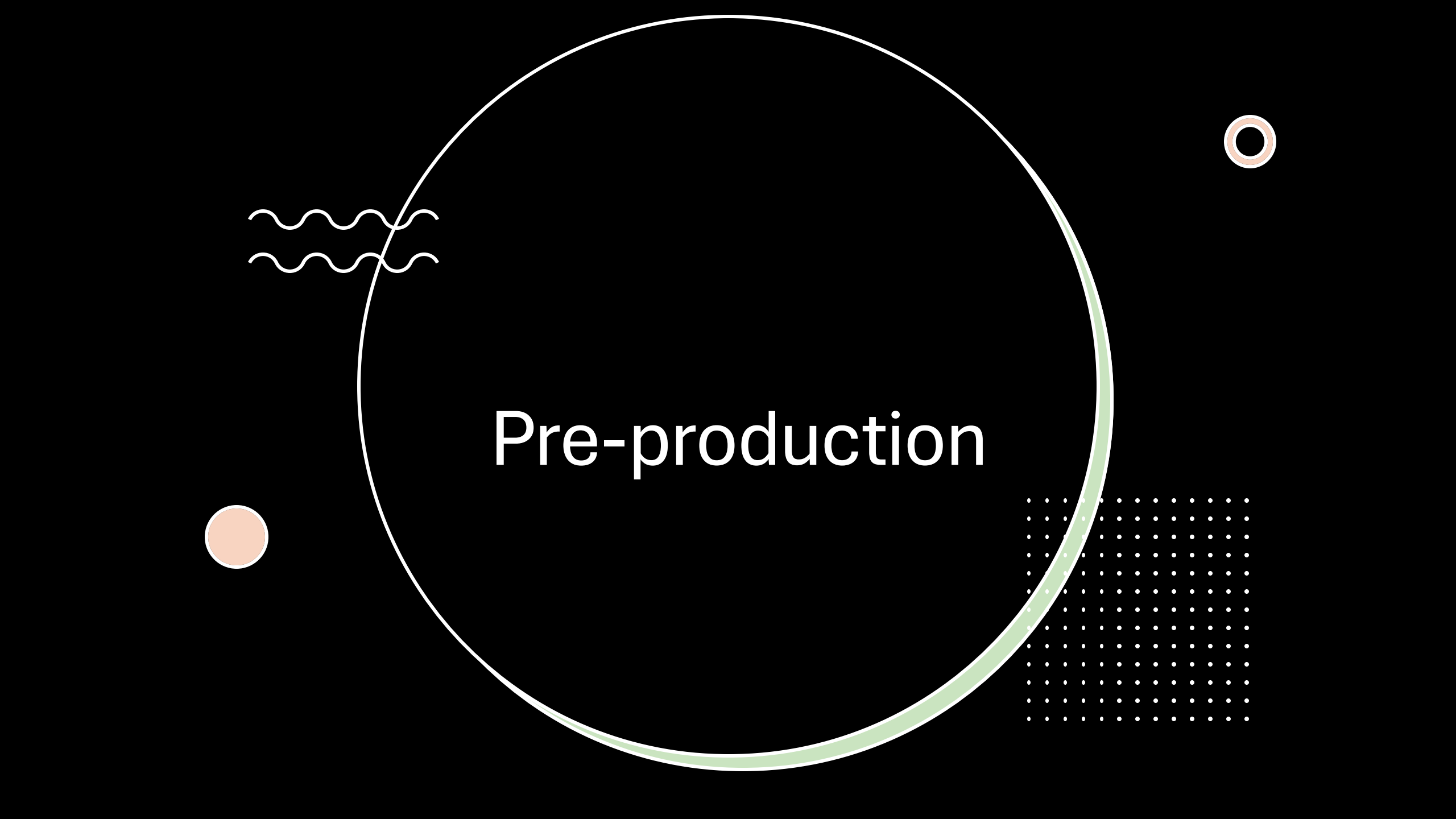


The image features a central white circle with a thick green border. Inside this circle, the text "Initial Idea" is written in a white, sans-serif font. Surrounding the central circle are several abstract elements: a small orange circle with a white outline to the left; two white wavy lines to the upper left; a small orange circle with a white outline to the upper right; and a grid of small white dots to the lower right.

Initial Idea

Initial Idea

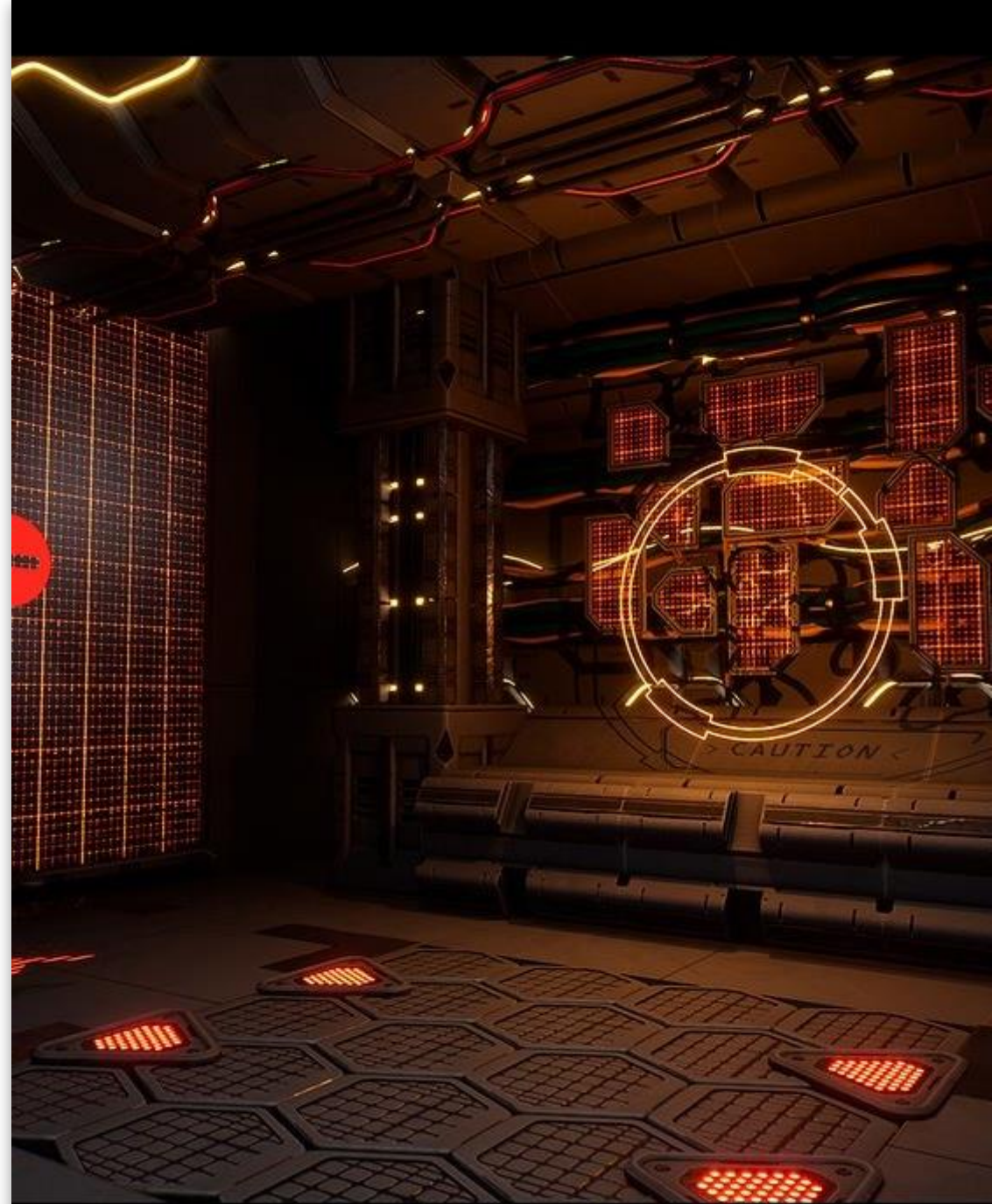
- My initial Idea for the project was a short action/exploration sequence following an adventurer into a mysterious tomb/temple.
- It would an Indiana Jones-esque adventure with a science fiction twist, following our protagonist as he explores this environment and attempts to steal an artifact

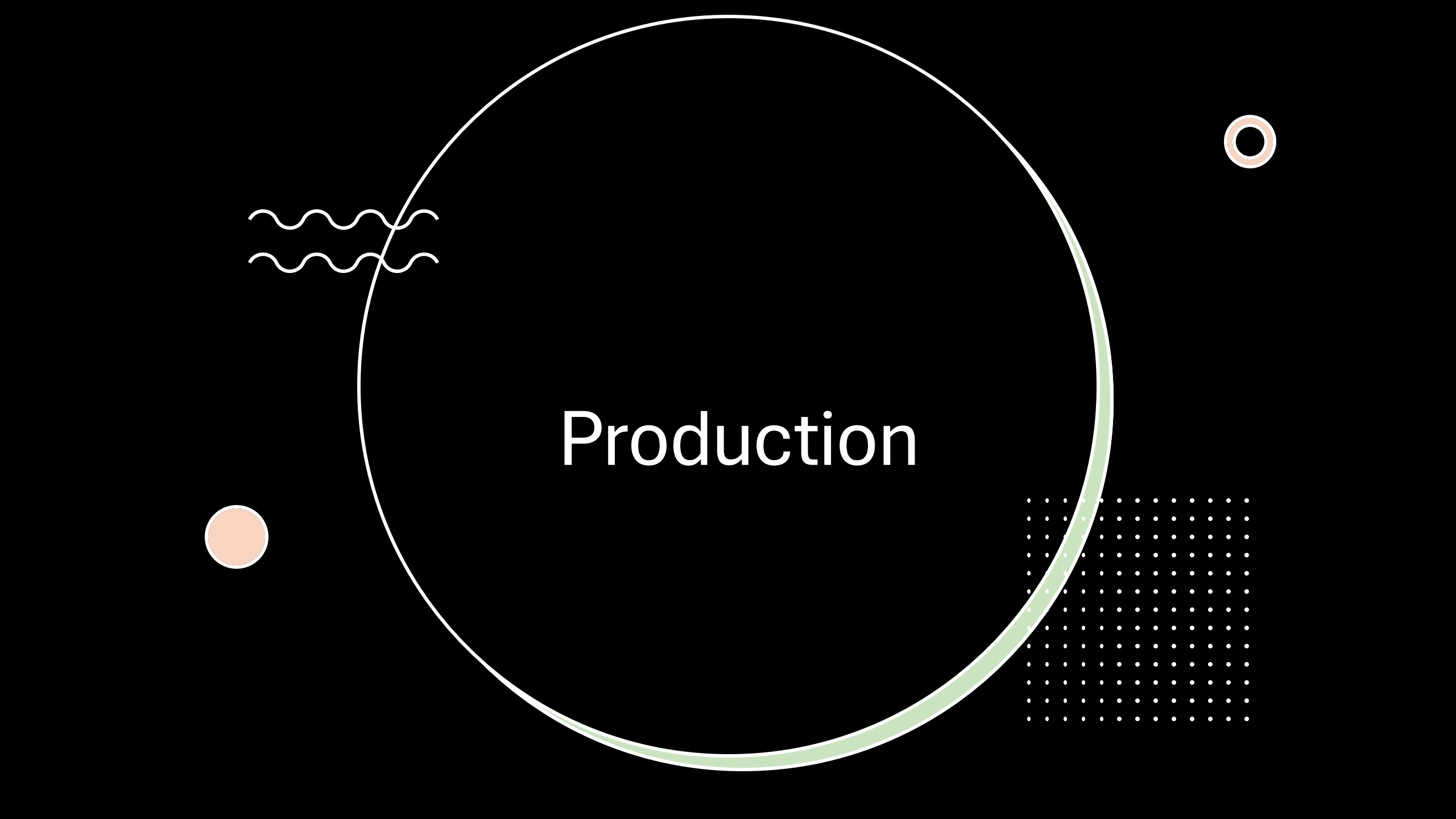
The image features a central white circle with a thick green border. Inside this circle, the text "Pre-production" is written in a white, sans-serif font. Surrounding the central circle are several abstract elements: two white wavy lines to the upper left, a small orange circle with a white outline to the lower left, a small orange circle with a white outline to the upper right, and a grid of small white dots to the lower right.

Pre-production

Pre-production

- When starting a project within Unreal Engine I find it best to scan the FAB marketplace for any free resources that I can utilize in my project. I do this rather than sketch or storyboard as I prefer to set up my cameras and shots after the environment has been made.
- I needed two types of Megascans and Modular kits: one for a cave entrance and more for a scientific research facility that would be built within.
- For the cave, I used a pack called "Quarry Collection"
- And for the sci-fi elements I used: Cyberpunk industries Vol.1, Sicka Free Environment Pack, Polar Facility

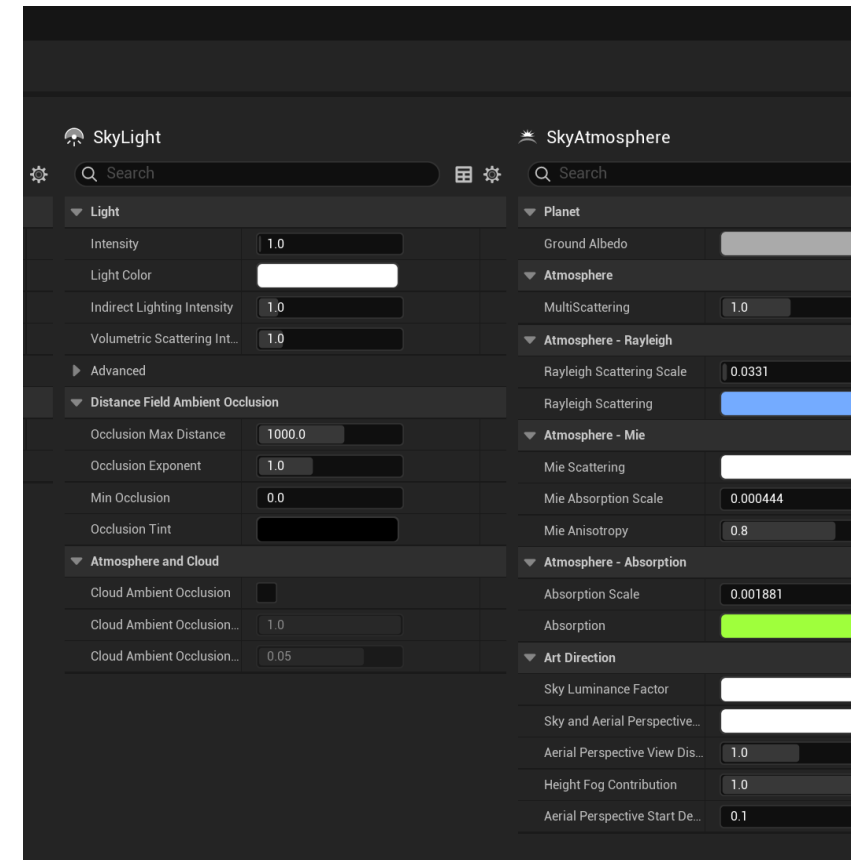


An abstract graphic design on a black background. A large white circle is centered, with a thick light green ring around its right side. To the left of the circle are two white wavy lines and a small solid light orange circle. To the right is a small double-lined light orange circle and a rectangular grid of small white dots. The word "Production" is written in white sans-serif font inside the large circle.

Production

Environment – Lighting and Atmosphere

- The first steps I follow when creating a new project in Unreal Engine is to set up the atmosphere and sky light.
- To do this I open the "Environment Light Mixer"
- Then I add these key components:
- Directional light – Simulates Sunlight
- Sky Light - Captures ambient light of environment
- Sky atmosphere - Realistic sky gradient
- Volumetric clouds – unnecessary as the animation will take place on the interior
- Exponential Height Fog - Simulates atmospheric height and fog,



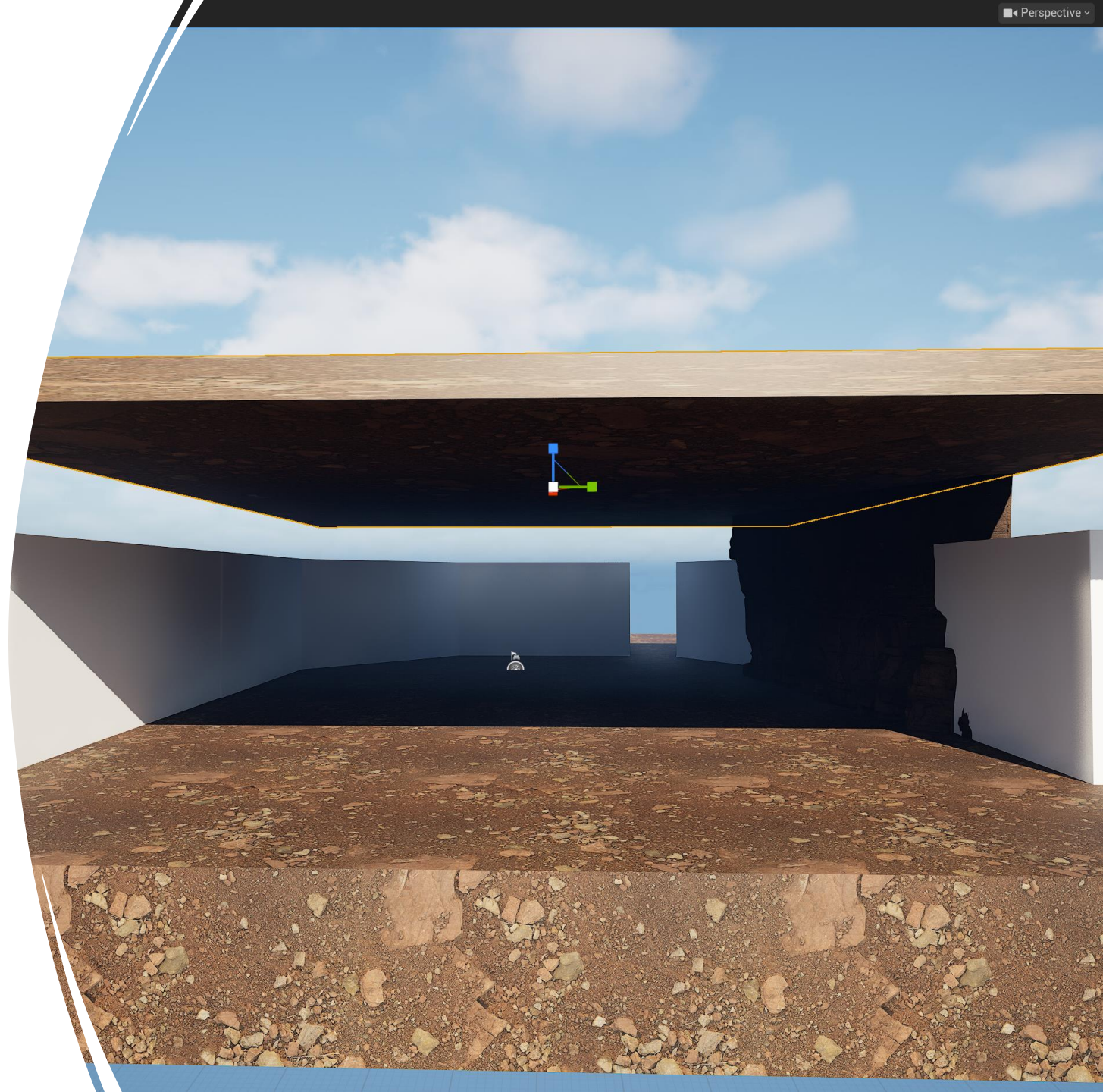
Environment – Blocking the cave

- The next step was to apply a basic texture to the platform and then begin blocking out the cave.
- For the blocking I simply added cubes from the "basic shapes" tab and began to manipulate them into place. I also brought a camera into the scene so I could better visualize the scale and scene.



Environment - Cave

- I then used the megascans from the "Quarry collection" pack and began to place them along the "walls".
- Hiding them with cliff faces and rocks, making sure to leave a man-sized hole at one end where my protagonist would enter from.
- I then placed a basic rectangle above and put the same texture on it.



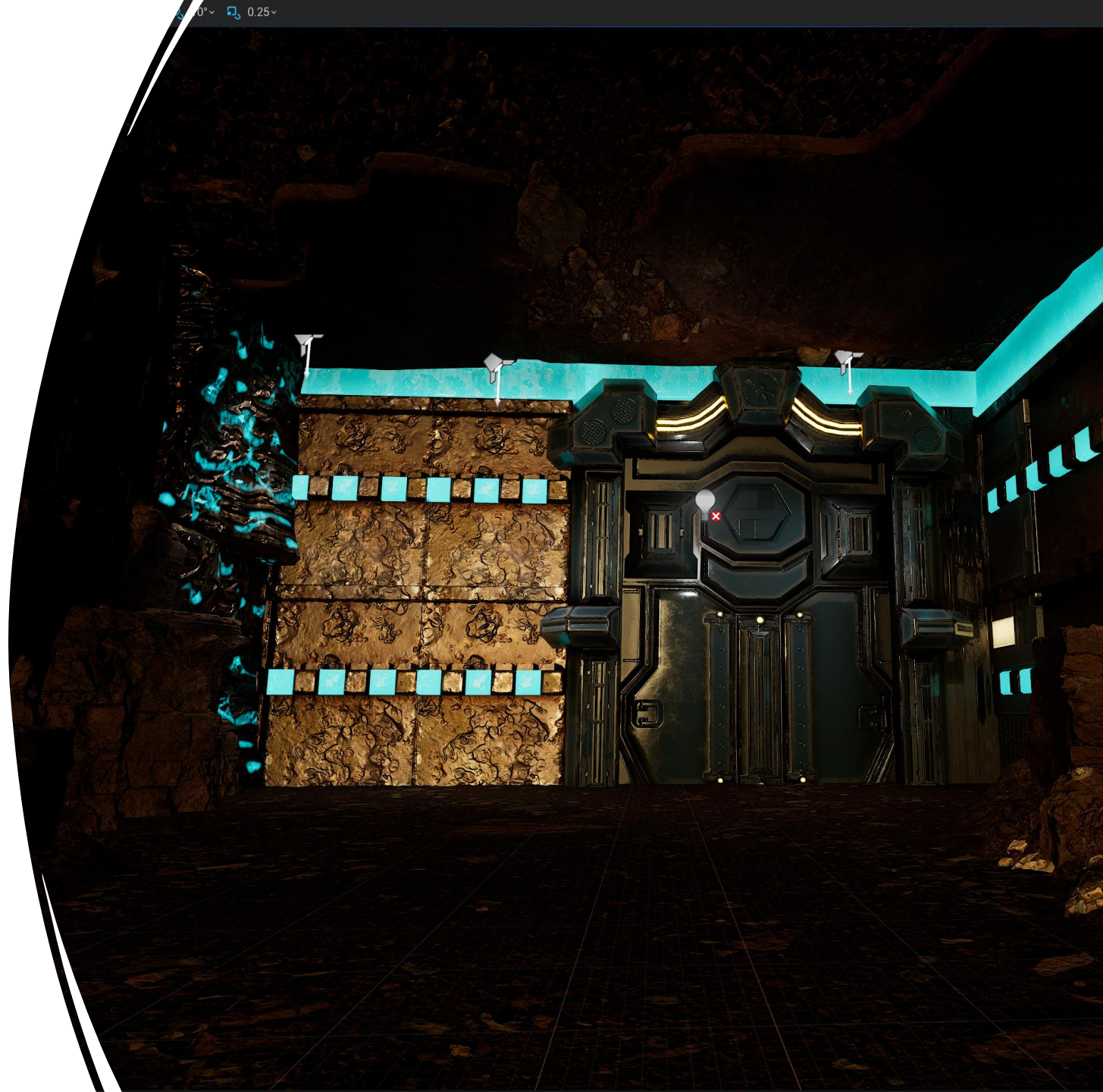
Environment - Cave

- Once the walls were built up, I placed some smaller rocks along the ground and made the ceiling more uneven to give the cave a more natural look.
- I then also changed the direction of the sun, so that it would shine through the entrance of the cave. This was the final look of the cave



Environment – Secret Base

- I wanted the tomb to be a mixture of man-made and natural phenomena, so I downloaded multiple packs of science fiction assets that I could mix and match together. The idea being that It would like a secret research facility that was studying some ancient rock.
- At the end of the cave, I placed large metal door and some walls.





Environment – Secret Base

- I was going to create the interior of the base in another level but decided it wouldn't be too difficult to do it directly connected to the cave.
- On the other side of the door, I followed the same process and initially blocked out the room with basic white shapes.
- I then covered these with Science fiction assets.

Warning: Marking Job Queue overflow. Performance may be affected. This occurs when many non-nanite meshes cover a large area of the shadow map. (4 seconds ago). See `r.Shadow.Virtual.AllowScreenOverflowMessages`.
Press `Alt+ScreenMessages` to suppress





Lighting when working

- One problem I faced was how dark the interior was because all the sun was being blocked by the assets.
- To fix this I turned "Cast shadows" option off on the directional light, meaning the sunlight was shining through the walls and giving me more light to design the interior.
- When rendering/sequencing I would turn this option back on and light the scene properly.

▼ Transform		
Location ▼	0.0	0.0 400.0
Rotation ▼	16.73258 °	-6.477879 ° -169.248672 °
Scale ▼ 	1.0	1.0 1.0
Mobility	Static Stationary Movable	
▼ Light		
Intensity	3.521338 lux	
▶ Light Color		
Source Angle	1.037034	
Source Soft Angle	0.0	
Use Temperature	☒	
Temperature	6500.0	
Affects World	☒	
Cast Shadows	☐	
Indirect Lighting Intensity	1.115216	
Volumetric Scattering Intensity	2.475983	



Character Design

- To make the protagonist I initially decided to use Metahuman, Unreal Engines inbuilt character creator. Which allows me to easily create a fully rigged character that works within Unreal Engine.

Jayson

- I eventually ended on this design that could then be easily rigged and exported into the Unreal Project



Jayson

- The problem I faced using Metahuman was that there were very limited clothing items.
- I explored programs such as Metatailor but in the end decided to take a different approach.



Character Creator 4

- In the past, I had used a different program called Character Creator 4 to create the models for my projects and recently discovered there is now a way to give them a rig that works within Unreal Engine.



Character Design

- This was the character I made within CC4, and then dressed using assets from their in-program marketplace.



Transferring to Unreal Engine

- The first step was to export the character as an FBX, making sure to keep it in a T-Pose and then drag it into the project.
- In order for the character model to be high quality I had to download "Auto setup for Unreal Engine" and bring it into the project file on my computer. Without this plugin the model would be a very low quality

Target Tool Preset:



Unreal

FBX Options :

Mesh and Motion



Prefix / Suffix



Texture Settings



Embed Textures



Max Texture Size :

2048



Convert Image Format to

Bmp



Include Motion

Frame Rate : (12 ~ 60 fps)

30



T-Pose



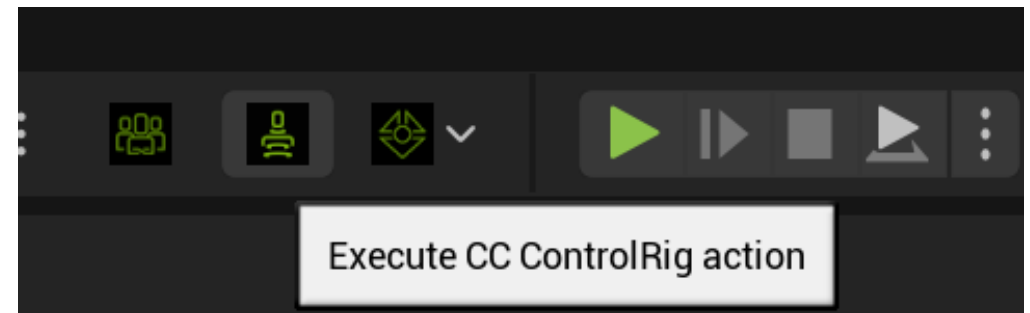
Calibration

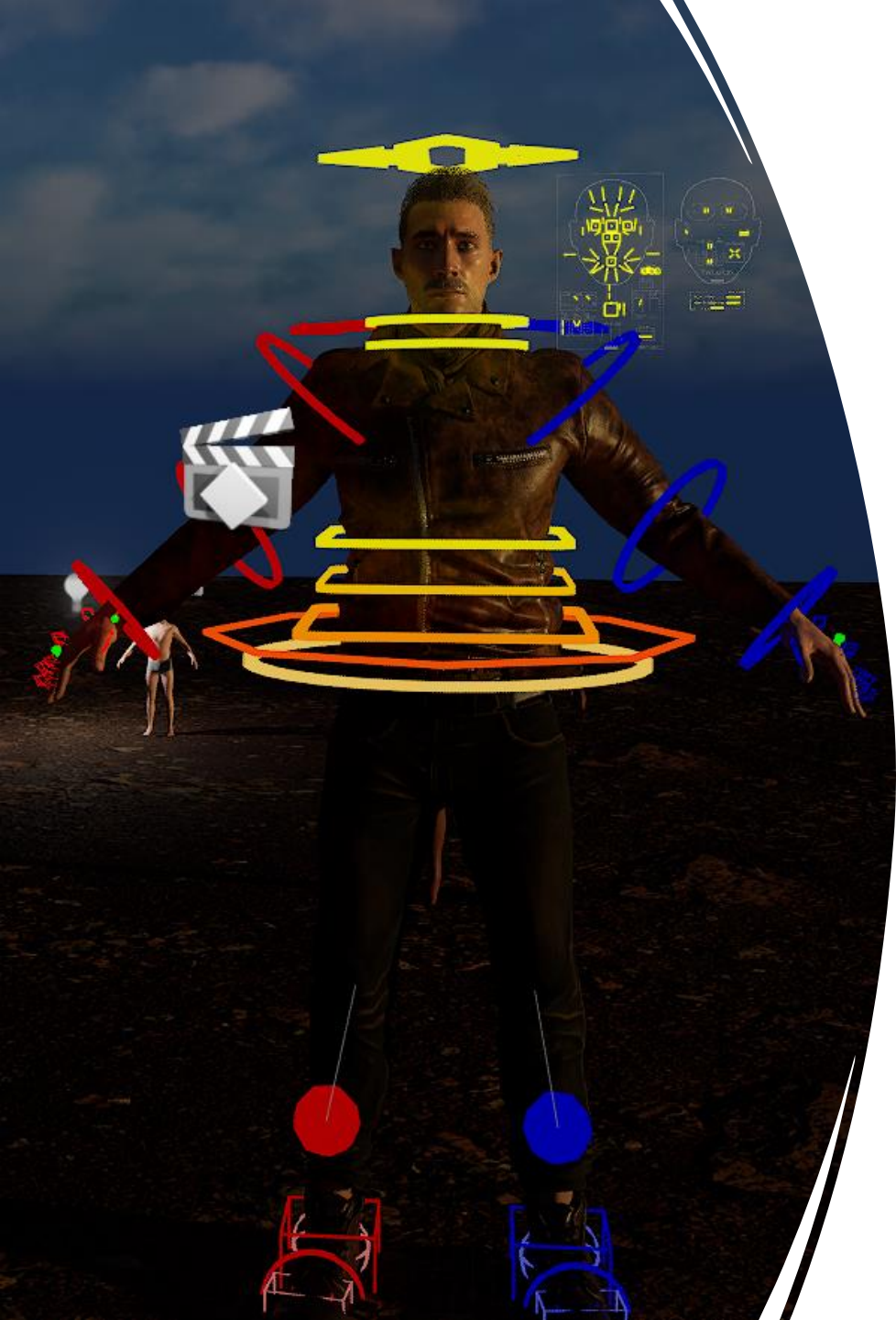


Current Pose

Converting the rig

- When the CC4 model was brought into Unreal Engine the rig did not transfer over. Meaning I would have to animate the character in Iclone8 (CC4's companion program) and export the animations separately and place them onto the character. I elected against this as I wanted to be able to alter the animations within Unreal Engine.
- To convert the rig in Unreal Engine I needed to download a plug-in called "CC control rig". Once downloaded, I simply had to activate the plug-in and restart the program.
- From there, I selected the character and "Execute CC ControlRig action"

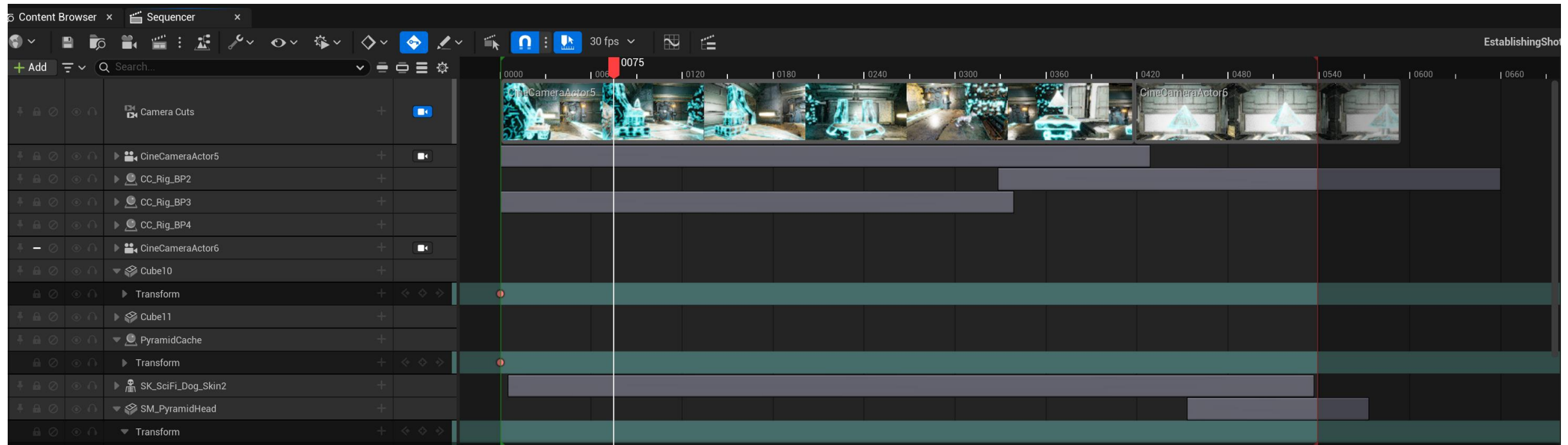




The CC Rig

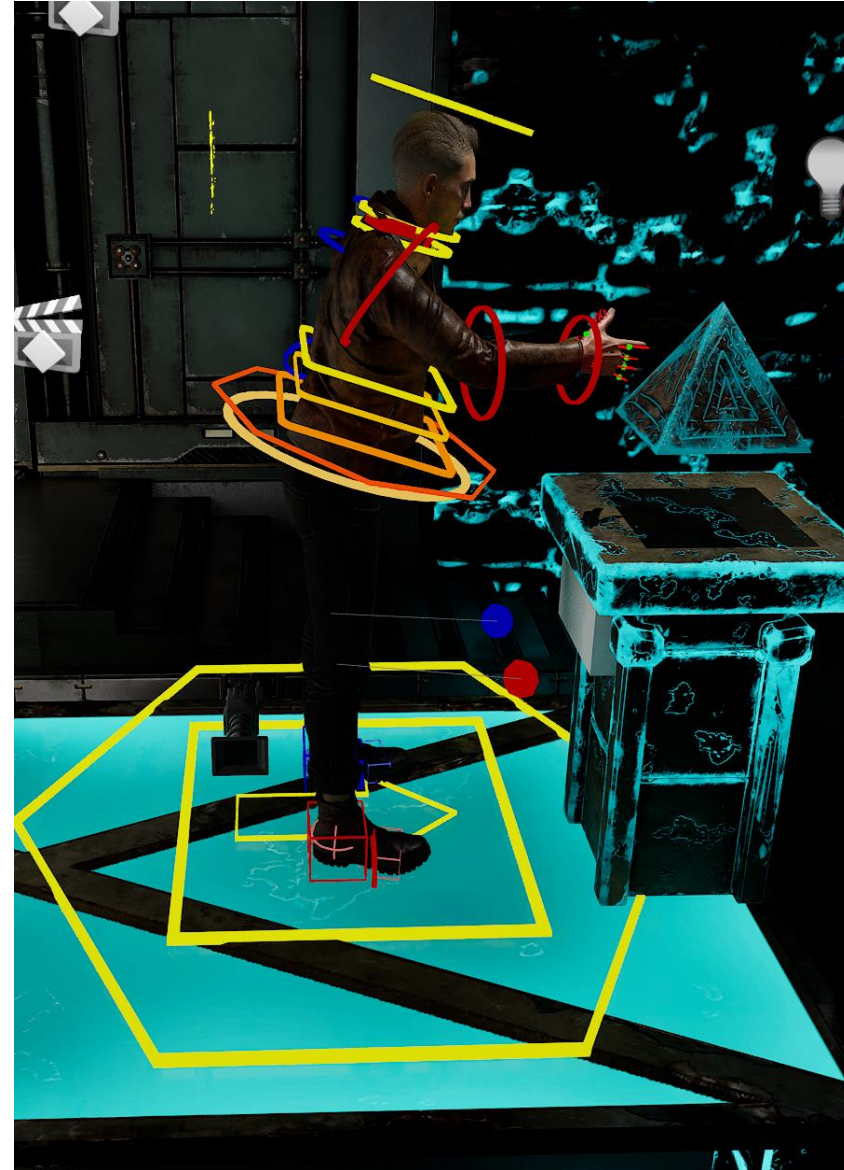
Animating and Sequencing

From here I could begin to animate the sequence which was all done within the sequencer.



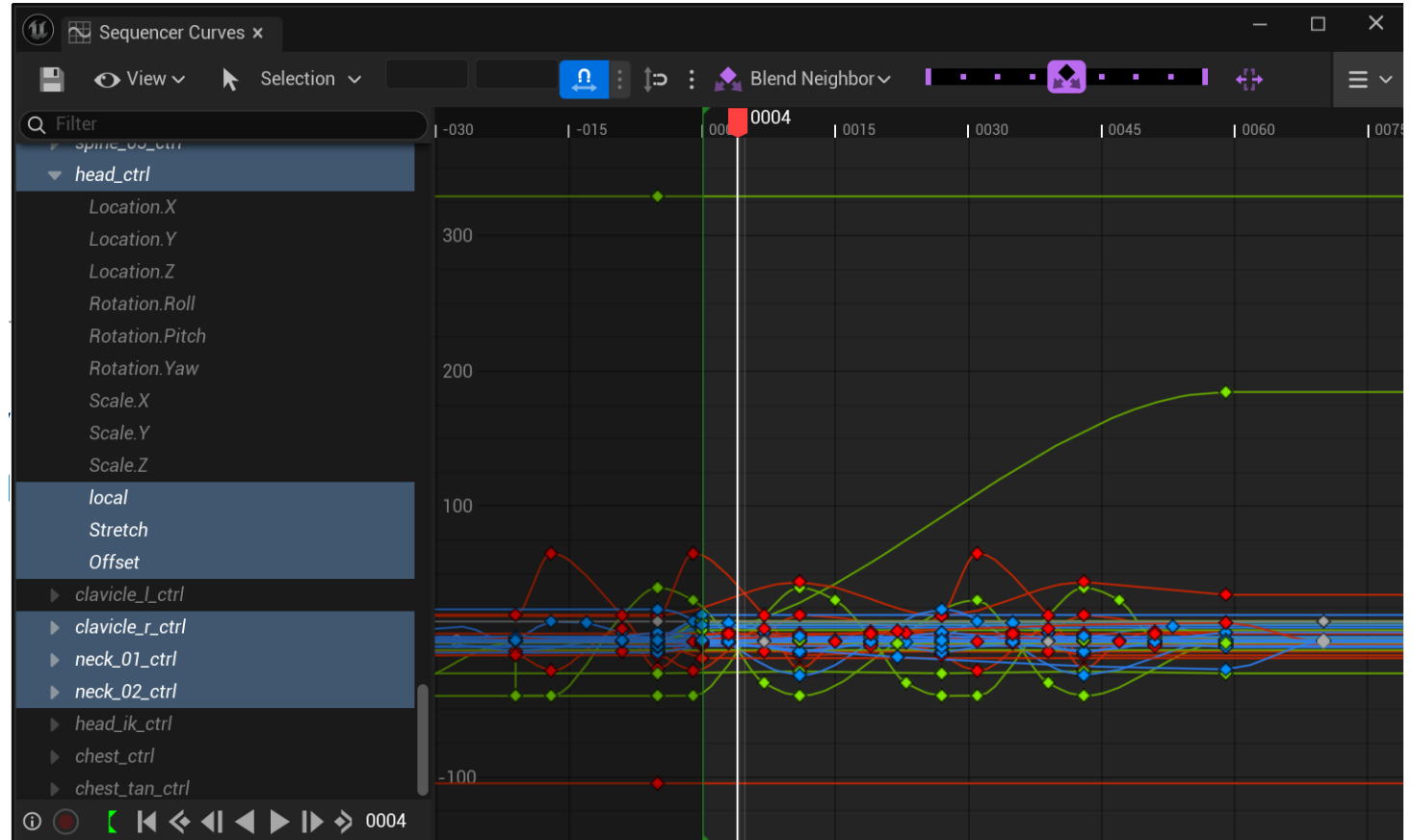
My process – character animation

- Before animating the characters and environment, the first step I followed was to block out the camera movements and cuts ,if there were any.
- Once a rough outline of the shot was made with the cameras I would bring in the protagonist and begin to keyframe it's movements. It works the exact same as Maya or Blender where I simply keyframe their movements within the sequencer.
- The only thing I didn't animate was the dog.



My Process – Walk Cycle

- Early on I also made a walk cycle for the character.
- After I completed two steps, I went into the curve editor and made the animations cycle.
- Both pre-infinity and post-infinity. This could then be copied into other shots.



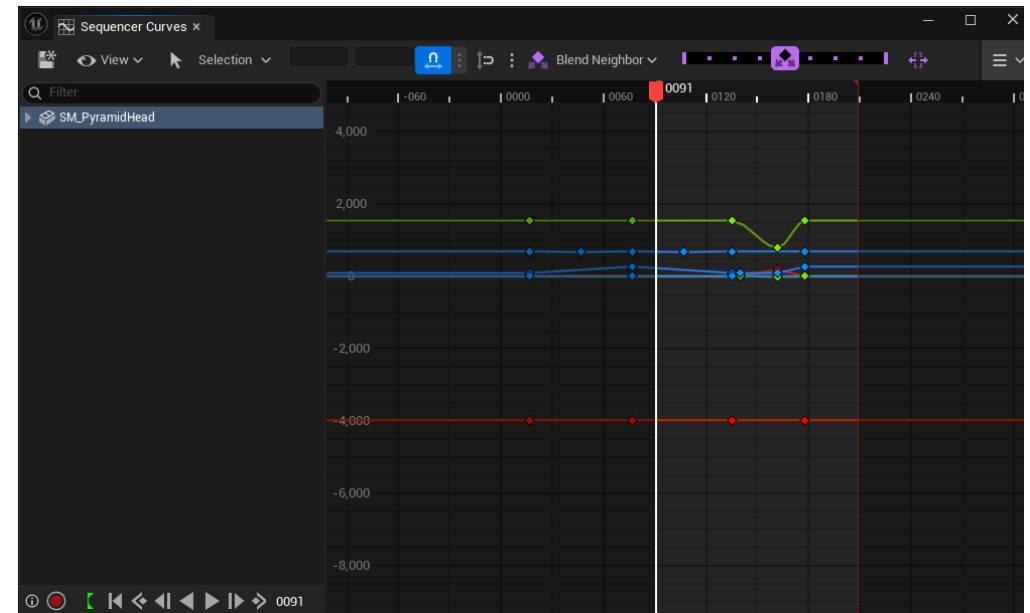


Constraints

- There are moments throughout when the protagonist would place a hand on a table. To make sure their hands stayed in the same place I decided to use constraints.
- To do this, I placed invisible cubes within the table that I could then constrain the hands to for a certain number of frames.
- I also did this when he had his hands on his knees, by hiding the cubes within the knees.

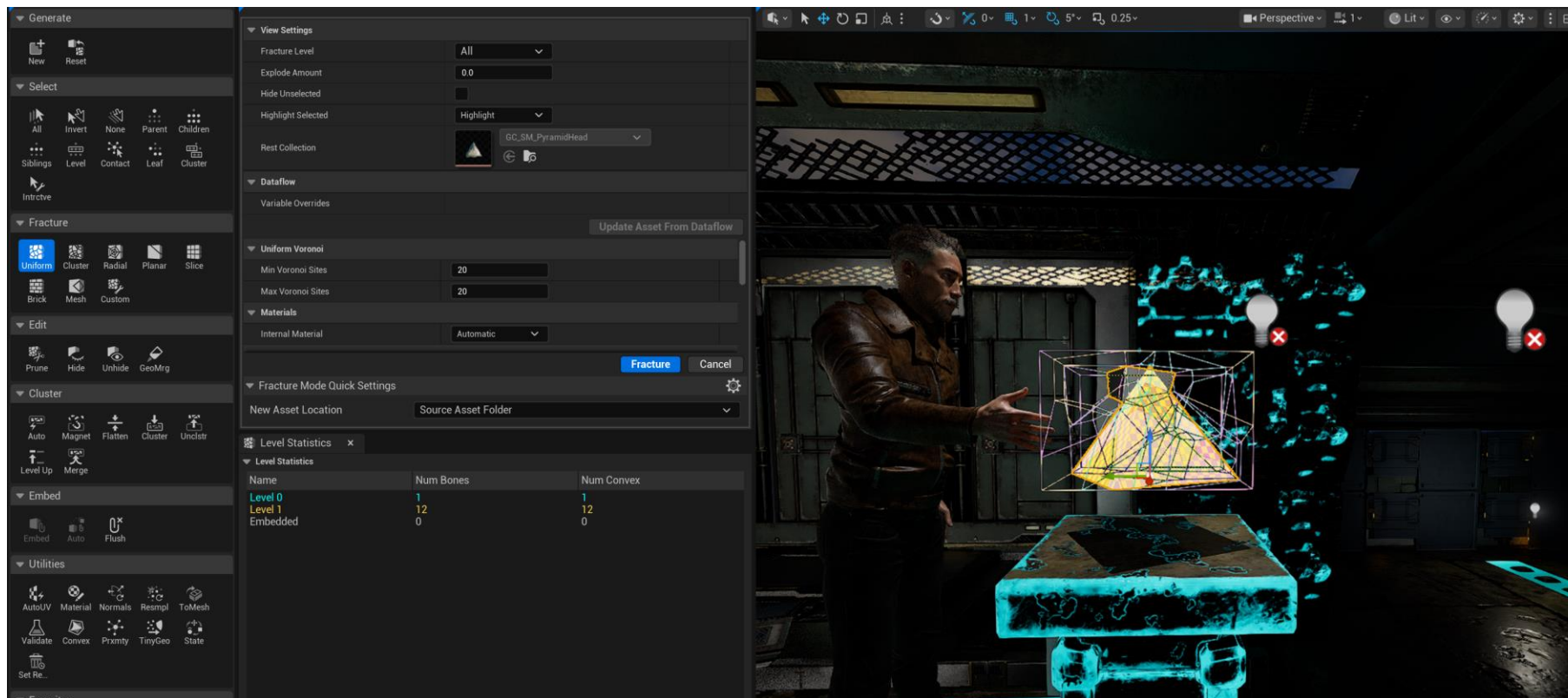
Environment Animation

- Two aspects of the animation needed animating, the first was the mechanical doors and the second was the artifact.
- The door came in two parts which allowed me to simply take them into the sequencer, line them up and keyframe their movements.
- I knew I wanted the artifacts to be in constant motion so I once I keyframed the rotation and location, I made it cycle in the curve editor like I did with the walk cycle.

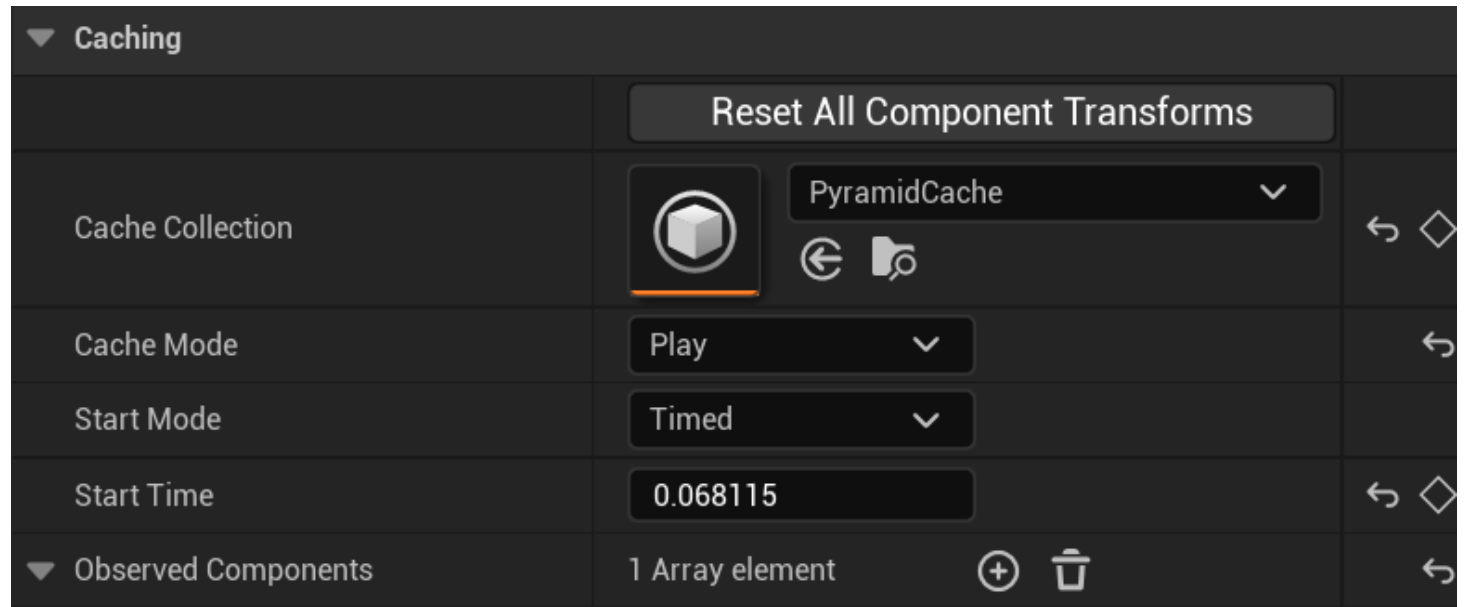


Artifact Breaking – Chaos physics

- For the moment the artifact breaks I utilized a plug-in called Chaos Destruction.
- From there, I could go into "Fracture Mode" and this splits the asset into sections that could break apart when simulated.



Artifact breaking – Chaos Physics

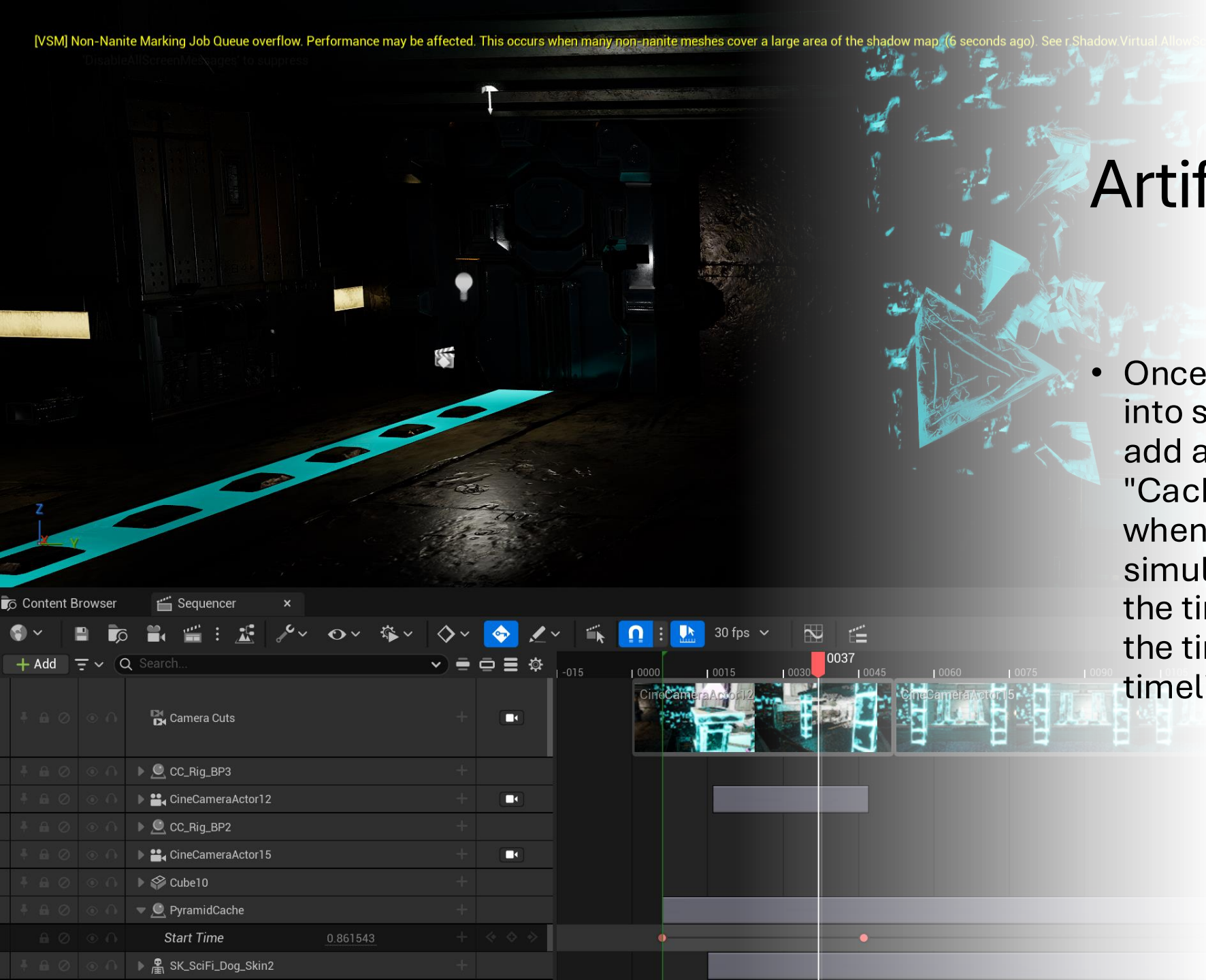


- From here, I can record the simulation and then store it a "Collection Cache" that I can then take into the sequencer.

[VSM] Non-Nanite Marking Job Queue overflow. Performance may be affected. This occurs when many non-nanite meshes cover a large area of the shadow map. (6 seconds ago). See r.Shadow.Virtual.AllowSize
"DisableAllScreenMeshPages" to suppress

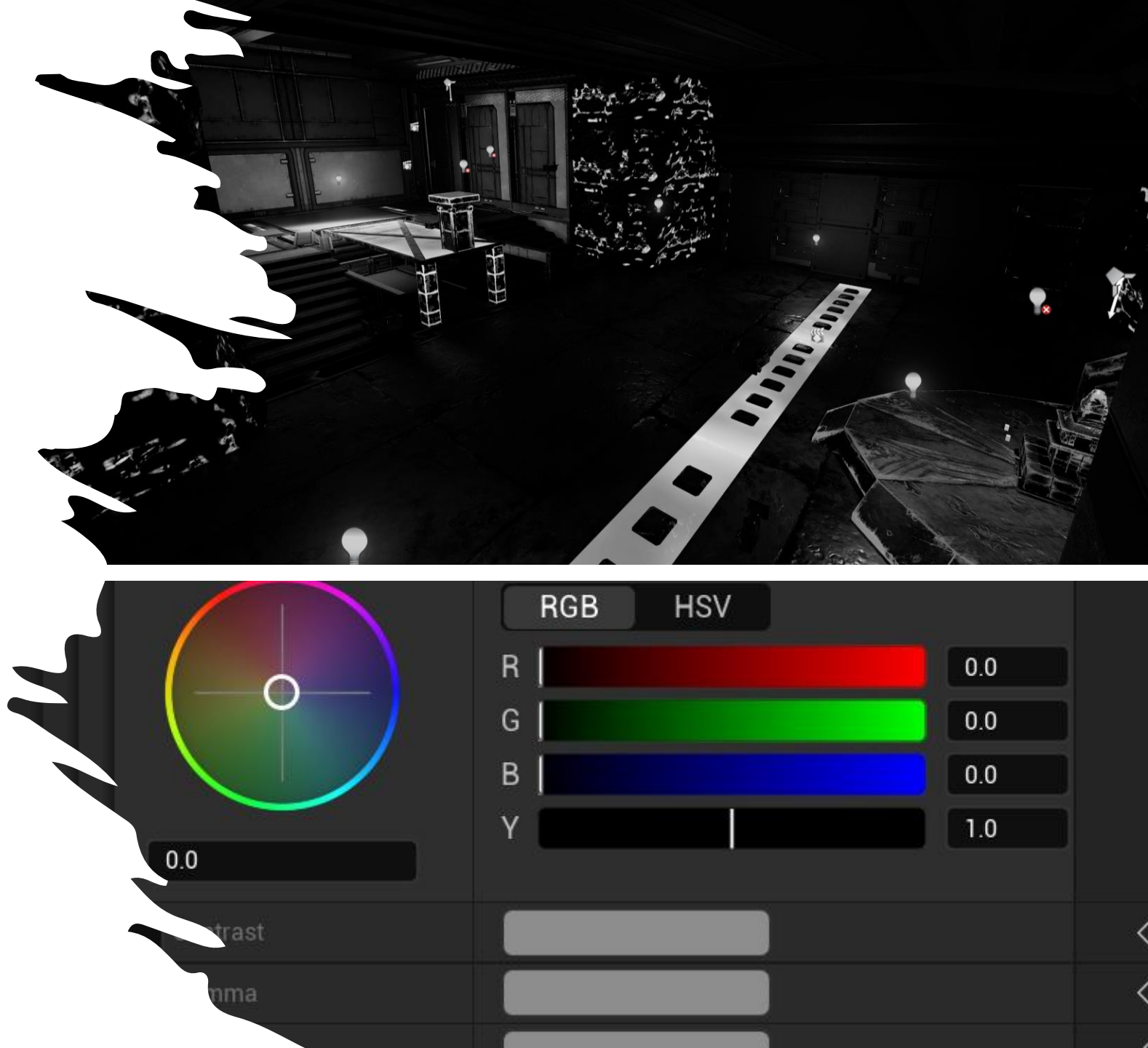
Artifact Breaking

- Once the Cache was brought into sequencer, I simply had to add a "Start time" under the "Caches" tab and keyframe when the start and end of the simulation would. Matching up the time of the simulation to the time passed in the timeline.



Security Cameras

- To fill in some gaps between shots I decided to add some short sequences that mimic the look of security camera footage. Instead of changing the color in Post-production I decided to desaturate the camera's within the sequencer by simply editing the camera settings.





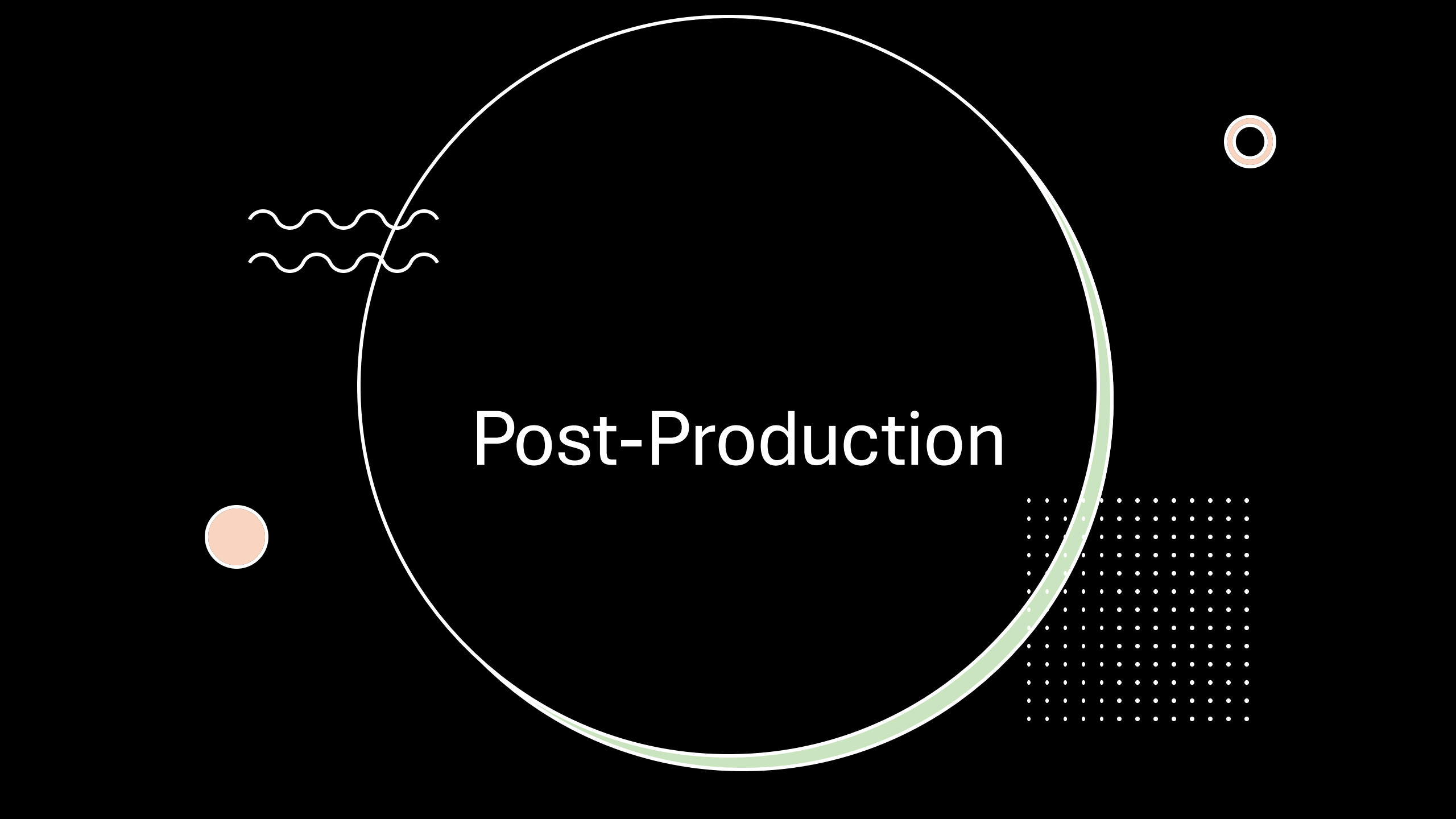
Lighting and Cinematography

- For moments where the natural lighting lacked, I placed point lights into the scenes to make the images clearer.
- There are a few moments throughout the animation where I keyframed the focal length of the cameras to add empathize to different moments.
- At the start I keyed the aperture to create the blur affect.

Failed Face Animations

- I did follow a method that allowed to do facial motion capture and add it to characters animations.
- To do this, I set up a live link to my WEBCAM and recorded a couple clips. I then applied this to a normal metahuman and then transfer it over to my CC rig.
- After following the steps, I realized that the face rig on my character didn't work properly and so I had to abandon the realistic facial animations.

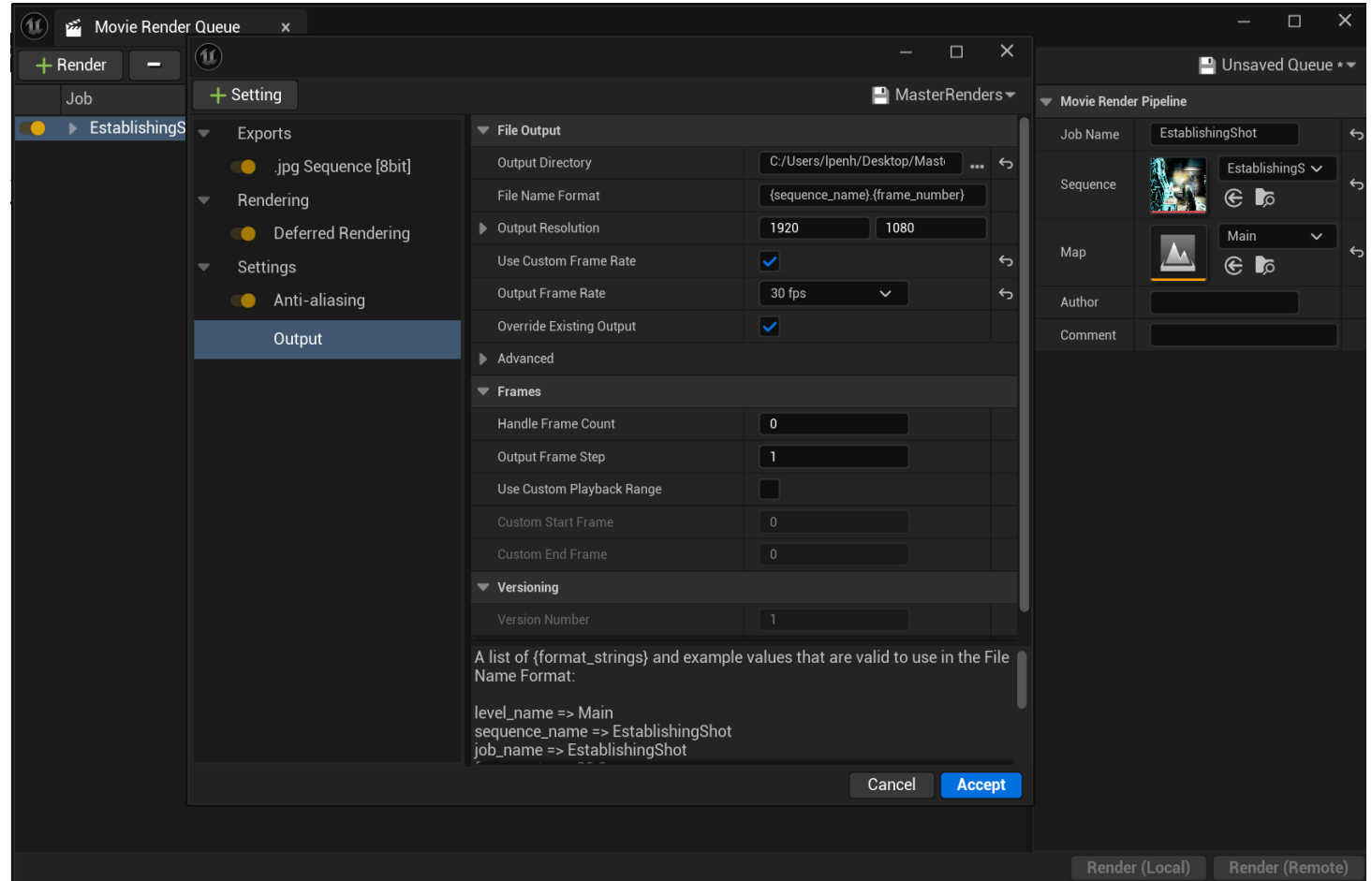


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Post-Production

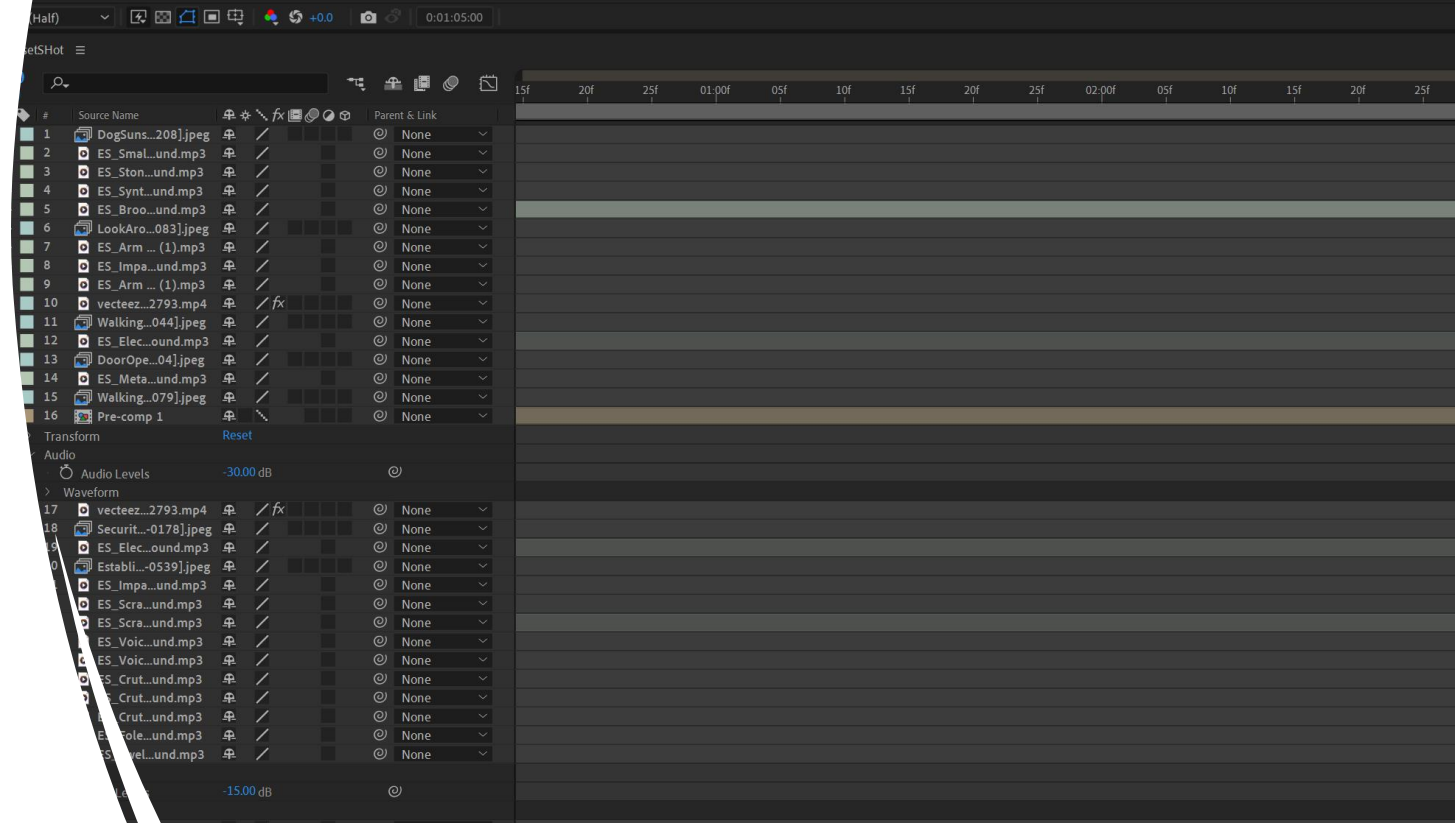
Rendering

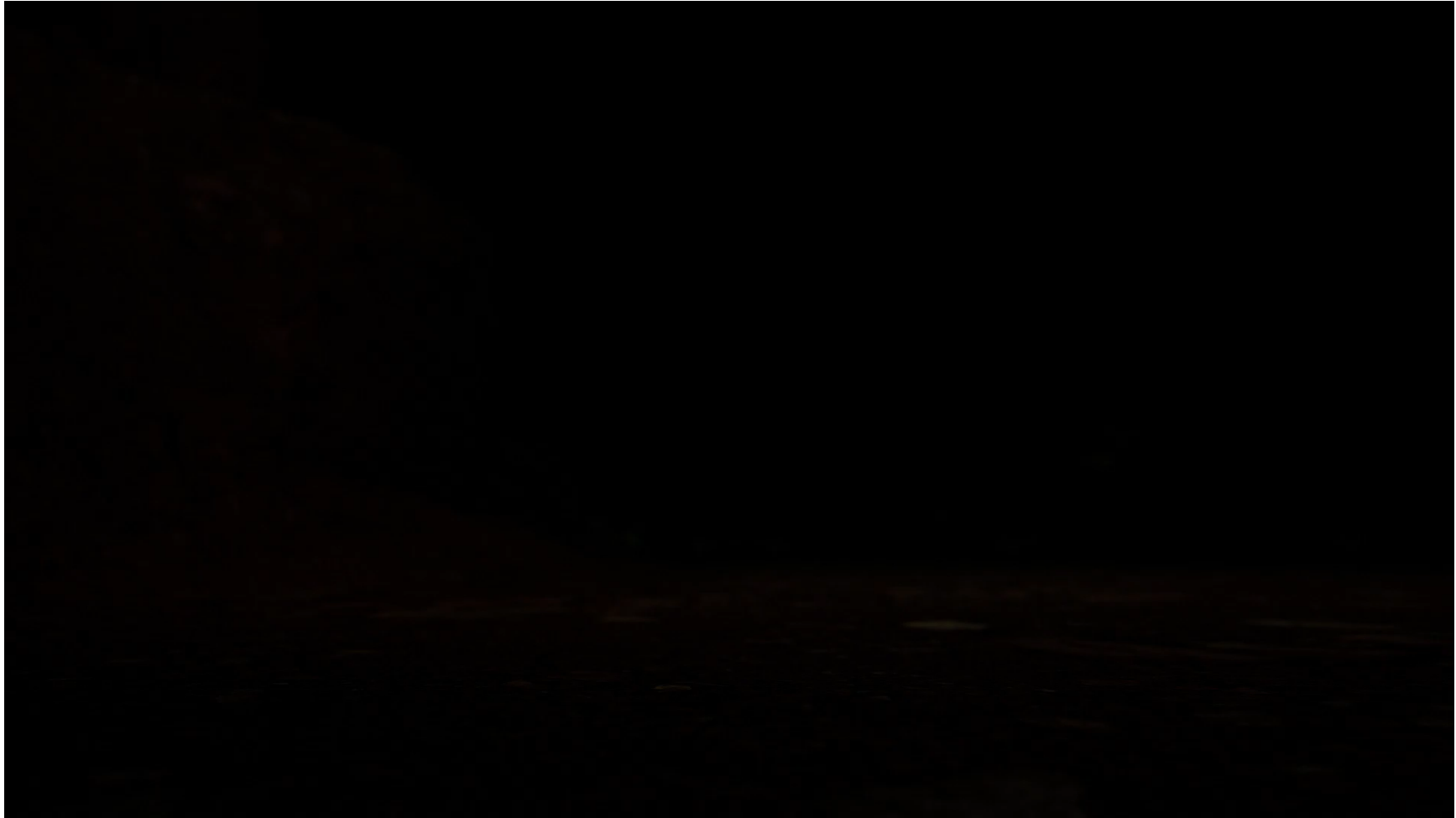
- I could then render out each sequence in the "Movie Render Queue".
- I kept the basic HD settings but made sure to add a certain amount of warm up frames to lower the risk of Unreal Engine crashing.



Editing and SFX

- To edit the final clips together I used After Effects
- I then added SFX from Epidemic Sound.
- I also added a security cam overlay to the camera footage sequences.





Final Edit



The End

Thanks for listening