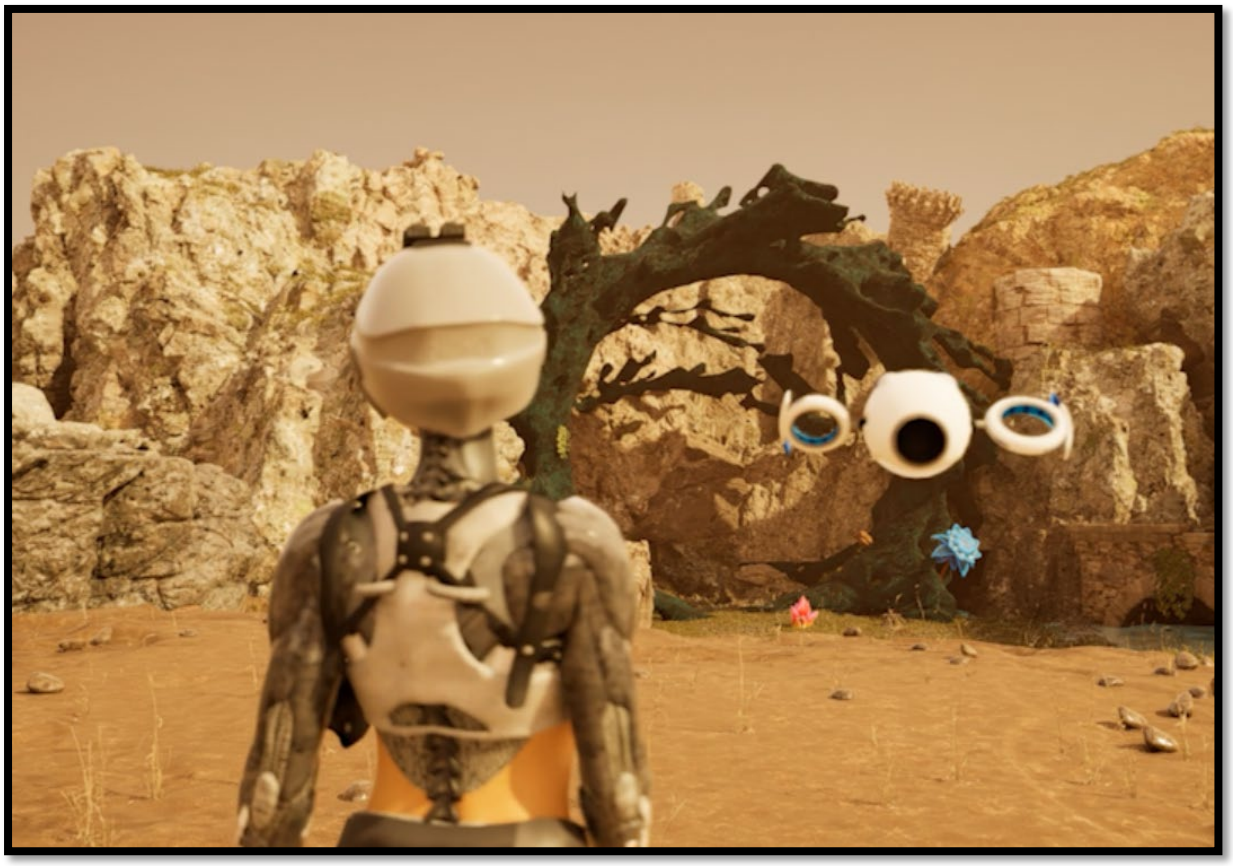
Benjamin Cook 40537620

Bridging the gap between film making and game development using Unreal Engine

Dissertation



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Declaration

Declaration

I declare, in accordance with Edinburgh Napier University's Academic Integrity Regulations that: except where explicit reference is made to the contribution of others*, this assignment is the result of my own work, and has not been submitted for any module, programme or degree at Edinburgh Napier University or any other institution.

*IMPORTANT: Contribution of includes use of generative Artificial Intelligence (AI) tools. Ensure you have read the University Guidelines for Students on AI & Writing Assistant Tools). Please declare here whether you have used such tools, and to what extent:

☒NO I have not used such tools

☐YES I have used such tools and I have provided details and included sample prompts and responses <below/in an appendix>.

1.1 Ideation

Theme of my honours

During the summer before the start of the final term of university, I thought long and hard about what I should base my honours project on. I began to think about and look at past work for my other modules and see which I enjoyed and did the best in. I have always loved creating and telling a story, I love story's and equally love creating something in a 3D space. I already had film making, animation, game and storytelling experience which I felt my passion lay in. But the issue I was having is picking between the bunch to base my project over. But then I thought, why not combine all of them into a project. And so, my Theme was chosen.

After deciding my theme, I came face to face with the next challenge, melding them into what I will be doing for my project. Out of my idea's I have narrowed some down to:

- VFX and Film (Creating a short film with FX included)
- Creating a fully rendered unreal engine scene including animated story telling.
- Creating a short film with a 3D rendered character included
- Creating environments in unreal and having a live action and an animated character interact in them.

While each of them has their own unique take on the theme I have chosen, the one that hits the most check boxes would be idea 4 "Creating environments in unreal and having a live action and an animated character interact in them."

This idea would enable me to put into practice a wide range of Film and 3D artists skills, show off my experience with unreal engine, while giving me a way to exercise my ability to design characters and craft stories. While this task asks a lot of me, with the accelerated development of new and innovative software, I strongly believe that an individual joining the industry must have many skills to aid a team or land a job. For example, 3D as a whole used to be a wide range of different job titles but know a lot of companies are after a few individuals that can handles their tasks.

Bridging the gap between film making and game development

Research:	How does the use of game engines such as Unreal engine impact development for media such as games and films, and how has the gap between the two began to meld in recent years?
Idea:	My project aim is to research how unreal engine has been used in recent years, scoping on the impact it has had on film making, and how game development tools has aided creation of visual effects and scenes.
Deliverable:	My deliverable of this project will showcase how environments created and manipulated in unreal engine can be used in gaming and film making for cinematic storytelling. This will include: • 3D animation (For an actor involved in the scene) • Unreal Engine scripting and scene development • Videography (For live character integration) • Green screen and Rotoscoping Possibly include: • 3D Modelling (If model isn't available) • Mocap (For Animation)
Ethics:	All ethics below apply to this project: **Truthfulness** – Due to the nature of how VFX can alter the perception of events or products, this project must avoid misleading individuals or being manipulative to avoid unethical practises. **Consent** – Consent forms of actors of all sorts must be collected before any filming for the project, ensuring actors understand the nature of the project and how their image/voice will be used. **Impact and Sensitivity** – Graphics must stay appropriate to the chosen age group to avoid disturbing or offending viewers. **Copyright** – Original work or sensibly referenced work is only acceptable, avoid all copyrighted work entirely.
Audience:	The **age rating** for this project will be 12+, which will follow the guidelines of the rating as it is in the UK: https://www.bbfc.co.uk/rating/12. The **target audience** is all that enjoy the Action, Romance genre due to the planned story.
Summary:	This project will be a short film, created using a mix of live action greenscreen, unreal engine and animation techniques. The project will follow all applicable ethics and adhere to the age rating of 12+. This deliverable will be handed in 2nd December and showcased to individuals during the exhibition, 15th May.

1.2 Why this project? (A Deep Drive into Unreal Engine Production)

Creating virtual short films has always been a trivial lengthy task, as the team is either yourself or a small group working multiple jobs to produce a final piece. Since individual's have needed to put focus in different areas of production, it's rare that these areas are given enough time to be fully realised, which can impact the overall quality of the piece.

However, in recent times, many shorts have begun to start cropping up and garner a lot of attention. Usual with individual or small team behind them. A great example of this is the short "Rally" which combines the latest technology of within Unreal Engine to create a short with semi realistic graphics, all in an impressive cinematic sequence. This 9-minute short was made by a small team with a single animator.

Rally: An Unreal Engine Short Film (Menghini S 2024)

I want to explore the various way's Unreal engine has been used, and how it can both open opportunities to allowing creators to produce Hollywood level graphics with a small budget. As well as this, diving into way to improve the production pipeline to assist with avoiding time constraits will be considered.

Exploring the different techniques film utilize for storytelling and cinematography can help develop similar methods when creating game cinematics. Unreal Engine offer's a lot of tools to assist in imitating movie sets and real-life cameras. Delving into these areas can help assist in telling how the gap between film and game can be bridge and the impact of storytelling it has.

I also hold personal interest in developing my own ideas in similar methods, which the research in this project will both assist in developing research into how it's done and producing a piece for my portfolio.

Research - Producing an Effective Short using new Technology

“How is Unreal engine used to redefine the cinematic VFX production process for film, and how does it seamlessly bridge the gap between realism and digital artistry?”

Introduction

This section of this scoping document goes into detail about recent examples that utilize unreal engine in different methods. This will give insight into unreal production and answer along with provide an understanding to the two research questions proposed. The case study choice made reflects the type of technology that would be used to produce the final deliverable during the end of the semester. As well as this, techniques developing an effective virtual short film will be researched to aid the development, and to be the foundation of how I can bridge the gap between realism and virtual worlds.

Three case studies will be chosen, each with a different focus of how realism, and what tools are used to aid tackling that issue. To begin with, explaining the Unreal engine will help for purpose, context and meaning behind the use of certain words, such as Lumen.

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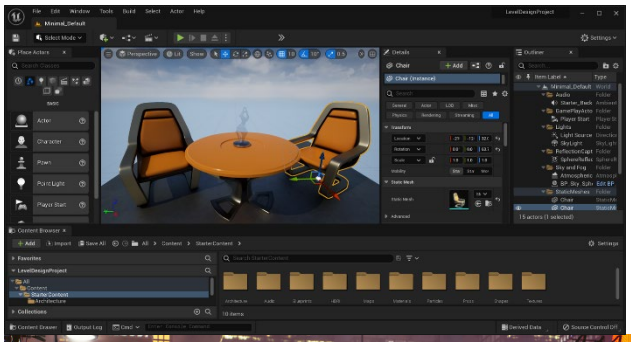
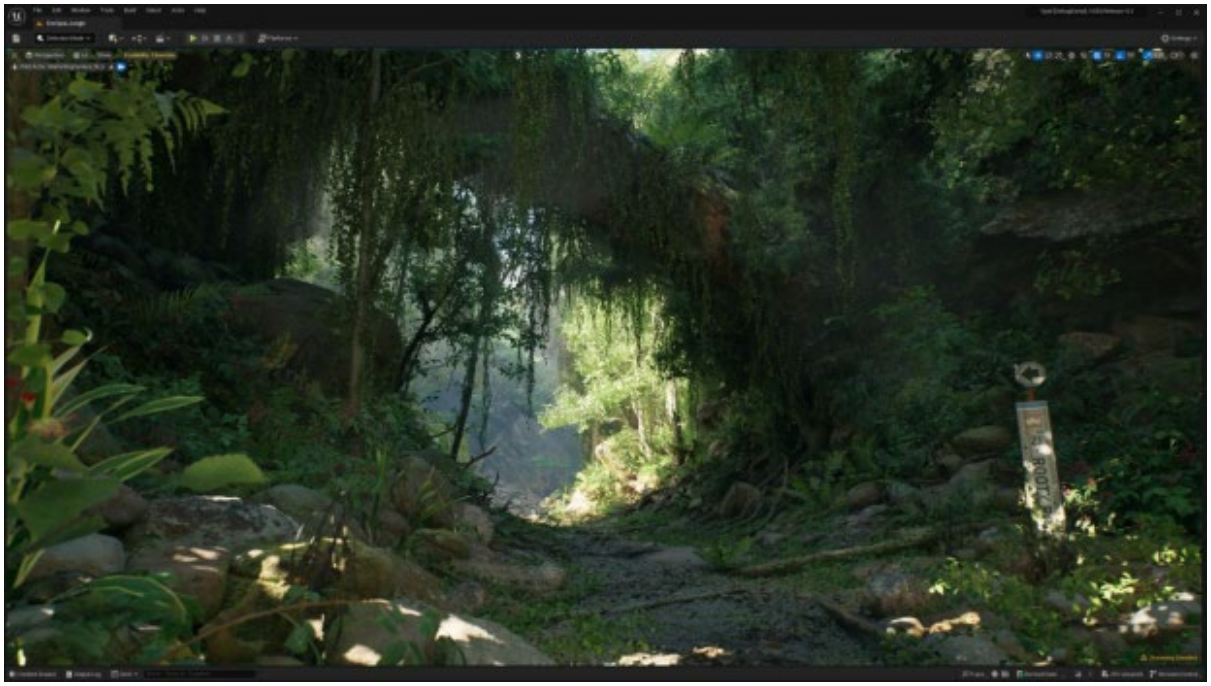
Tech Review – Unreal Engine





Unreal Engine is a game engine developed by the studio Epic games, containing powerful tools assisting in developing media in real time 3D setting. The engine is used for all form of media, from computer games to film and television.

Lumen, which is one of the lighting systems within the engine allows for lighting to be dynamic, affecting objects outside indirect light, close to reality, offering auto photorealism. “Using Lumen allows for more accurate and realistic lighting than previous methods and better performance because it can be done in real time” ((Orvalho L, 2023) p2). Complimenting this, Unreal Engine offers a complex material system allowing for stunning textures to be created and impact the scene in unique ways.

Another feat of Unreal Engine is the worldwide content developed using it, due to its free and user-friendly UI. A lot of tutorials existing helping user’s around using the many tools offered by the engine.

Case Study 1 – “The Mandalorian”

Background manipulation in Unreal engine

The first case study will explore the use of unreal engine and its use for producing backgrounds for films. The document will investigate the effects of using LED projections of a live unreal project and the implications this has when filmmaking.

(Starwarsnewnet, February 2020, “Behind the scenes”)

https://www.starwarsnewsnet.com/2020/02/new-behind-the-scenes-video-of-the-mandalorians-virtual-production.html

For the series, The Mandalorian, a 270-degree cylindrical wall of LED's was created to be utilized like a giant monitor. (Yarter, T , January 2024) "**In layman's terms, engineers at ILM and Epic Games were able to use the "Unreal Engine" software paired with the hardware of "The Volume" to compute and display a 3D environment that can move and react to movement similar to a user's character in today's hottest video games."** This presented a new way of filming as scene's could be brought onto the background with the click of a button, apposed to gaining access to a filming permit and travelling. Filming in this manner brought many advantages to the crew, for example:

- Cost Efficiency – Acquiring filming locations can be quite expensive, depending on the location. The use of the LED screen's allowed producers to project the actors into the scene, without set building.

- Realistic Reflections on shiny surfaces – This is an expensive process in the virtual production industry as creating reflections on an object that isn't on the same plane as the reflected image is very time consuming and requires a skilful VFX artist to execute accurately. Realistic reflections prove very important for cinematography as CGI heavy films must imitate reality as much as possible due to (Card . W 2016) **. "…doubts whether an apparently animate being is really alive; or conversely, whether a lifeless object might not be in fact animate" (P23).** To avoid the "Uncanny" effect of CGI, realism is employed as much as possible, and realistic reflections helps mitigate that.

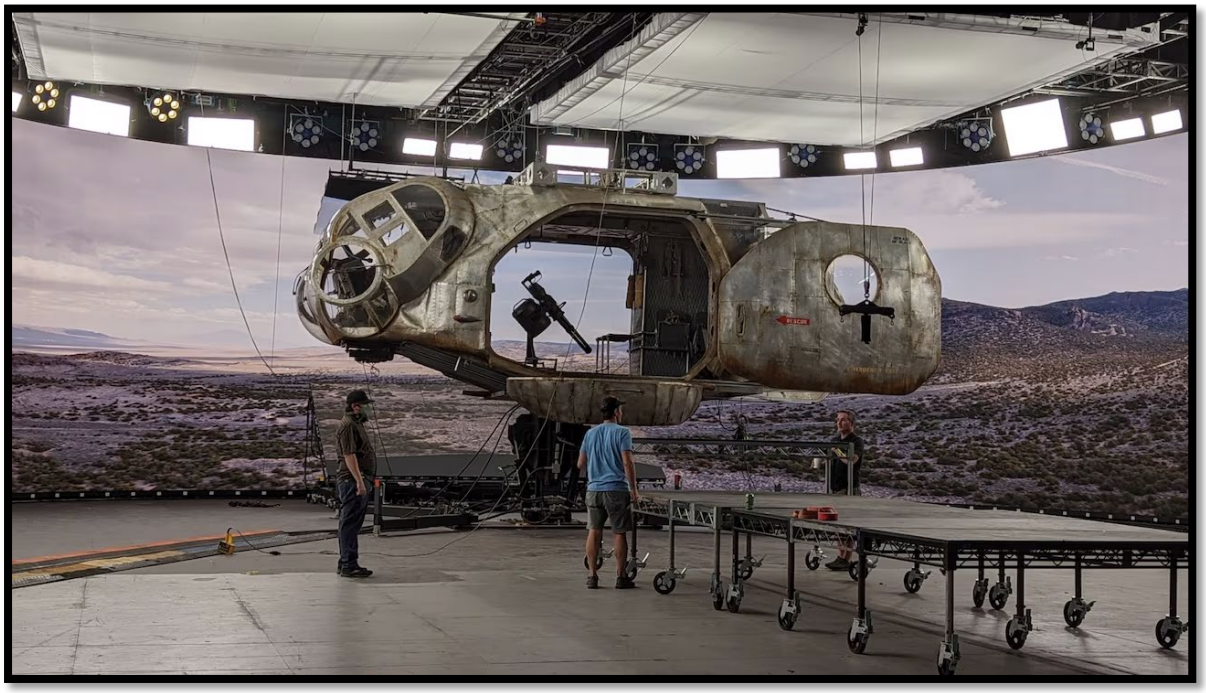
- Enhanced Live Actor / 3D Character - Scene Interaction – Getting an interaction between live action and CGI elements right can be difficult, and requires proper directing, practice and expert actors. Ian McKellen, actor in the popular movie franchise Lord of the Rings had this to say about his CGI experience. (McKellen **,** I. 2015) **"All I had for company was 13 photographs of the dwarves. Pretending you're with 13 other people when you're on your own stretches your technical ability to the absolute limits."** Due to the overuse of green screens and lack of connection between the actor and the character's the actor is trying to interact with, the actor had a challenging time performing.

- Background Manipulation – Due to the scene being projected directly for unreal engine, the background can be manipulated during shooting at any time, creating this effective mix of virtual development and filming. This also enhanced the realism for actors on set as it provided them with a world space and characters, opposed to the need of memorisation and imagination based on images and a script.

Mandalorian uses all these to "**redefine the cinematic VFX production process for film and Gaming".**

This technology would be used again in the filming of the “Fallout TV Show”

(UnrealEngine, May 2024, “Virtual production powered by Unreal Engine”)



https://www.unrealengine.com/en-US/spotlights/magnopus-brings-amazon-s-fallout-series-to-life-with-virtual-production-powered-by-unreal-engine

As seen props used in the scene are brought in front of the monitors, while everything the actors don’t interact with are generated in the background.

Summary

Both, the Mandalorian and Fallout became successful examples of excellent filmmaking, in big part due to the technology which heavily improved the realism of unrealistic qualities in each film. I would like to take these ideas and put them into a short, testing the technology on a small scale to see just how this method of production works.

Case Study 2:

What is necessary to create effective 3D characters

Introduction

3D character development has been shaped and reformed continuously throughout the years thanks to impressive technological feats in both filming equipment and VFX tools. Film and gaming follow similar procedures when creating impactful characters for storytelling. Each follow the same fundamental values of captivating users but take different approaches. Gaming must take a interactive approach, which filming will attempt to conjure a character with as much realism as possible.

Case study 2: "Avatar" (2009)

The "Avatar" was a Heavy CGI technological innovation, which is a great case study of how visually immersive and stunning characters can be created through the use of CGI and animation tools. Priya, E (2023) . **"Cinematic technology not only reshaped the way stories were told but also transformed the landscape of filmmaking itself" [8].** Technology not only allowed the use of realistic 3D characters, but world for them to shine within. For example, characters from the movie would not have been impactful if not given a world that makes sense said characters.

"https://www.youtube.com/watch?v=Cimy6T1nczw"

Many tools were used to create the complex creatures of “Avatar”

This includes:

- Motion capture suits – for the use of creating realistic movements.
- Stereoscopic 3D – which allowed the mimicry of human eyes
- Vicon – For complex facial emotions

Avatar managed to surpass the bad representation of “Uncanny” 3D characters had during the early 2000’s, and these tools helped progress. Making a passable 3D character relies on a lot of perfection, in both anatomy and realism.

The adventures of Tintin (2011) is a good example of uncanny animated characters. (Ferreira, C (2015) . “Tintin looks simultaneously too-human and not human at all” and “There is an excessive amount of realism in the design of the characters in this film, which are made uncanny by the addition of exceptionally large heads and disproportionate noses. This in fact is applied to all characters except Tintin, who retains a more human appearance. Textures, cloth and hair are hyper-realistic.” [83].

This informs us on the importance of repetition in design, scale in proportion and how to avoid uncanny character designs.

Avatar managed to avoid this by keeping consistency with their designs, creating non – human aliens with features that a day-to-day person can recognise and realistic proportion.

Summary

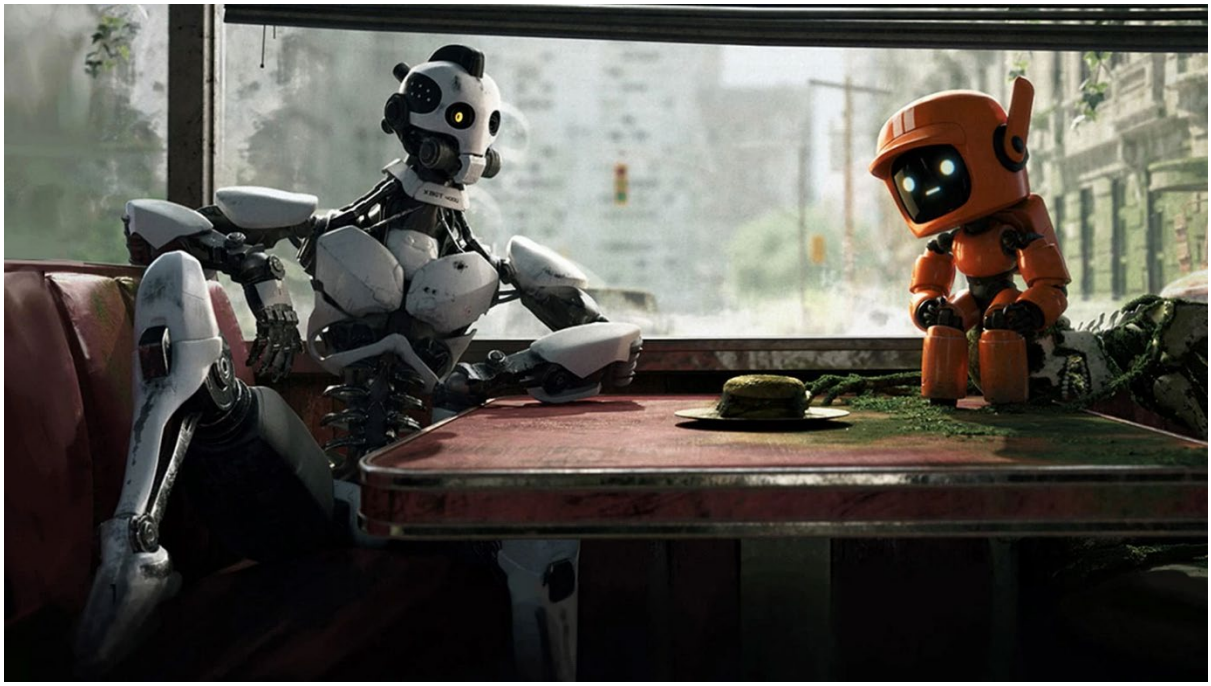
This short look into character design has given me an insight into the importance of using identifiable features on “Alien” like characters, which I plan to use for my project, and the importance of using realism in character creation to avoid “Uncanny” and unsettling character design and animation.

Case Study 3

Effective virtual Sets

Introduction

Virtual sets overcome the boundaries of traditional sets of film, offering limitless creativity, empowering artists to tailor each aspect of an environment to enhance storytelling. Virtual sets not only shape the backdrop but guide the audience through the world of the story. With this, the art of designing and developing effective virtual sets is pivotal in crafting a truly captivating and intriguing piece.



"Love, Death & Robots" utilizes strong environmental storytelling each episode to drive the narrative and convey emotion and atmosphere. Each episode is unique, requiring a whole new environment to be developed for a separate story to convey the narrative. A great example of the story building in this is in the episode “The Secret War”.

This episode is set in a harsh Russian forest, utilizing foreboding expanses to convey the isolation and grim circumstances of the soldiers. The snow-covered trees within the darkening atmosphere are used to create the feeling of mystery and hide the supernatural presence that threatens the soldiers. The environment is chosen effectively to hinder the soldiers' senses, further conveying the feeling of dread.

Another example of the world building in the show is "Three Robots".

The environmental storytelling plays a crucial within this episode as it has three characters traversing through the post – apocalyptic world left by humanity, which requires the utilization of mass amount of narrative through world building to show the collapse of society and nature reclaiming the land it once had lost.

These two examples from "Love, Death & Robots" were chosen as they closely relate to the deliverable outlined for the project, and the attention to world building make for great examples to learn and create my own environment. The use of real-time animation & rendering via Unreal Engine, allowed for world to be built around characters, with tools enhancing the total landscape and atmosphere.

Evaluation

Each Case study highlights unique tools and techniques to bridge the gap between realism and digitalisation. I can integrate these to further enhance my deliverable:

Lighting: “The Mandalorian” shows how the use of lighting in a real-time rendered game engine can impact the immersive and believability of a character being within a virtual space. With similar lighting direction, shadows and colour, characters can be seamlessly integrated into any environment. This case study also shows how environments can be drastically altered easily with tools in Unreal Engine, further cementing the power of the engine in developing realism in virtual production.

Environmental effects: The Series “Love, Death & Robots" highlights the importance of using environmental effects in virtual production. Using effects, like fog, the series builds realism to their landscapes, intergrading realistic weather conditions. Through the power of unreal engine, I use similar effects, adding to the environment. This would help flesh out my scene and add to the feel of the short film.

Storytelling through Environmental Design: “Love, Death & Robots" short “Three Robots” shows how I can utilize the Environmental Design to drive the narrative and create emotion within my audience. By using story driven assets, I can shape my story through my environment, as well as my characters, bridging the gap between realism and uncanny valley.

Realistic Character Movement: The “Avatar” conveyed how effective fluid character animation can be achieved in a virtual setting. Using a Mocap suit allows each tiny movement to be captured, resulting in lifelike movement, as natural movement doesn’t follow a set line. Great character animation is key for immersion in virtual production.

Using the techniques above, I can foundation my project on solid industry methods on achieving realism in virtual production and telling an effective story both through effective character animation, and environmental development. Unreal Engine enables the use of all these tools, with its wide range of use and its extensive library of community support, making it the perfect software for bridging the gap between realism and virtual production.

Competitor Analysis

As stated in why the decision was given to explore this research, there are many Unreal Engine project being created. Exploring these films, alongside the case studies can help funnel idea's in best utilizing the game engine to create my own short.

Example 1: "The View" Created by Shane Spence, 2023

"The View" is a short emotional piece about 2 characters and the passage of their time. Using Lumen and raytracing, realism within the scene was achieved with accurate reflections from the water, life-like outdoor lighting and soft shadows. This piece highlights how far the Lumen system with Unreal Engine has come (Lumen being a realistic lightning rendering engine) with each update. While this piece takes on an emotion role, different to the project being produced, much can be learnt from how expressive the characters are.

The characters are always moving, never still, as people are. Subtle movement and relatable poses sell the humanity of these virtual characters. Another point to be made about this short is that the camera angle is a single wide shot throughout the whole short, emphasising the passage of time between the two characters.

As stated, while different, a lot can be taken from the simple yet engaging character animation and how it is combined to give life to them. Using this, I can apply similar animation techniques to my own characters and build upon them to further imitate life like movement.

While the camera technique during this short was impactful to the narrative, my project will use far more for the more action-based theme, however, thinking how camera angles can be used for narrative development will be considered thanks to the work done here.

Example 2: Oryctes - An Unreal Engine short film

“Oryctes” is a short set in a fantasy theme about a knight and a dragon and their fierce battle to the death. This short uses many shots with a lot of motion blur to show off the action-packed fight. This is done using an unreal engine slow shutter camera, to achieve the blur effect that traditional camera’s get. While being only 2 minutes long, the action is filled throughout, really portraying the grave danger the knight is in and the lack of rest during the battle.

Textures and lighting during the scene accurately achieve that photorealistic effect. Shadows perfectly depict location, thanks to the normal mapping of textures. Materials have been adjusted accurately to simulate how they would in real life, like the leaves with the shine from the sun.

Many techniques have gone into ensuring the quality in graphics for this short and would be hard to match. However, learning from how textures react to the environmental lighting can help in bettering my own project, leaning closer to realism.

While my short won't be near as action filled as this one, it’s a great study to investigate how the story play’s out, along with creating an impactful ending. The ending turns the tables on the dragon, and gives the character power, enabling a power play between the two characters, creating this satisfying feeling for the audience. I want to build upon this idea, but instead of just a power balance, I want to create mystery and a need to see the conclusion from the audience, which this short failed to do. To do this, using this example, empowering the character’s is a must, but adding onto this with fast action can impact the mysterious factor.

These two examples depict two ends of a narrative structure, along with the kind of camera play each use. A lot is taken from how each use the lighting rendering within the software, with “Oryctes” using a lot of realistic texturing to make up for the darkened shaded area’s it has, while “The View” uses the directional light of the virtual sun within the system to handle all the lighting work. Combining the two, I can make the best use of directional light and proper material texturing to gain the best of both worlds, ensuring photorealism is achieved within my piece.

Title “N/A: Reverie”: A Short film

Introduction

For this project, I aim to take the idea’s researched and produce a cinematic piece, containing both elements of filmmaking and VFX using gaming technologies. This short will be roughly aimed to be 1 – 2 minutes in length, telling a small story between two characters, both animated, but one will be a robot without appendages. Learning from the research above, I will integrate practices and methods to avoid uncanny animation feel using new tools and motion capture equipment.

Story

“Two partners, Lucy and Den, scavenge the torn wasteland for scrap and valuables to pawn off for a living. They both get a tip on a location that could yield fortune for them both. However, the area has been long forgotten and avoided. Knowing this, they still both went out to uncover this forgotten location and explore its secrets”

However, the story will, as mentioned above, play out between two characters. Three scenarios are being considered for this:

Battlefield – Two soldiers are reaching their climax against each other in battle, when emotion breaks in between the two. (Film)

Mirrored – About a girl trapped solving a puzzle with an alternate reality of herself, while their very existence is being threatened (Teaser)

Intertwined – About a girl who’s love lives in the digital world, and their goal of seeing each other. (Teaser)

“Battlefield” will be possible if I can attain a shooting location with a big enough screen.

“Mirrored” will be my back up in case of shooting errors with “Battlefield”

“Intertwined” will be chosen if I am unable to shoot either as this will be much easier to pull off

This will be further discussed with peers and supervisors.

The story will be chosen before 1st January, before any of the second phase of development comes into play.

Technology use

For the technology I'm going to use:

- Unreal Engine (For scene creation, rendering and composition
- Blender (Modelling and animation)
- Mocap (QuickMagic AI)
- Blackmagic Camera (For live action footage)
- Premier pro and After Effects (Final touches and creation)

Tech Review: Blender

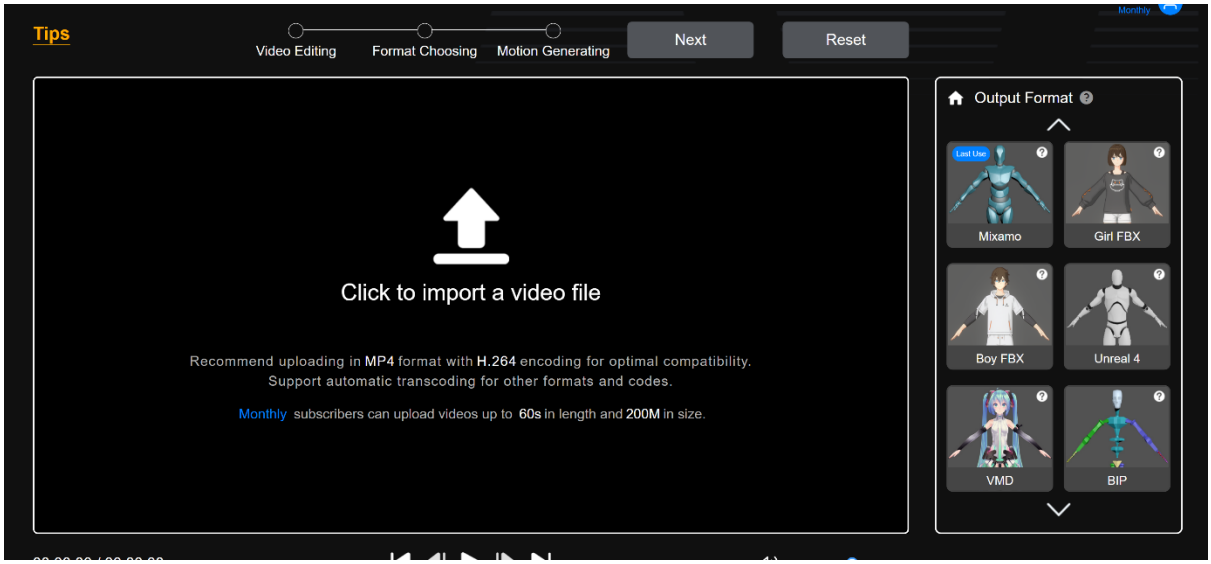
Blender is another free to use 3D software with similar uses to Unreal Engine, being a real time rendering engine for modelling and animation, which are the software's only two focuses. Blender has two light rendering engines', Eevee and Cycles.

- Eevee: This Light engine focuses on rendering colour, at a performance. Since Eevee minimizes light bounce, shadows and image depth, the render achieved with this isn't photorealism, as of more a stylized rendered fitting for the simple nature of it.
- Cycles: This engine focuses on realistic lighting, while not as strong as Unreal Engine, is great for previewing how assets will look within other software's.

Blender is going to be used for that reason, since the software is used for creating models and animating, it will be used for animation, with the cycle's engine, which then will be exported as an FBX for compatibility between the two.

Tech Review: QuickMagic

Quick Magic AI is a new Mocap tool which doesn't require a capture suit. The software uses AI to generate an animated 3D rig of a selected person from footage uploaded to the site.



Tech Review: Adobe Premier Pro

Premier Pro is a popular software by Adobe, used for editing video's and applying simple effects. With this application, all the footage from Unreal engine will be cut for smooth flow throughout the short. While this can be solved in Unreal, re rendering takes time, affecting the project timescale, to minimise this, all the footage can be speed edited with premier for the sake of project feasibility.

Colour grading can be done for the short, if need be, within the software, in case of any mismatch white balance during shot rotation.

Final render will done with the program, due to the nature of composition editing within premier pro.

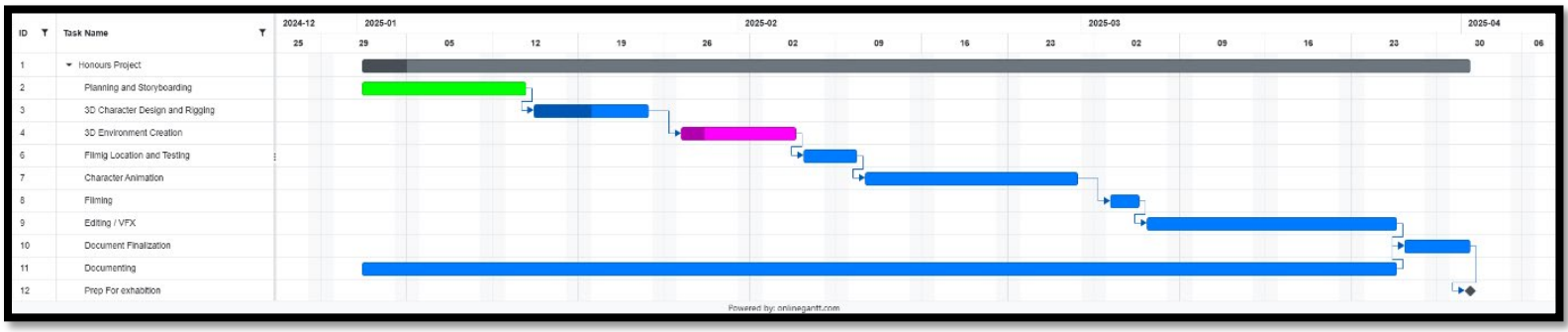
Tech Review: Adobe After Effects

Adobe After Effects is another software in the adobe family related to video editing. Unlike premier, after effects is used for VFX on a large scale, but clip by clip, which they are timeline within premier.

Any clip that can benefit from using an After Effect, such as an emmsive texture needing additional colouring, can be sliced from Premier and plugged into After Effects.

After Effect's will also be used for additional particle effects at the portal scene of the project can benefit from the supporting VFX to give that magical fantasy look sees in the short "Oryctes".

Project Feasibility



Testing out wonder dynamics

To start my project, I will first need to get a grasp of the tools I would like to use, this being wonder dynamics and it's potential use in unreal engine. Wonder dynamics brings new possibilities for creating 3D animation and CGI characters, allowing users to film themselves and instantaneously convert themselves to a fully rigged 3D character. While the software has it's limits and isn't always accurate, this can be edited and cleaned up by hand.

Recording test animations for quickmagic

During this test time, I learned of the limitations that wonder dynamics hide until you use the software, for example, not allowing the editing of animations unless on the big plan, limited time if using own 3D characters and limited character emotions.

Instead, I have done research into AI mocap software instead of this, as I want the benefit of rig editing, and am more than happy to put my character into the scene. This tool being quick magic AI.

Methodology

Cinematography

Cinematography refers to the artistry of combining video and photography through filmmaking in both virtual and reality. This consists of many different techniques that involve camera angle shifts, lighting and composition. The choice of lens, and camera options also relate to cinematography. This including depth of field, f stops, ISO and stutter speed of the camera. Many different methods exist on be utilizing all the techniques to create artistic pieces of cinema. An artist named "Yutong Shi" used a technique in cinematography to expressive his short in a unique manner:

"A Montage is a major narrative and expression method in movie art. As an artistic technique of connecting the shots and giving new meaning to them, it is also an important way of animation narration. Through the montage method, different scenes and objects of animation shots are connected together to generate different visual expression." ((shi, Y, 2022) p. 172)

Using this example, I can learn how someone has used cinematography to help drive the narrative of their short. Using a series of different shots to "Establish" the scene, the audience can be given an idea of the kind of theme the film is going for, and the key areas of interest, like how "Yutong Shi" used a montage to build up their narrative and visual expression. Using long shots can assist viewer's into getting a good grasp of the environment.

"The large perspective shot is used to describe the environment or to exaggerate the atmosphere, while a close- up shot is used to describe the process of the characters' action. ((shi, Y, 2022) p. 172)"

The example shows the how they used different ranged shots assisting in their cinematography, further conveying the importance of how the camera is used in film. During production, different camera angle examples will be researched to assist my own scenes and help the narrative sequence.

Photorealism

Photorealism relates to the mimicry of real life through computer graphics. VFX often uses the principles of Photorealism to incorporate special effects into footage for film. Game creation uses this technique when art style call for photorealism. Lighting and texturing are key for this mimicry.

Texturing is used to give mesh skin and has many configurable options for the engine to decide which kind of texture it is. Roughness and Specular can be changed to configure a meshes smooth and shine, for example. Photorealism texture's use multiple texture files of the same texture to give information to the engine how different elements of the texture are rendered. In Unreal Engine, the material options include:

Base Colour – Contains the colour of the texture.

Metallic – How "Shiny" the material is.

Specular – How light shines on the object.

Roughness – Smoothness of the object.

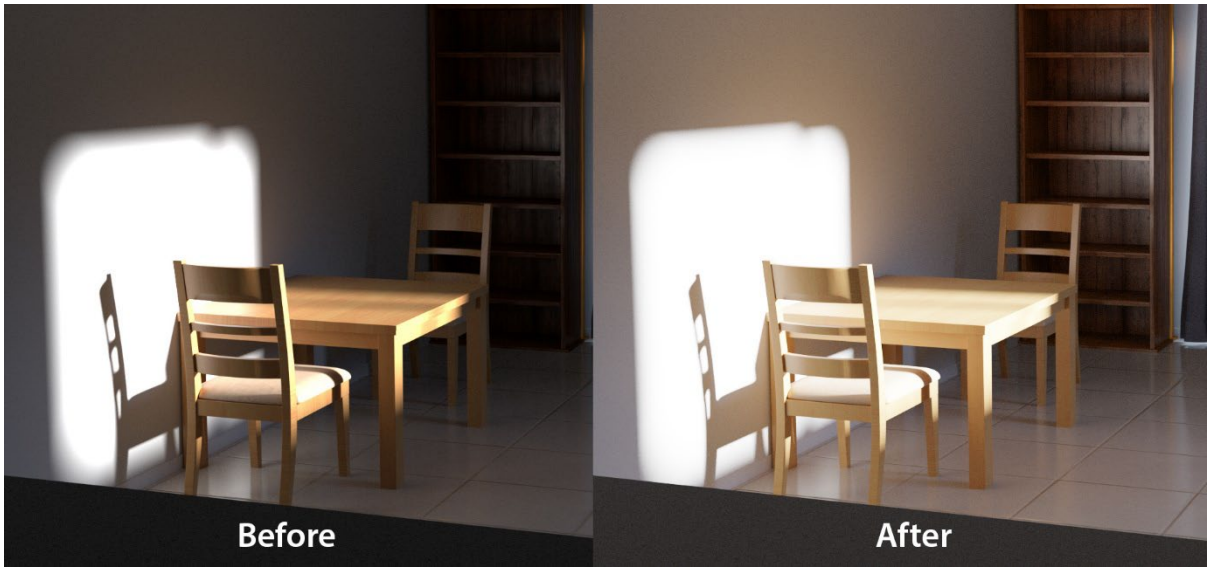
Opacity – Removes backgrounds of images to render them transparent.

Normal – Controls height levels of a texture.

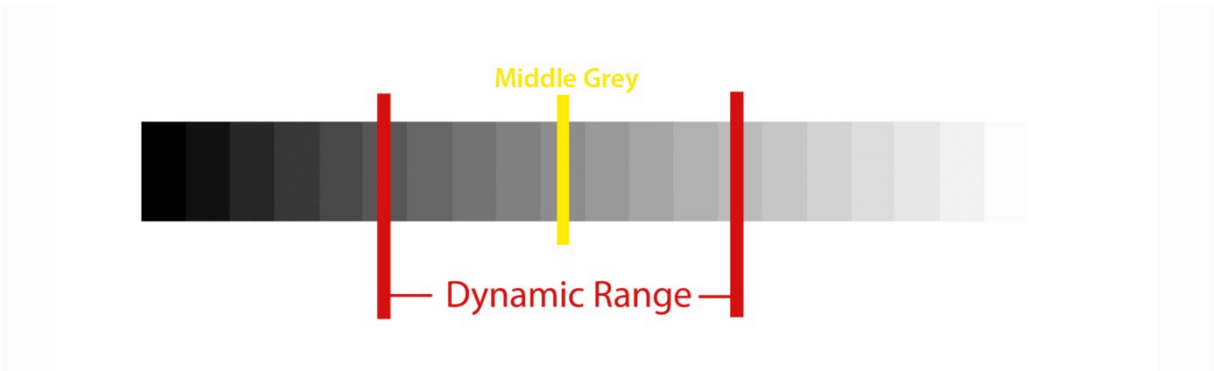
Base colour, Roughness and Normal maps are the key texturing configurations needed to create photorealism, with the other's being used depending on texture. With a high-resolution texture on the base colour, a normal map of the texture to inform the engine on texture heights, enabling the texture to have fake holes and scratches, and roughness controlling how the light bends from the object, all make realistic looking meshes.

Lighting

Lighting is the garnish that tops the whole scene off, without it, the scene would be left uncoloured and bland. Lighting play's a massive role when imitating reality, so getting it right is very important. Lighting includes light (Which in Unreal Engine Is produced from the light objects or emissive textures), shadow's and the gap between the two, subsurface scattering or "Middle Grey".



"The camera can see area's outside of "middle grey", but only to a certain point." (Price A, 2017)



“The amount that it can see on either side is called the dynamic range of the camera. The more range, the better the image.” (Price A, 2017)

While the example given relates to the software Blender, the same process can be done within the unreal engine, ensuring shadows match objects, and reflected light consist of colour of the reflected object, natural lighting can be achieved. Dynamic range refers to the number of steps the virtual camera takes when rendering lighting (F-stops in traditional Video) and shadows in an image. With lumen, Unreal Engine’s answer to auto natural lighting, a properly lightened scene and a configured camera, the deliverable will ensure as close as possible to photorealism.

To properly bridge the gap between film and game, both must be combined as without one or the other, photorealism wouldn’t be possible.

Fantasy/ Dystopian Realism

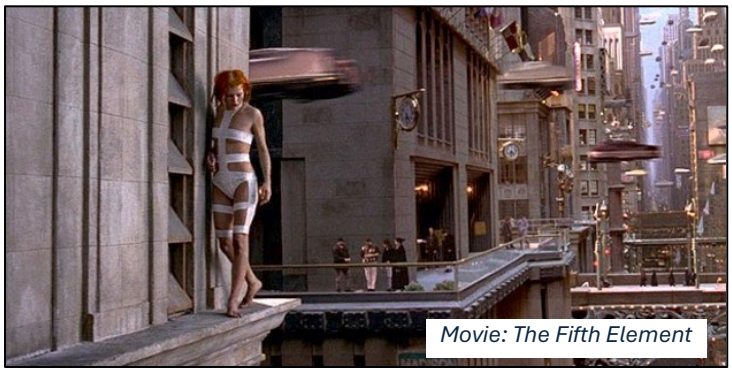
Both themes are going to be used during the pre-production of the document, used to portray two sides of a conflict.

Dystopian relates to the future and the technology that we imagine would exist during that time. Dystopian will be used when designing the main characters background and design. This will include:

- SI – FI gadgets: like multi use helmet or a tool with holographic elements.
- Cybernetic enhancements/Body alterations: This can include metallic appendages, such as a cybernetic arm.
- Companion Robots: A sidekick or a helpful companion, who’s a robot with lifelike artificial intelligence.

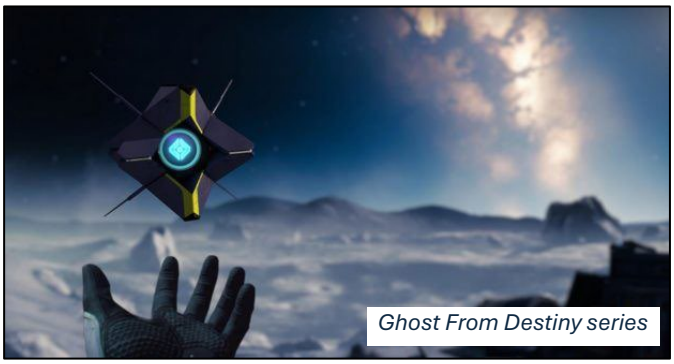
Regarding the environment, large neon skyscrapers and neon light, with a modernized look can give the dystopian feel seen in movies depicting similar themes.

Narrative structures of dystopian media usual tell of corruption or problems beyond redemption, with nature usually destroyed.



Movie: The Fifth Element

Character from Cyberpunk 2077



Ghost From Destiny series

Each point will be conveyed within the deliverable to include the dystopian theme, with the main character having similar augment's scene in game's like Cyberpunk 2077, with the cybernetic alterations.

Fantasy theme relates to the magical and the supernatural, with tales of beasts only imagined. Fantasy tropes are usually set during medieval periods, when knights clashed for kingdoms. Characters from this theme usually include:

- A magic item usually related to the plot
- Armour made from metal
- Some sort of magical power
- Melee or ranged wooden weapon
- Medieval attire

Using a character using this theme can be idolized for the opposition in my plot. Fantasy themes usual tell a narrative structure between light and darkness, or a hero's journey. Using these themes, I ensure that the deliverable follows a fantasy theme.

Elements from both themes will be used during the pre-production of the project. Characters and landscape will be chosen and designed based on familiar designed media using these themes.

Sound Design

With this project's focus mainly on visual's, sound will be used to immerse audience further into the deliverable and help develop the narrative of the story. Sound will be used to convey aspects and actions of the short story.

Design Approach

Original Story: Far From Home

A Soldier awoke in battle after being knocked out by a nearby explosion. After waking, all the conflict around him brough on a urge of desperation to finish the mission. After taking one last look at a picture of his family, the soldier runs off to disable the crystal and stop the invasion of the other world.

World building

Desert

To start the production, world was needed to be a base to deliver the atmosphere required to create the short. Looking online, I managed to find a world map based on a desert set around dusk, this being he fractal desert pack: https://www.fab.com/listings/def86157-07ce-4193-96f0-b10e145a5f36

Using this, concept images were produced to get ideas on how the production may look. With a combination of assets from the fractal desert pack, and my own asset, these were produced:

These concepts were created over the week, empowering the ideation of the setting, and assisting in testing the limitation of the Engine. Through this testing, I found that the Prior story I had was far too ambitious given my own skill and time wasn't enough.

A concept art of the character:

Concept for live action attire:

Animatic:

A simple animatic was produced to showcase the original envisioned animation that was in mid for the project, but due to time feasibility, was reduced down into the new story:

New Story:

In a wasteland, two scavengers, eager to find their next big haul turned their attention to an old tale mentioning an ancient battle ground lay in an Oasis. People darn not to tread into that place in fear and disbelief, however our scavengers dismiss this and are blinded by possible treasures.

Similarities to the old story:

- Wasteland setting
- Cyberpunk themed characters
- Fantasy evil

Using the previous story as an example, this new story is far more achievable, using only a handful of characters in a mild setting. Similar setting themes are re used however as assets can be used for this story, due to them both being set in a wasteland. However, a new character is needed for this story.

Lucy

Lucy is the name of the protagonist of this story. She, with her partner Den, are scavengers out in the wasteland, using junk and treasure as a source of income in their harsh reality. Lucy is dressed fit for wasteland exploration, equipped with a visor helmet to help combat the harsh rays of light. Lucy also has cyber augments for the cyberpunk theme the short is in.

Den

Den is a small AI Robot with a lot of personality, equipped with hover wings to traverse the rough landscape. Den also adds to the cyberpunk theme with its unique design and emissive colouring.

Dragon

This dragon will startle our main characters, crashing from a portal lucy accidentally opens, this dragon will fit the theme of a traditional fantasy dragon, with red emissive eyes to drawn fear and attention to its advisories.

Knight

This knight will appear from the portal, shortly after the dragon. This character will be shrouded in mystery, however, seems to be in a battle to the death with the dragon.

Preparing the Script

Setting: Inside tent

<Fade in to pages on book flipping, and character pointing at it>

Guide: "Here it is, the tale of an ancient dig site, rumoured to be about west from here." "a supposed unknown battle happened here but no records or evidence back this up." "Maybe you can find something useful here"

<From focus of book, then to main character>

Lucy: Where abouts is this ancient dig site.

Guide: Within the barren wasteland of Enel.

<Graphic of map and a cross being put on supposed location> *15 seconds*

Setting: Ancient Dig Site

<Dissolve from map into a wide of area, Characters leaving their bike> 6 seconds

<Side view of characters, Den moving towards the oasis, lucy standing and looking>

Lucy: An Oasis, all the way out here?

Den: Weird, but rather exhilarating!

Lucy: Don't get too excited, this could be nothing.

<Lucy walks towards the Oasis> 5 seconds

<Close up of lucy>

Lucy: Den Scan those weird structures forming out if the ground, would ya?

<Close up of den looking at structure and back to Lucy>

Den: Nooooo No, they look way too freaky.

<Zoom on lucy and Den, alternate between the two>

Den: Ok.

<Den rushes off to scan> 10 seconds

<Close up of lucy walking to an odd pile>

Lucy: Weird

<Picks up something from the pile>

Lucy: What's this?

<Zoom in on the sword>

Lucy: Awesome!

<Swings the sword>

Lucy: Why is this here? And where did it come from

<Close up of lucy and the sword, with big portal structure in the background> 15 seconds

<Den rushes back from scan>

Den (worried): I completed the scan, but it's apparently BONE?!

<close up of den>

Lucy: that can't be right?

<cut between characters, crystal in middle>

Crystal and sword chime

<Still in cut, they look at each other, and both slowly approach crystal> 10 seconds

<side shot> Lucy places hand on crystal, sword and crystal glow>

<Portal opens>

<den and lucy flinch branch and slowly backup from crystal> 10 seconds

<Close up of leg>

<Close up of claws>

<Close up of eyes>

<Behind shot of creature>

<Wide shot of lucy, den and creature, creature breathes fire> 15 seconds

<Knight suddenly appears from the portal, striking the dragon>

<Fade to back and title>

Development

Preparing the Oasis

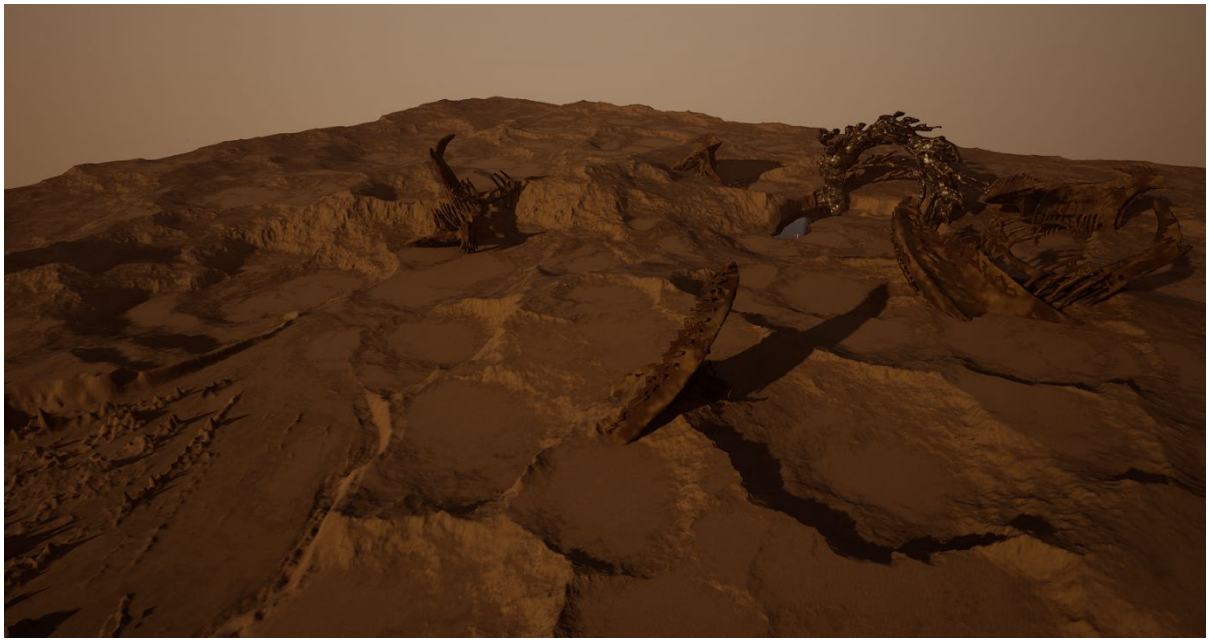
To start of the production process, the environment will be built first as a foundation for all the animation. Due to the ease of terrain editing in unreal engine, editing the existing terrain allowed me to added rocks, pebbles and foliage. This really added to the landscape, including other elements to the desert than the standard land map that was provided.

The environment was too dark for the vision of the story however, to combat this a sky map/light was incorporated, which added a fully customisable day/night cycle to the world with its own textures and directional sunlight.

Unreal Engine also let's you edit a huge landscape map, allowing you to manipulate the ground best fitted for your scene. Starting with this, using tools such as the smooth and extrude tool, the landscape was made (See Below)

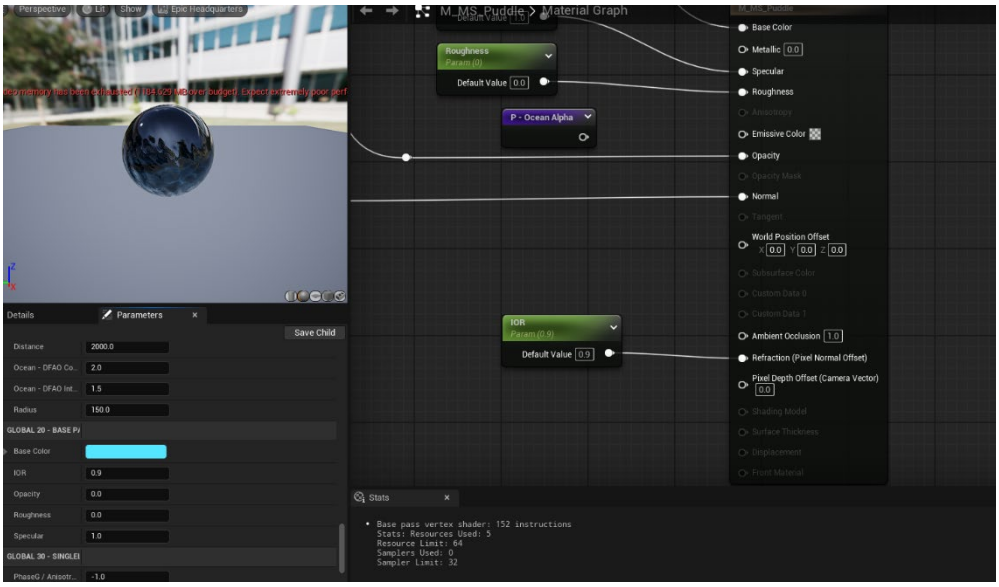
Ridges and rock piles were created to add volume to the land, for increased shadow work, however the land was kept flat to emphasis the barrenness of the world, edited with volumetric shadows for enhanced photorealism.

An orange tint gave it the desert look I was looking for, completing the lighting of the world. This was accomplished by changing the tint of the skylight. To complement this the sky texture was made blurry to emphasize heat within the desert.



Next, the layout for the stage of the scene was re did to include an Oasis area around the portal, using a detailed customizable material from the mega scans pack over a plane, I was able to create water within the world.

Using Unreal Engine's material production, and a preset water material, this orange tinted texture was put over a plane and animated to create the Oasis. This water had highly customizable features to create realistic water simulations. Simple ripples were animated to show the material was "alive".



After the landscape mesh was altered for the oasis, the giant portal frame was positioned towards the back, and act as a wall for the scene, with everything in front being crucial props and foliage. The portal acted as a back wall for the set, assisting with position for characters within the film.

Along with the portal, I decided to add highly detailed terrain from the “Dark Ruins Megas Scan” asset pack from fab, inspired by the short “The View”, which utilizes mountainous terrain to close in the scene, giving borders to the stage, like “The View”. Animated foliage was scattered onto the landscape mesh to add greenery to the scene, to show the combination of the fantasy and dystopian wasteland theme and showing the liveliness of the Oasis.

Animation

With the scene base complete, animation can begin. A sequencer, which is a tool in unreal engine to house all animations and camera's, along with setting up triggers for FX, being an essential tool in movie production. Two Cameras were created, Marco and Polo:

- Marco Camera: Utilizing a wide 12mm lens with 16:9 video capture and a configurable focus point.

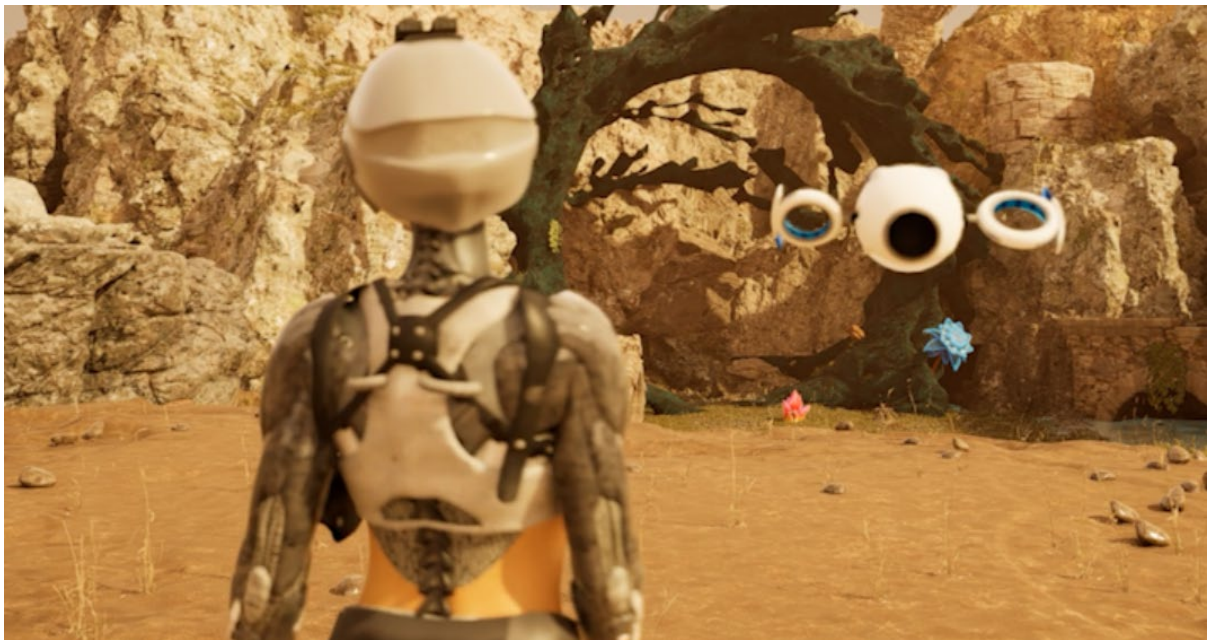
- Polo Camera: 30mm Lens camera with 16:9 video capture used for close shots of characters.

Unreal Engine attempts to mimic traditional camera's as closely as possible, being an easy-to-use system for those familiar with video.

The sequencer allows easy flip flop between these two cameras', along with animated tracks for rotation and location. Focus on the two cameras' can be configured for controllable depth of field, for cinematic close ups.

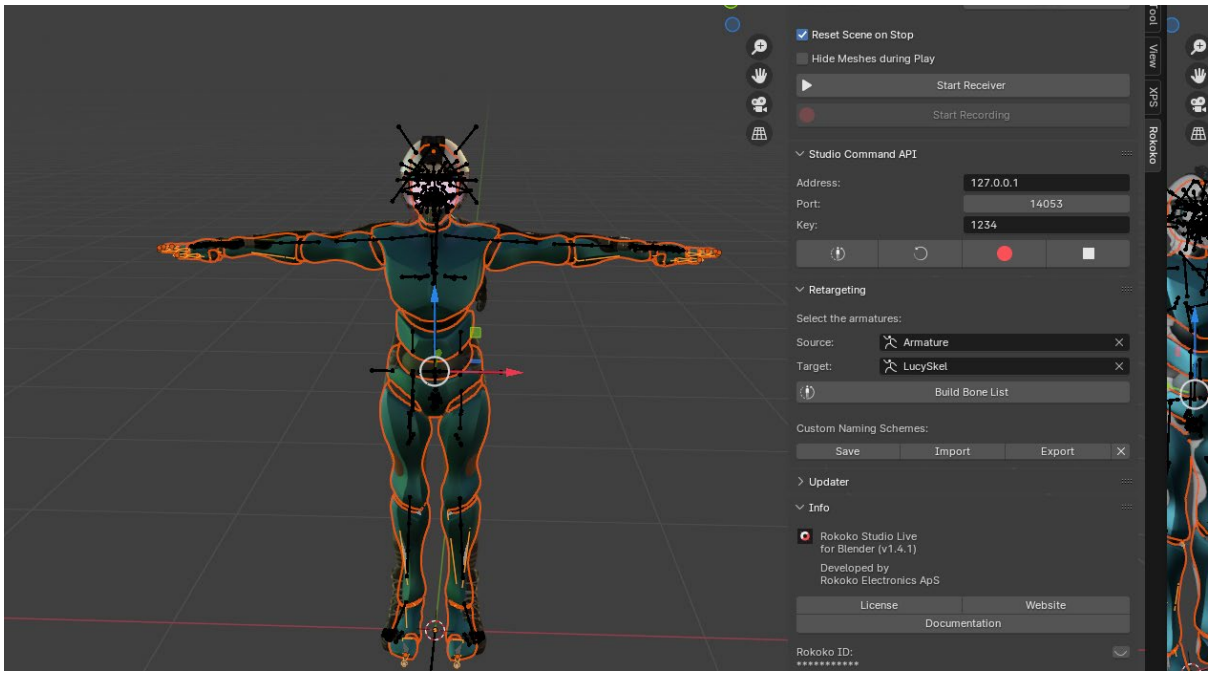
With the camera's configure, the first character was introduced into the scene. Lucy, as well as the cameras could have her location animation tracked, making for easy movement between shots.

Lucy

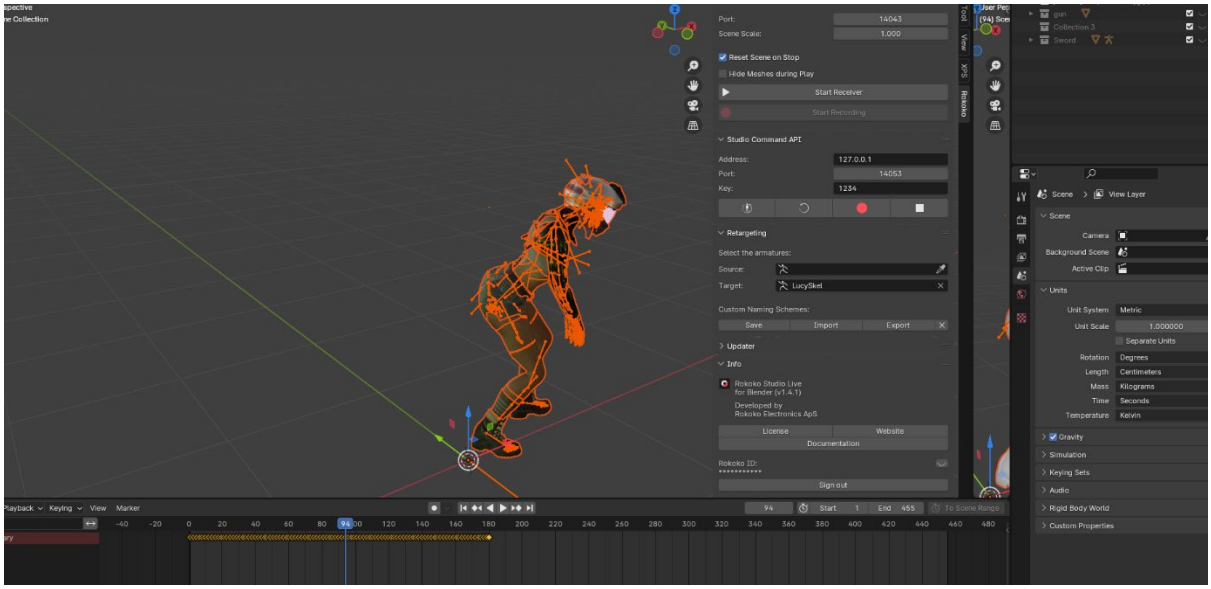


Lucy, being the main character, will be the point of focus. Lucy uses the Dystopian theme, equipped with cybernetic arms and spine, as researched, with standard wear for heat. Lucy uses a helmet to shield from the harsh sunlight of the desert and top of the dystopian feel of the character.

Lucy is animated within Blender, the chosen animation and modelling tool. Animating the character will use the Web application Quick Magic. The animation rig is configured in a unique manor, which it first copies the motion of bones from the Quick Magic output rig:

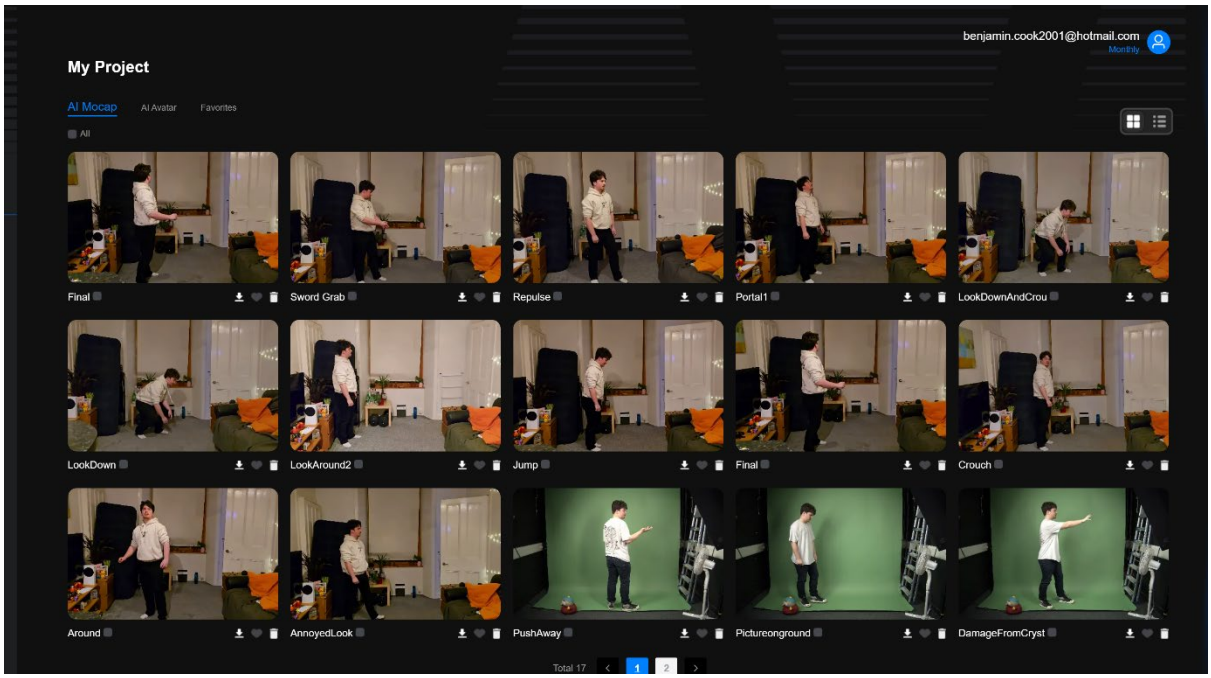


Which is then applies to all relevant bones.

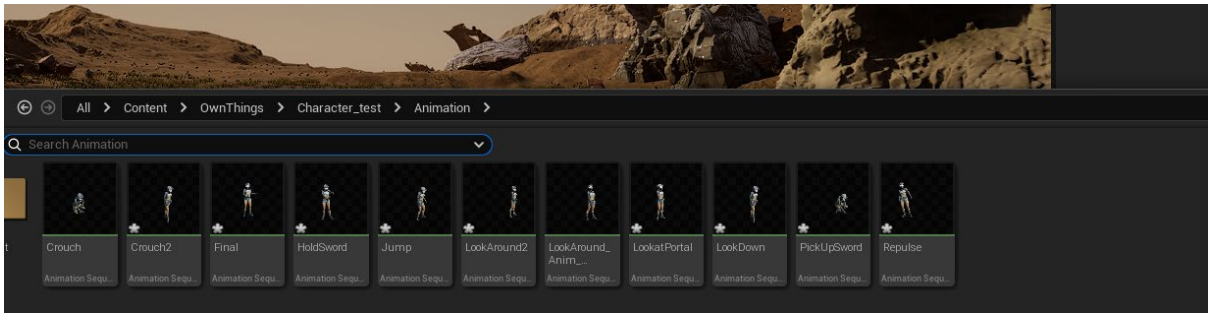


The 3D MoCap plugin Rokko, which is a motion capture technology developer, is standardly used to copy mocap to live animated characters, however, in this instance will copy animations from another rig.

Next is creating relevant animations from the script. Using the scene in unreal, a good grasp of where motion will be placed can be planned, helping with realising animations.



A mix of greenscreen and average backdrop was tested to see the limitations of the QuickMagic studio, but animation from each source displayed correct animation, resulting in greenscreen being a choice for safety other than a requirement. With this, animation can be re shot till the correct motion is given, without the need of a studio. Boosting production time, with rig's being produced within 10 minutes of upload to the studio. With this, animating the character was done within a mere few days, with most of the time correcting motion behaviour within Blender, exporting and positioning into Unreal Engine.



Issues did arise during this process however:

- Issues with Unreal Engine translating scale from Blender, this was solved by changing the unit of measurement within Blender, to the same on Unreal Engine was using.
- Stretched Bone's of lucy and 2 animations, this being a result of improper bone translation between the Quick Magic rig and Lucy's own rig, which conflicted with the rig imported to be the base within unreal, fixing this required said bones to be retargeted within the Rokko plugin.
- Rotation of animation's were random, which was a simple fix of readjusting rotation using keyframes at the start of each sequence.

With all the animations working, each was attached to the Lucy skeleton on the sequencer, were their run time and transform could be altered, alongside camera cut.

The only indifferent animations from Lucy are those ones which require her to be holding an object, which she was given an extra bone to compensate for. This bone matched up for the position and hight of the sword object, which she would be holding. This bone was incorporated into all animations using the sword.

Within unreal engine, this bone could be selected, within the sequencer, for an "Attach" track to be applied to, which linked the sword mesh and this bone together, Appling all motion to the sword that the bone experiences. With this, Lucy's animations are finished.

Overall, animating Lucy this way, while faster, took away some of the magic and smoothness that key by key gives, which is lacking within some of the animations from Quick Magic. One last issue experienced from those rig's was a small jitter from time to time during the animation, which wasn't fixable, after research. But, even with these issues, the fact of the power this technology has for budget productions is impressive and will only continue to grow further.

Den

Den the Robot, Lucy's friend and AI Assistant, acts as a sidekick character, used for story progression and character interaction. Along with Lucy, Den pack's futuristic part's, also for the dystopian feel the short is going for. Den is over the top, acting as a mirror to the audience.

The robot Den was first stripped into parts in Blender to allow unique animation to certain parts of the body, then was added into Unreal engine. All parts of Den were attached to the base body within the sequencer to ensure that all part's moved with Den's location. Den, unlike the other character, is primarily animated within Unreal Engine, due to the simplicity of the character's animation, and external mesh requirements. Den's wings were easily animated using frame by frame Yaw rotation. With Lucy's animations completed, creating these animations can be done seamlessly by lucy using the sequencer.

Some issues did happen, for example:

- The face mesh was supposed to be interchangeable, however issues arose with the mesh and the textured, as the mesh didn't cross over into unreal well, which impacted the UV of the texture fitted to the face, the one seen on the character ended up being a mesh attached to the bot's head, with a material I re did.
- An issue with some of the meshes attached to the head, which resulted in them being scrapped, which was ears for the robot.

With all the animation being handled by Unreal Engine, it's smooth and can be easily configured for correction. Due to the simplicity of the robot, animation work is easy. To top off the animation, a light was attached to the bot's face to glow a faint blue to close objects.

The Dragon

The dragon will be animated within Blender and then imported into Unreal Engine using they same process as Lucy, these animations will be hand crafted as the Quick Magic studio only supports human rigs. The animations will take inspiration from similar media stated within the research of the fantasy theme.

The Dragon uses two animations', the crash and the stare down, both being created within Blender using frame by frame, and then being added a location animated to the sequencer.

The only issues face for the dragon was a rendering issue. Due to the size of the dragon and an error with the object anchor point, the camera was treating the object as "Colliding with Camera". The simple fix for this was to increase the "Bounds Scale" option so that the dragon was treated as a collided object, rather than the dead space between the dragon and its anchor.

Overall, the dragon animations turned out great but could have used some additional speed for actions like the wing's flapping for realism.

The Knight

The knight will follow the same process as Lucy, as the character will utilize a human rig for movement. These animations have been created alongside Lucys animations, within a greenscreen room for safe hand capture. The knight will appear at the end of the scene, facing lucy and the dragon in an imposed standoff.

The knight uses two animations, like the dragon, using animation created with Quick Magic, further being cleaned up in Blender. This animation will have him walking from the portal to pick up a sword lodged into the ground. Following this, he will end putting his sword into the ground facing the characters.

The knight's inspiration was inspired by tales of knight's VS Dragons, taking an idea from the short "Oryctes" mentioned above. In this scenario, however, the knight seems to be the one taking the charge in attack, as the dragon is sent hurdling through the portal.

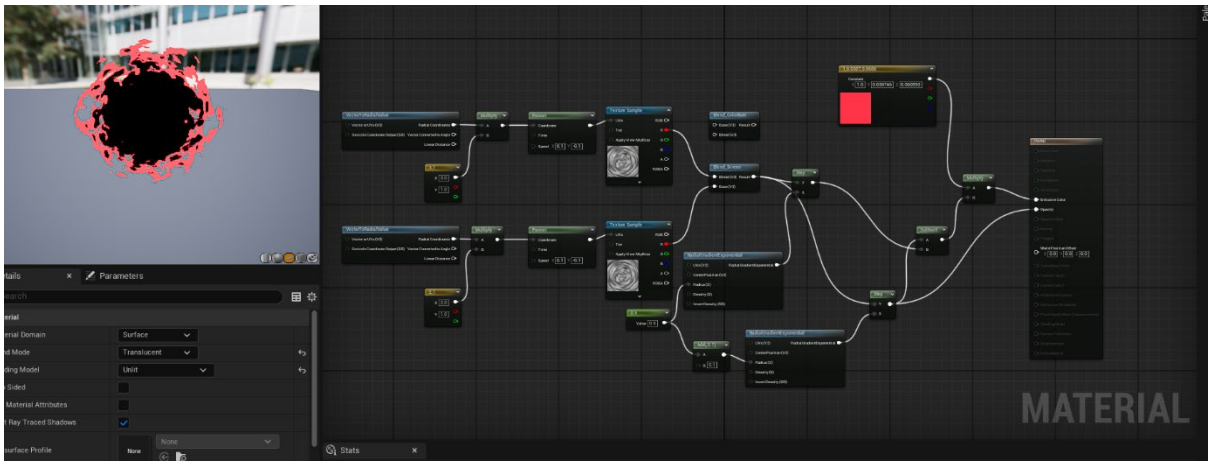
Overall, the only issue with the knight sequence is the model. Due to budget issues and the lack of realistic model's available for free, a low-quality model had to be used. To combat this, daker lighting and focus blur was used to kid the character's lack of detail, putting more focus on the sword rather than the character himself, which added to the mysterious factor that the character portrays, which fantasy themes heavily rely into.

End Of Animation

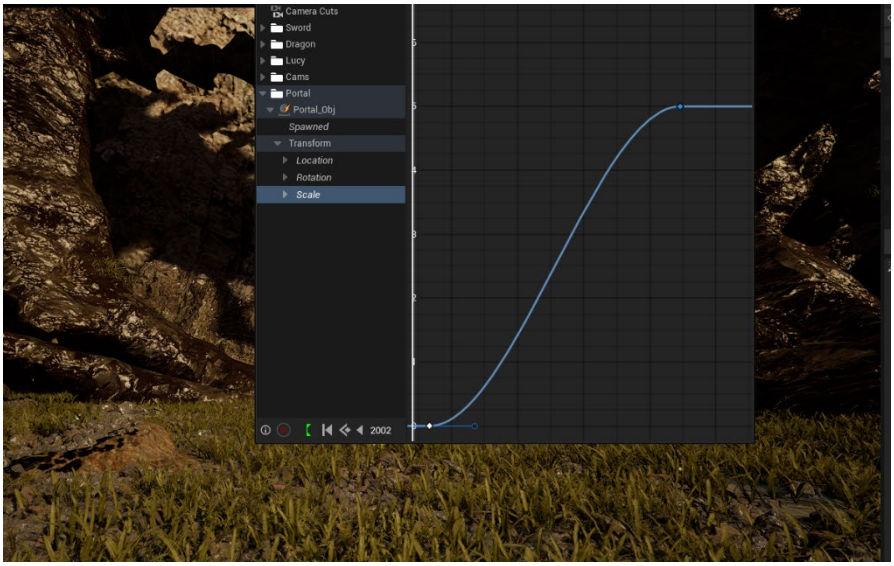
The Portal

The portal is the build up event of the story, in which it bridges the gap between the dystopian and fantasy world, or is a vault, which is left up to audience to decide. But our characters, the knight and the dragon emerge from it.

The portal was fully created using the material creation in unreal engine, 2 noise textures with emission, rotating atop of one another. An opacity mask was used to cut the portal texture from it's background, resulting in the texture below:



With a simple scale change, animated to ease in. The portal appears at the centre of the portal frame after lucy interacts with it.



To add to this portal texture, a modified dust VFX included within Unreal engine is place around the portal, giving the illusion that the portal is illuminating the area around it. During the scene darkening, a Spotlight was added to the portal to illuminate surrounding objects, using the cinematography researched above, so contrast the actors within the scene, hiding the knights flaws as mentioned.

Static meshes

With the main scene finished, the scene needed additional props to convey to audience the mystery of the Oasis. Using the “Fantasy World” pack, containing realistic textures with normal maps, these props were placed throughout the land to reduce dead space, and achieve a view like the set’s researched within the case studies. Mandalorian and Fallout had many story relevant objects littered within their scenes to immerse the actors into the world when filming.

While not using real actor’s within this project, the audience must be immersed into the world and using these props help tell the history of the Oasis, while still being shrouded in mystery, keeping true to the fantasy theme.

Following the example from Love. Death. Robots Little details are placed within the world to showcase the abandonment of the Oasis, Like vines handing from the props from “Fantasy world”.

Exposure Post Process Volume

This is a scene object responsible for handling dynamic global illumination and is what the renderer will use to finalize the scene. This object is useful for being a “small sized video editing software” as it can handle a wide range of tasks. The one used within this short handled:

- Colour grading – Editing the overall tint given by the skylight, making it a tad orange to mimic a desert-like setting.
- Lens Flare – Reduce Len’s flare, helping with camera work.
- Motion Blur - Added motion blur to character’s, helping with the fast-moving animations, like the dragon crash.
- Exposure control – Due to the direct sunlight, auto exposure was constantly changing the lighting of the scene. To avoid this, a manual exposure is used throughout the whole scene, handled by this process. The Exposure is set at two.

This is one of Unreal Engine’s best tool’s as it gives control of how the scene look’s right into an easy-to-use object. Each variable is labelled to help inform user’s how it would impact the scene.

Skylight x Bloom

The bloom effect was altered to react to objects in the way seen above. A soft but noticeable bloom effect is given to objects that are in the skylight's direction. This effect is further enhanced during a scene that faces the direction of the virtual sun. The bloom was altered till it displayed a similar look to the "dynamic range" used by the "Blender Guru" as mentioned above, giving the scene a look as close to reality as possible, so that the film hit's the photorealism mark.

This type of lighting was observed within the short "Oryctes", which gave that world a very fantasy, but realistic looking setting, a mash of the two, which was attempted here to give the same effect.

Indirect lighting

Before Direction light indirect

After Direction light indirect

This is a configurable variable within the direction light, a light that was added to the skylight mesh in place of the sun to give direct rays of light, which attempts to light objects with a tint of the colour used by the directional light. This feature is also used to hit the “dynamic range” of lighting and help with the cinematography. As observed above, the lighting complements the static area, reflecting what would be observed within reality.

Example of “Indirect light” in photography.

Cinematography

Using the examples set by Love. Death. Robots. I will be using slow camera movements with my characters as a focus. The series has many examples of showing off their artistic scene’s with usual longshots and wide lens.

Example from the show:

My own take:

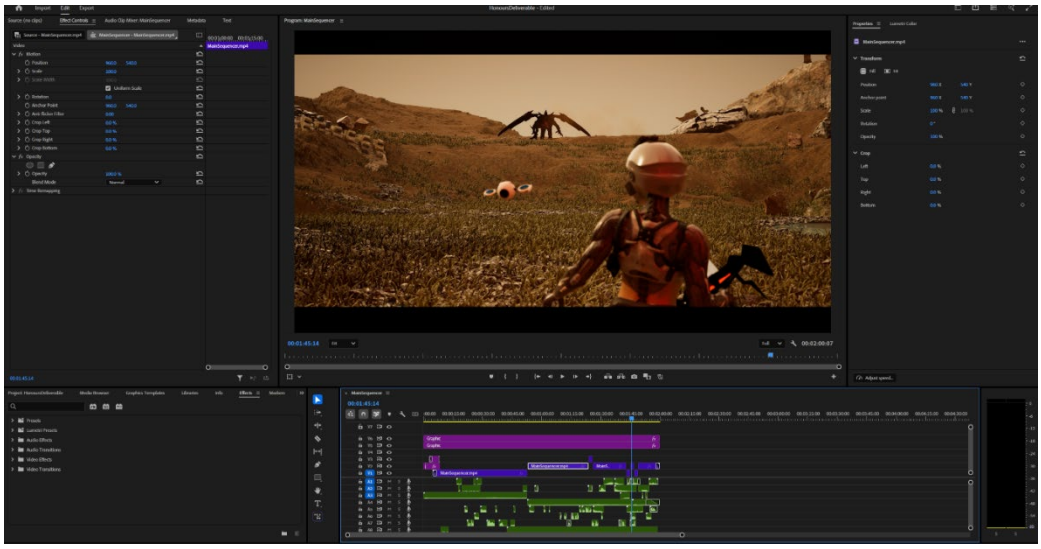
This shot was inspired by my watch of the Love.DeathRobot. scene. While being a closer shot to the character's, this was done to give an idea of scale to the audience, while still showing off the surrounding area.

This shot was used with inspiration from "Oryctes" as shots within that short convey the dire situation of the knight fighting against the dragon. A shot here was used with the same purpose in mind, with our characters in the middle, between a conflict ensued by the dragon and the knight.

Final

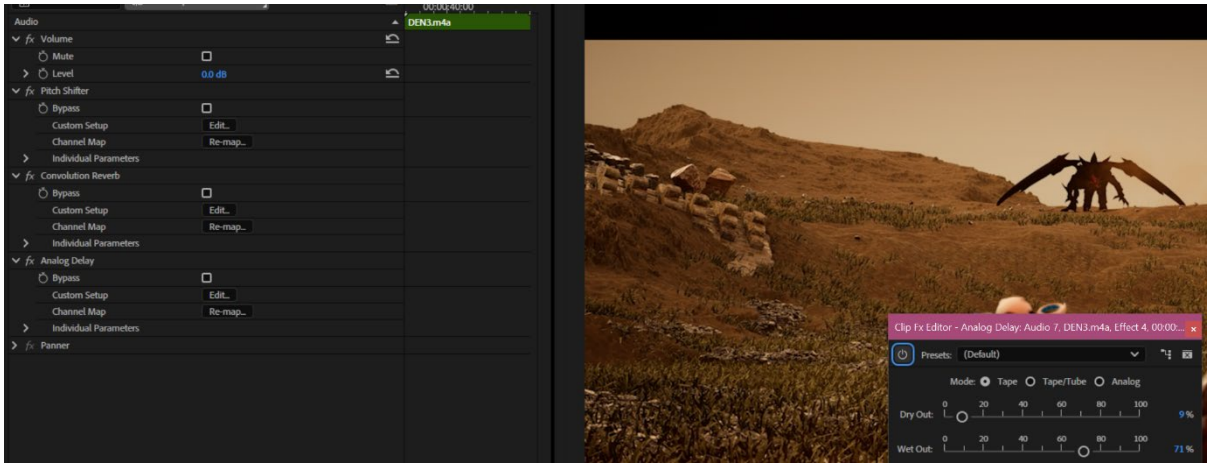
With the short film complete within Unreal Engine, it was time to add sound. The video was exported and rendered with the post volume holding the render options. This process too about 30 minutes. Additional rendering sending were added to enhance the output render, this being:

- Anti-aliasing – For additional motion blur between character movements
- High resolution – For optimal Image quality
- FFMPEG Plugin – For compiling the PNG sequence into a H.264 Codec MP4 file for easy viewing.

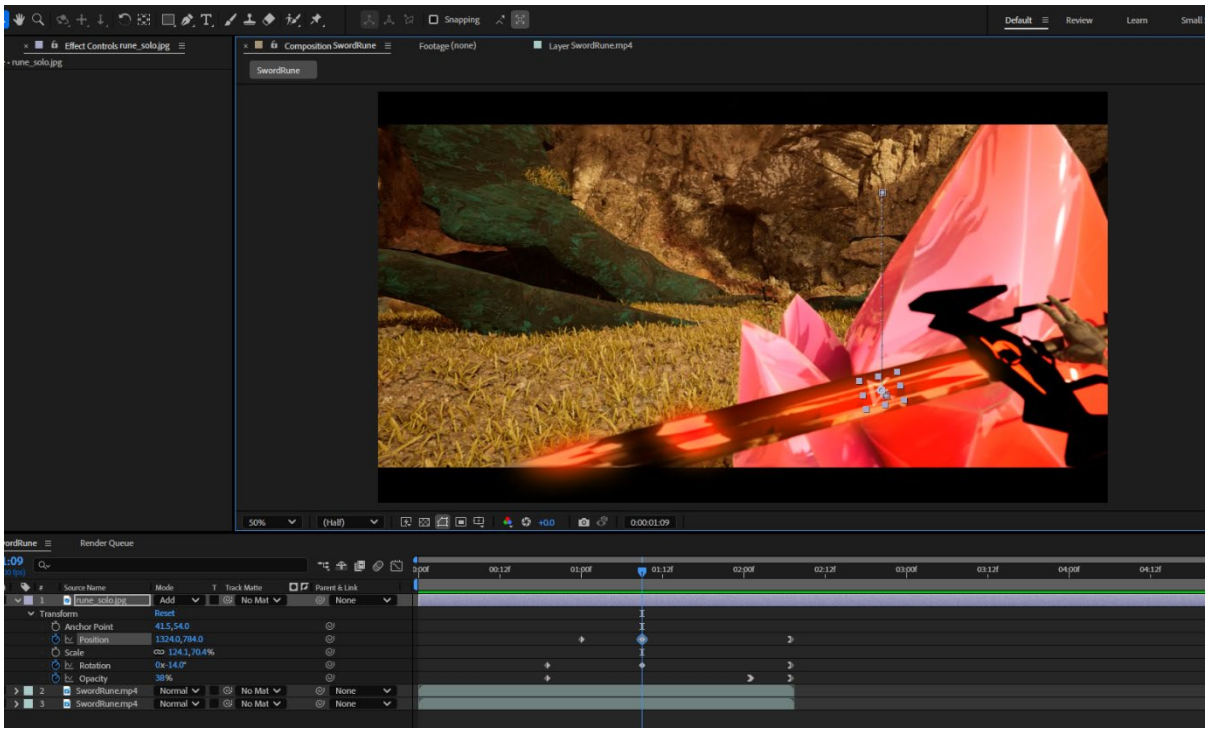


Once the MP4 was produced, it was transferred over into premier pro for further editing. Any Animation/Transform issues from actors within the clip were cut, being simple errors like animations still being in T-pose phase. Cinematic bars were added to the top and the bottom to hide unused space and give it that polished finish.

Next, simple sound and voice was added to the video, to help convey the story to the audience. This sound wasn't the focus of the project, and so, acts as a place holder for what could be. The voice work was done by me, with Lucy being AI converted audio clips using Eleven Labs, and Den being a heavily edited version of my own voice.



Next, After Effects has been used to help tie a loose end with how the crystal is activated. On personal re-watch, the crystal scene was left suggestive for how the portal appeared, which didn't relate to how the script is written, to patch this up, a graphic, which was originally going to be placed over the sword, was added as a transparent track matte within After Effects and then was pasted over the clip. This clip helped convey to the audience that the sword activated the crystal, in a cinematic way.



Finally, a title was decided for the movie, this being:

This being a word referring to daydreaming. Which is what the main character felt was happening during the events throughout the short, and the N/A referring to the lack of daydreaming. A short-animated sequence was produced to show off the title of the film for the introduction. With this wrapping up the film.

How does the Short Film “N/A: Reverie” showcase the technology of Unreal engine?

With the short film complete, gathering opinions and feedback on how the piece showcases unreal engines potential to create cinematic content would benefit future projects and add external insight. There are many ways of acquiring this data. For example:

Focus Groups: An organised showing in person with a group.

Online Screening: Linking views to the video and providing a short questionnaire for data gathering.

Social media: Uploading the video to a site like YouTube and using commentors for feedback.

Network: Share the Short on a forum site such as Reddit, into professional groups, and get feedback from those who share or work in the applicable field.

With this, each bring their own atmosphere of feedback. Online screening, social media and Network all share the fact of being online, which due to the lack of direct discussion, can be very biased answers, and may lack context to the short without forward questioning to the producer.

In person feedback offers dynamic discussion between audience on certain aspects of the media they consumed, with myself to provide context to any confusion or answer how parts of the animation were created.

Using a Focus Group

(RICHARD A. POWELL and HELEN M. SINGLE, 1996) A comparative advantage of the focus group, however, is its ability to enable researchers to identify quickly the full range of perspectives held by the respondents. Moreover, the interactional, synergistic nature of the focus group allows participants to clarify or expand upon their contributions to the discussion in the light of points raised by other participants, thus expanding on contributions that might be left underdeveloped in an in-depth interview. (p504) Expanding on this point, focus groups, in this context allow a joint viewing, ensuring the media is fully consumed, making for relevant feedback.

The group will be shown the short in unison. Afterwards they will each be asked to share their opinion on the film. With these opinions, we can gather how the audience feels particularly about the short, unreal engine and my ability to utilize it into bridging the gap between film making and game development.

Organising and Process of the Focus Group

For this focus group, 5 Participants have been asked to take part and share their mind on the short movie. Each audience member will originate from different fields of work to ensure mixed answers and promote varied discussion points. Key feedback will be noted onto an online

document. Concluding the feedback, the audience will be questioned on if they think the short would be better utilized for a game or film, helping research into bridging that gap.

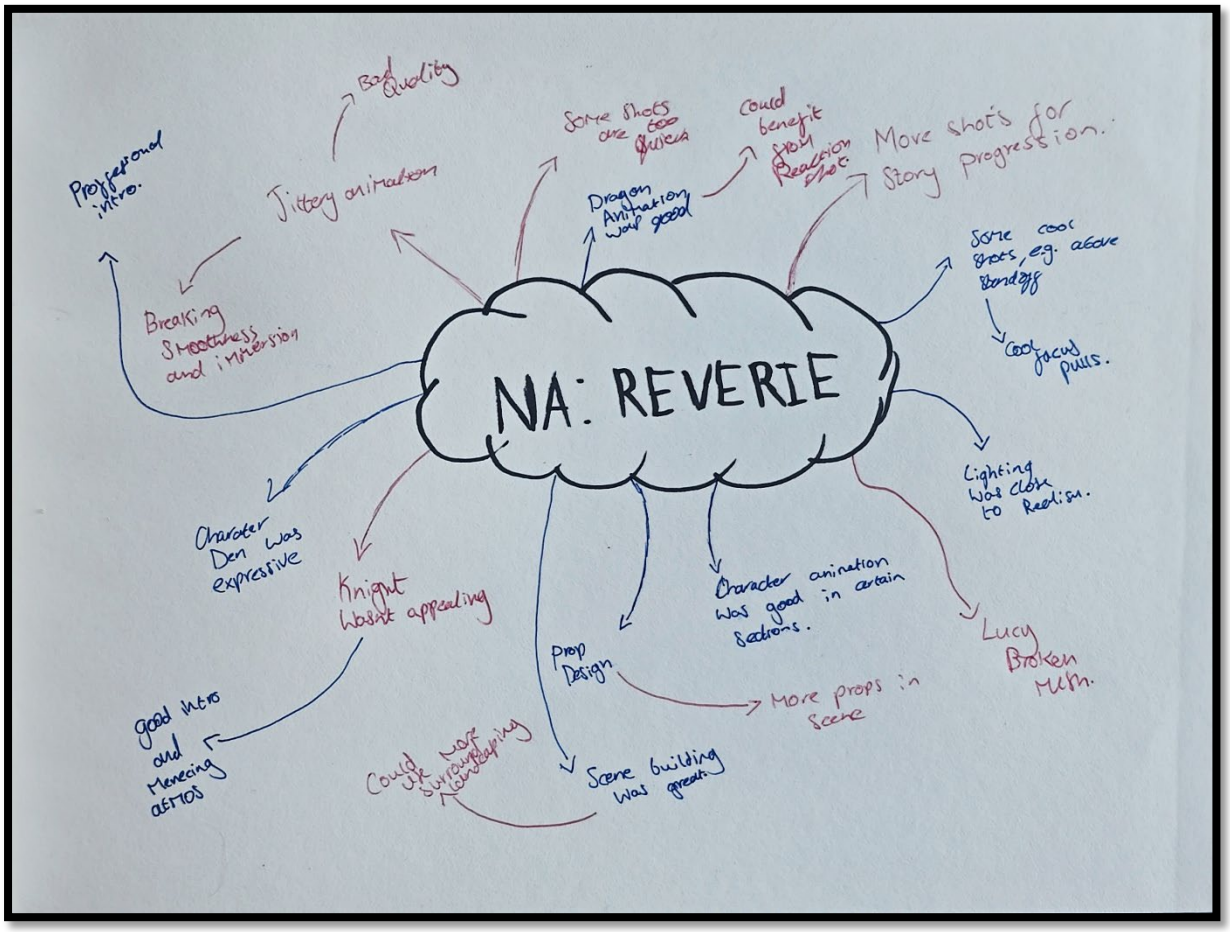
Data Collected consists of:

- A Document containing the feedback from the focus group discussion
- A list of audience members, using fake names, but containing their experience with unreal engine.
- A A3 Piece of paper for helping with discussion.

Data collected will not be personal to the audience, excluding their experience with unreal engine. For ethical reasons, the audience will be asked if they would like to share their experience before collecting this data. This data will be signed off by participants when accepting to the Focus group. A relevant ethics form must be signed before anyone takes part in the group.

Findings of the Focus Group

For the findings, it was discussed in the group and recorded on paper, access to an A3 was impossible at the time so an A4 was used.



From the focus group, it seemed the audience found that the concept was quite unique and can be a great concept for a full short film. “Blending both these themes creates a dynamic action paced setting which would be rather enjoyable”, one audience member said. A few stated the quality of the scene was “well designed”, with one emphasizing the quality of “lighting” throughout the short. The group rather enjoyed the end shot, the standoff as their favourite shot, which was designed to be the best part of the sequence, to end on a high note, learning from the short “Oryctes” mistake. Another stated that they “loved the character Den portrayed” within the seamlessly estranged setting. Everyone liked the story of the short, and all agreed that the scene quality was great. A few said that the scene’s were “Lifelike” and “Photorealistic”.

Two comments were made on the animation, both being about the “jitter” which is stated withing the production to be an issue irremovable, caused by the Quick Magic Process, which they felt, if these issues didn’t exist, then the short would be near perfect. The group agreed that a few key scenes were missing to really help round off the story. These being:

- A shot of Lucy investigating the area before reaching the sword
- A shot before lucy touches the crystal to give time for Den to respond
- A shot before the dragon reaches the cliff face
- A shot to build up what Den said about the Bone
- A shot of the two reacting to the knight
- A shot of the dragon reacting to the knight

With these additional shots, the scene would have been perfectly rounded off with its storytelling potential. Additional Visual Effect’s were also suggested during discussion for area’s were dust may arise, or the impact from the dragon could have been bigger, which could have helped immersing the characters into the scene, which in turn, immerses the audience.

Focus Group conclusion

The group really enjoyed the unique story the short was trying to tell. They all deemed the quality of the short was impressive for a single manned project, and there where qualities of photorealism displayed throughout the short, showing the gap being bridged between film and game. With the changes suggested, the short would have been extremely successful conveying the “Confusing” narrative some failed to follow, despite this, the animation worked in most cases, and the character Den was enjoyed within the group. The focus, detail and lighting, was met with the group’s agreement, textures were lifelike, and the scene was “Alive”. With this, the short was successful in bridging reality with fiction within the group.

Comment’s were made on the sound of the project, but these were dismissed as the project was focused on the video quality, with the sound only acting as a guide.

The focus group turned out to be a huge help with gathering critique on the short and get an idea of the kind of reaction a public release would say. The group offered both the good and bad of the short, with both offering changes that can be made if the project was repeated, and, giving me, the creator, point’s where my skills are lacking, and what I should develop to become a much more skilled creative. The focus group was definitely a success, assisting the evaluation process of the document.

Evaluation

With the project complete and the feedback through. I can now reflect on the project as a whole and evaluate the progression throughout. The project began with a complicated deliverable for a first take attempt on a live action mixed with virtual short film. The project was originally meant to use a live action character on top of a virtual backdrop, which is were the research into Mandalorian played off, showing the hardship and time-consuming process behind accomplishing such a feat. With this, and my own testing during preproduction, I was able to switch this early in development into attempting to bridge the cinematic gap between film and game, using the unreal engine. With this, the project became a virtual short film, researching ways to enhance the cinematography and the photorealism in Unreal Engine.

The process faced many challenges as I was new to the software and new to virtual film development, with little knowledge and skill in animation for Unreal Engine. To combat this, I used a software I was very familiar with, Blender, to help transition animation from 3D software to game engine. Another challenge I faced was financial, being limited to 2 purchased characters, being Den and Lucy, and free assets from the FAB store, I was limited to what they had to offer. To counter this I downscaled the scene, cutting the first scene entirely from the script due to the time it would have taken to produce the assets myself.

There is much I would improve about this project, as many creatives' feel about their work once produced. The focus group really opened up the issues within the scene, as different eyes can catch what mine can't see.

If I was to re produce the project I would:

- Animate the character Movement by hand. While technology has come far, it hasn't come far enough for the MoCap technology QuickMagic to take off just yet, as the jitter did break the immersion in some of the scenes. Smooth animation would have made for a better viewing experience. With the video's however, I can trace the movement I filmed with the characters for smooth frame by frame animation, still using the footage I took.

- Additional scenes for story development, I would reflect on the storytelling of the short and incorporate additional scenes to help with the pacing of the story, as it is now the story is rushed, and some scenes are hard to understand on initial viewing.

- Extra visual effects within After Effects could have complimented scene's like the portal opening, adding additional magic to it for the quality sake of the scene. I couldn't get the runes to appear on the sword in time and was left with just a glow on the crystal scene. Given more time, this scene could have been re touched.

- HDRI. In early development of the short, I couldn't find a suitable HDRI to complement the background of the scene. I was originally looking for a HDRI with a SiFI city to help show off they dystopian look I was trying to achieve and reduced the wasteland theme.

- Cinematography could have been better, with much more creative camera shot's than the slow zooms and pan's I used within this shoot.

The short could have benefited with extra time, this being my own fault for pursuing a different story during the beginning of design. A greater skill with the software and animation would have definitely assisted in the final quality of the project, which I hope to gain after a few similar projects to this.

Conclusion

This project was the biggest I have tackled yet, being both over feasible and beyond my skill range. However, despite this, I still managed to finish with a completed short, with knowledge and skills I didn't have when I started the project. Elements of cinematography and photorealism can be observed throughout the short, confirmed within the focus group.

Some of the key findings of this project include:

- The potential and Limitation's of Unreal Engine – Through my own testing and development of this short, I have found that Unreal engine has lot's of creative features to offer for both film and game development, focused on realism. Object's like the Post Volume, which I used, are huge game changer's, giving the user all the variable to play with and configure the lighting engine all in one place. The Unreal Engine does have limitation's, which is the requirement for grade A asset's for realism, processing power and the problem with lot's of different options, which had me trying to fix issues caused by single sliders, the program can be very unfriendly for new users.
- AI MoCap was a huge boon for the project as it offered a way to Motion capture without the expensive suit. While is has it's issues, it has help me personally realise the direction of virtual animation development. This software has the potential to become something great with more time, and will be great for film maker's on a budget, like myself.

A takeaway lesson from this project is time management. I personally didn't consider enough the time to develop a quality piece of work, using time consuming processes, being set design, camera work, animation and visual effects.

Another Lesson learned from this project is my own skillset, I felt overwhelmed most of the production by the amount of work required. As I was having to act in every area of the development, my time in each was restricted, resulting in a drop in the short's quality.

Self-reflection and creative growth

I am proud of what I managed to achieve with a one-man team with this project. As stated, this was my first time using the software for animation and film, which required me to learn a lot of tools and processes required to reach my end goal. I personally think I had a great first attempt with the software, with much feedback to help me in the right direction next time I tackle a project this big in the future. This project humbled me into the amount of time these short's take in development and the different skills required in each field.

The skills learnt from this project can be utilized to enhance my efficiency within the software I believe myself to gain a job role using. I can see myself attempting a similar project in the near future, to further hone my skills. I have really enjoyed using the software and testing the limitations of the realism the software has to offer.

Overall, this has been a project far beyond my own skillset, which I can be proud to say I have accomplished.

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Sound

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Appendix

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Pre-production

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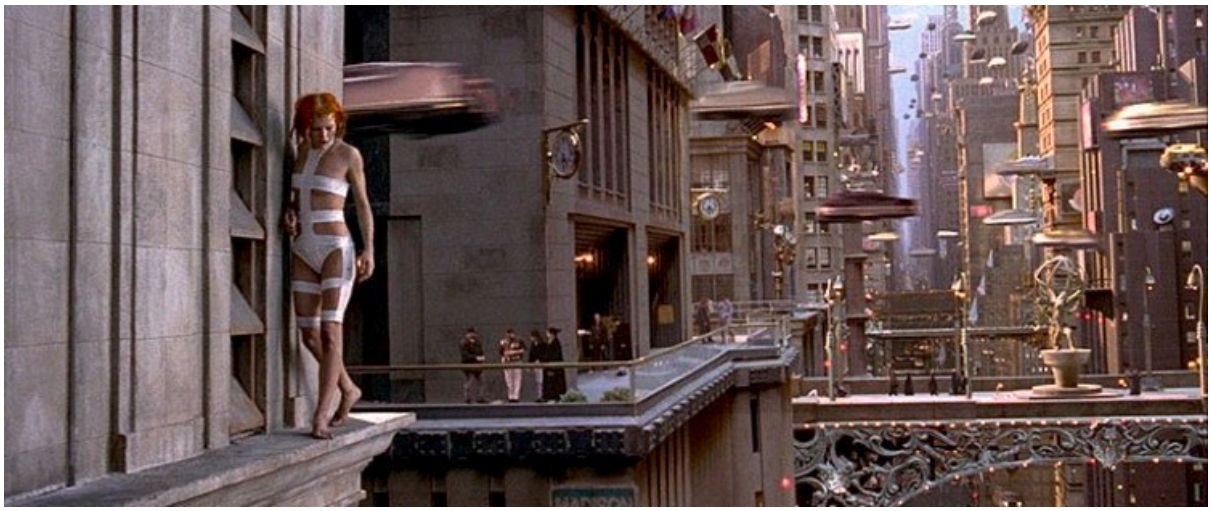

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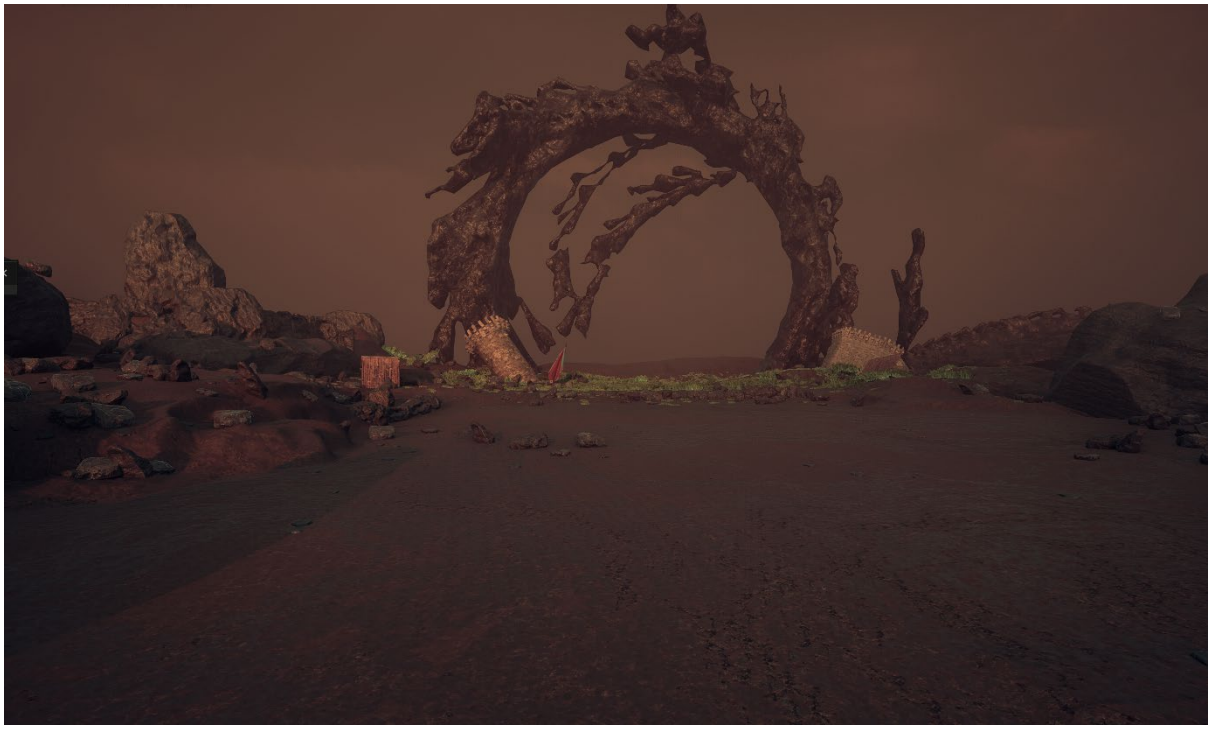

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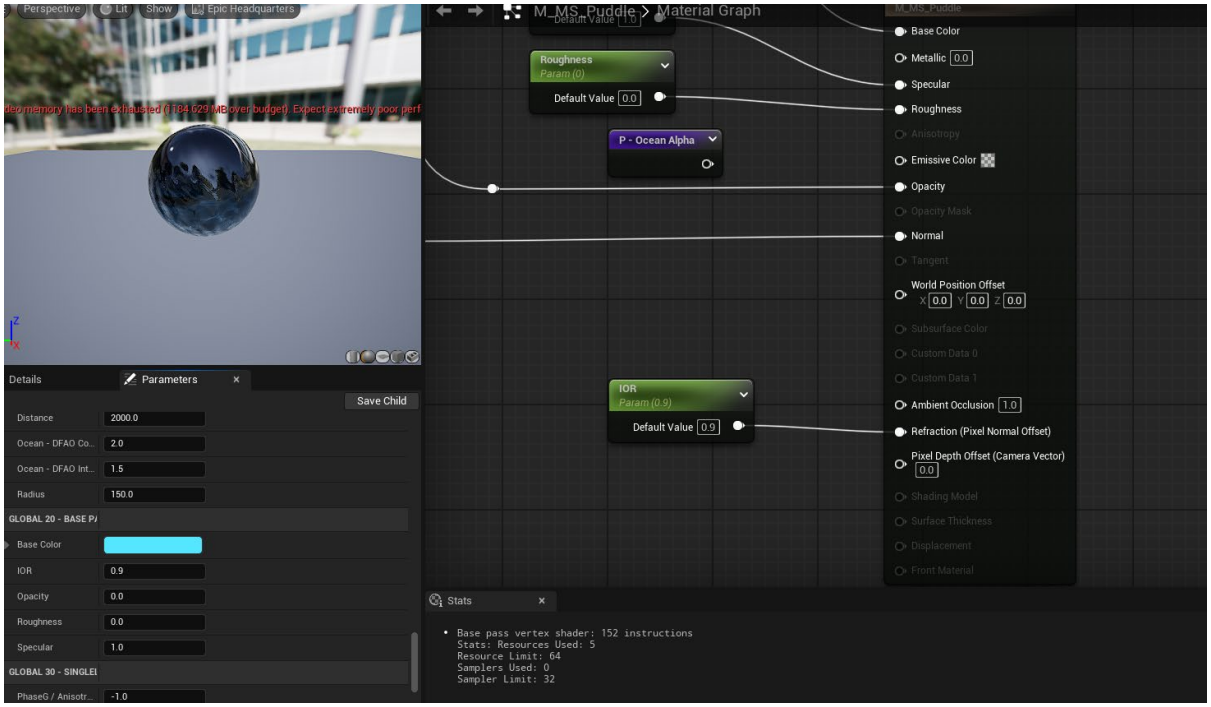
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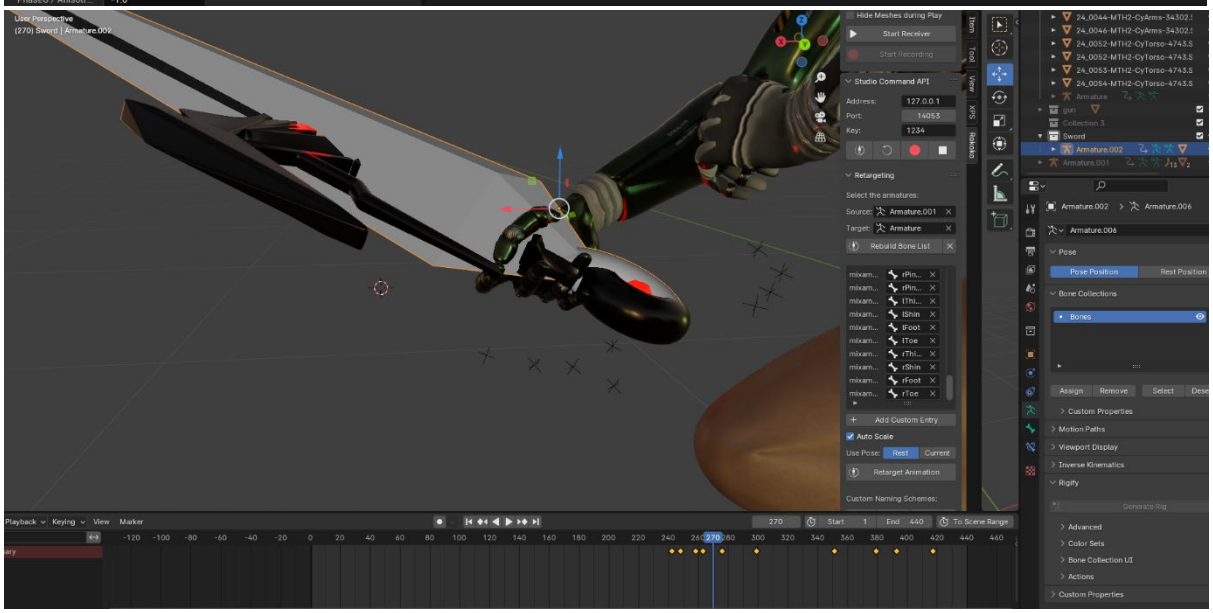
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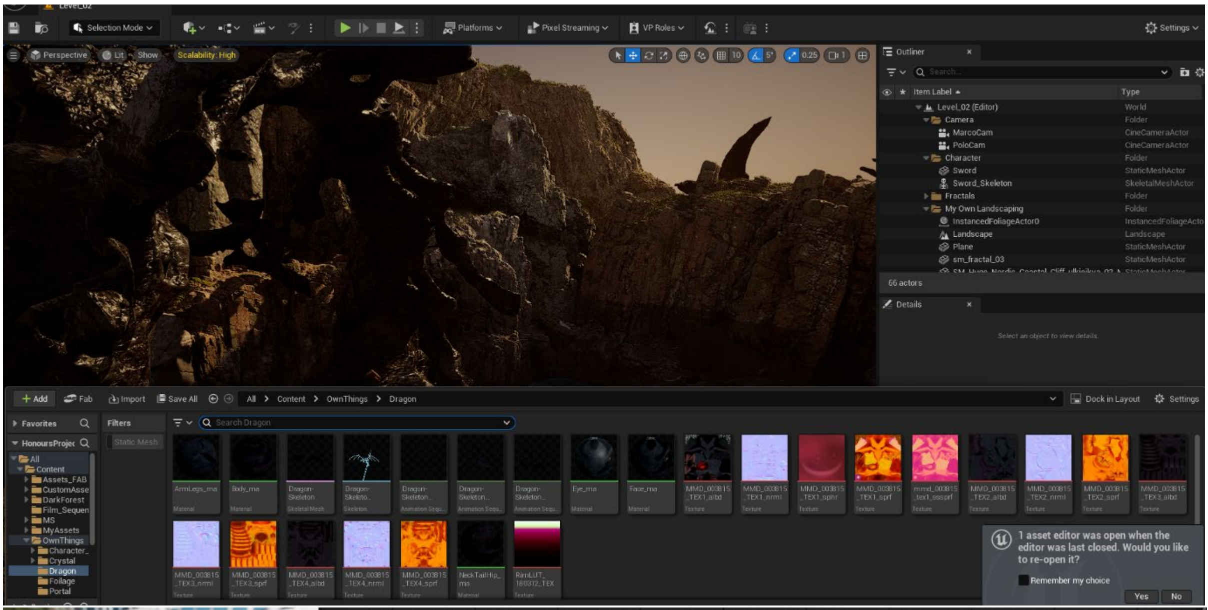
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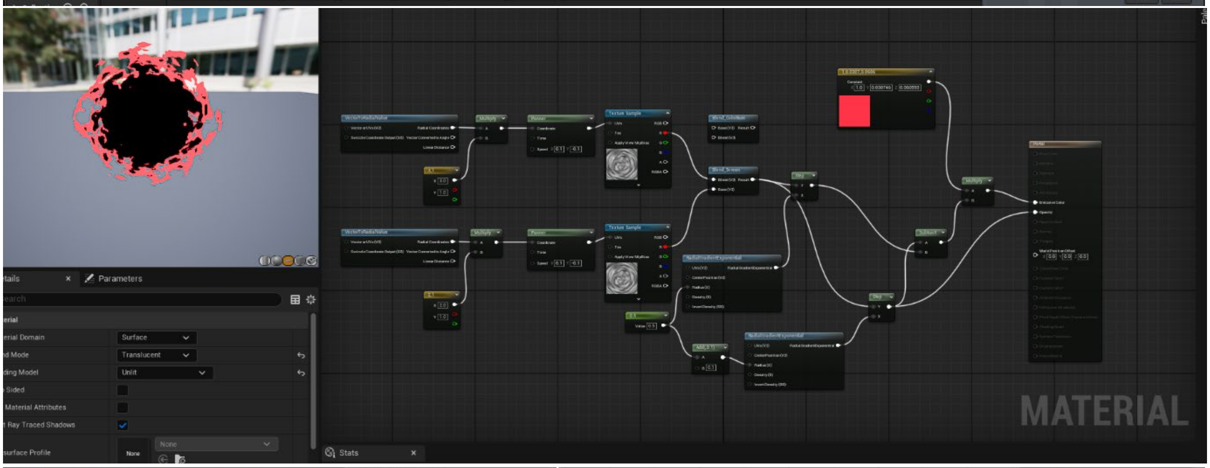
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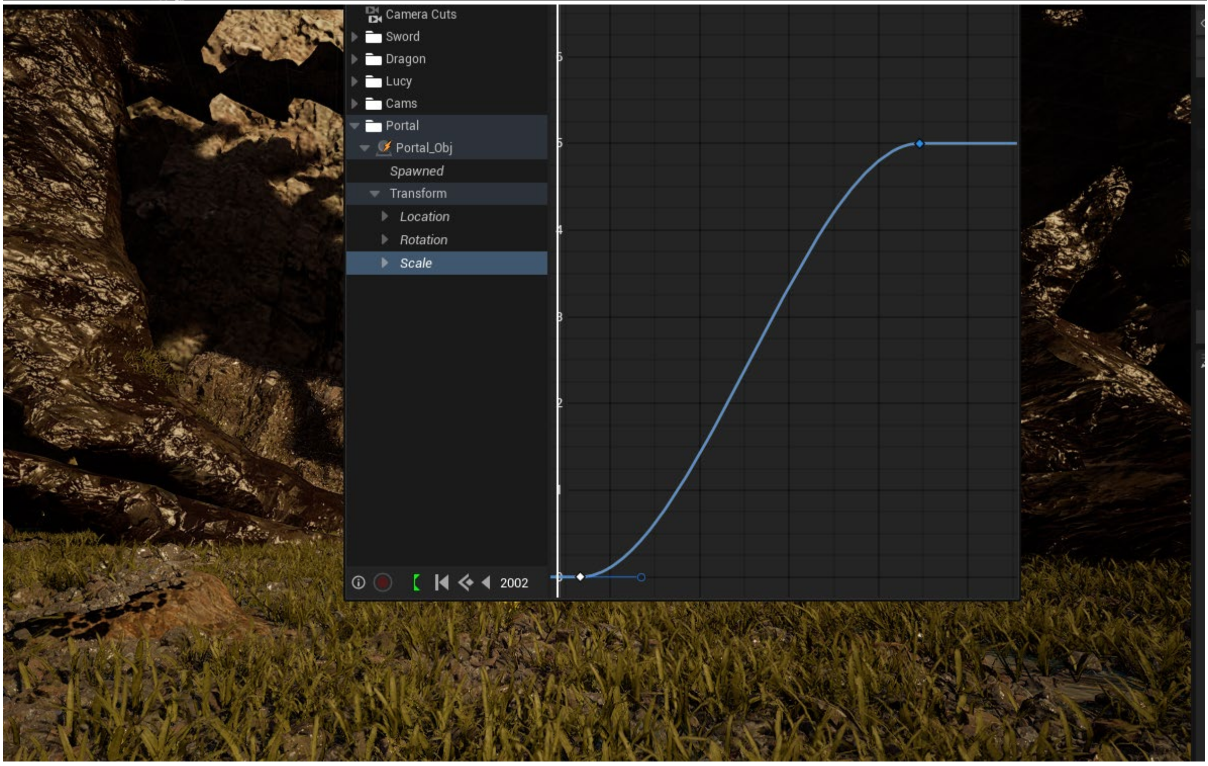
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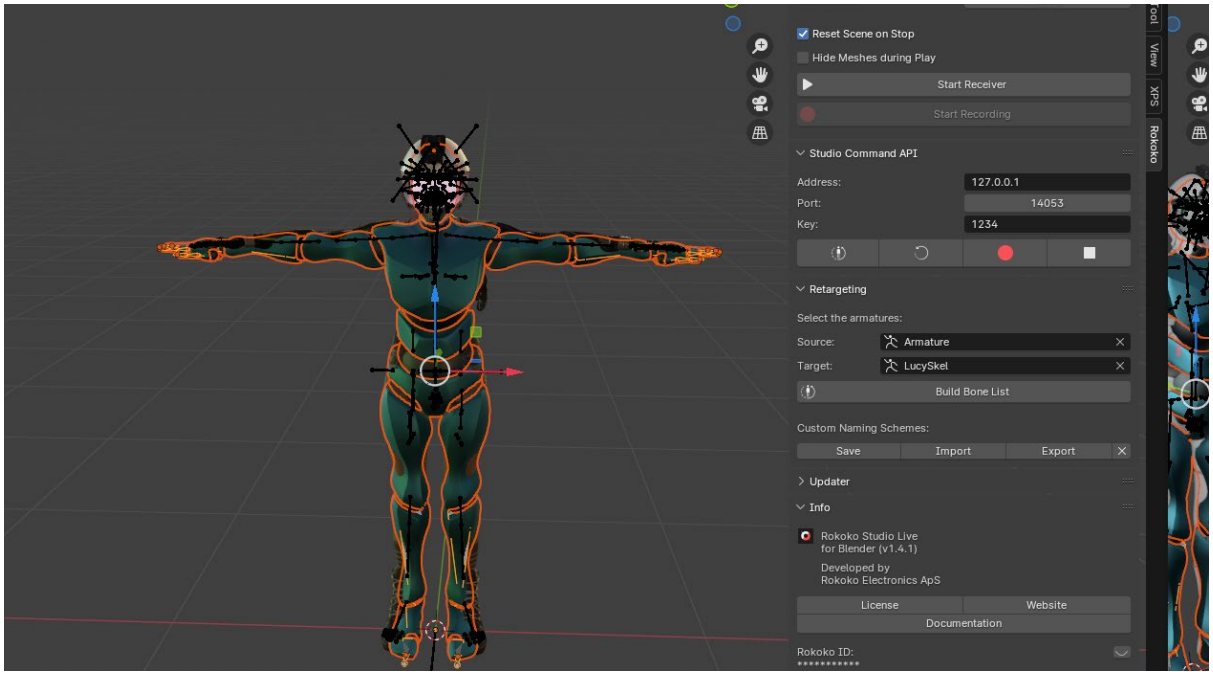
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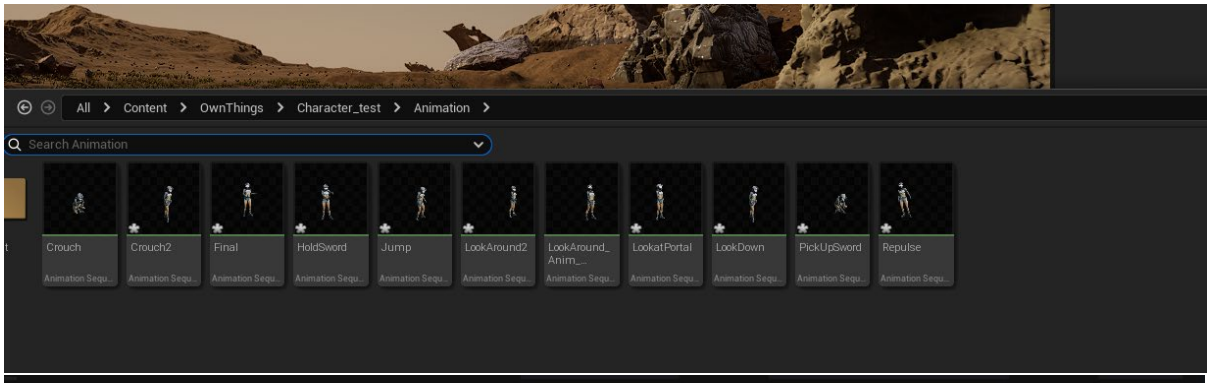
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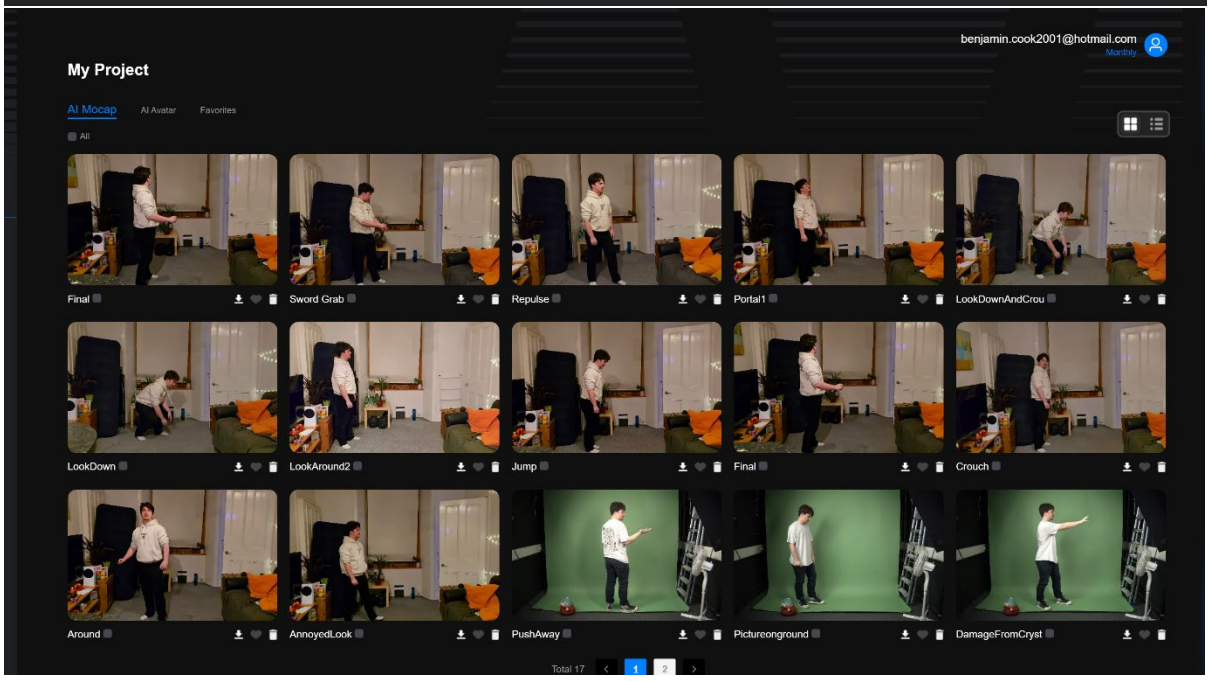
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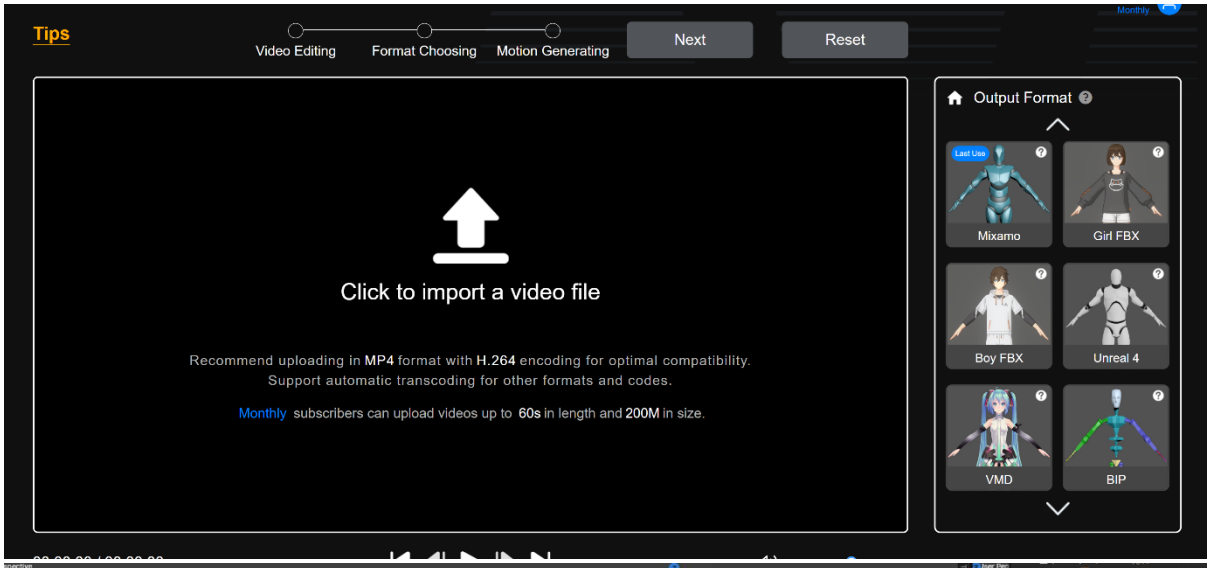
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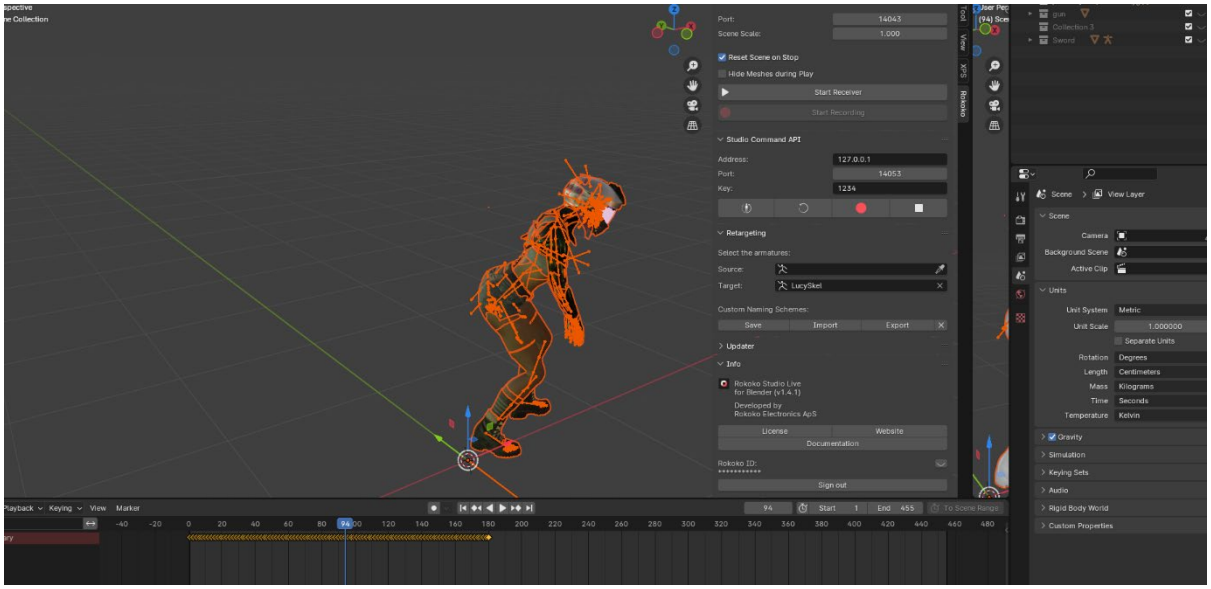


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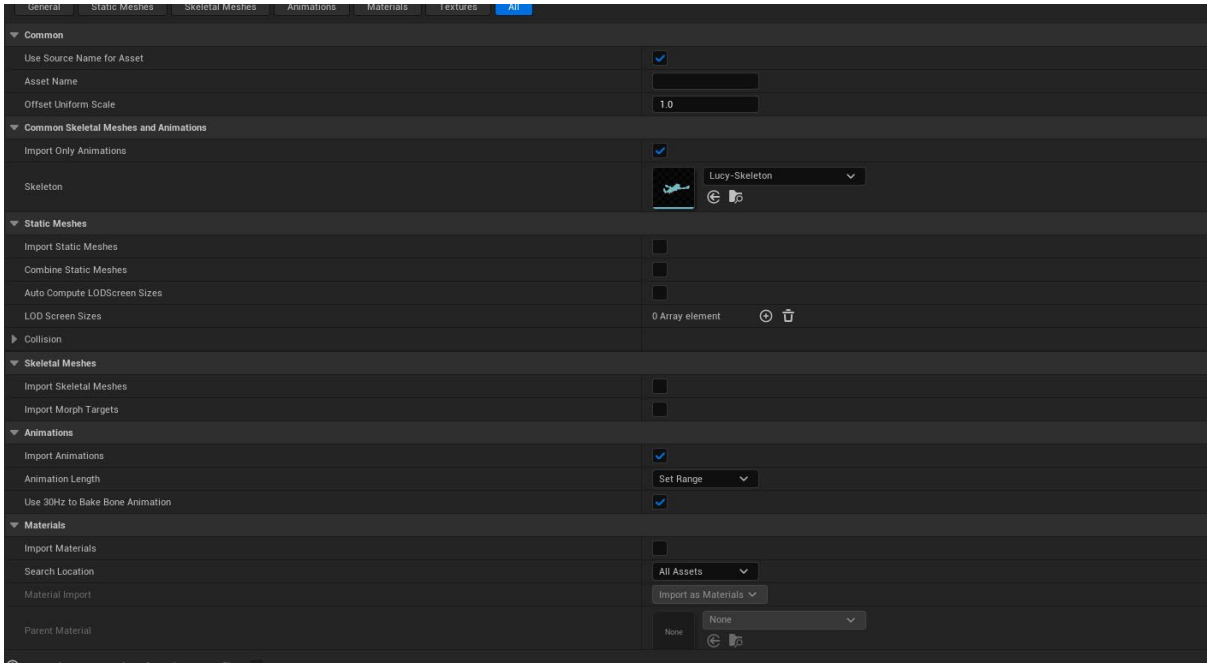
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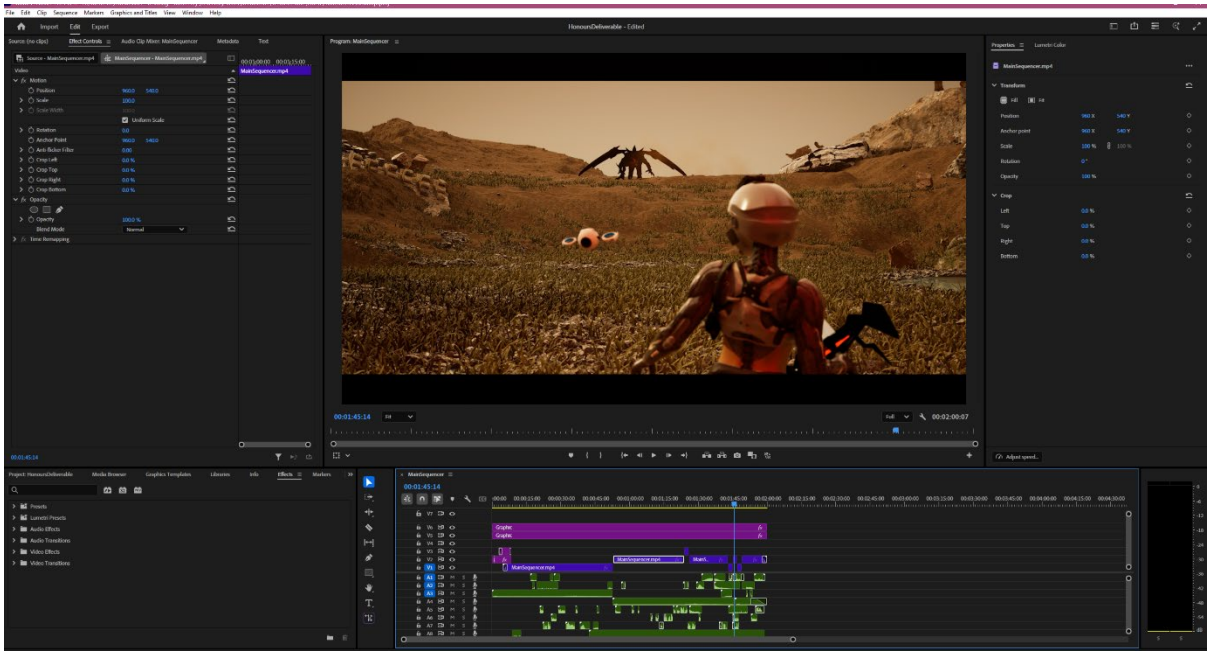
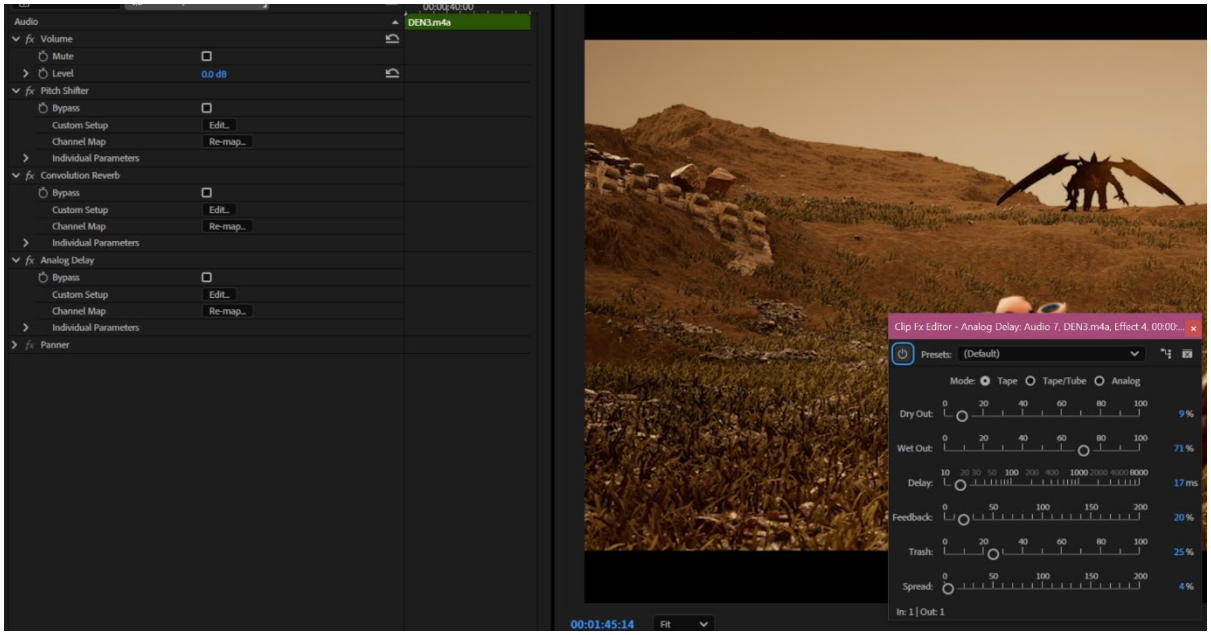
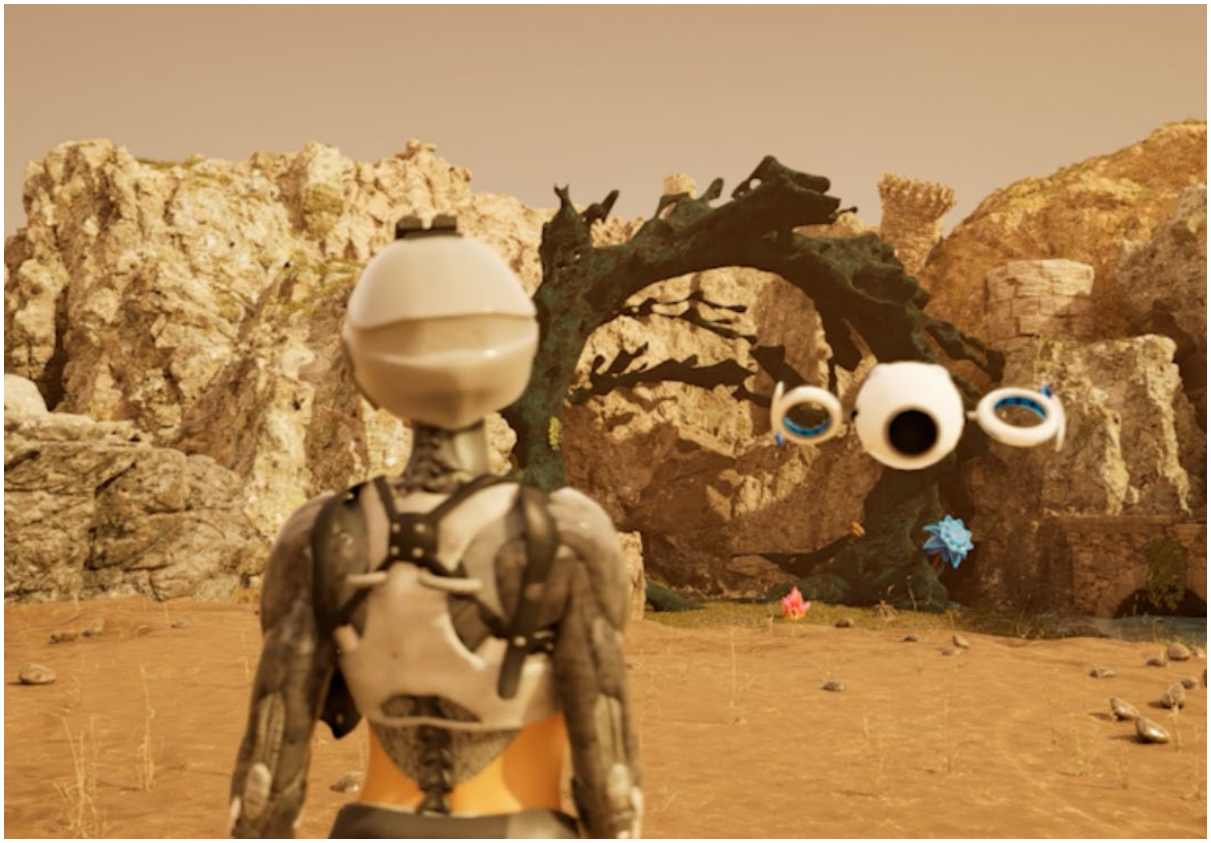
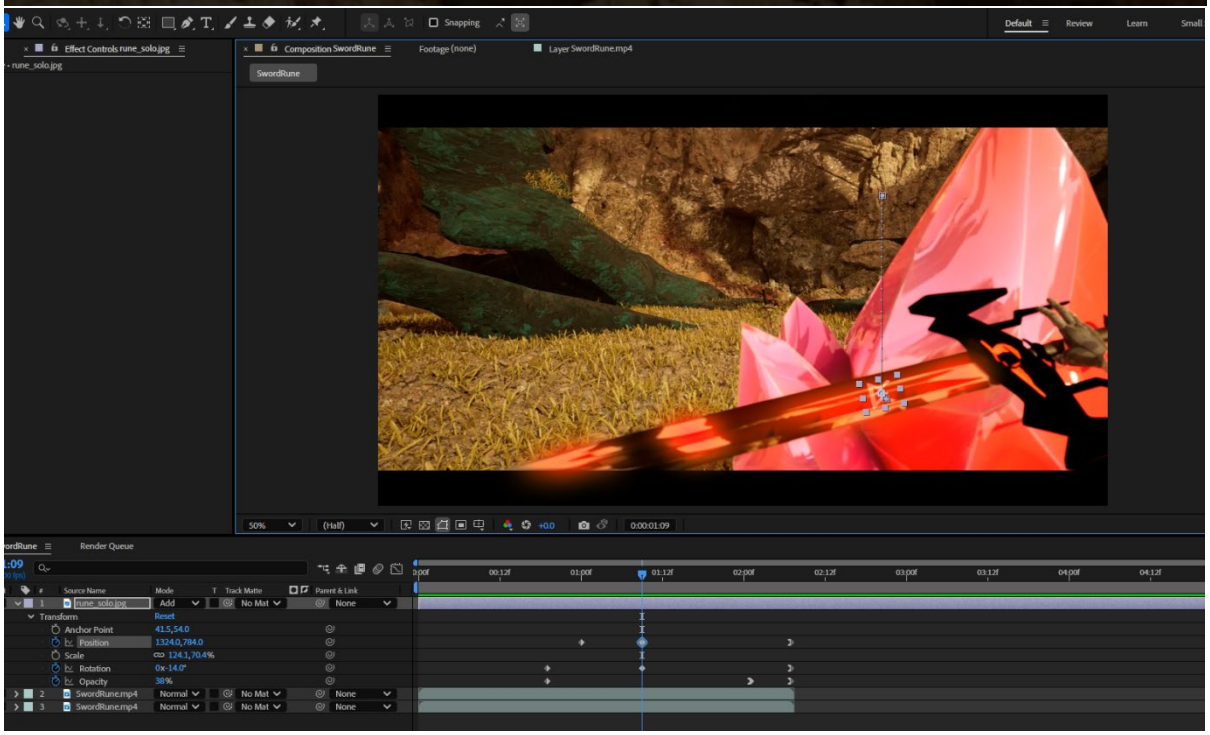
All
Lens
Exposure
Metering Mode
Manual
Exposure Compensation
10.199999
Apply Physical Camera...
Exposure Compensatio...
None
Exposure Metering Mask
None
Min EV100
1.0
Max EV100
1.0




Audio
DEN3.m4a
Volume
Mute
Level
0.0 dB
Pitch Shifter
Bypass
Custom Setup
Edit...
Channel Map
Re-map...
Individual Parameters
Convolution Reverb
Analog Delay
Panner
Clip Fx Editor - Analog Delay: Audio 7, DEN3.m4a, Effect 4, 00:00:...
Presets:
(Default)
Mode:
Tape
Tape/Tube
Analog
Dry Out:
9 %
Wet Out:
71 %
Delay:
17 ms
Feedback:
20 %
Trash:
25 %
Spread:
4 %
In: 1 | Out: 1
00:01:45:14
Fit




N/A: Reverie


Snapping
Default
Review
Learn
Effect Controls rune_solo.jpg
rune_solo.jpg
Composition SwordRune
Footage (none)
Layer SwordRune.mp4
SwordRune
50%
(Half)
0:00:01:09
Render Queue
Source Name
Mode
Track Matte
Parent & Link
rune_solo.jpg
Add
No Mat
None
Transform
Reset
Anchor Point
Position
Scale
Rotation
Opacity
SwordRune.mp4
Normal