

The Road

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Course: MA Animation

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Project overview

Two middle-aged men were driving along a remote, pitch-black mountain road late at night. As thick fog gradually enveloped them, the car's sat-nav began issuing eerie instructions, whilst inexplicable anomalies kept occurring all around them. When a mysterious elderly woman suddenly appeared on the mountain road, the two men gradually realised they seemed to have become caught up in an inescapable supernatural event, and what had originally been an ordinary journey ultimately turned into a nightmare filled with the unknown and fear.

Expectations and Objectives

This project aims to enable the audience to understand the unfolding of the story and the characters' fears through visual storytelling and atmosphere, whilst minimising or even eliminating dialogue. By utilising visual and auditory elements—such as dark mountain roads, thick fog, erratic sat-nav readings, the characters' movements and facial expressions, and the appearance of a mysterious figure—a sense of oppression and unease is gradually built up, allowing the audience to grasp, without the need for verbal explanation, the process by which the two men transition from a normal car journey to becoming embroiled in a supernatural horror incident.

1 Introduction

This report documents my individual contribution to the production of a 3D animated horror short film developed as part of my Master's project in Animation. The project focuses on two middle-aged men travelling along a remote mountain road at night. During their journey, a series of increasingly unsettling supernatural events occurs, including strange sounds, distorted navigation instructions and the appearance of a mysterious elderly nun. The film aims to create a tense and unsettling atmosphere through character performance, environmental design, cinematography, lighting and sound.

As an individual project, I was involved in multiple stages of the production

pipeline, from the development of 3D assets to the final rendered animation. My responsibilities included modelling, texturing and material development, character rigging, animation, camera setup, lighting, atmospheric effects, Arnold rendering and aspects of the final compositing and editing process. These processes required both technical and creative decision-making, as the visual style and atmosphere of the film needed to remain consistent throughout the different stages of production.

A major focus of my contribution was the practical development of the animation using Autodesk Maya and Arnold. I worked on character and environmental assets, prepared models for animation, developed character movements and interactions, and constructed lighting and atmospheric effects to support the horror genre. Particular attention was given to the vehicle and mountain-road sequences, where character animation, camera movement, lighting and environmental effects needed to work together to create a believable and immersive scene.

The production process also involved a number of technical and organisational challenges. Problems related to rigging, animation, materials, camera positioning, atmospheric effects and rendering required repeated testing and adjustment. Rather than treating these problems only as production setbacks, they became part of the development process and provided opportunities to evaluate different approaches and improve the final result. Time management was also an important consideration, as the original production schedule had to be adapted according to the complexity of individual tasks and unexpected technical issues.

The purpose of this report is therefore not only to document the final animation, but also to critically examine the processes through which it was produced. It will discuss my technical, creative and organisational involvement in the project, explain the methodologies used during production, and evaluate the

effectiveness of these approaches. The report will also identify key problems encountered during production, the solutions applied to address them, and areas that could be improved in future projects. Through this reflection, the report aims to demonstrate how my individual production decisions and practical processes contributed to the final animated outcome.

2 Processes

2.1 Modelling

The character was modelled in Autodesk Maya with the aim of creating an unsettling and unnatural appearance that would support the horror atmosphere of the film. Compared with realistic human proportions, I intentionally adjusted the character's body proportions by making the limbs relatively long and the body thinner. The facial features were also designed to appear aged and distorted, helping to create a more disturbing visual impression. The proportions were tested from both front and side views to ensure that the character remained visually consistent from different camera angles.

During the modelling process, one of the main challenges was the intersection between the body and clothing. Some areas of the arms, legs and upper body initially passed through the costume, particularly around the sleeves and the main dress. This became more noticeable when the character was viewed from different angles and could negatively affect the final animation.

To solve this problem, I first adjusted the underlying body mesh before refining the clothing. The proportions of the body were modified to provide more appropriate space for the costume, while the clothing geometry was edited to follow the body shape more closely. I also created a small gap between the body and clothing where necessary and checked the model from multiple viewpoints to identify areas of intersection. Parts of the body that were completely hidden by the costume were also simplified where appropriate, reducing unnecessary geometry and helping to prevent visible intersections

during animation.

Through these adjustments, the final character achieved a more exaggerated horror-oriented silhouette while maintaining a clean relationship between the body and costume. This process also provided a more suitable base for the subsequent rigging and animation stages.



Fig. 1



Fig. 2

2.2 Texturing

After completing the character modelling, I developed the character textures using Procreate and Photoshop before applying them in Maya. The texturing process focused on creating an aged and unsettling appearance that would support the horror atmosphere of the animation.

I first created and painted the main texture details in Procreate, including the skin colour, facial features and other surface details. Photoshop was then used to refine the texture and adjust details such as colour balance, contrast and overall consistency. This allowed me to create more controlled details on the character, particularly around the face, where the exaggerated eyes, wrinkles and darker areas were important for creating a disturbing appearance.

The completed texture maps were imported into Maya and connected to the character's material. I then checked the texture under different viewport lighting conditions to ensure that the details remained visible and consistent with the intended visual style. Particular attention was given to the contrast between the pale skin, dark clothing and facial details, helping the character stand out within the darker environments used in the animation.

This workflow allowed me to combine hand-painted texture details with the 3D model and gave me greater control over the character's final appearance. The resulting texture helped strengthen the character design and contributed to the overall horror atmosphere of the film.



Fig. 3

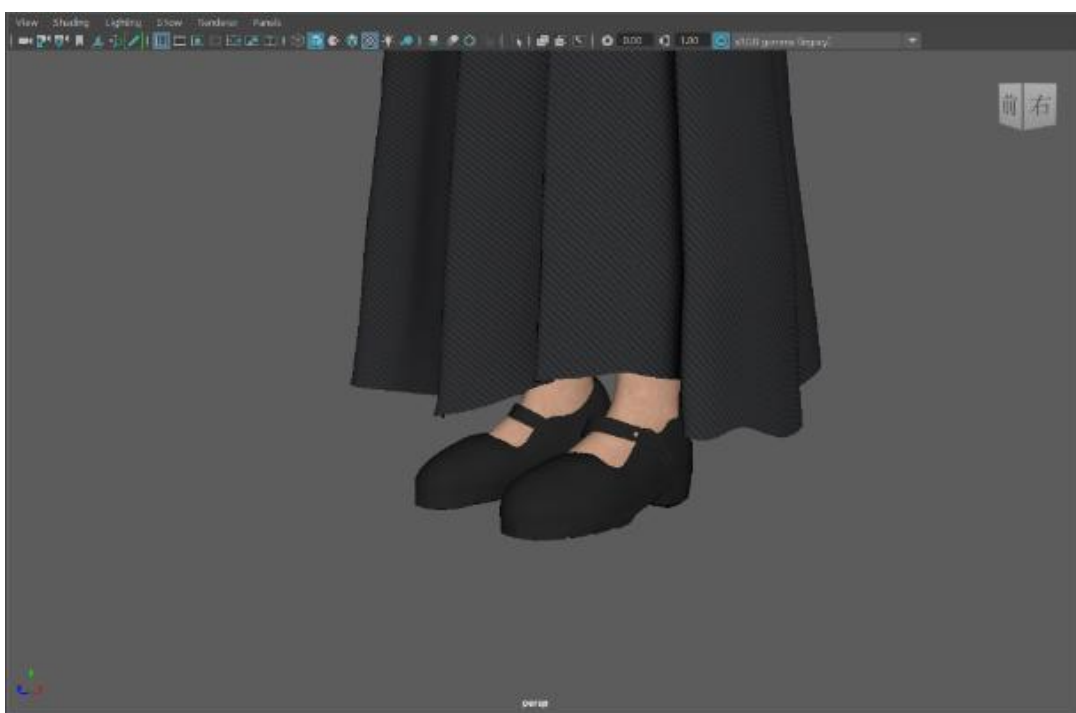


Fig. 4

2.3 Rigging

After modelling, the character was prepared for animation through rigging and skinning. The rig was created in Autodesk Maya to provide a controllable skeletal structure for the character and allow the main body parts, including the head, arms, hands, legs and upper body, to be manipulated efficiently during animation. Controllers were also added to simplify the animation process and provide a more intuitive way to control the character.

One of the main technical challenges during this stage was achieving suitable deformation after the skeleton was connected to the character mesh. Automatic skin weighting initially produced several areas with undesirable deformation, particularly around the shoulders, elbows, knees and other joints. When the corresponding joints were rotated, some parts of the clothing and body mesh were influenced by neighbouring joints, resulting in unwanted stretching, collapsing or intersecting geometry.

To solve these problems, the skin weights were manually adjusted using the Weight Painting tools in Maya. The influence of individual joints was refined around important deformation areas so that the mesh could follow the movement of the skeleton more naturally. Additional attention was given to the character's long clothing, where excessive joint influence could easily cause the fabric to deform unnaturally or intersect with the legs.

After the initial weight-painting process, the rig was tested through a series of basic poses and joint rotations. The character was moved into different standing, walking and bending poses to identify deformation problems and potential mesh intersections. Whenever visible deformation or skinning errors occurred, the corresponding weights and controller movements were adjusted and tested again.

The final rig provided sufficient control for the animation stage while maintaining relatively stable deformation across the main body areas. This testing process was important because it ensured that the character could be animated without

significant deformation problems and reduced the need for extensive corrections during the later animation and rendering stages.



Fig. 5

2.4 Animation

The animation was produced using an iterative approach. First, 'blocking' was used to establish the main actions and key poses, followed by gradual adjustments to the timing, range of motion, and interactions between the characters, vehicles and the environment. The final animation runs for approximately 3 minutes and 30 seconds, with a mountain road serving as the primary setting throughout.

Given the animation's considerable duration and the inclusion of multiple distinct shots, I divided the entire project into several Maya source files organised by shot to facilitate management and production. Each source file corresponds to a single shot and contains the scene, characters, vehicles, cameras and animation settings required for that shot. This approach allows each shot to be edited, tested and rendered independently, whilst also minimising the impact of large scene files on the production workflow.

Animation production began with the blocking stage, where keyframes were set to define the main movements of the characters and vehicles. At this stage, the focus was on establishing the overall composition, direction of movement and primary actions for each shot, rather than immediately adding detail. Subsequently, the animation's pacing was further refined by adjusting the time intervals between keyframes.

During the vehicle animation process, I 'parented' the camera to the car, enabling the camera to track the car's movement. This approach allowed for a smoother depiction of the car travelling along the mountain road, whilst also facilitating control over the relative position and movement between the car and the camera. In certain shots, I further adjusted the camera's path and angle to ensure it followed the car's direction of travel whilst preserving the sense of space within the mountain road environment.

After completing the basic animation, I refined the movements of both the character and the vehicle. As the vehicle travelled along the mountain road, I adjusted its position, direction and speed in response to bends, gradients and the composition of different shots, ensuring the vehicle's movement more closely matched the actual road conditions. For the character animation, I adjusted keyframes and poses to ensure the character's movements remained in harmony with the narrative within each shot.

In addition to the character, vehicle and camera animations, I also incorporated a fog effect into the mountain road scene. The fog was primarily used to enhance the scene's spatial depth and atmospheric ambience, whilst also creating a sense of visual depth in the distant mountain road and surroundings. By adjusting the density and range of the fog, I ensured it harmonised with the camera movement and the overall atmosphere of the scene.

During the post-production phase, comprehensive testing was carried out on the characters, vehicles, camera and fog effects. The relationships between the various elements were examined from the final camera perspective, and keyframes, camera movements and scene effects were repeatedly adjusted to

ensure good continuity between different shots.

Consequently, the entire animation production workflow can be summarised as follows:

Blocking → Refined Animation → Camera and Vehicle Movement → Environmental Effects (Fog) → Final Render

By saving different shots as separate Maya source files and integrating vehicle and camera links, character animation and fog environmental effects, the entire three-and-a-half-minute animation could be produced, modified and finally rendered in a clearer and more controlled manner.

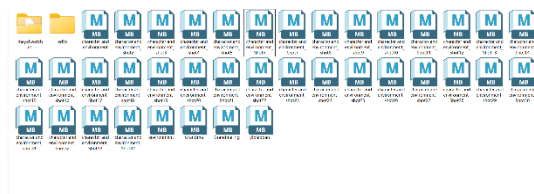


Fig. 6



Fig. 7

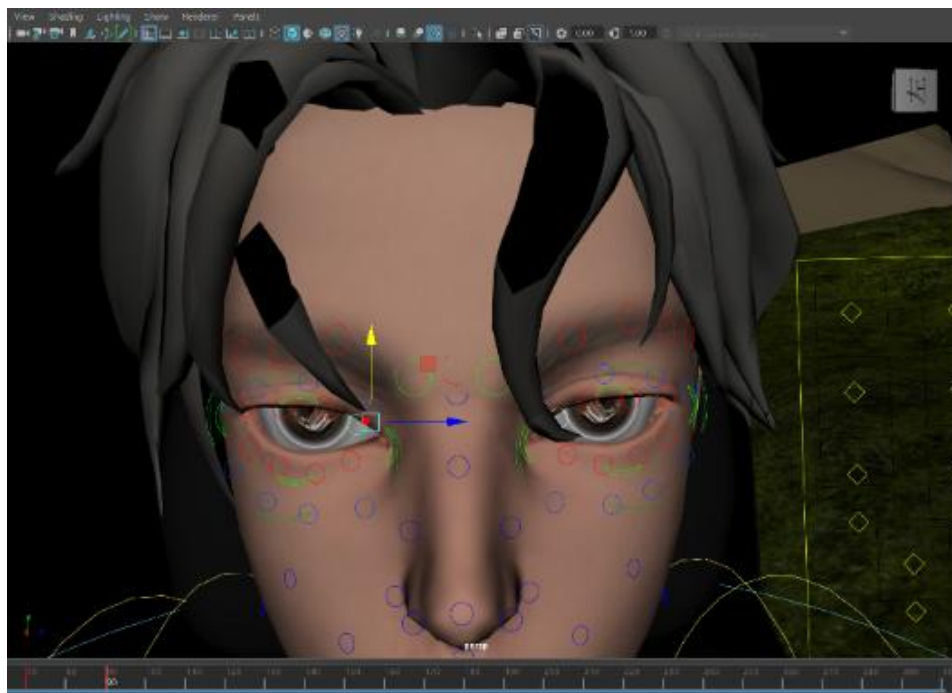


Fig. 8 Facial animation

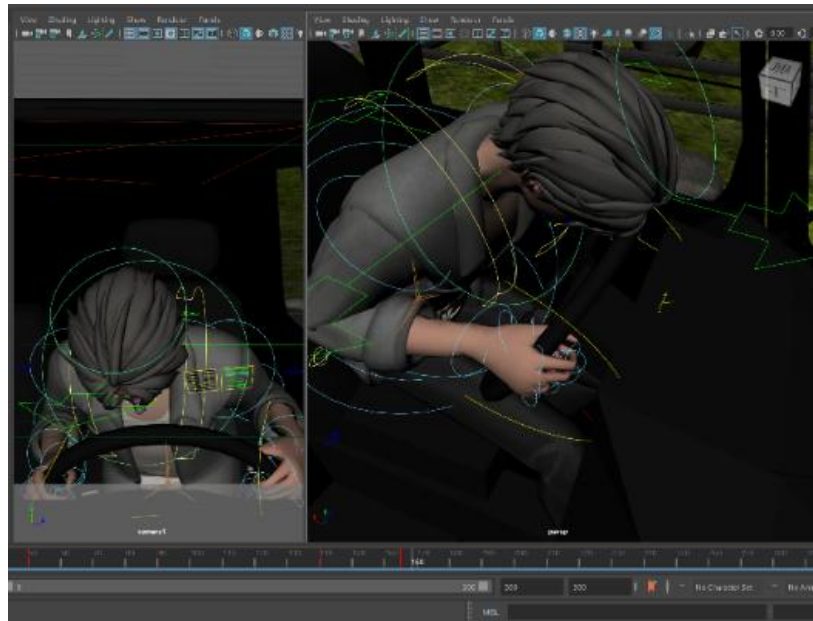


Fig. 9 Body animation

2.5 Rendering

The final rendering stage was completed using Autodesk Maya with Arnold Renderer. Arnold was selected as the primary renderer because it provided reliable results for the project's realistic materials, lighting, shadows and atmospheric effects. During the rendering process, particular attention was paid to render settings, sampling, noise reduction, rendering performance and hardware compatibility.

Arnold and Render Settings

Arnold was used for the final production renders. The render settings were adjusted according to the complexity of each scene, with particular attention given to camera resolution, sampling levels, ray depth and lighting quality. Higher sampling values were used when necessary for important final shots, while lower values were maintained during preview rendering to reduce unnecessary processing time.

CPU and GPU Rendering

During the production process, both CPU and GPU rendering were considered. Initially, Maya 2023 failed to correctly recognise the computer's GPU for Arnold GPU rendering, which limited the available rendering options and resulted in longer rendering times when relying on the CPU. After troubleshooting the software and hardware compatibility, Maya 2025 was installed, and the GPU was successfully recognised by Arnold. This significantly improved the rendering workflow and made GPU rendering a more practical option for final production.

Rendering Time

The final rendering process was relatively time-consuming because of the combination of character animation, lighting, materials and environmental effects. Initial test renders showed that some shots required excessive rendering time, making it impractical to use high-quality settings throughout the entire production.

To reduce this problem, lower-quality settings were used during test renders, while higher sampling and quality settings were reserved for the final output. This allowed lighting, camera composition and animation issues to be identified without repeatedly waiting for full-quality renders.

Optimisation

Several optimisation strategies were applied to improve the overall rendering workflow. These included reducing unnecessary sampling during preview renders, adjusting ray depth according to scene requirements, optimising lighting and materials, and using GPU rendering where possible. Scene elements that did not significantly contribute to the final image were also kept as simple as possible.

A major optimisation improvement came from resolving the GPU recognition problem by upgrading from Maya 2023 to Maya 2025. This allowed Arnold to recognise the computer's GPU correctly and provided a more efficient

rendering workflow. Overall, the optimisation process demonstrated that final rendering quality depends not only on increasing render settings, but also on finding an appropriate balance between sampling, noise, hardware performance and rendering time.



Fig. 10

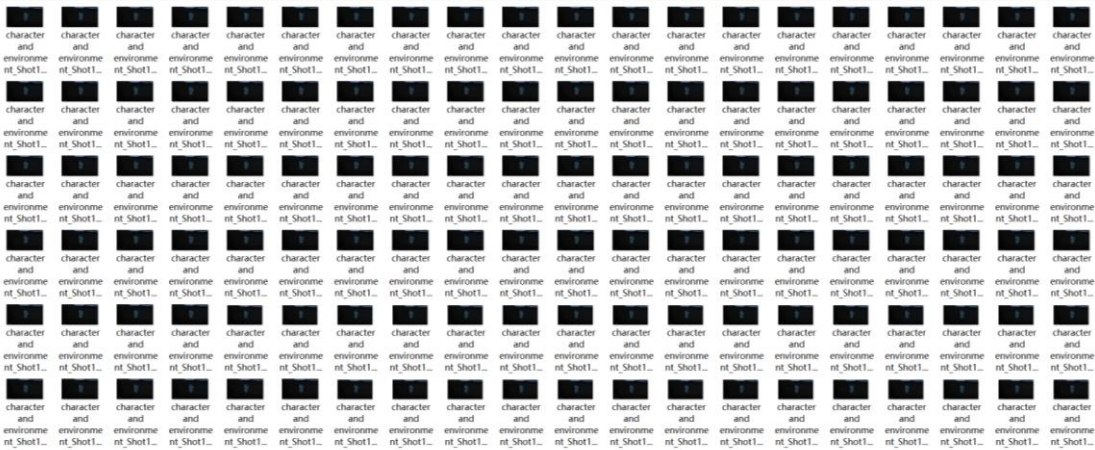


Fig. 11

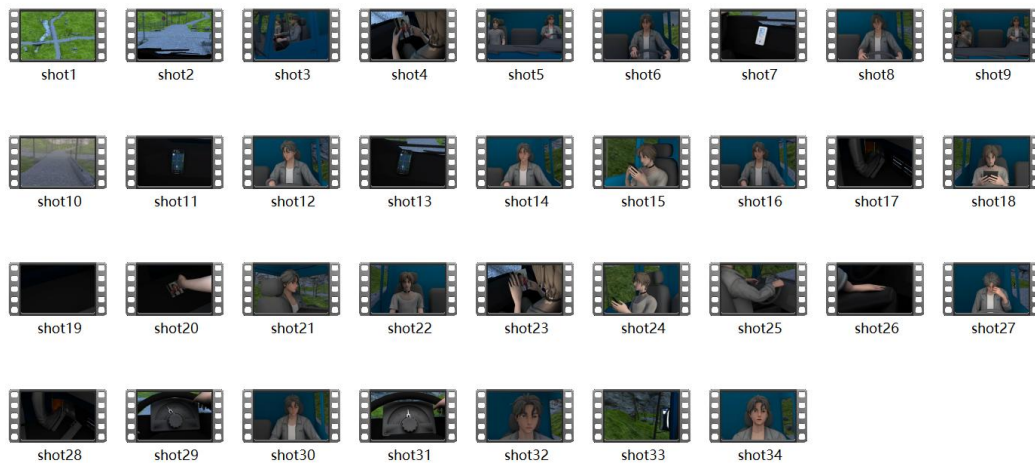


Fig. 12

3 Methodologies

3.1 Technical Methodology

Autodesk Maya was selected as the primary 3D production software for this project, as it is capable of handling multiple stages—including modelling, character rigging, animation, lighting and scene creation—thereby meeting the project's overall production requirements.

In terms of animation production, keyframe animation was used to control the characters' movements and pacing, whilst a rigging system was employed to establish the characters' skeletons and controllers, thereby enhancing the efficiency and controllability of the animation process.

Arnold was ultimately used for rendering, combined with Volume Fog to enhance the lighting, sense of space and ambient atmosphere, resulting in a more natural and realistic visual effect.

3.2 Organisational Methodology

Gantt chart

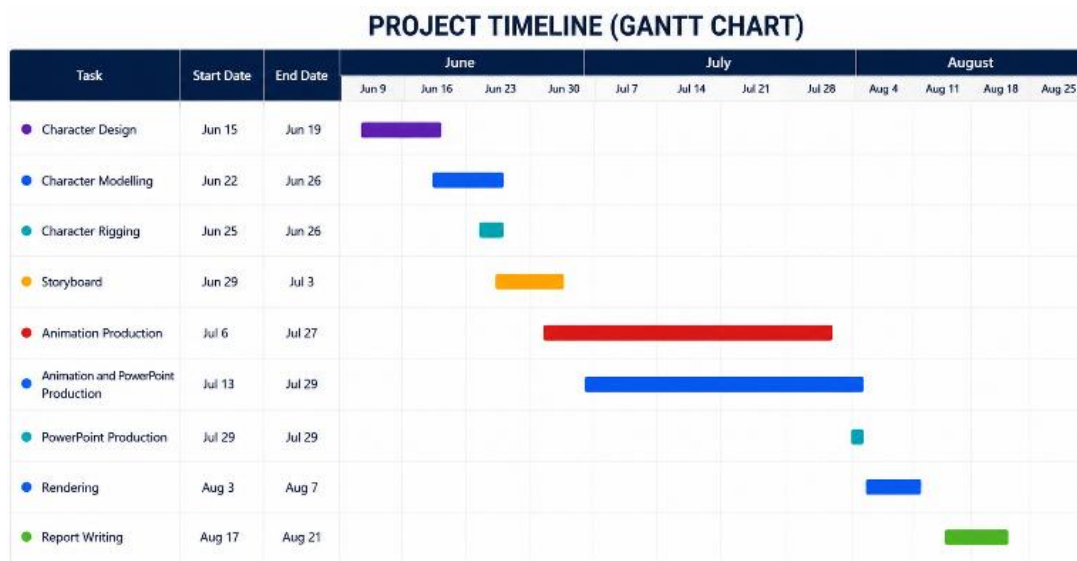


Fig. 13

Task prioritization:

During the project production process, I will prioritise tasks appropriately based on their importance and production dependencies. Firstly, I will prioritise character modelling and rigging to ensure that the character's model structure, proportions and rigging meet the requirements for subsequent animation production; secondly, I will proceed with animation production, carrying out motion design, keyframe adjustments and shot performance once the character rigging is complete. I will then proceed to colour grading to further refine the colour, lighting and overall visual effects of the footage, ensuring a more consistent animation style. Finally, I will carry out animation rendering, perform the final output of the completed shots, and check the image quality, lighting, materials and rendering effects. This task schedule ensures that the foundational work is completed first, providing a solid production foundation for subsequent animation, visual adjustments and final rendering.

Shot management

During the animation production process, I save the animations for different shots as separate Maya source files, rather than consolidating all shots into a

single file. This reduces the complexity of individual files, minimises the impact of scene stuttering or file corruption on the entire project, and makes it easier to adjust, test and render each shot individually. This approach to file management improves overall production efficiency and allows for greater flexibility in terms of subsequent modifications and project management.

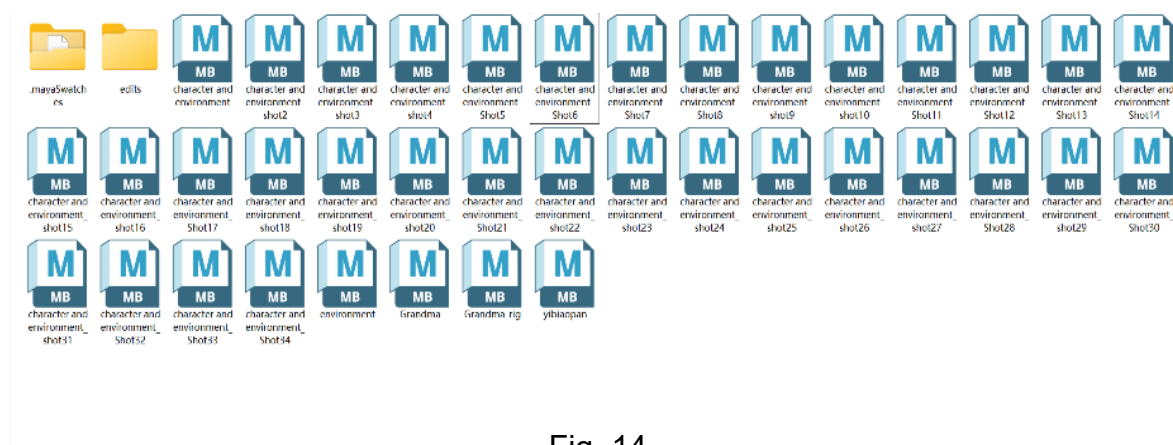


Fig. 14

Conclusions and Analysis

The technical approach adopted for this project was generally effective and met the requirements for the final 3D animation production. Maya, as the primary production software, provided a comprehensive workflow for modelling, character rigging, animation and scene creation. Keyframe animation allowed for precise control over the characters' movements, positions and timing, whilst the rigging system enhanced the flexibility of character animation production. Low-key lighting proved effective in creating the visual atmosphere required for the project, whilst Arnold rendered lighting, shadows and materials well, lending the final footage greater depth and realism. Through these production processes, I gained a deeper understanding of the complete 3D animation production workflow and enhanced my ability to independently carry out various stages of production.

However, I encountered some technical issues during the actual production process. During the character rigging phase, facial distortion occurred,

particularly when the character was in motion relative to a vehicle, resulting in unnatural stretching and distortion of the face. By examining the relationships between the rig, bones and the model, and adjusting the relevant weights and control settings, I was ultimately able to resolve the character's distortion issues. This taught me the importance of conducting thorough testing once character rigging is complete, rather than proceeding directly to the final animation production. In addition, the initial Volume Fog settings reduced scene visibility whilst increasing rendering complexity; I therefore optimised the setup by adjusting the fog density and related parameters. During the Arnold rendering process, issues with noise and excessively long rendering times arose; these were mitigated by adjusting the sampling settings, optimising the lighting configuration, and utilising low-quality test renders. Furthermore, Maya 2023 failed to correctly recognise the computer's GPU; this issue was successfully resolved after upgrading to Maya 2025. These experiences taught me that, in 3D animation production, technical issues are an integral part of the process and must be resolved step by step through analysis, testing and adjustment, rather than simply relying on the software's default settings.

If I were to undertake this project again, I would schedule more rigging, animation, lighting and rendering tests at the outset of production. In particular, once character rigging is complete, I would test facial and body movements, as well as the character's interactions with the scene, at an early stage to prevent deformation issues from arising during the later animation phases. At the same time, I would check the compatibility between Maya, Arnold and the GPU in advance, and complete animation blocking and lighting tests earlier to establish more suitable rendering presets. Through this project, I not only learnt techniques such as Maya, character rigging, keyframe animation, lighting, Arnold rendering and volume fog, but also improved my ability to solve problems, optimise workflows and manage production timelines. More

importantly, I have come to realise that a complete animation project requires not only strong creative and technical skills, but also advance planning, continuous testing, and the ability to identify and resolve issues promptly. These experiences have given me a more systematic understanding of 3D animation production and laid the foundations for independently completing more complex animation projects in the future.