



Animated Movie Making Using A Game Engine

Authors

Mr. Rishi Mehta¹, Mr. Yash Bhatt², Mr. Yashvardhan Joshi³, Mr. Sanjay Vidhani⁴

^{1,2,3}Student, Department of Information Technology,

K.J. Somaiya College of Engineering, Vidyavihar East, Mumbai, India

⁴Assistant Professor, Department of Information Technology,

K.J. Somaiya College of Engineering, Vidyavihar East, Mumbai, India

Email: ¹rishi.mehta@somaiya.edu, ²yash.bhatt@somaiya.edu, ³yashvardhan.j@somaiya.edu, ⁴sanjayvidhani@somaiya.edu

Abstract

A game engine is a software framework designed for the creation and development of video games. Video game developers use them to create games for video game consoles, mobile devices and personal computers. Thanks to the growing power of video games engines, which are responsible for creating the whole in-game experience - from rendering the physics system and sound architecture to artificial intelligence and networking - the idea that film makers could take advantage of them to improve, speed up or even completely abolish the post-production process is slowly becoming a reality. In this paper we explain how to develop an animated movie using a game engine.

Keywords: game engine, video games, artificial intelligence, networking, animated movie

I. INTRODUCTION

Creation of an animated movie with the help of game engines is a comparatively simplified process compared to the techniques used today. Game engines today can handle high end graphics and animations which can be created in it and can help in reducing the rendering time which is the main issue nowadays. Not only does this help in only animated movies but can help in aiding visual effects which is often a cumbersome job and is often used in almost all the movies. Game engines thus, will help in reduction of time which will result in overall reduction of money to be invested in a particular project.

II. EXISTING SYSTEM

The production pipeline of a typical animated short or a movie can be divided into three stages; pre-production, production and post-production.

▪ Pre-Production:

The first process in the animation pipeline, and also one of the most important, is pre-production. It begins with the main concepts which are initially turned into a full story, and then, once the story has been finalized, other things such as the script, shot sequence and camera angles are worked on.

Some major components of pre-production are:

1. Story Boarding:

The Storyboard helps to finalize the development of the storyline, and is an essential stage of the animation process. It is made up of drawings in the form of a comic strip, and is used to both help visualize the animation and to communicate ideas clearly. It details the scene and changes in the animation, often accompanied by text notes describing things occurring within the scene itself, such as camera movements.

Not only can storyboards be especially useful when working in group environments (something quite common in the animation industry,) but they also provide a visual reminder of the original plan; something that can be referred back to throughout the production.

2. Layouts:

Once the storyboards have been approved, they are sent to the layout department which then works closely with the director to design the locations and costumes. With this done they begin to stage the scenes, showing the various characters' positions throughout the course of each shot.

3. Model Sheets:

Model sheets are precisely drawn groups of pictures that show all of the possible expressions that a character can make, and all of the many different poses that they could adopt. These sheets are created in order to both accurately maintain character detail and to keep the designs of the characters uniform whilst different animators are working on them across several shots.

During this stage the character designs are finalized so that when production starts their blueprints can be sent to the modeling department who are responsible for creating the final character models.

4. Animatics:

In order to give a better idea of the motion and timing of complex animation sequences and VFX-heavy scenes, the pre-visualization department within the VFX studio creates simplified mock-ups called "Animatics" shortly after the storyboarding process.

These help the Director plan how they will go about staging the above sequences, as well as how visual effects will be integrated into the final shot.

▪ Production:

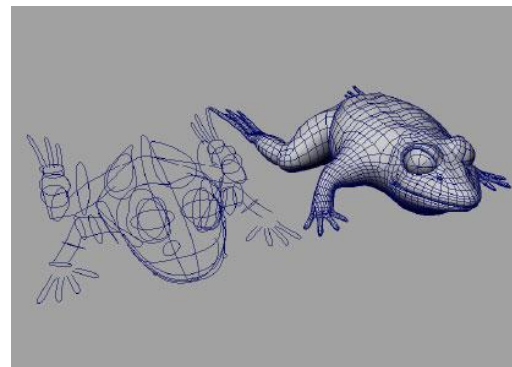
Now that the storyboard has been approved the project enters the production phase. It's here that the actual work can start, based on the guidelines established during preproduction. Some major parts are:

1. Layout:

Using lo-res models or blocks of geometry in the place of the final set and characters, the Layout Artist is responsible for composing the shot and delivering rough animation to the animators as a guide. What they produce is the 3D version of what the storyboard artists had previously drawn on paper.

2. Modeling:

Working closely with the Art Directors, Visual Effects Supervisors and Animation Supervisors, modelers turn the 2D concept art and traditionally sculpted maquettes into high detail, topologically sound 3D models. They then assist the Technical Animator and Enveloper as the model has a skeleton put in place and the skin is developed. Following this, the model may be handed back to the Modeler, who will proceed to sculpt facial expressions and any specific muscle tension/jiggle shapes that may be required.



Once the model is approved, it will be made available to the rigging and texture paint departments, who complete the final stages in preparing the model for animation and rendering.

3. Texturing:

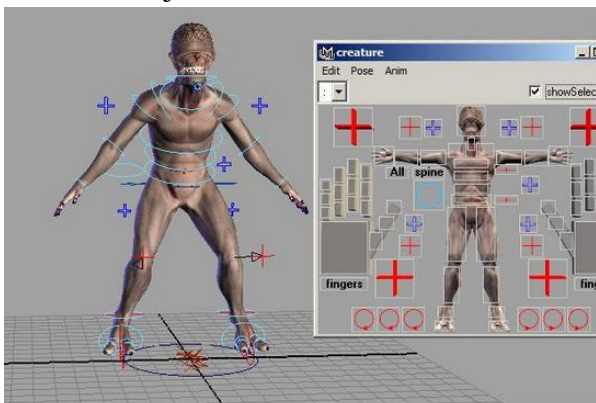
Whether creating a texture from scratch or through editing an existing image, Texturing Artists are responsible for writing shaders and painting textures as per the scene requirements.

4. Lighting:

Not only does a Lighting Artist have to think lighting the individual scenes, they also have to consider how to bring together all of the elements that have been created by the other departments. In most companies, lighting TDs combine the latest version of the animation, the effects, the camera moves, the shaders and textures into the final scenes, and render out an updated version every day.

5. Rigging:

Rigging is the process of adding bones to a character or defining the movement of a mechanical object, and it's central to the animation process. A character TD will make test animations showing how a creature or character appears when deformed into different poses, and based on the results corrective adjustments are often made.



6. Animation:

In modern production companies, the practice of meticulously planning a character's performance frame by frame is applied in 3D graphics using the same basic principles and aesthetic judgments that were first developed for 2D and stop-motion animation. If motion capture is used at the studio to digitize the motion of real actors, then a great deal of an animator's time will also be spent cleaning up the motion captured performance and completing the portions of the motion (such as the eyes and hands) that may not have been digitized during the process.

Post Production:

Post-production is the third and final step in film creation, and it refers to the tasks that must be completed or executed after the filming or shooting ends. These include the editing of raw footage to cut scenes together, inserting transitional effects, working with voice and sound actors and dubbing to name just a few of the many post-production tasks.

Overall, however, the three main phases of post-production are:

1. Compositing:

The compositing department brings together all of the 3D elements produced by the previous departments in the pipeline, to create the final rendered image ready for film! Compositors take rendered images from lighters and sometimes also start with compositing scripts that TDs develop in order to initially comp together their dailies (working versions of the shot.)

2. Sound editing:

This department is responsible for selecting and assembling the sound recordings in preparation for the final sound mix, ensuring lip sync and adding all of the sound effects required for the final film.

3. Video editing:

Video editing is the process of manipulating and rearranging shots to create a seamless final product, and it is at this stage that any unwanted footage and scenes are removed. Editing is a crucial step in making sure the video flows in a way which achieves the initial goal. Other tasks include titling and adding any effects to the final video and text.

III. PROPOSED SYSTEM

Most tools only create a fraction of a movie: a renderer, a 2D video clip editor, a keyframer, a motion capture editor, a sound editor, etc. A game engine is a hybrid of all these workflows merged

into a single system, where you can create an entire movie by reusing assets and events from the video game world.

If you combine video games with film-making techniques, you can start to have these real deep, multi-user experiences.

Being able to animate, edit and compose live is going to change the way we work and it's really going to bring back the creative experience in digital effects.

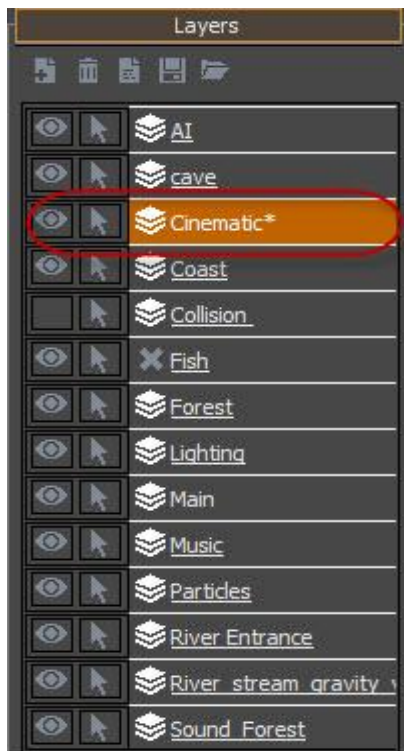
The pre-production involved in the process of movie creation using a game engine is almost the same as it forms the basis of any movie making process.

The production is a different process.

Explained below are the steps involved in making a movie using a game engine.

- **Adding a New Sequence**

It's recommended to create the new Track View Sequence within a Level layer. In the Layers Settings panel of the Rollup bar, you can create a new layer called **Cinematic**.

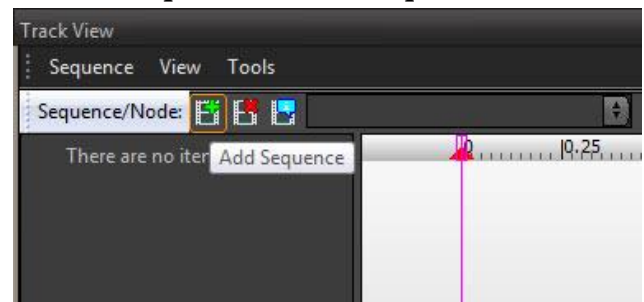


You can now create your Track View sequence and place the objects or entities you want to modify using Track View. All of these added to the level will automatically be added to the selected **Cinematic** layer.

Saving the level also saves the newly added layer. The advantage of this is the possibility of working on your cutscene separately from someone working on the same level.

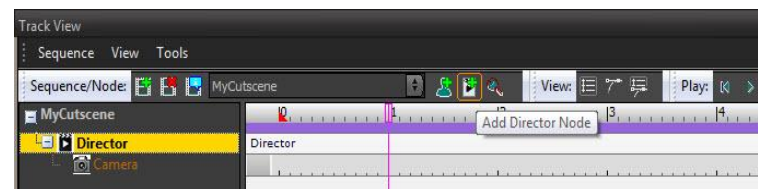
This also allows you to re-import only your Track View Sequence without modifying any other objects in your level. Thus, avoiding the accidental addition of entities to the incorrect layers.

1. Open the Track View Editor via **View -> Open View Pane -> Track View Editor**.
2. To create a new scene, on the **View** menu, click **Open View Pane**, and then click **Track View**.
3. Once the **Track View** is open, click the **Add Sequence** icon. You can also click on **Sequence -> New Sequence**.



- **Adding a Director Node**

The first element that needs to be added to the scene is a **Director Node**. The Director node will already have a camera track, which is meant to contain viewpoint settings. Keyframes added on the camera track enable switching viewpoints at any time of the sequence.



IV. CONCLUSION

The production pipeline detailed above is broadly common in most studios, however each studio is likely to have a custom pipeline determined by the type of project they are currently undertaking. A 2D production pipeline starts with workbook and goes all the way through final checking, compositing and

film output, whilst the 3D CGI production process emphasizes the design, modeling and rigging and animation stages. Moreover, animation production is a very coordinated process where different teams of artists work together while utilizing optimum resources and achieving the initial goal in the time available. On top of the decreased time and cost benefits, using a game engine for movie production allows the characters and environments to be re-used in video game spinoffs.

REFERENCES

1. <http://www.theinquirer.net/inquirer/opinion/2385371/the-video-games-engine-and-movie-post-production-gap-is-closing>
2. 3d Animation And Film Making Using Game Engines: The Art Of Machinima, Paul Marino
3. Step-by-Step : How to Make an Animated Movie By Pratik Gulati
<http://cgi.tutsplus.com/articles/step-by-step-how-to-make-an-animated-movie--cg-3257>
4. <http://www.kurzweilai.net/how-to-make-awesome-movies-and-games-in-the-same-engine>
5. <http://gamedev.stackexchange.com/questions/82816/why-are-gaming-graphics-not-as-beautiful-as-animated-movies>
6. <http://www.gamedev.net/topic/614793-engine-for-making-short-movie/>
7. Machinima: The Art and Practice of Virtual Filmmaking- By Phylis Johnson, Donald Pettit
8. <http://www.animationcareerreview.com/articles/unreal-engine-3-game-design-engine-worth-knowing>