COSC 3P98 Final Project
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Story

Battlestar Galactica is a science fiction television show from the 1970's that was recently (2003) recreated into a new series, along the same lines. The theme of the show is that of a human race living in an area of space very distant from our own. They are much more advanced technologically than their human counterparts on Earth. They are spread out on 13 planets known as colonies. A mythological 14th colony known as Earth is believed to contain a long lost tribe of humans as well. The humans of the 13 colonies created a robot race known as the Cylons who rebelled against their masters and raged war with them. The Cylons won the war and a rag tag fleet of ships protected by the sole surviving Battlestar: "Galactica", is all that remains of the human race. For years they have been on the run from the Cylons, searching for the lost 14th colony of Earth. When Earth is finally found, it is only a matter of time before the Cylons return to exterminate the human race…

I decided to create this animation after being a fan of the old and new show for many years. The choice of using the new series models was only a matter of personal preference. When imagining a storyline I wanted to create something that we were unlikely to ever see on any of the TV shows. TV series usually have a happy ending and this is anything but.

Overview

This short fan film involved the use of many commercial animation and Audio/Visual production systems.

3d Studio Max Version 9
This program was used exclusively to animate the various scenes of the film as well as the many special effects throughout. 3D Studio Max is a very powerful animation program. It has many features built in such as special effects, animation production, modelling, video rendering and exporting. It is also able to use many plugins that add new features as well as enhance others. 3d Studio was used because it had a Computer Aided Design (CAD) interface that was very appealing and worked well with my previous CAD experience. This allowed me to quickly jump into the program without having to resort to tutorials for even the most basic things such as project creation, rendering, etc.

Although the basic features were easy to grasp, the program gets complicated quickly when you try to combine features or use special effects. Here, 3d Studio has a learning curve that looks something like a

brick. The Auto Key function is very useful in that you can specify the parameters for two frames and it will linearly interpolate those frames inbetween (tweening). This allows the animator to quickly create movement and other effects. The problem with this feature is that if you can get yourself into trouble very quickly by forgetting to shut it off. 3d Studio's special effects were extremely helpful, especially in a space battle where the viewer is expecting some.

The most used 3dStudio effects that employed in this production were Lens Effects, Starfield, and Lens Flares.

Lens Effect

This effect was used to create the engine glow that can be seen on the Cylon Raider, Colonial Viper, Missile and the Battlestar Galactica
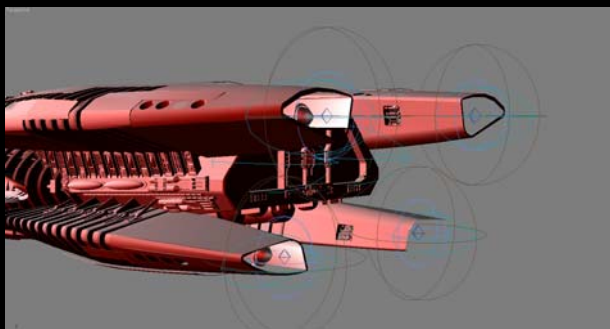

The effect is created by creating a SphereGizmo object in 3dStudio. An Omni light source is then created inside the SphereGizmo. This type of light source shines in all directions to give a uniform glow. The Lens Effect is then added. There area few subtypes of Lens Effect. A Fire Effect is used then modified to look like the engine glow. There are many parameters that can be set but the main ones are the amount of detail of the glow, the size of the glow, opacity and of course, colour.

Most notably, the Lens Effect was used to create the exhaust of the missile that followed just before the Vipers are destroyed. The movement of the flame was created by adjusting the 'phase' of the Fire Effect at each frame.
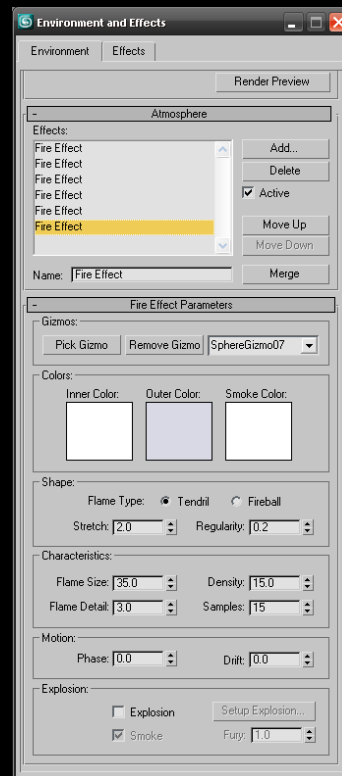
Starfield

The Starfield effect is used to give the 'world' of the animation more realism. In space you can see the distant stars and they have different sizes and intensities based on their suns glow. They also play an integral role during camera manipulation. Fast moving cameras and zooms can create the illusion of streaks whereby the stars are also active during motion. This motion effect was very difficult to duplicate in my first attempt; using a giant sphere with a noise map of white speckles. In fact the sphere was able to replicate the distant stars very well. It fell short when it came time to replicate the streaks caused by camera motion. Although this is possible using camera parameters, it is automatically handled when using the Starfield effect. I felt like I had struck a gold mine when I stumbled across this effect. The Starfield is an example of a 'Video Post' effect in 3d Studio. This means that the geometry in the animation such as the models, lighting, etc. are rendered first and then the Starfield is rendered last. This required some more learning to discover just how Video Post works and its capabilities. It is a very powerful way to create realistic effects with minimal effort. In regards to the Starfield, the systems renders the planets, ships, etc. and then computes where the camera is pointing and how fast it is moving. It uses these figures to determine the amount of streaks to give the stars. This gives a realistic representation of motion in space and was very satisfactory. The Starfield effect also allows you to set the intensity range of the stars and the amount of motion effect you desire.
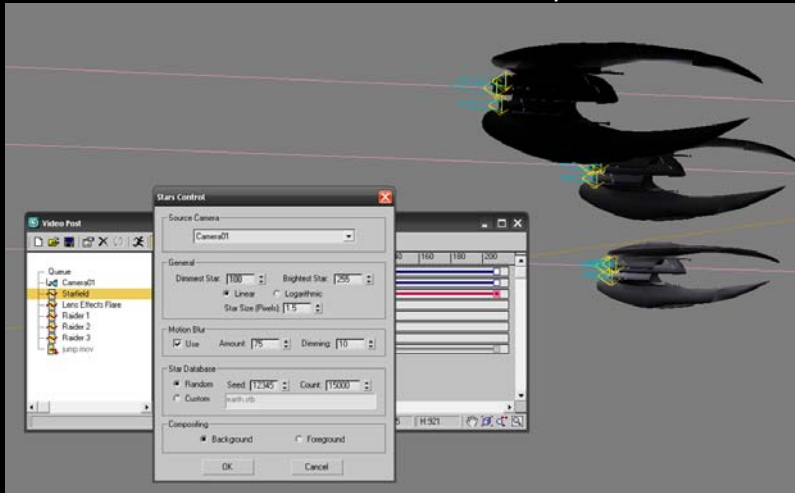
Lens Flares

3d Studio has lens flare available for use during regular model rendering as well as Video Post rendering. The Video Post option was chosen over the regular rendering because it was not affected by objects in the world such as shadows and lighting. This reduced the amount of problems that had to be dealt with in regards to lighting. Lens Flares were used in the program to create the Star that is seen in the distance when the Cylon Raiders 'jump' in the video. This was accomplished by creating a very distant Omni light source with a high intensity to generate light and then assigning a Lens Flare in Video Post to that light source. Lens Flares were also used to create the Jump Effects when ships appear in space, the red eye in the Cylon Raiders during the flyby, the red radioactive portion of the nuclear missile and the explosions of the Vipers and the Battlestar Galactica. Had more time been available I would have preferred to use a different effect for the explosions, something with more 'fire' and debris. Given the time constraints the lens flares did the job well enough. The destruction of the ships was accomplished by generating a lens flare with increasing size over time, once the size was maxed out the ship was scaled down to less than 1/100 its original size (invisible to naked eye) within 1 frame and then the lens flares size was decreased to 0. The reverse was done to accomplish the jump effect. The ships started out small and were scaled many times larger in 1 frame.
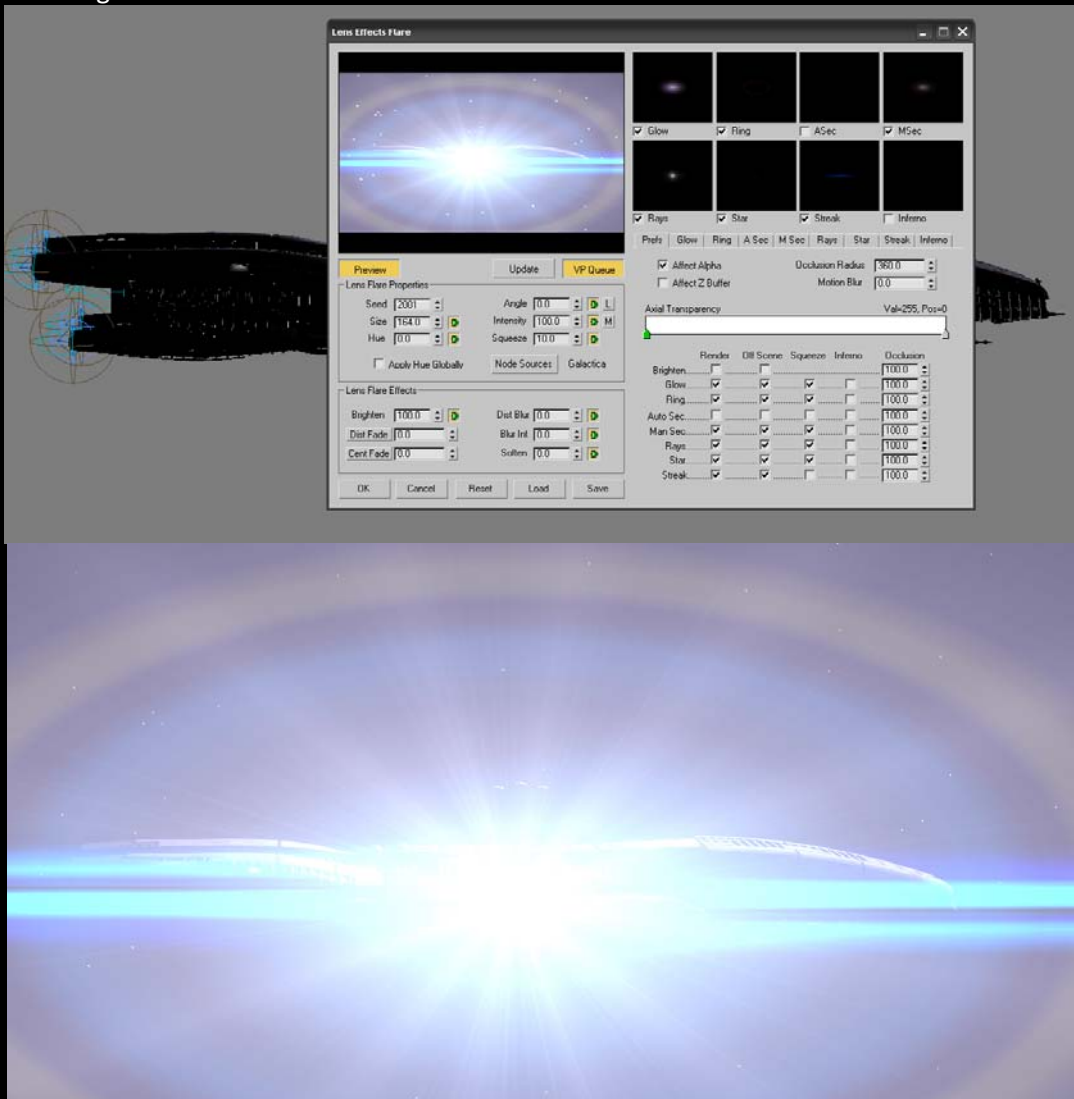
Animation

The animation in the video is a mix of using the AutoKey function to interpolate frames and using Path Constraints. In addition, the AutoKey function can be combined with Path Constraints. For some scenes using the AutoKey was the simpler approach. The start condition is set and then the end condition is set and the in between frames are computed automatically. This was used for movement that was fairly linear and did not involve and curves or turning of object locations/states. The Path Constraint was used when there was more of a curve to the object movement. An example is the Colonial Viper destruction scene. In this scene the timing was very critical. Not only were the Colonial Viper fighters moving, but the camera was moving along with them. In addition, the missiles strike the individual Vipers at different times and therefore locations. Lines were used to denote the paths and then the constraint was added to each object that needed to follow the path. The AutoKey function could then be used to time the objects location on the path.
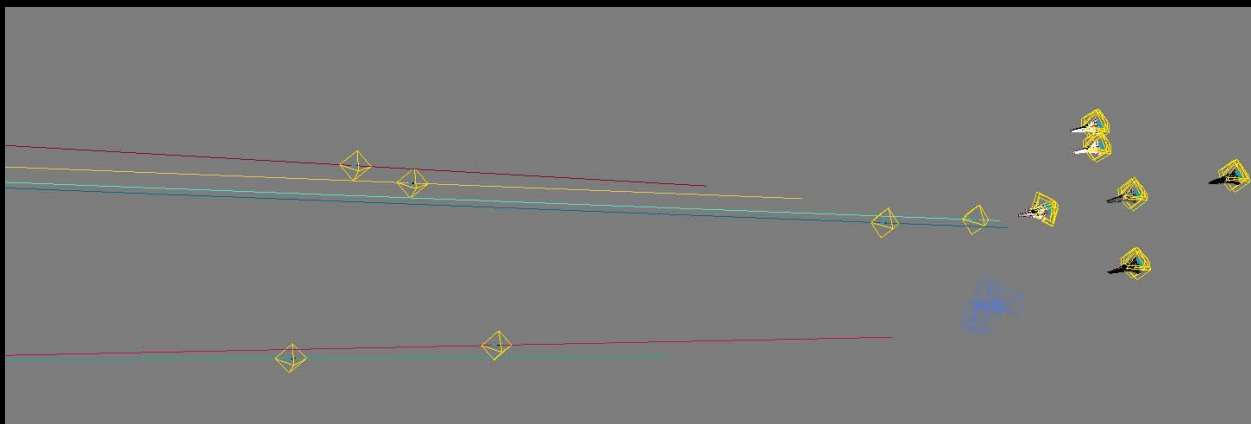
UGS Solid Edge

This is a CAD program that uses sketches and solid bodies to create models. It is a very powerful application that allows the user to create their own protrusions and cutouts to determine object shapes rather than using primitive objects such as spheres and rectangles. This program was used to model the missile in the animation. The missile was then exported to 3d Studio where the final touches such as individual face colouring and lighting properties were set for use in the video.

EXP Studio Audio Editor

This is a simple Audio Editor I found that was able to do the editing that I required. I was able to upload the Miniseries sound into it and then select the parts that I needed for each scene in the movie. I was also able to tweak them a bit such as amplification and shortening/extending sound clips.

Windows Movie Maker

This application was used to create the ending credits in the movie. I found the lack of functionality and customizability to detract from the effectiveness of this program. It gives you very few features as far as the frame size and quality go. Worst of all was that it's impossible to get a true black background in any film you create, it always has a slightly grey appearance. Nonetheless it was suitable for creating the credits. I was however required to find a better application to put my animation together.

Ulead Video Studio 10

This product is many times more powerful and user friendly than Windows Movie Maker. I was able to add all of my clips, both video and sound to the programs 'Collection' and then order and manipulate them however I needed. The program provides many different tracks that proved to be useful such as video, voice and music. Once I added my clips I simply ordered them as I needed and adjusted the play time and duration for each to my liking. I was also able to fine tune the volume of my audio clips to get them fairly uniform. The lack of an Ending Credits template disappointed me but I was able to add a text box to the beginning of the film stating that the animation takes place at Earth and at present day.
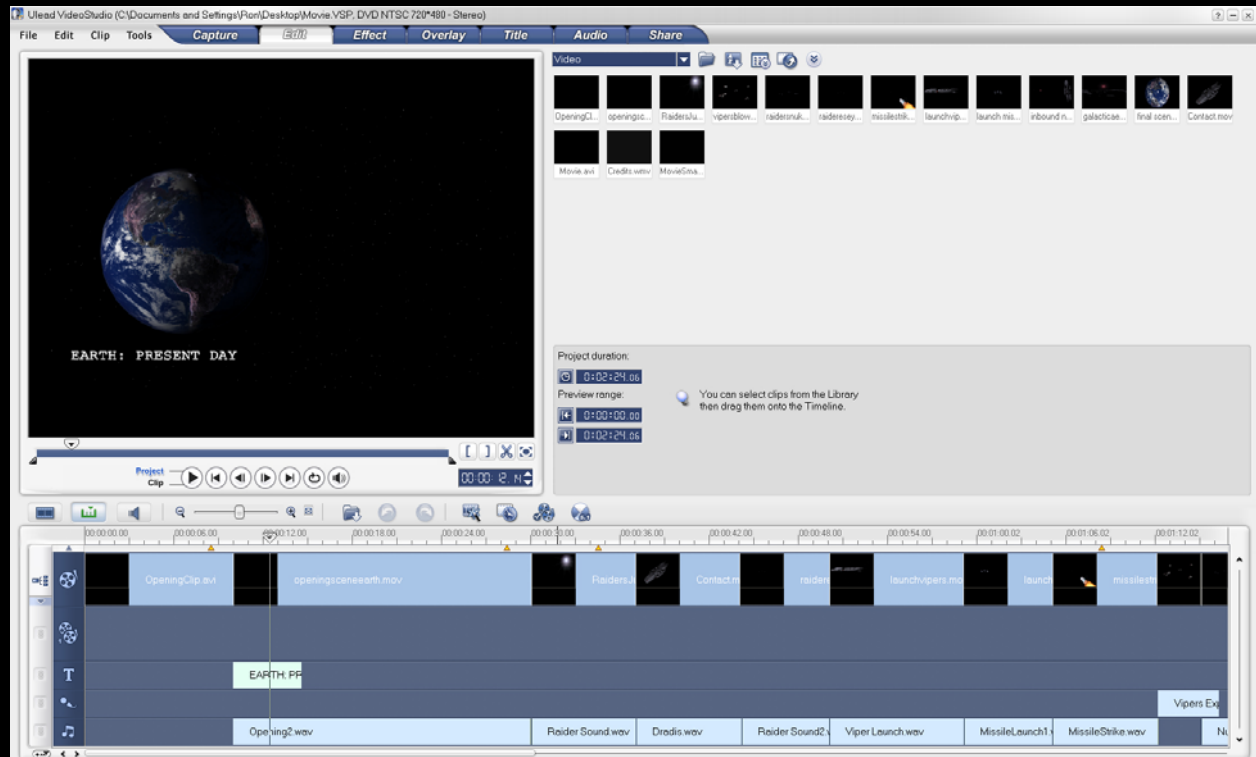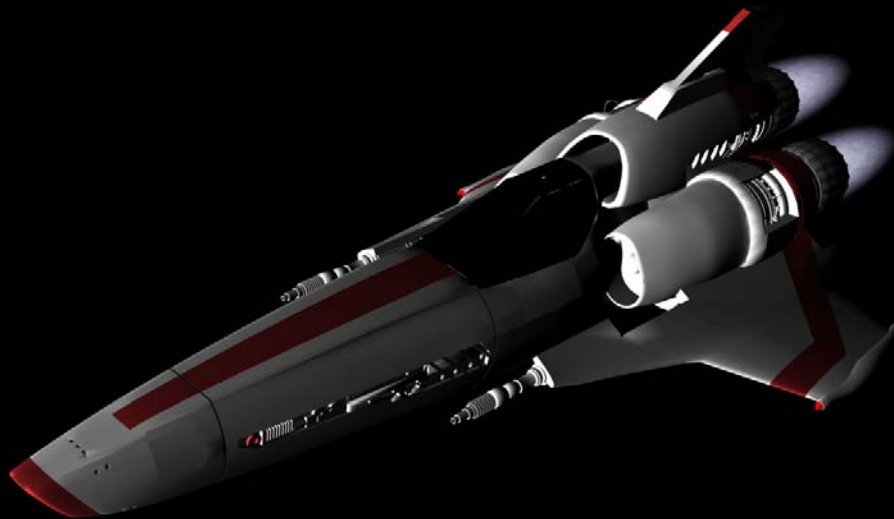
Models

Galactica

The Galactica model was obtained from www.colonial-fleets.com. It was created by Wil Jaspers and came with the textures and model already in 3d Studio format. I added the engine glow.
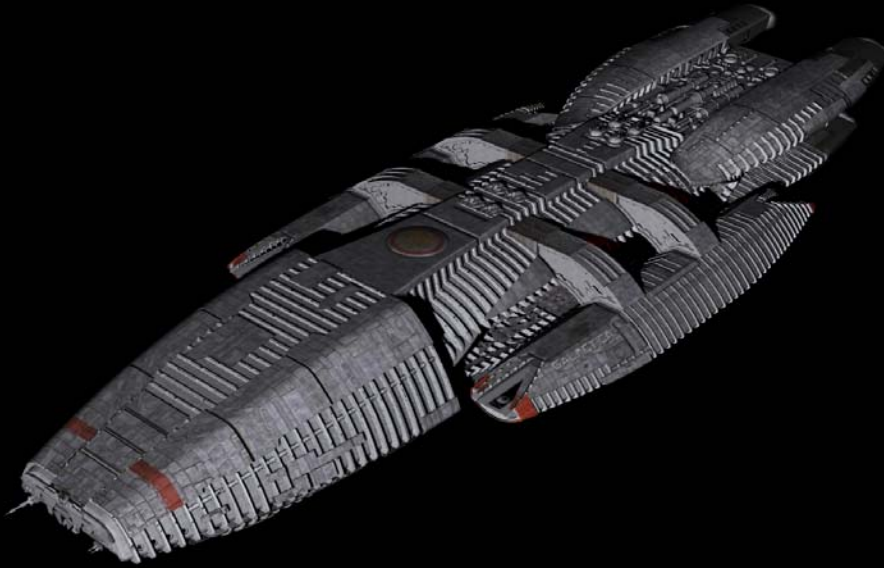
Colonial Viper

The Viper was also obtained from www.colonial-fleets.com. It was created by Sean Kennedy and came with the textures and model already in 3d Studio format. I added the engine glow.

Cylon Raider and Cylon Base Star

The Cylon Raider and Cylon Base Star were created by member 'Coxxon' of www.scifi-meshes.net. They came with the models and textures already in 3d Studio format. I added the engine glow to the Cylon Raider as well as the red eye glow.

Missile/Nuclear Missile

I created this model in Solid Edge and then exported it as an IGES file that 3d Studio was able to import. The import into 3d Studio was not very clean and the model required some cleanup such as smoothing out of vertices and the faces they connect. The materials were then created for the missile and applied to each face accordingly. I also added the Fire Effect to give the missile an exhaust and in the missile trailing scene I modified the phase of the exhaust at each frame to give it some very lifelike movement .
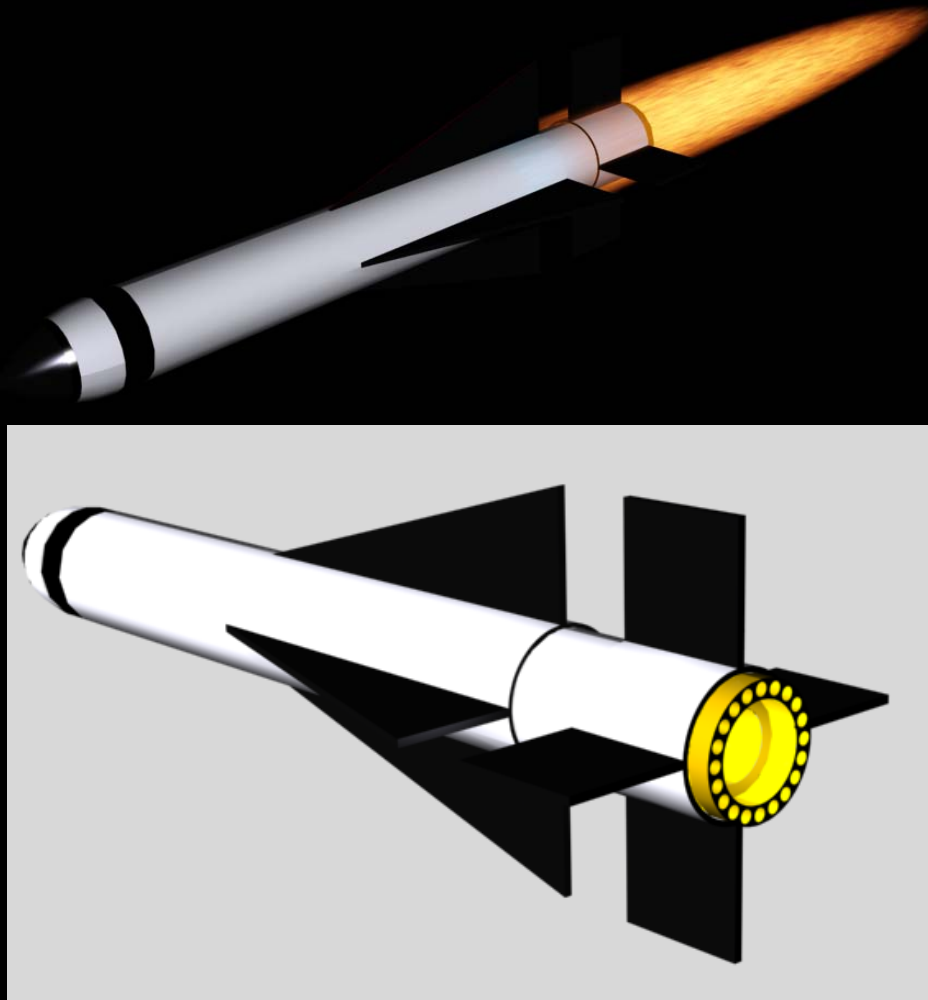
Earth

I created this model by making a sphere in 3d Studio and then applying maps to it. The maps were obtained from www.celestiamotherlode.net. There were many maps used on different channels to create a realistic and high quality earth rendering. These included a Diffuse channel map which is the actual surface of the planet, an opacity channel map that was the clouds, a specular map to highlight the specular characteristics of the planet and tone down the specular light on the water, and a bump map to give the terrain some height features. I also added a faint Fresnel effect to the circumference of the planet to give a slight appearance of an atmosphere.

Sound

The sound effects were taken from the Battlestar Galactica Miniseries produced by the Sci-Fi Channel. The individual sounds were cut out of the soundtrack and tweaked to fit the timing of the scenes.

Opening Title
The opening title that displays "Battlestar Galactica" was used from the Miniseries produced by the Sci-Fi Channel. It is a very short clip compared to the remainder of the film and enhances the viewing experience.

Video Specifications

Video Codec: DivX AVI Version 6.4.0
Audio: 44100 Hz MP3
Resolution: 1500 x 900 Widescreen 30 frames/second
Running Time: 2:24

Note: DivX Version 6.4.0 may be required to play video.