

Independent Research of a Software Development System

by: David Walter Truax Jr.

Submitted to:
Frank LaBanca, Ed.D.
Science Department Chair
Oxford High School
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Abstract

The video gaming industry is becoming more and more popular as new technologies further advance the quality and playability of the new games coming out. As new technologies are produced, new software is made to create better, smoother, and more playable games. To further my interest in video game art and design, I plan on using a free online software called blender to work on and create digital renders, character models, and other such things. Blender is a simple software, generally easier to use than others open to the public, and free. This makes it a prime candidate for me to practice with and learn the basics of. Should an understanding of this software be developed, I hope to move on to Unreal Development Kit, a more advance software that is available to anyone who wishes to use it. Tutorials to use this software and learn basics of creating different objects such as models, animations, and other such things are readily available and it is my hope to use these to develop and understanding of what working in the gaming industry will feel like and to better prepare myself for having to use similar software in the future.

Introduction

This project was more of a way to better enhance experience in a certain field rather than create a new solution for a novel problem. The particular field in question was the video game industry and, more narrowed down, developing models and animations using a free effective software. The first thing done was to research different types of development software available to the public for free download. Software such as this is not relatively common, but there are a few sources that are relatively easy to access. Unreal gives out a system called UDK, Unreal Development Kit, which is basically the Unreal Engine for free download. The complications with such a system are that it is extremely complex and a lot of computers simply do not have the requirements to handle the complexity of it. Software that was briefly looked into was Valve's development software, Steam. This program was not looked into thoroughly, however, and was not attempted to download after UDK had failed. The most affective software found was Blender and this was the software used to for the majority of research.

Blender is basically the ultimate free development software for free download on the internet, simply because of its easy accessibility and the extensiveness that it gives to its users. Blender is a program that is completely free for anyone. There are plenty of people who use Blender for recreational practices. While it is not used by any major game developers, it is a very good example of what other programs work and feel like. Blender offers a variety of basic and complex modeling, animation, coloring, and lighting systems, especially for free software. It provides everything needed in order to research and learn more about developing models and games.

Choosing Blender simply sets a guideline for the rest of the project. Obviously the work done on Blender is not as advanced as the work that can be completed on other programs but it is what was available at the time and the only thing that would somewhat work with the technology used. In choosing this software the rest of the project was to be set in stone. Modeling, shading, animations and everything that is required to create a game can be done on Blender. The only difference is that it looks

slightly less advanced.

So now that a program had been chosen the steps to create the things that had to be put into a game. It is vital to learn to create models and learn how to detail them. And since that is the main thing wanted to be done that would be the focus of the entire project, although animation and other part were planned to be looked into a small amount as well.

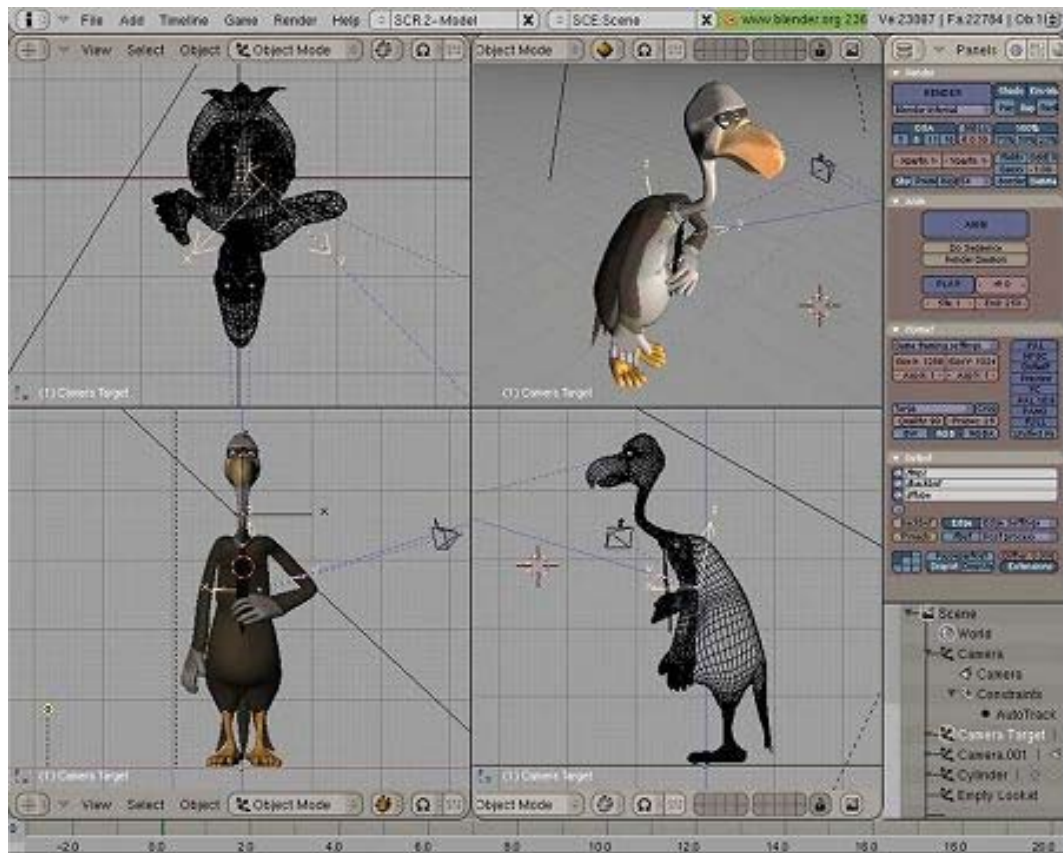
Modeling

The main development aspect looked into at this point in the research has been modeling basic structures. Modeling's roots are originated through the warping and scaling of common geometric shapes. It is possible to take your standard cube and morph it using different points on the object. It is possible to take a corner and stretch out, select the entire face of an object and pull it forward. Although these tools sound simple, they can be extremely helpful in creating any model that the artist can think of.

Imagine that the geometric shape is actually a piece of clay and that the software is just a bunch of tools that the artist uses in order to mold and form the clay to anything that the artist envisions. That is basically the process being done in Blender. The person controlling the object molds and forms it into something new.

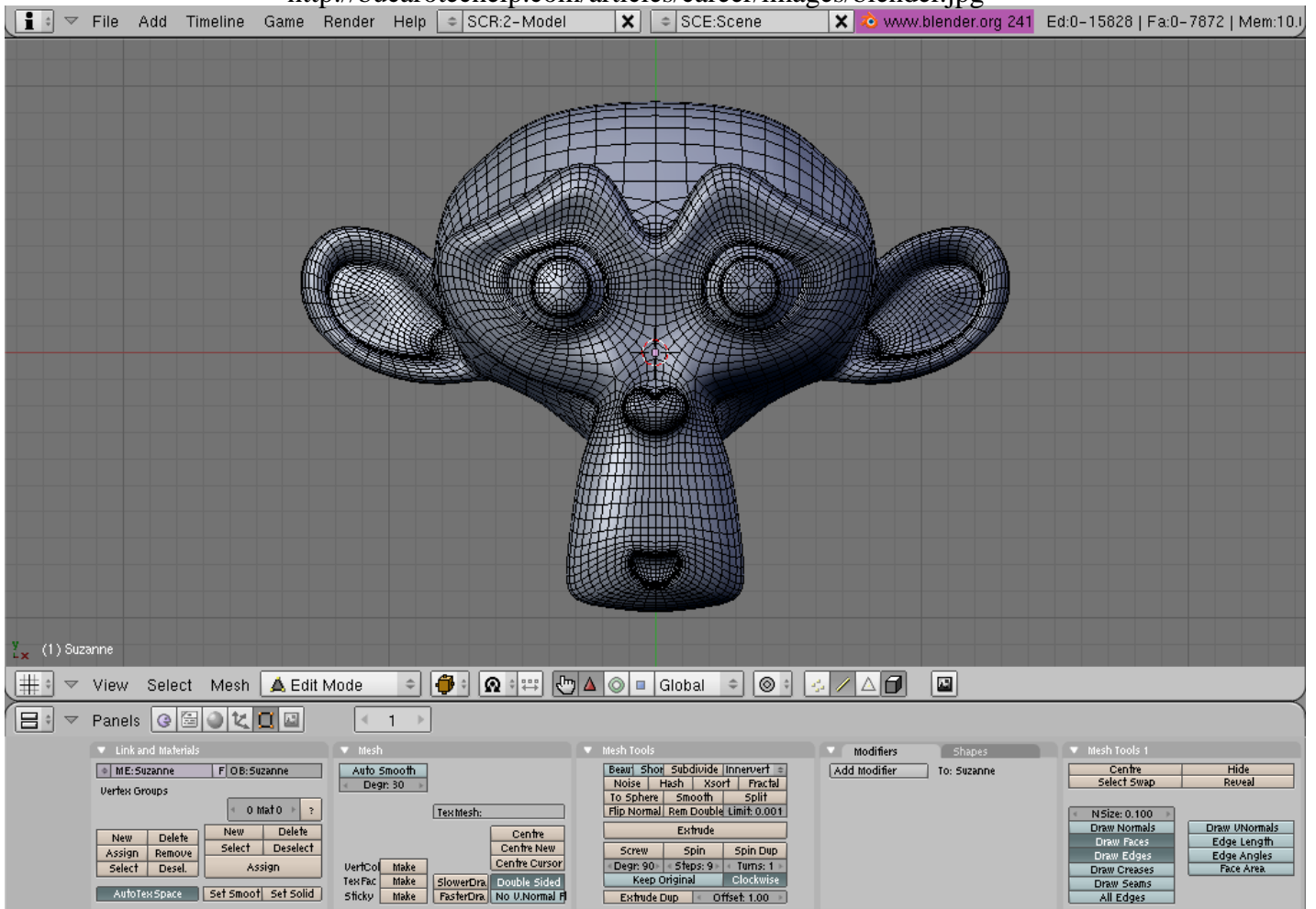
The artist can employ an image onto the template and divide the screens into however many sides that they need. So when the model is shaped in the front, it affects the way the object looks on all sides and the model can then be worked with from all angles without having to constantly switch around the object and losing track of each detail.

In order to work with the modeling system on Blender the basics of it first needed to be learned. It is possible to take the cube and expand it into an identical but larger object. You can stretch the object out to create something such as a limb to an organism or branch to a tree, and then indent it to add detail to the object. The extent to which modeling was looked at was not as much as could have been done in the time allowed and the modeling process, although the most looked into of all the processes, was not as accomplished as it was hoped.



<http://www.davidcornette.com/gsl/blendercap.png>

<http://bucarotechelp.com/articles/career/images/blender.jpg>



<http://www.davidcornette.com/gsl/blendercap.png>

Shading

Shading an object is also a simple ability given in Blender, possibly simpler than modeling.

Shading has its own personal toolbar that allows the user to color, shade, give an object a shine, and multiple other uses. Shading takes the bland gray model and turns it into an actually life-like object. As stated before, shading an object can be rather simple but that is all dependant on how the artist feels to go about the process.

Simply adding color to the model is extremely easy and can be done with a few clicks on the toolbar. From here the artist can choose basic colors or go more in depth by taking the color pallet and moving to the color desired. Once this is done the parts of the object that had been selected will change to the desired color. Now this sounds simple and it is simple when applied to a large scale, however, when the details are put into the object, such as if one were to make an eye they would need to zoom in on the object and create every variation in color. All the veins and different colors within the iris need to be shown in full effect in order to create a realistic looking eye. The separation from iris and pupil and iris and the rest of the eye is also important in order to make a believable model.



<http://www.blenderguru.com/wp-content/uploads/2010/04/eyeball-540x291.png>

Obviously this is just part of a model and already it can be seen that there is some extreme amount of detail needed in order to create something visually attractive. This is just one example of shading there are many other ways to shade and add detail to a figure. Everything from fur to scales, skin to feather can be created using shading and all of the processes become more and more complicated as more attention is paid to the detail of the object.



Animation and Lighting

Animation is also one of the major aspects of Blender, allowing the models to move and bring life to scenes. Animation is used to give a frame by frame perspective of a scene and shows movement and interactions between the objects created. The way the animation works on Blender is that the timeline at the bottom is separated into frames and the frames can all make up one second. For example, twenty-five frames would equal one second and during these frames the animator can implement all the desired actions they want to occur. As the time line goes on and frames are added together, the seconds make up minutes and the animations become more complex. The animator can choose different points on an object and move them individually, or they can take the whole object and move it in different directions as one solid object. Say that the model being worked with is a basic human body. The animator can choose to control the limbs of the body, bending the model's joints in any direction and using the toolbar to record the way in which it moves. Obviously, the details in animation become more complex as the model is focused in on and smaller portions are moved and recorded. While the animation aspect of Blender has not been thoroughly looked into, a basic understanding of the system has been met.

Lighting is also important in Blender. Lighting allows for shadowing and, along with shading and animation, they give life to a basic model. As animation has not been thoroughly looked through, lighting is even more misunderstood at this point. The basics of how lighting works in Blender are that the designer is given the option to place lights at different areas of the scene. The lights will add a shine to objects, gives objects a shadow depending on the placement, and brings out the scene more than without lighting.

The work done in Blender all revolves around the toolbar and the toolbar's hotkeys. Each portion of Blender has different slots on the toolbar. Many are dedicated wholly to the processes described before in the paper. Others are only used for subcategories or different processes altogether.

The hotkeys mentioned before are used to access portions of the toolbar quickly and easy rather than searching the entire toolbar for specific processes. For example, clicking Shift + G allows the user to enter grab mode and grab an object or different keys on the number-pad can be used to pan to a different side. So using the number-pad perfectly aligned views of the front, back, top, bottom, or side views of the object can be affixed into place.

Results

The research gathered in Blender up to this point has been rather basic and just a learning experience. It is necessary to get the basics down in order to create more complex scenery and, seeing as only a few of the main tools have been learned, there is still quite a bit more to research. Animation and lighting are two of the major tools that have not been extensively looked into as well as rendering which has basically not been looked at much up to this time.

Futures studies will be performed to learn and perfect animations and maybe look a little bit into lighting before the end of the year. Animation is more complex and harder to learn than the other more basic tools of modeling and shading and is not as easy to pick up as the others. Overall the research of Blender has been extremely insightful and gives a sight into the hard work needed to excel in the field. It was a bit more difficult than previously thought and it has taken some time to get used to the program. It has, however, given a good look into the act of creating and designing models on a computer program that, while it may be simpler than professional programs, is extremely similar to those used by professional companies.

Conclusion

Not as much work was done as there could have been in the time allowed. It is regretful to say that although there was plenty of time allowed to learn the process of creating and giving life to models, it was not as successful as it could have been. Looking back upon the entire project, the time given definitely should have been used more wisely and this is somewhat of an eye-opener as far as work ethic goes. Should something like this ever be hoped to be followed career-wise, definite changes need to be made in the way time is spent. It is regretful that only a small understanding could be grasped throughout the scope of the research, but it also revealed some problems with the way work needed to be improved.

This project was not meant to be shown in a fair or to impress some audience, it was to better the understanding of a field of interest. It was beneficial to the researcher and had not been carried out as it should have been and that only hurts what experience could have been gained by such an endeavor. So if this project were to be continued, it would be within the best interest of the researcher to go through with it fully and grasp a better understanding of how such a software actually works. It would be great to gain access to better materials as well. But above all it is important to focus on the research since it was chosen due to its relation as a career choice.