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# The Creation Process of a Stylized Character in Comparison to a Semi-realistic Character

Caitlin D. Hall 4464202  
*East Tennessee State University*

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THE CREATION PROCESS OF A STYLIZED CHARACTER IN COMPARISON TO A  
SEMI-REALISTIC CHARACTER

By  
Caitlin Hall

A thesis submitted in partial fulfillment of the requirements  
for the Honors-In-Discipline and Midway Honors Programs  
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## Abstract

### I. Introduction

- a. Thesis statement: What is the process for modeling a stylized character and how does this differ from a semi-realistic character?
- b. Expanded thesis statement: The two styles differ from start to finish in a variety of ways. I believe that semi-realistic characters require more source material when drawing and modeling; however stylized characters require a different level of creativity and artistic ability in creation. Modeling semi-realistic characters will be more dependent on source images while stylized characters may require special attention with non-standard texture, style, etc. Rendering techniques will also differ when it goes to presenting the final polished versions with the stylized character focusing on rendering styles that flatten the character while the semi realistic character will require rendering techniques that make it seem more real visually.

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## Introduction

When creating characters from concept to final render, it is important to understand how much the particular style or aesthetic of the character in question affects the process of creation. Everything from the way the concept work is put together to the way the character is modeled and rendered is affected by this decision. The creation of the characters differ in the way reference images are collected and used with semi-realistic characters being far more dependent on source materials. Even the manner the character concepts are put together change drastically as stylized characters call for a different level of creativity and drawing skill. The final renders of the starting concepts call for different aspects with semi-realistic characters requiring textures to push a further sense of realism and detail while the stylized character needs to be flat while still holding a sense of life and personality that is dependent on the line weight and the color choices. Modeling is the second part of the creative process for character creation and many of the differences carry over. Facial modeling differs in the sense that the semi-realistic character is still greatly dependent on other reference materials. The body modeling follows a similar pattern with the stylized character requiring less focus on reference materials outside of design work in addition to being at a mid-level of detail as opposed to a high level of detail needed for the other. To maintain the specific styles of both, certain measures had to be taken for instance different techniques in creating the hair. Rendering is the final step of the creation process for the two with both differing greatly in methods used. The semi-realistic character's rendering focused on making her appear as realistic as possible with the inclusion of skin texture and lighting that accepts the 3-dimensional form. The stylized character's process would take the opposite route with measures to make the character seem as flat and 2-dimensional as possible.

### Semi-Realistic: Concept

The semi-realistic character was not difficult to grasp in theory, however the methodology for painting it was a challenge I had to overcome. Gathering source materials was easy enough as I had a very clear idea of how I wanted her to look from the very start. The semi-realistic character, Aisling, was a character I had created for a story and a personal world building project and so much of those details informed how she was going to look. She was part of a heavily Celtic-based culture and so much of her design had that inspiration. Her armor was made out of leather and baring the torso which is reminiscent of some samples of Celtic inspired armor and also the historical consensus that the Celts went into battle with little to no armor and sometimes little to no clothes. Her particular clan is one of 7 and is one of the most internationally involved clans, with their focus being on mercenary work. Her original armor from her clan was lost during her time as a prisoner of war so the armor she wears is a simple rendition of her culture's style of armor. As a traveler in a foreign land, she lacked the tools to make anything more substantial. Her scars and worn clothing suggest a warrior lifestyle and the leather armor adds the impression that she isn't part of a formal military which would have more impressive uniform or armor. Both physical traits and character information are important aspects to take into consideration when creating a character. This is said also by character designer, David Colman, in his DVD, *The Art of Character Design Vol 1*. A character designer shouldn't focus only on what a character is nor on who the character is but rather they should endeavor to combine the two elements to create a character that holds a readable narrative that viewers can follow (Colman). Already knowing how I wanted her to look and already knowing what kind of character she was helped speed up the process of picking reference and drafting a line art of her, so this aspect wasn't really very difficult.



The more challenging aspect of the process was in painting her. I have little personal experience in digital painting a character that is supposed to be as realistic as she is and so I ended up having to research a good bit. However I started out with methods I already knew and had used before. I understood how light and shadow worked in creating a form, and I understood how to choose colors to keep the piece from looking dead or flat. My first attempt was insufficient, however, because I failed to take into account the textures of a semi-realistic character as well as not understanding how I could use light and shadow to emphasize things I wanted to be noticed. There was also an issue with the anatomy of her face. In an attempt to make her read as more feminine than my first draft (which had more masculine qualities than I wanted) I over compensated by making her eyes a bit too big and distorting the jaw to make the

chin look sharper and the jaw less blocky. My first attempt had an airbrushed quality and was rather loose in several areas.



I fixed the jawline after finding other references and referring back to proper human anatomy, however the other issues took longer to figure out. I researched on a number of ways to fix the issue and ended up combining a few suggestions. I made use of custom brushes and the



pattern stamp tools in combination to create the skin and leather textures with adjustments of opacity for the pattern stamp tool so the patterns used didn't overtake the painting. I also researched on better ways to go about shading and found an article that helped give me a different understanding on the subject. Semi-realism is essentially creating something that we can identify as "real" or "close to real" based off our perceptions of the natural world around us and is not an objective image of reality. A successful semi-realistic character is created with the illusion of reality. This is done by using light and shadow to create the form. However, we can also use light and shadow to emphasize aspects of the design in ways that would not be found in nature. This is a technique that can be used to bring more attention to the curve of muscles or to draw more attention to the face. You could say that an artist can use this method to "sculpt with light" to show a character as attractively as possible, putting emphasis to bring out details that might be needed further down the production pipeline (Zagrobelna). By using this, I was able to emphasize aspects of the design such as Aisling's muscular figure or the intensity of her expression.



### Semi-Realistic: Modeling

The modeling phase wasn't difficult to get the ground work however there were technical difficulties to overcome with Zbrush, the program primarily used in this stage, and with my initially limited understanding of sculpting. I started in Zbrush as opposed to Maya so that I could have quicker creative control in drafting the model's form out. If I were to redo this, however, I believe I would start with a base mesh created in Maya unless what I was making was a bit less predictable than a human form. Even if I had needed dynamesh at one point, which

would have ruined the base mesh in Zbrush, I could have simply transferred details on the initial base mesh after the fact. Blocking out the body with z-spheres and getting the basic shape carved in was simple enough and I had no difficulty there. I separated the head and body into different subtools when I felt the head was going to need more subdivisions than the body. The initial challenges of this step were in sculpting the details, specifically the head and eyes. . I re-sculpted the head several times until I decided to look up sculpting reference. Digital sculpting reference and tutorials were easy enough to find but none of them really helped. I actual got the most information out of two YouTube channels, Joanna Mozdzen and Philippe Faraut, which are both dedicated to tradition sculpting with clay. These was the most informative as Philippe Faraut's video, *Sculpting Geometric*, breaks down faces using planes to help set up the shape and structure of the face which I was able to use to resculpt my character's head more successfully. Planes are used to simplify complex shapes by creating the object using flat planes and simple geometry to use as a base (Faraut). This technique is demonstrated in greater depth in Philippe Faraut's book, *Figure Sculpting Volume 1: Planes and Construction Techniques* that I also used as reference to better understand the process I was using. Joanna Mozdzen's video, *Sculpting Open Eyes in Clay*, broke down the area I had the most trouble with in the face and helped me understand what I was doing wrong, that is sculpting the area as far flatter than it really is due to the curved shape of the eyeball (Mozdzen).



With the body and head worked out, the clothes were the next step and there were technical difficulties in this. I found that if I wasn't careful in how I sculpted the different pieces, the normals and faces would get twisted up in a way that would be beyond repair in Maya. This problem would be generally undetectable if I didn't toggle the wireframe on from time to time (or toggle double sided display as I found out). If I hadn't caught it, I wouldn't have found out unless I exported it to Maya. I'll admit that I didn't research how to fix this so much as I played around with Zbrush until I found a general fix. If a subtool gets too twisted up, deleting higher subdivisions won't fix it. One option is to start over completely on that subtool but it could also be fixed by alternating between Dynamesh and Zremesher until the mesh works back down. To avoid having to do that at all, working with back faced masking and with double sided display on

all subdivisions will help. This is the methodology I used to get the clothes worked out. Minor details were touched up or reworked several times before I was finished with everything.



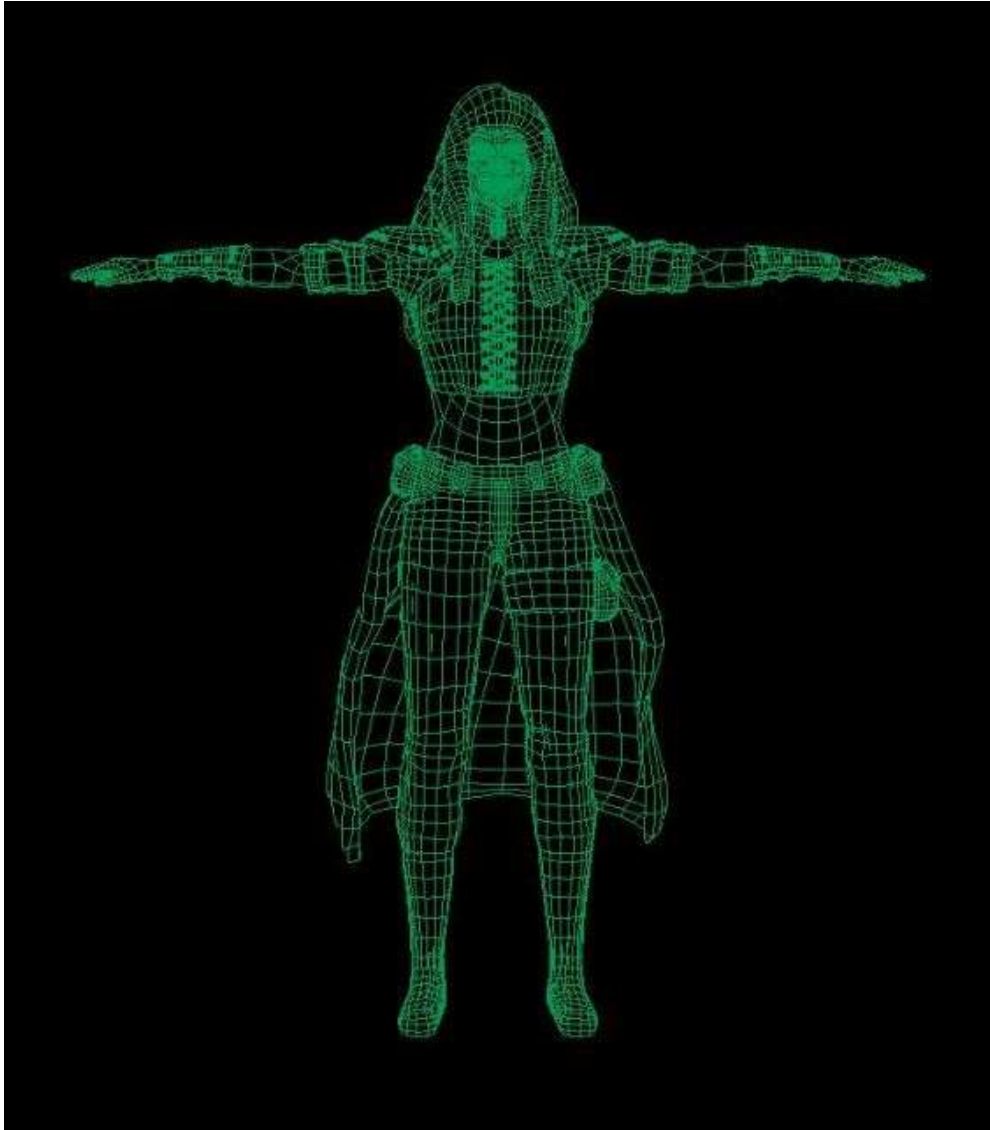
The last subtool I sculpted was the hair. My first few attempts were bad at best so I felt that some research was necessary for this step. I researched the topic and found a tutorial, [Sculpting Hair in Zbrush](#), which explained the basic concepts of digital sculpting with hair. I had first concentrated on getting a sense of the hair strands of the hair when I should have instead concentrated on the different shapes that made of the hair, starting from larger clumps of hair to

smaller details built from there (Jason). I primarily used the standard brush for this phase and managed to get out an acceptable shape for the hair by the end of the process.



After the sculpt was completed, I used the decimation function of Zbrush to get the subtools into Maya so I could create a low-poly mesh by using the quad draw and make live tools. The clothing and hair were fairly straightforward however the body was were challenges rose. My first attempt at making the base mesh for the body didn't account for animation and so the edgeloops didn't fall where they needed to be. This would also cause a complication if I wanted to pose the character with rigs after the fact (I didn't but it's an important consideration if I did). I asked for guidance from my instructors as well as researched human base meshes so that I could make a mesh that suited my needs. A good mesh that is usable for animation has loop

edges that, in many ways, follow the anatomy of the body. Joints need to have edge loops for bending but the torso also requires edge loops that shape the area of the stomach so that the deformations aren't strange when animated. I achieved this by use of concentric circles starting under the ribs and ending above the hip bone. I imported the OBJs into the project file as separate subtools and went down the line to transfer the details. I took the base mesh subtool and made sure it had the same number of subdivisions as the sculpt that it would gain the details from. Making sure they lined up and were the same size helped save me a great deal of trouble and if they were a little off, I used the move tool to gently nudge everything in place. Just in case things grew messing, I made sure I had the base mesh subtool selected and went down to the Morph Target function, clicking Store MT. This would store the information of the base mesh so that I could use it in the morph brush to clean up any messes if necessary. I could also use the smooth tool in less troublesome places. After that, I made sure only the sculpt and new base mesh of one section was visible and made sure the new topology was selected before projecting the details (Sanden). I repeated this process for each section until all of it was retopologized and cleaned up. Finally, I used a combination of the noisemaker function in Zbrush and a series of custom brushes, alphas, and high res images to create the higher resolution details. This part of the process was fairly straightforward.



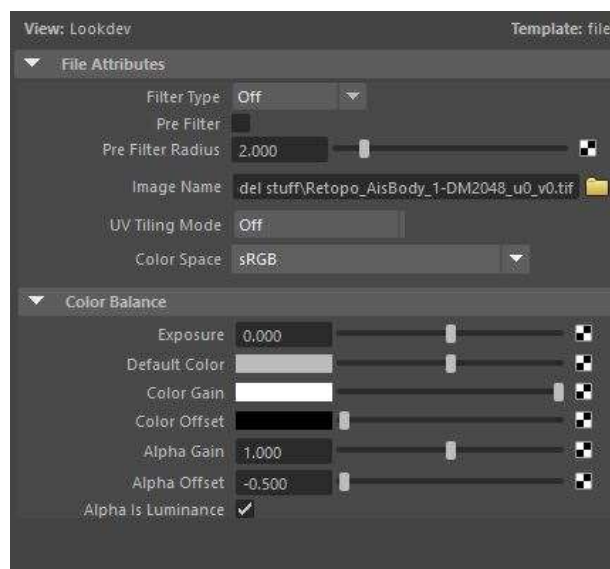
### Semi-Realistic Character: Rendering

The final phase was rendering and while there was much that was straightforward, I struggled with the displacement maps and getting realistic textures to look good. I took the models back into Zbrush in this step so that I could make use of the powerful texturing tools in that program. For a semi-realistic character, being able to paint on high resolution textures is extremely useful to express the detail needed. I found that just straightforwardly painting one texture on anything left the texture looking a bit flat and unnatural. To fix that, I started using a combination of different textures layered on top of each other at a lower opacity so all the details

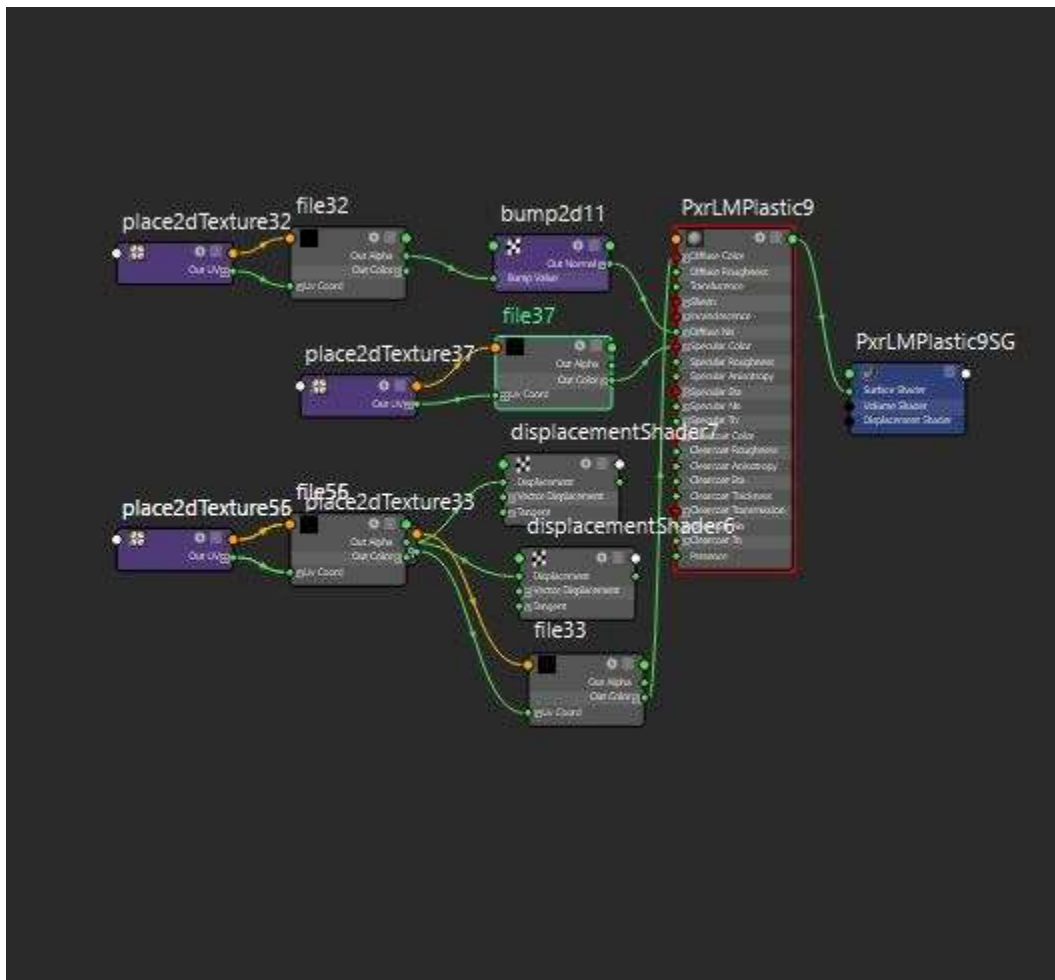


of each would come through. I put some in Photoshop to layer colored filters on top to sneak in tones that I wanted, such as a bit more red in the skin. I repeated this process for each subtool after I figured out how to go about it. Other than making sure the texture didn't look so flat and obviously airbrushed from other images, texturing the character wasn't difficult. The most challenging part of this process was getting the displacement map to work correctly in Maya, in some cases even at all, in Renderman and this required multiple different trials and research. My original attempt was to follow previous instruction on the subject by managing all of the connections through the hypershade and using the RMSDisplacement node to connect the displacement map. Since this is a vector displacement, it was connected through the vector displacement and setting the displacement mode as Zbrush Vector (Tan). The mesh would react in one of two ways to this method. It would either be totally unresponsive or would be fractured along the edges of the mesh faces. Most other tutorials used the same method and I did revisit my professor on the matter to make sure everything was set correctly. I also went through and tested going through this process in a different order to see if perhaps that was the issue. I used a tutorial by Renderman called Displacement II: Rendering with External Maps, to help understand what was going on with the mesh each time I got a new response. While their solutions didn't seem to totally work, the information was useful to understand the problems. After this, I attempted to use other rendering software other than Renderman. I tested it in Marmoset Toolbag and got the same response. I concluded that there must be something in the mesh bothering the programs and double checked it. While I did get rid of some concave faces I detected with Maya cleanup, there was little else wrong with the mesh. I tested a third rendering program, Vray, and got it to work successfully through the use of a tutorial (Sanden). However, the program restricted the size of the rendered image as I was using the trial version. The

rendering program, due to the restriction of the trial and the cost of the full version, was unusable for this project but a good possible option in the future. Finally, I decided to test using a scalar displacement map rather than a vector displacement map. I went through a similar process to the one my teacher suggested and the mesh did not react. Understanding that displacement maps are temperamental, I decided to test the scalar map in different orders until I found a method that worked. I would import the OBJs, go ahead and group them as needed, and smooth the edges of the entire mesh. I would also go through and select each model and go to the mesh's attribute tab (this is important as other attempts I went to the material's tab). I would then go to the attribute tab, go under Renderman, and click subdiv scheme. I would check under Extra Renderman Attributes to make sure it was set to Catmull-Clark. From there I would assign the model's material and go through the attribute editor to apply the maps rather than connecting everything in the hypershade first. To go to the displacement connection, I would start from the material tab and click the output connections button. I connected the displacement map right there. I then went to the file's tab and changed the alpha output to  $-0.5$  under color balance ("Displacement II").



This would keep the mesh from looking inflated in the render. Overall, this seemed to work. The map was still very temperamental to deal with though deleting history or smoothing edges again seemed to take care of any hiccups. The only issue I ran into after this was a somewhat pixelated appearance to the displacement after getting it to work. I found this was simply due to the size of my maps (which was 1024 by 1024). This was too small so I then re-exported the maps out of Zbrush at a larger size (4096 x 4096).



I did find that multiple displacement maps don't seem to play well with each other. I overcame this by deciding which models would benefit the most from the use of displacement and which would read just as well with a simple bump map. The models that create the main silhouette were more likely to need displacement, so I used it for the hair, cloak, armor, and the

pants and boots models. Everything else simply used a bump map without displacement needed to carry the information. With the displacement figured out, the other maps were applied and had no trouble. These were the settings used for the final render.



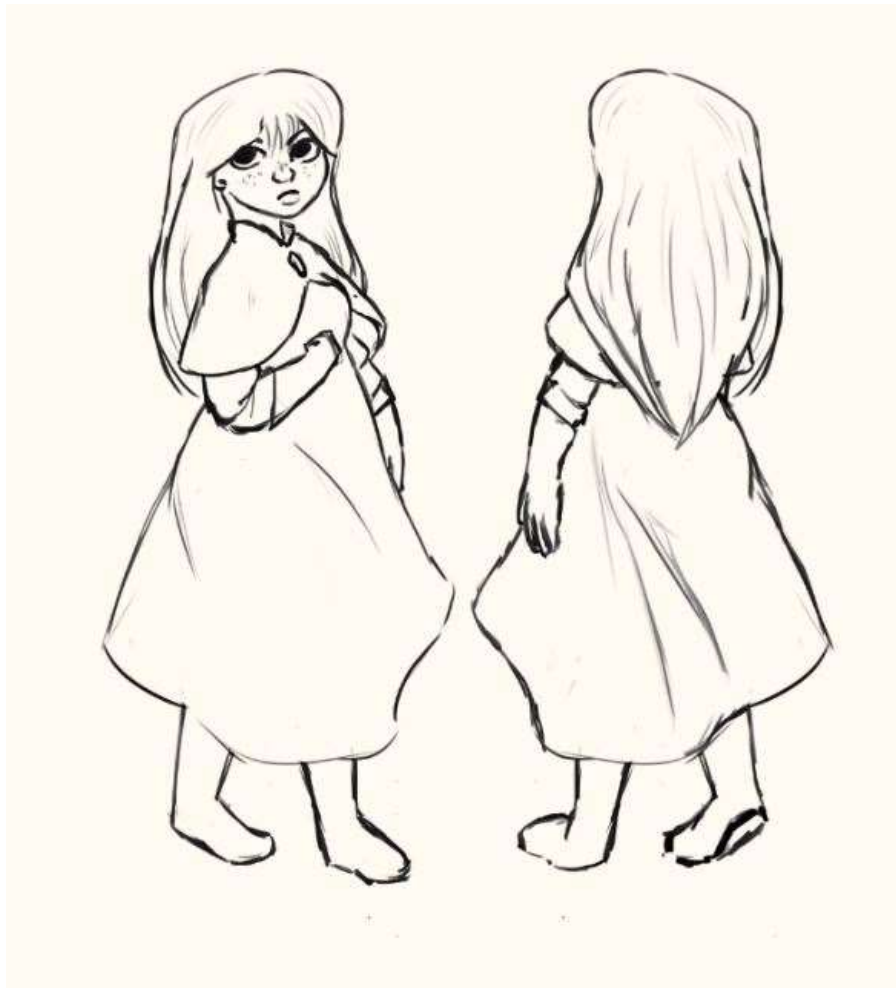
Stylized Character: Concept

The stylized character came with different challenges and I struggled to abandon personal preference to meet the requirements of the style. The stylized character, Agatha, was much like Aisling in the sense that I already knew the character and already knew how I wanted her to look. Agatha had a very different background and so I had to find a way to translate that. She

comes from a much colder country than Aisling and is the daughter of a wealthy merchant in a culture that is very conservative and traditional in their roles of men and women. Agatha is covered from the neck down both due to the cold and the conservative culture. Her clothes are modest but have no patches or wear with a fur trim and a jade brooch to hint to a wealthy background but a modest personality. The purple tones to some of her clothes are also a subtle indication of wealth as purple is often associated with the rich. Unlike Aisling, Agatha had other considerations in her design which were in the exaggerations to the figure and the shapes used to create her. The more exaggerated the features, the less the character will read as semi-realistic, however they can still read as a human woman by understanding where to place the exaggerated features. However, different exaggerations or changes within the form of a character will cause them to read as different types of people. Again, a character's design should show not only what they are, but also who they are (Colman). I went through several different thumbnails before settling on her line art. Some were more representational of the human figure, while others leaned a bit more to geometric shapes that made up the character's design.



This introduces another challenge. What shape makes up a character like Agatha? Most characters can really be broken down to their basic shapes with the most common shapes used being a circle, a square, and a triangle. Circles and triangles specifically get used often as they are at odds to each other and are often shapes used for the good guys and bad guys respectively. Rounded shapes tend to be safe, while shapes with sharp, knife-like edges give a sense of danger. Circles have no sharp corners and give the sense of being soft and harmless which is why it is the most commonly used shape for likable, protagonist characters (Solarski). For this reason, the majority of Agatha's form is soft and round with more geometric focused versions being more obvious of the shapes that built her form.



The design process was not terribly challenging, however the painting was. I had a person preference for more traditional painting in the sense of using light and shadow to create volume. Stylized characters are flat with little to no shadows and dark outlines which are usually conventions to be avoided in traditional art. I still heavily favor my first draft of the character despite it not meeting the requirements and this is part of why it was so difficult to get the final draft of the concept. I had to continually taking out more and more detail despite my discomfort doing so. I had to give up the shading and the various shades of color before I could really call the character stylized. The experience did make me more comfortable with a stylized style however so I don't believe I'd have the same problem if I were to do this again.



Stylized Character: Modeling

After much of the problem solving had been done with the semi-realistic character, I had less technical problems with the stylized character however; I had difficulty in the more artistic

aspect. I blocked this character out in Zbrush as well and, again, I believe I would start with a base mesh if I were to redo this. Using Zbrush to block things out first would be more useful for more unpredictable forms like a creature that might have any number of different possible features rather than a basic human figure. The basic blocking was largely of no real issue, with the exception of the head. While I could get the straight on appearance about right, the profile view would look very strange. It took several attempts of pushing and pulling the cheeks, jaw, nose, and mouth around to get everything to fit together correctly. I actually referred back to some of my earlier thumbnails as I had done a profile sketch of her in that phase and it was a valuable reference for this part of modeling. Another aspect of the face that had given me issue was the eyes. While the semi-realistic character's issue was in getting them close to realistic eyes, the stylized character's problem was that I was unsure if a cartoon character like her would have eyes that were close to realistic or not. With the concept, I just understood the general shape of the eye and the fact that her eyes would be larger. I wasn't sure if the eyelids would have all the folds of a realistic eye in a simplified manner or if there was a different take to it. What I ended up doing was looking up stylized character models to see what others had done. There were different solutions but I found that a rounded out crease about where the eyeball would meet the socket was enough.





Much of the technical issues for the modeling process had already been solved by this point with the previous model so I modeled the clothes with backfaced masking and double sided display on to avoid messiness. With the character being stylized, I knew the model wouldn't go above medium resolution however, I still had difficulty. As with the last part, I had difficulty letting go of the details of the character and found myself repeatedly smoothing out extra lines and details that would add too much to the model. Much of this process was less of a technical issue and more a fight with what I had been previously taught and what was essentially hardwired into my preferred approach. I kept adding detail only to have to smooth it back out when it was too much. I did take on a different aspect with the stylized character in that I posed her slightly. It was a very simple change but one that I still went through a lot of trial and error to accomplish. I had more ambitious ideas for a pose but ultimately decided on something simple. There are several ways to pose a model from rigging it in Maya to rigging it in Zbrush to using the transpose tool and move brush. I have no knowledge on rigging in Maya so I tried the other two options and

ultimately settled on using the transpose and move brush. While I could get the rig in Zbrush to work to some extent, it was difficult to get it to keep the model from distorting too much with the Zbrush rig.



Once I got that done, I took it into Maya to retopologize. This process all stayed similar to the semi-realistic character with the exception of a new strategy in drawing the new geometry. Going from a suggestion from my teacher, I took a snapshot of my model and drew the edgeflow over top that I wanted to follow. This helped me feel more organized and less lost with the quad draw tool. Transferring the details followed the same process as the semi-realistic.

#### Stylized Character: Rendering

Much like the modeling process, many of the technical problems of rendering had already been figured out however, the stylized character took a different approach to the texturing aspect.

Texturing the model started not after the details were transferred, but before. With the character being stylized and therefore not really needing high resolution details painted over top, there was no reason to take it into Zbrush to paint. Instead, I UVed the model in Maya and created the texture in Photoshop. There are a number of different ways to go about UVing a model and out of all of them, I chose to use the Bonus UV Unwrap tool. This tool allowed me to have much more control of where the seams fell and how they fit together. While this did leave me with more clean up in the UV editor than some other methods, I found it was worth it in exchange for the simplified approach for greater control. I would send OBJs of the models back into Zbrush, but not for texturing. On the off chance I might need a bump or displacement map, I decided to go ahead and make one. Otherwise, I exported the UVs of each subtool over to Photoshop (making sure they were of a high enough resolution to avoid the problems I ran into with the semi-realistic character). Since the character is stylized, there wasn't much detail to really paint beyond flat color for most of it with the exception of her face, but even then the details were simple. Getting all of the details to line up right at the seams and painting to the right lines were a bit of an issue. The fur trim gravitated up or down depending on the attempts. While I was painting to the right lines, I had to make sure the trim color was fairly exact or else it would stick out. The lips ran into a similar problem. Once I had everything painted, I put it all together. I did have to come to a decision on whether or not I wanted to use any bump or displacement maps for the model. While the model retained most of the details perfectly fine with the softened edges, I found there were spots that I wanted to look a bit shaper so I did make use of a bump map on the face. I also used two displacement maps to sharpen out the trim and give the silhouette even that slightest bit of added interest. In hindsight, I could have just added a few edgeloops to do that but

the decision came out of the single minded effort to make sure my approach to displacement maps still worked regardless of model.



### Comparison and Conclusion

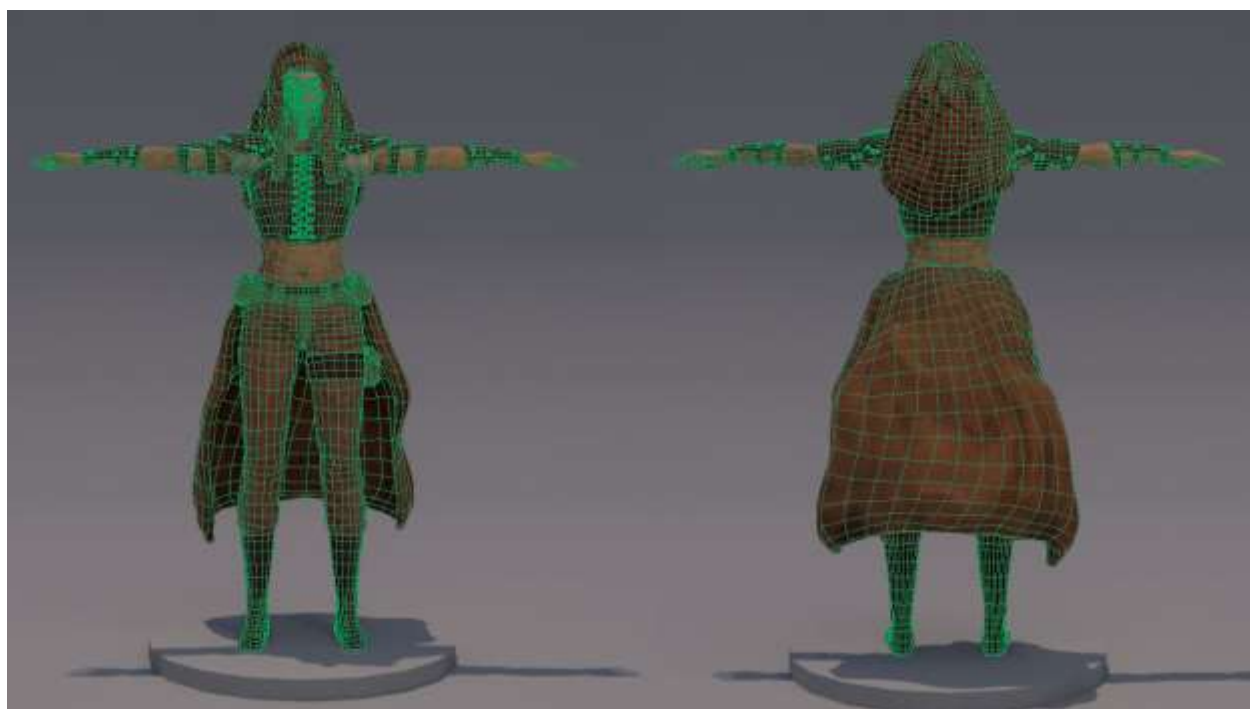
While the production pipeline for both characters remained fairly similar, the challenges and methodology for the two differed in many ways. The concept challenges between the two were very different. In the semi-realistic character, the focus was to build up more depth and detail, while the stylized character's focus was in simplifying down to the least possible detail to relate the information needed. I have a natural leaning to greater detail and so the stylized character was more difficult to get a hang of, largely because of the conflicts with my personal

style. The focus for the two were different, with one focused on a sense of realism and accuracy and one focusing on what shapes and style should be used to make the character read as desired, however the conflicts for both seemed to occur in the painting stage while drafting and line art went with little trouble. They shared some of the same technical problems in the modeling phase where one was less difficult only by virtue of those problems being previously solved. Again, the tendency of leaning towards higher detail made the stylized character more difficult than necessary and I was caught in the previous process of simplifying detail out as much as possible to get that model to work how I wanted it to. The challenges of the semi-realistic character was much more in the technical complications and there were very little artistic limitations that I ran into that couldn't be solved with some research, such as the face and the hair. The rendering process was different due to the different needs and again, I found the more detailed aspect coming more naturally. Zbrush was a powerful tool in painting textures and I found the process with Photoshop to be more frustrating in the sense that I had to be careful with my strokes. With the semi-realistic character, it was less about exact work and more about detailed work which relied on layering textures and colors until everything had the detail I wanted to it.

In conclusion, while both the stylized and semi-realistic style follow the basic steps of the production pipeline, they both have different focuses in their design and so followed different methods at each phase. The semi-realistic character had a focus in building up detail throughout the whole process. It started with the foundation of good anatomy and a sense of volume created through shadow and light in the concept. It continued progressing through the sculpting and texturing of high resolution, and finally rendered with a combination of displacement maps, bump maps, and its texture maps. In comparison, the stylized character went the opposite route, largely focusing on carving down detail to the most basic parts necessary for all the information

to still be read and understood. This style started with the basic geometric shapes that build the character along with the exaggerated features as the foundation. This theme continued through the process with details being smoothed down and textures being painted in Photoshop to have control over the flat colors and dark lines of the character. Ending with a final render that used very little displacement or bump maps for any added details.













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