

CG Animation from the Island of Manga "The Aurora"

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As you peek into Japans history of fine arts, a traditional way of expressing pictures can be found. It all started from printing scrolls way back in the 12th century and now turned into a medium as known as manga. Today Japan is the world largest producing country of manga and its animation can be seen almost anywhere in the world. These manga-loving people are now beginning to create computer graphic animation. All though the method have changed, the importance on the theme depicted therein haven't changed. Until now, a big topic of CG animation was to create images to look just like the "real". However from the advance on technology, CG animation came to a point where creating the picture to feel "real" is becoming the big subject. Symbolizing the image is thought as a way to express the "real" picture. "The Aurora" is challenging to reach a new genre of an image, different of those "photoreal", by symbolizing the act and giving more meaning to the animation.

Creating CG Animation in the Island of Manga

"Click", as I turn on the television sitting inside a hotel room in Europe, I find myself in surprise to almost always see a Japanese animated program broadcasted. It is well known that Japan is the world most largest producer of *manga*. Japanese *manga* holds about 40% of all published matters. There are several *manga* magazines which sales over 4 million copies every week and even have titles that have proceeded over a hundred million copies. By all means, when it comes to animation, the moving version of *manga*, the popularity makes is easy to understand why Japanese animation can be seen in almost every country around the world. Once you get on the subways of Tokyo, a sight of many businessmen and students reading *manga* magazines is a common view. There is no other population who cherishes *manga* as much as the Japanese. These situations are a resolution from the Japanese history of the traditional way of expressing painting which is carried on over thousand of years taking root deep into the culture. Back in the 12th century, the picture scroll was originated. The picture scroll took the painting form of outlining an image, and this technique was taken over to *Ukiyo-e*, *manga*, animation and so on, till the present days. It has sketched different kinds of scenery for a long time. However, scrolls and prints shouldn't be considered as just fine art, but a medium same as a newspaper or a magazine, from its importance on the subject depicted therein than the good or bad of the style it was drawn. This is why it is hard to consider *manga* and animation as for children. Even if an image is drawn by a simple technique of outlining, the story lying underneath and the way an image is expressed would be complicated and be more likely for adults.



Figure 1: an *Ukiyo-e* woodblock print

These *manga*-loving people are recently beginning to create animation by using computer graphics. Though they only have altered their pens into mouse, it doesn't mean that what they want to express is going to change. The CG animation from the island of *manga* should definitely have the same characteristics as those of the former printings. It should be enjoyable for adults as well as have characters in the story hold complicated backgrounds, not to mention the importance of the message the producer leaves behind.

Motivation of "the Aurora"

"The Aurora" is a special TV program produced by the staff of "Five Amorous Women", the first fully computer-animated film in Japan, for over two years. The former pictured the strong and passionate lives of women in the Edo period, however the latter is turning out into a piece reflecting the blockade feeling drifting in the period of Japan today.

Many images can be visualized when Japan is mentioned. It may be a place with high-tech machinery or numerous businessmen running about and working their heads off. What Japan has really come up too is the fact that it is going through a big turning point of the era at this very moment. Japan

has encountered a step of completion as a modern society. Advancing of the economic growth is no longer continuing and is becoming obvious that a bright future would not arrive. Acting as a pleasant family and entering a company as an elite student won't always make oneself fortunate. A lust for clothes, food and housing, which was formerly held in common by the people, are disappearing from the society. A lot of people are feeling stressed from not being able to find the conclusion of how to overcome this "reality". Then a simple question comes up. What can be done to at least lessen the weight of "reality" people are carrying on their backs.

The answer to this question can only be found in oneself. In "the Aurora", mysterious life form invade and destroys mercilessly the various "reality" of the people. Even if "reality" is said in one word, its meaning held is different depending on the character. For one, it may be "family", but for another it may be "school" or "work". Those "reality" are being destroyed from a coldhearted, unknown creature. The story pictures the main character falling into unprecedented crisis and cutting open for a new possibility. The hero belongs to a generation which doesn't feel "dream" nor "hope" against "reality", and because he considers family, school and work only as remains of the former century, he doesn't get deeply hurt from the alienation from "reality". After all, "reality" for him is only a boring routine work in lost of "dream" and "hope". Instead, in the world said to be "reality", he gives out stress by creating another world of "fantasy". "Reality" is boring, "fantasy" is a whole lot more fulfilled and interesting. When encountered with crisis, on the other hand of people being particular over "reality" and running about in confusion, he doesn't lapse into panic but boldly go into action. It is all right as long as he can live his "fantasy".

"The Aurora" is not a story full of characters who live without self-consciously worrying as the hero, but characters who can't easily give up "reality" and suffer within itself appears as well. Whichever, the characters comes in need to find a means of settlement to recover the peaceful days as it was before. The motivation of "the Aurora" is to picture various ways of settlement the characters find when falling into crisis and to some way live through the "reality" of the society, which is to come.

Description of "the Aurora"

The year is 2033. In order to investigate for changes to the Earth's environment, a deep-sea drilling project is conducted by a team of international researchers. A submersible goes down 6500 meters

and what they discover is the mother of life, bacteria, sleeping deep in the Earth mantle. As the researchers extract samples of the bacteria, it awakens it from its long time sleep. The bacteria spreads into the sea and glows like an "Aurora", reacting violently with the submersible and the land above it. The original source of life confronts the living being who brought it up. Researchers come in need to fight against this unknown creature, besides the struggle they have in themselves against the "real" world.



Figure 2: One scene from "The Aurora"

"The Aurora" is a fully computer-animated film for Nippon Television Network. A clip from a 90 minute, 100% CG animated program, feature the meeting between men and the very source of life produced by bacteria at the core of the Earth. The story underlines the notion that the Earth and mankind share the same deep source.

Techniques of "the Aurora"

The aim of the picture is neither photorealistic nor plane as the 2D cartoon, but to look "real".

Modeling

The design of the models such as the submersible and the underground base, were avoided to be shaped as the ones of the real world, but to have it fit in a world which went through a special evolution design wise. The shaping of these models are made by bronze by a sculptor, then later into NURBS model. On the other hand, the characters were first made by clay and converted into NURBS by laser scanning the model. As all models needed detailed changes made by hand.



Figure 3: a clay model



Figure 4: the drawing of the character

Texture

All textures are directly drawn onto the models by using 3D Paint. To express the more fine details for both the background and character models, the displacement mapping is used.



Figure 5: a rendered model with texture



Figure 6: textured character

Animation

The animations of the characters are done by both motion capture, by dancers, and key-frame animation, by animators who have experience in the traditional cell animation. To express basic movements such as actions done in our daily routine, practices the motion capture. However the over reactions needed as the spice in the act, in another words "symbolize", is done by key-frame animation. The facial expressions are done by Artiface with the help of key-frame animation as well. The hair and clothes are done by the calculations of Dynamics, however we are now still tackling for a new method of expressing the hair and clothes, which is reckoned as a big theme in CG animation nowadays.



Figure 7: motion capture

Rendering

Because Mental Ray is a ray tracer, it is used to simulate the manners of both light and shadows. To express the detailed displacement, Renderman is used.

Method of Success in CG Animation

In the world of CG the lecture upon "real" such as "photoreal" and "non-photoreal" is recently being hot. The goal of computer graphics was to create images just like the "real". However from its long time pursuing in technologies to reach the goal, CG has reached to a level where it can't be distinguished from pictures of those a camera might capture and eventually concluded with nothing more left to do in this field. Now, even spectacular images can't captivate the audience. Without objection, monsters expressed in fine details and SFX are certainly amazing, however on the other hand it is nothing more than a beautiful picture seen from a monitor or a picture tube after all. Isn't it strange, as the techniques improve to create just like a photograph, CG images tends to become more unattractive. This is the reason I wanted to challenge on creating a full-animated film. Here "the Aurora" aims to be accepted by many people as a new genre of an image, different from photographs with special effects nor handwritten animation. After all, computer graphics, a new method of expression is born, isn't it boring to picture a world just like the one always viewed everyday?

To acknowledge the new technique called CG as a new genre of expressing an image, I believe setting traps to make it *feel* "real" is the big thing.

The story might go off track a little, but when a film based on a well-known story is produced, it is inevitable to hear voices of "the image is different than the original". Readers of the original text have the freedom to interpret the outlook as they wanted, thus, when the world becomes more specific, the readers would feel a sense of incongruity. Images can be "real" or "unreal" through the interpretation of the viewers, not through what is reflected on our

retinae. Interpretation is "how people arrange the world in order to make sense of it", which also can be said as "the symbolization of the world achieved by our brains". Much of CG though aims at visual simulation so genuinely, they intend to view less on the act of interpretation. For example, how would you model a glass in CG? Probably calculation on how light falls on the glass is expected as the first thing thought. However if you really want to create a "real" image, it is better of to start with the question of "how best to draw the glass so that it will look with the necessary characteristics of a glass".

In the first place, animation uses characters to appear in images as symbols to stir up the viewers' imagination. The sort of symbols that can be invented greatly effects whether the image is taken as "real" or not. What keeps going on day and night in the spot, is the actual thinking of how and when to pose the characters so that it effectively stimulates the interpretations of the viewers. As a result, images of characters with its hair bristled up, enormously grow the arm when force is put into, or allowing it to run in an unbelievable speed is made. These aren't at all close to "photoreal", but as a "real" animation, it surely catches the heart of the viewers. That is why in animation, the amount of information doesn't matter as long as it achieves its role as a symbol. It is a success if the symbol is gives a chance for a character to exist, live, in your head. The essentials of an animation is this symbolism. CG is believed to be the same. The key to success is whether or not the image can turn into a symbol.

The Limit of CG Applications

To create characters materialize as a symbol, being able to change the structures and textures freely is indispensable. To transform audaciously and adjusting the textures allows it to be more likely to the "appearance". The idea may be easy to just write it down on paper, but it is unexpectedly hard because expected effects cannot be obtained. Adding random jitters on the structure or transforming by IK (Inverse Kinematics) doesn't always result with the wanted image. After all, you find yourself ending up moving control points and working on shape animation, which is somewhat a primitive operation.

Unfortunately, it is unexpectedly hard to actualize transformations against conformity with the physical law and express textures subjectively with the application we have today. As mention before, the basic idea of CG, is the realism through the tracking of light and also have limits to the methodology of moving characters. Even when it comes up to rendering, ray tracing and Radiosity is developed with the purpose to create an image near to the real

world. To overcome this realism in CG, a development for a new technique is definitely a need. When CG tools are becoming easier to get in hand like nowadays, many people begins to say that "CG is nothing but a tool", "what is important is the sense of the user", but I think that technology is still the big point in computer graphics.

Between these restrictions (though the biggest restriction is the mucho expenses) it is a big bet whether the audience will accept "the Aurora". However continuing working on CG animations in such situation, is the only way to raise this genre, and there is to only advance in parallel the trying out and improving the tools we can get.

CG From Now On

As long as the technique called CG presupposes 3 dimensional spacing, the problem of how to understand spacing sticks with the act of symbolizing an image. The painters of picture scroll and cartoonists and animators of the present day came up with the progress by tackling over getting information from all dimensions, finding out the characteristics and over exaggerating it. Now, what WE, the possessor of CG, is supposed to do is certainly not to copy the "picture" by computer. The hint to make images that are not "photoreal" nor "mangareal", but "CGreal".

Western paintings only makes a thorough investigation on the characteristics of visual art and cuts off most of its meanings. On the other hand, Japanese cartoonists continued with policy to paint images as symbols to express the meaning. The similarity between *manga* and the actual model is not a big deal in the medium of *manga*. Anything goes as long as the meaning is acquainted to the audience. There is no good or bad in *manga*, the important thing is whether it is accepted as a new symbol or not.

The same thing can be said on computer graphics. If there is a new symbol that can only be made by CG, the expression of images will not ratify the present condition, but will open a new genre in animation. In the history of fine arts, as surrealism came up after realism, idealism and cubism, it has come to a period to challenge the multiplicity on expression. To picture a new genre, a new "real", I am thinking of challenging on computer graphic expression without relying on "photoreal".