

Hyper-Realistic Characters and the Existence of the Uncanny Valley in Animation Films

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Abstract

Fed by the infinite imaginative power of mankind, reflecting their imagination and fantasies onto the screen, the characters of the films produced in the fields of cinema and animation are becoming a part of our lives more than ever. The success of the films produced depends on to what extent the audience will identify themselves with the events and the characters in the film. Together with the developing technologies, the hyper-realistic human characters created in animation films have been being questioned for their believability and also been associated with the uncanny valley argument. While the reality of the characters created in animation films increases, whether or not the audience accept them as real at the same rate has become a subject of discussion. For that reason, today the animation film producers have been facing a paradox. While this article studies the relation between the uncanny valley and animation, with the sample of *The Adventures of Tintin: the Secret of the Unicorn* by Steven Spielberg, it emphasizes the fact that increasing reality does not necessarily provide recognition all the times.

Keywords: Animation, uncanny valley, Tintin, familiarity, increasing reality.

1. Definition: The Uncanny Valley

The concept of "Uncanny" was firstly used in the article entitled "On The Psychology of The Uncanny", by Ernst Jentsch, a German psychologist, in 1906. Jentsch points out that the uncanny arises from the case of uncertainty, when a person has a difficulty in making a decision. According to Jentsch, physical uncertainties can be the causes of the uncanny. The answers to the questions such as "Are the objects, which we visually perceive alive, really alive?" or "Are the objects, which we perceive as non-living, really non-living?" create a doubt in mind. The way to overcome this feeling of uncanny might be to identify the thing which creates the doubt (Sellars, 2008).

After Jentsch, the concept of uncanny was discussed in the article entitled "Uncanny" by Sigmund Freud, in 1919. According to Freud, the reason for the existence of the concept of uncanny, which has been called the Uncanny Valley thereafter, is the effort of mankind to reach the immortality by overcoming the sense of death as it can also be understood from the fact that the mankind has created wax sculptures and then robots which look like living

beings. According to a quotation from Otto Rank, Freud's colleague, the effort to create a secondary man, that is, the effort of doubling is a clear denial of the power of death and the immortal soul is the first 'double' of the body. The feelings of uncanny starts as we realize the fact that we cannot really create our own doubles or reach the immortality in this way; however, we cannot help doing it with a primitive feeling. The sad consequence of this is that, in Freud's words, "The double reverses its aspect. From having been an assurance of immortality, it becomes the uncanny harbinger of death." The copies we feel compelled to make only serve to remind us why we began making them in the first place: We are, inevitably, going to die (Kloc, 2009). In brief, Freud defines uncanny as a field which is under the effect of fear, death, and the increase in worry. This is the fact that an uncanny effect often arises when the boundary between fantasy and reality is blurred, when we are faced with the reality of something that we have until now considered imaginary, when a symbol takes on the full function and significance of what it symbolizes, and so forth (Freud, Uncanny, 1936, p.150).

The concept of uncanny, which was first suggested as a psychological approach, has been dealt with again upon the production of human-like robots of almost perfect nature as a result of the technological advances in the field of robotics in particular. Although the argument of "the Uncanny Valley", put forward in an article entitled "Bukimi no Tani Gensho" by Masahiro Mori and published in 1970, is suggested in regard to the effect of developing robot technology on mankind, it has also become a subject of discussion on the animation films, where hyper-realistic characters are used today. Mori defines the Uncanny Valley as follows in his article: "...people are usually upset when faced with some phenomenon it cannot represent. Climbing a mountain is an example of a function that does not increase continuously: a person's altitude y does not always increase as the distance from the summit decreases owing to the intervening hills and valleys. I have noticed that, as robots appear more humanlike, our sense of their familiarity increases until we come to a valley. I call this relation the "uncanny valley." (MacDorman and Minato, 2005, p:1). Mori created a graphic indicating the relations between human likeness (on horizontal axis) and familiarity (on vertical axis) and explained the "the uncanny valley".

According to Mori's table, the industrial robots, which have a working discipline like factory workers with known functions and which even stop after the completion of work, are far from human in respect to their appearance; as a result, they are also far from the uncanny valley. However, robots which have hands, arms, legs and move almost like a human get closer to the borders of the uncanny valley. Increasing human likeness moves towards the borders of the uncanny valley in emotional aspects.

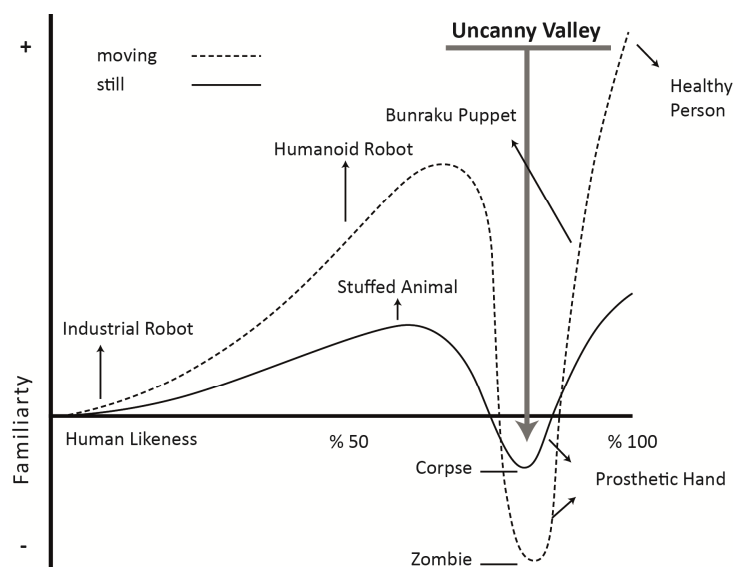


Table 1: The Uncanny Valley

Mori also appreciated that robots are not defined by the single dimension of form and considered the effect of robot motion. Here he proposed that motion and form together will form a different function of acceptability versus realism. For example, motion could deepen the valley since form sets up expectations in an observer and if other factors such as motion do not match these expectations then there is further rejection of the entity. Mori tread a little further into the realm of thought experimentation and illustrated this phenomenon with the example of viewing a corpse. Certainly a corpse has to be very similar in form to an actual human, yet we find viewing a corpse as unpleasant, and if the corpse would suddenly move to stand up, we would be terrified. (Pollick, 2009, p.70). CGI (Computer Generated Images) characters may sometimes be perceived as “human” during general shooting and when they stay motionless. However, any trouble in motions, dullness in eyes or any strangeness in facial muscles during close shooting result in the situation that the audience recognize them as different from human.

2. Animation and the Uncanny Valley

It was in 1980s that CGI was started to be used more often in animation films. Virtual actors starred in some movies such as *Abyss*, *Batman* in 1989, *Terminator 2* in 1991 and *Jurassic Park* in 1992. The success of Pixar's *Toy Story* (Walt Disney Pictures, 1995), the first 3D animated feature released in 1995, marked a critical time in the history of animation production (Butler and Joschko, 2007). In the following years, as the technological facilities became capable enough to create more realistic human characters, the producers tried to make films in which hyper-realistic virtual human characters would take part.

Upon *Final Fantasy* in 2001, in which hyper-realistic characters were used, the existence of the uncanny valley in animation films has become a discussion subject. The hyper-realistic feature of the characters seen as technological success in the film took its place before the story in critics. Long time was spent on skin and hair details and it was admirable to see such a detailed creation of characters there. However, after the film was released, it couldn't succeed. Peter Travers in *Rolling Stone* wrote, “...but then you notice coldness in the eyes, a mechanical quality in the movements.” (Marisa Book, 2007). According to Matthew Butler, the film producers fell in the trap of “the uncanny valley” by using all the technological methods of photo-realistic animation. Some believe that the box-office failure of 2001's *Final Fantasy: The Spirits Within* can be partially attributed to the Uncanny Valley effect (Marisa Book, 2007). In *Wired* magazine, Andy Jones, the *Final Fantasy* animation director, says “It can get eerie. As you push further and further, it begins to get grotesque. You start to feel like you're puppeteering a corpse” (Pollick, 2009). *Shrek*, which was on at theatres during the same year, has become one of the most watched 3-dimension animation films of all times. *Shrek* is not likely to fall into the uncanny valley. Because the heroes are green ogres and look fantastic. PDI/DreamWorks' Lucia Modesto noted her team had to pull back a little on Princess Fiona (of *Shrek*) adding that ‘She was beginning to look too real, and the effect was getting distinctly unpleasant.’ Thus, she says, they preferred to keep away from the uncanny valley (Butler and Joschko, 2007). Although the film is fantastic, it creates an ambiance as if the characters are inspired from the real life. For example, the peasants rebelling against *Shrek* are designed by caricaturing from real life.

In 2004 the 'Uncanny Valley' concept came to the fore again as a talking point in the CGI field during box office 'battle royal' between two blockbuster CGI films, Pixar's *The Incredibles* and Warner Brothers' *The Polar Express*. The comparison between the emotional warmth we felt for Pixar's stylized plastic family and our uncomfortable feelings about the more accurate yet eerie characters in *The Polar Express*, which were described by many critics as being disturbing, was a subject for much critical debate, partly because their releases coincided (Oddey and White, 2009, p:33).



The Polar Express - The Incredibles

Although the characters in *The Incredibles* film are defined as human, they cannot approach a reality beyond the traditional cartoon film character form. The basic principles of animation, cringing - embarrassment, exaggeration, pre-motion and similar use also provide exercising joy of traditional animation between the film and the audience. Tid Newton, designing the characters in the film *The Incredibles*, expresses their approach regarding the character design as follows: "From the beginning, we all wanted the cast of characters look like cartoon people instead of photo-realistic. In animation, it really takes a bit of exaggeration to make something look convincing" (Vaz, 2004, p: 59). Brad Bird, the director of *The Incredibles* thinks that there is a very fine distinction in character design by saying "The character design was difficult. CG looks plastic without detail, but beyond a certain point with the stylized deformed people, it starts to look creepy" (Computer Arts, 2005). There is almost no danger of falling into the uncanny valley for the three-dimension films stylized with inspiration from real life. Researchers confirm that the animated version of reality needs to remain sufficiently abstract to allow audiences to employ their imagination and create unique bonds with characters (Butler ve Joschko, 2007). It is considered that the characters of the films such as *Despicable Me*, *Tangled*, and *Up* have been successful due to designing by caricaturizing but not because of their perfect hyper-realistic human being forms from the beginning. On the other hand, since the human characters in *The Polar Express* have been too realistic, the sense of disturbance to the audience has been defined as uncanny valley.

Tom Hanks, actor, performed as five separate characters in *The Polar Express* movie where Robert Zemeckis, director, employed MOCAP-Motion Capture technology. Regarding the animation of the characters, Zemeckis says: "...all expressions were created by actors. Performances are not the products of computers but actors. The computer just takes the existing performance and surrounds it with a cinematic skin."

In the motion capture technique, the digital data of performances of real actors in special costumes -including their facial expressions- are adjusted, cleaned and then loaded onto virtual characters to realize the animation. Bodies-walking, standing, running, slouching, brawling-turns out, I was being assured, that these are all quite doable, no longer that big deal. Hands-grasping, signaling, stroking, idling at rest-granted, they're abit more of a challenge, but not all that much more, and at least conceptually within reach. But a believable human face -a credible face- in motion, and what's more, *emoting*-damn, that was proving tough (Weschler, 2011, p: 1). Real actors base their performances on their current feelings. How they lift their eyebrows and the way they look all develop naturally in association with their talents, whereas such feelings and moves are created by animators for the virtual characters. Actions like how much to lift the eyebrows and how to look are not easy in terms of reflecting the real feeling. Such facial expressions may appear odd or unnatural and can adversely make a character appear life-less as opposed to life-like. Strong relationships were identified between the uncanny in virtual characters and an awareness of a lack of expressivity in the upper face region. (Tinwell, Grimshaw, Nabi and Williams, 2011). That is what has been experienced partially in *The Polar Express* film. The dull expression in the eyes, the tightness

in the skin and the pausing in the motions prevented the audience from enjoying the film and made it impossible to convey the desired feeling effectively. In the beginning of the film, when the child character is in his bed, everything may seem fine until when he opens his eyes. The way he opens his eyes, gets up, and looks puzzled when getting out of the door just pulls the audience to a non-normal world and may feel creepy. The grotesqueness of the conductor acted by Tom Hanks' performance is felt from the very beginning. The virtual characters in the film almost have a convincing reality, but the critic Philip French notes, 'the human figures look like shop-window dummies brought to half-life as zombies' and the BBC's Stella Papamichael states 'Forget Christmas cheer - kids will run screaming from *The Polar Express* after seeing Tom Hanks looking like he's been killed, embalmed and resurrected by lightning' and talks of 'its dead-eyed cast' (Oddey and White, 2009, p:33-34).

Another film suggested to fall in the uncanny valley is *Beowulf*, 2007, produced by use of Vicon technology by Sony Imageworks. Computer copies of several actors and actresses such as Angelina Jolie, Anthony Hopkins, John Malkovich have been successfully reflected on the screen. Although the expressions in the film seem more successful than the ones in *The Polar Express*, thanks to the mimic and facial expression capture technology, artistic expressions of real actors could not be transmitted to virtual artists in a perfect way. It looks as if the last few yards of the journey toward convincing realism are going to be the really hard part (Gallagher, 2007). Despite this, *Beowulf* has been indicated as a positive indicator of 3D technology developments by several media critics. Empire magazine's Tom Ambrose exclaims, 'you'll be glad to know that the creepy dead eyes thing has been fixed' (Oddey ve White, 2009, p: 37), and underlines how the characters are close to reality.

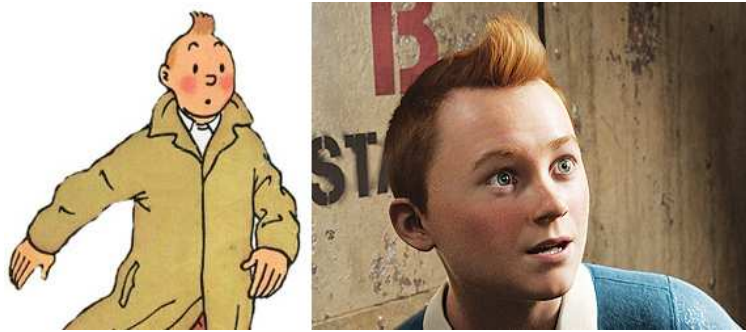
Hyper-realistic CGI characters and motion capture technology are the developments contributing to the field of animation. The use of such technologies has also helped the production of films where we see real and virtual actors act together. It has also provided films with a preference to keep away from the uncanny valley. In James Cameron's *Avatar*, Avatars do not raise the feeling of uncanny. *Avatar* avoids the uncanny valley because the aliens are distinctly alien - blue, stretched and unreal. The faces of the Na'vi don't trigger our uncanny reflexes because they're simply not human (York, 2010). Film makers have definitely refrained from the uncanny valley. The character Gollum acted by Andy Serkis in the *Lord of The Rings* is also of the similar nature. Since Gollum is a fantastic creature, he has no mimic and actions from real life and that is why it does not fall into the uncanny valley. Film critic Roger Ebert continues this thread in his column in the *Chicago Times*, when discussing the role of Andy Serkis in portraying the character Gollum in the *Lord of the Rings: Return of the King*, saying "If Serkis brought Gollum to life, other artists fine-tuned the balance with the uncanny valley" (Pollick, 2009).

3. Existence of the Uncanny Valley in “The Adventures of Tintin: The Secret of the Unicorn”

The famous Tintin character of Georges Prosper Remi or better known by pen name Hergé (1907-1983) was released as an animation film directed by Steven Spielberg and the experience of Peter Jackson by the use of CGI medium. According to Hergé, the best name that can convey his stories onto the big screen is Spielberg.

After the film was on at the theatres, a discussion on how far it approached the uncanny valley was started, too. While the characters of Spielberg and Jackson were entering from a linear world into a world of photorealism, would they be able to go beyond the uncanny valley? Thanks to the motion capture technology, the film seems to have become more successful than the other samples until then. While it is the common opinion that films such as *Final Fantasy* and *The Polar Express* have fallen into the uncanny valley, the critics have made different comments about the Tintin. The phrase has cropped up a lot in early reviews of *The Adventures of Tintin: Secret of the Unicorn*, referring to the strange effect created when animated characters look eerily lifelike. As *New York magazine* put it: “*Tintin looks simultaneously too human and not human at all, his face weirdly fetal, his eyes glassy and vacant instead of bursting with animated life.*” Shiven Sharma from the University of Ottawa,

Canada, says *“Our mind is more accepting of stylized representations. That’s why the Tintin movie looks so good. They’ve made photorealistic people out of the comic books. But they’re Tintin people—the way they’re shaded, and the way they’re proportioned, is all made to have the same visual style that Hergé created in the comic.”* (Stu, 2011).



Hergé Tintin - Spielberg Tintin

Since the characters in the film are on a line between comic strips and photorealism, it is of a different approach from *The Incredibles* and *The Polar Express*. They are neither stylized human beings nor hyper-realistic characters. Nevertheless, the critics say that the characters created with detailed photorealism from simply drawn characters in original comics strips make the film fall in the uncanny valley. For a person who has followed the adventures in comic book series by Hergé, watching Tintin in three-dimension on the screen can be scary. Although the character usually seems normal, when the camera gets closer, the audience may get confused because they cannot easily say if the character on the screen is the real Tintin or an entire human being. According to Manoj Nair: "Tintin (Jamie Bell) appears to be weirdly slack-skinned, has seemingly lifeless eyes and a plastic demeanour. Moreover, though the verdict about the ingenuity of the technology is still out there, it remains one of the most poetic terms in all of robotics: *The Uncanny Valley*." (Nair, 2011). Another hero in the film, Captain Haddock has been designed more successfully than Tintin with his big nose, standing on a line between a caricature and a real man. However, it can be suggested that the success is associated to the actions rather than the appearance of the character. It is likely to say that the most important indicator of this is the talent of Andy Serkis, whom we have watched as Gollum before. With the capability to create a believable character, Andy Serkis, in the role of Captain Haddock, looks as if he has established total control over the entire film. In other words, Jamie Bell's Tintin has become another example of how Keaton's Batman was overperformed by Nicholson's Joker (*The Adventure of Tintin: The Secret of the Unicorn* October 29, 2011 movievangelist). In this respect, while staging the adventures of Tintin, Peter Jackson and Steven Spielberg may have got closer to the edge of the uncanny valley.

The film might become a visual fest if it is watched without fear of the uncanny valley, concerns for any trouble or faults in motions. When the camera is at wide angle, the fast and paced flow of events reminds us the *Indiana Jones* films of Spielberg. While characters are seen from a distant point, it works in favor of the film. The scene which shows passing to sea while there was a big sailing ship in the desert is impressive. Besides the character animations, cities, seas, sky and the other surroundings have all been visualized successfully. Snowy, the Tintin's dog, has been animated by animators without the use of motion capture technology and provided the action scenes of the film with liveliness.

4. Conclusion

Although there are various views about the concept of the uncanny valley, attempts that might prove its existence experimentally are still limited. However, it is a common understanding that the animation films where we encounter hyper-real characters, which are sampled according to Mori's table, fall into the uncanny valley due to failing to establish an emotional bond with the audience. It is possible to produce hyper-realistic characters at this level of CGI

technology. However, the more likeness to a human being increases the more the audiences pay attention and become sensitive to small faults, deficits and anything that might seem strange. While seeking immortality on one hand, facing the scary reality of it on the other hand is disturbing.

During the production of animation films, keeping away from the uncanny valley in particular seems the best way. The success of films such as *The Incredibles*, *Up*, *Shrek*, *Tangled* supports this fact. The production of films with hyper-realistic characters will be carried on with the aim to go beyond the valley and reach the summit. Being more realistic than other hyper-realistic films, the films like *Tintin* are good indicators of it.

The recreation of Tintin from the original drawings of Herge is another reason for *Tintin* to become more successful than the other samples. When Tintin first appears in the movie, Tintin shows Herge's original drawing and asks the question "What do you think?" This may actually be a question which is directed to the audience. Spielberg and Jackson may have started such adventure, aiming at going beyond the borders of the uncanny valley.



The Adventure of The Tintin: The Secret of the Unicorn time: 4:55

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