

The Seduction of Realism

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Abstract

The “illusion of life” has long been a mantra for educators of animation. In the past, the artistry of animation has been centred around how to create this illusion with environments, objects and characters that are clearly not alive. However, in recent years technology has successfully given animators this very illusion. Technology can now provide “visual realism”. Does this then make animation more successful as a visually convincing and immersive medium? In some situations it does, though in other situations it simply brings a whole new array of issues that question realism at a new level.

A prime goal of animation is the illusion of life. In order to achieve this illusion, an illusion of reality is conveyed. Though realism can be described in many ways, the overall aim is to give the animation some real-world authority; that is, there is some aspect which is lifelike, thus fulfilling the illusion, and increasing immersion for the viewer. This realism in animation in the past has often been represented through real-world informed movement, often stylistically exaggerated. The exaggerated movement of characters is drawn from real life, creating a poetic explicitness that increases the perception of movement and the life of the character. This exaggeration of motion in some ways compensates for the otherwise unreal nature of the animation medium.

Over recent years, and with the advent of computer 3D animation, a more convincing visual realism is now achievable. Though the exaggerated styles of traditional animation are often maintained, the unique qualities of the computer 3D medium are able to provide an extra layer of visually convincing realism. One interesting consequence is that as realism increases, the exaggerated movement and artistic interpretation decreases. The ultimate solution suggests absolutely realistic rendering, with absolutely realistic movement. Is this then, still animation, or is it something else? Is this still an expressive and creative medium?

The realism that technology has brought animators also creates new demands for an educator. Should an educator stay with the founding principles? How do educators embrace technology while retaining the expressive individuality that animation can provide? Should they adopt the new mediums, such as digital sculpting and hyper realism? And when does new technology create new areas that have little to do with the definition of animation?

This paper discusses new expectations of realism in animation education, and via a journey down the Uncanny Valley, [Mori 1970] suggests some approaches and philosophies that can move with technology while retaining artistic independence and actively managing the seduction of realism.

1. New Realism

One of the reasons for the outstanding success of 3D computer animation as a medium is due to the realism that 3D rendering gives. With 3D rendering, the viewer can relax their interpretative effort somewhat, as what they see more closely matches real life. The immersive seduction is more real. Sometimes proponents of 2D animation criticise 3D animation as a showy method that relies on its “looks”: that 3D does not need to try as hard to generate the illusion of life. With 2D animation, because it is really just a drawing that moves, the power of that movement, and the power of the narrative must be strong in order to gain immersion and believability.

The tools of technology allow students of animation and visual effects to create increasingly visually high quality and realistic outcomes. With techniques such as displacement mapping, using programs such as Z-Brush[®] and Mudbox[®], a degree of realism can be achieved that competes with the high details of fine photography. This type of modelling has taken the name “Digital Sculpting”, which also partially describes the modelling techniques used when compared to the assembly approach used in mainstream modelling programmes. When used to create highly realistic detailed characters, the resulting models are often termed “hyper-real”. Taking the term from the 2000s art movement, 3D hyper-realism usually refers to extremely realistic looking computer models of characters, including fictitious characters and creatures.

Following the character development stage, modern production and compositing techniques also bring methods that would seem infallible: body motion capture, face capture, face replacement, hi-res texture re-creation – it would seem that all the tools are available to recreate human realism. Indeed this is successful in visual effects and stunts, where the computer generated stand-in replaces the actor temporarily. This substitution is usually very successful and unnoticed by the audience. However, in such cases, the CG stand-in is usually used in stunt scenes, or far from the camera, where detail and readability is diminished, blurred, or obscured by fast cuts. The audience simply does not get the time to experience the disjunction between the image they see and their memory of what it “should” look like. In this area of visual effects, realism is working, and getting better every day.

In the area of fully animated media, however, there are different criteria. The realism is in front of the viewer’s eyes constantly. The viewer is asked to immerse themselves in a world that is fully invented by the animation. And in the pursuit of realism, this introduces the phenomenon known as the Uncanny Valley.

2. The Uncanny Valley

The Uncanny Valley is a term coined by the roboticist Masahiro Mori to describe the eerie feeling a viewer can experience when encountering almost-human robots. His graph suggests that a robot would need to appear and act almost perfectly realistically before the feeling of unease will stop. However, this hypothesis does not include the awareness of the participant as a factor. It is a feasible proposition that robotic realism will always feel uncanny, as long as the human participant is aware that the robot is not human. Even if the robot was perfectly realistic in every way, the human participant will know still this. In fact, it is quite feasible that the unease will be even worse, upon encountering a perfectly realistic robot.

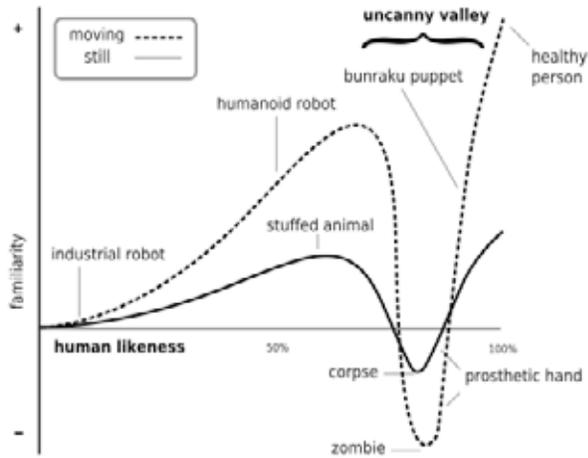


Figure 1: Mori, Masahiro 1970. The Uncanny Valley.

This possible non-acceptance of artificial realism is discussed by Bartnek et al, [2007] who suggest that the Uncanny Valley is perhaps more like an Uncanny Cliff, from which there is no recovery. They went on to conclude that “the most human-like androids are not liked as much as toy robots or humanoids”. This suggests that stylisation and anthropomorphism are more acceptable and endearing to participants than artificial realism.

This same discussion has a direct application to the increase of realism in computer animation. With such productions as *Final Fantasy: the Spirits Within* [2001], *Polar Express* [2004] and *Beowulf* [2007], the degree of visual realism is quite convincing. However, as the qualities increasingly approach realism, so does the judgement of the viewer. The viewer has an extraordinary memory of how real people appear and move, and if the animated characters appear real, then they also have to move and act realistically in order to cross the Uncanny Valley. This phenomena could be termed “infinite acceptance”: as animation realism increases, so does the viewer’s criteria for acceptance. Computer gaming studies report a similar result, “An ‘increase of realism’ often leads to an at first paradoxical increase of disbelief [*sic*] for the user.” Wages [2004]. This implies that only absolute perfection will succeed, which may not be technically possible, and in which case you may as well use real actors.

However, unlike robotics, screen media has an advantage. All movies are by their very nature unreal. Even when fully immersed in a movie, the viewer remains consciously aware of themselves: they are not actually encountering the characters in the movie. The viewer is a stationary spectator, their view is controlled, they

are unable to use movement, touch or smell to assess their environment and confirm the reality of it. Even though viewers will acknowledge that they may have been immersed in a movie, they were immersed as a close spectator. They are witnessing reality, but not actually experiencing it. In doing this, the viewer gives up some confirmations of reality, accepts what they see on screen, and accept a temporary reality for the duration of the movie. This “persuasive immersion” allows screen media to cross the Uncanny Valley whereas robotics cannot.

This suggests that for computer animation, “near enough” may be good enough. In each of the movies mentioned above, there are moments when all components are successful, and the viewer can willingly accept what they are seeing. This then leads to the next question: What is achieved by getting there?

From an animation education point of view this is a critical question. Bartnek et al concluded that “the most human-like androids are not liked as much as toy robots or humanoids”. This implies that realism will reduce character endearment: The more realistic an animated character becomes, the less endearing it will become. Before we conclude that stylised characters are the preferred method, it is worth a side glance at a convention that states that the lead roles should in fact be the most realistic. This is evident in an example such as *Bolt* [2008], where the lead dog has more realism and stylistic neutrality than the supporting cast of the cat and the hamster. The deliberate generic realism is intended to increase identification by the audience, in that the character is a “bank sheet” upon which the viewer can place themselves. It is thought that stylisation may reduce audience identification, in that not everyone will agree with the style. This approach may be seen as safe from a commercial producer, but is not appropriate for an educational situation. To bring out a character’s personality through stylisation is a well established skill that not only endears an audience but gives extra expressive depth to any performance. To dilute this in a fear of being too “colourful” contradicts many principles of acting. Fortunately we have many examples where stylisation and character identification have worked seamlessly, in such enduring movies as *Toy Story*, [1994], *Shrek* [2001] and *The Incredibles* [2004].

To draw a summary from examining the Uncanny Valley, it can be concluded that the pursuit of realism will not in itself improve the viewer’s relationship to a character nor improve the story. Realism can improve visual immersion but must be driven by and compatible with the visual style adopted for the characters.

3. Unrealism

Frequently students of animation will be impressed by an animation that has a strong realistic aesthetic. Inspired by such examples, these students may begin a pursuit of realism via the tools of the software. Invariably, without them being aware, the tools themselves will begin to dictate the look and feel of their work. This is not a new effect, as the nature of the tools have always influenced artists’ work. Most animation mediums have an inherent aesthetic which the artist agrees to adopt. A stop motion animation, for example, has a puppet-like appearance, and moves in a jerky non-blurred manner. Cell animation has a drawn characteristic, often showcasing an artist’s hand skill. And the default style for computer animation is that well-known 3D computer-look, now generally considered as “bland” and lifeless. However, computer animation offers more than just one style. In fact it can also offer an extraordinary variety of styles, and within each, increasing degrees of realism. The student, as well as

adopting a visual style, must also decide on the degree and type of realism.

4. Necrosis – student case study

This case study exemplifies how a student is able to encompass several ambitions, including a sense of realism, into one short animation production. The student, Andrew, was familiar with the issues of the Uncanny Valley and was able to discuss the topic fluently. Following his own interests, he chose a graphic novel sensibility, creating a short story situated in the world of Hellboy. There are three characters in this scenario, an assassin, his accomplice, and an incidental victim. The two characters have differing personalities; the assassin is overweight, with a bad attitude, and is generally annoyed with this assignment, and having to work with a partner whom he despises. The accomplice is part human, part demon, has a magical ectoplasmic projection ability, has a willing and co-operative personality, but his constant efficiency annoys the assassin. The incidental victim is a guard of the basement area in which the scene takes place, and who's only role is to stumble upon the assassin and his accomplice, and get shot as a consequence.

Following examples of hyper-realism, graphic novel art, and games modelling, the student intentionally placed himself in the cross-roads between realism and stylisation. His character design had to conform to all of these criteria. This was not a problem, as the student was very conscious of these criteria, and had many examples to refer to, and a clear vision of what he was trying to achieve. This was not to say that it was easy. He was creating an original style, and there was always the temptation to let it slide into an already known style, be it hyper-realism, cartoon, graphic novel or computer game influenced. At several stages, supervisor and student needed to discuss the direction and look and feel of the progress. This self critique and feedback formed part of the formative assessment which enabled the student to maintain a steady path towards his outcome.



Figure 2: Asherah and Necrosis. The assassin and his accomplice. Andrew Stairs, Massey University.

Using techniques from hyper-realism, the student added textural authenticity to the characters using Mudbox. This moved the aesthetic away from cartoon simplification, towards graphic-novel stylised realism.



Figure 3: Smooth polygons and normal-mapped displacement textures. Andrew Stairs, Massey University.

At this point the student made a significant decision towards further stylisation with hand drawn colour textures. This was to address his desire to create an explicit hand drawn element. This was not so much a concern about realism, but more a desire to impart the artist's touch, an appreciation common in the graphic novel genre. Furthermore, if the student left the model with plain colours, then the 3D rendering environment would impose its own style, a style calculated to recreate reality as best as possible. The student realised that creative control would then be imposed by the tool, not by the artist, and the choice to draw much of the colouring and texturing was a deliberate choice to reclaim artistic control and expression.



Figure 4: Colouring and texturing. Andrew Stairs, Massey University.

5. Action

The actual animation in this piece was minimal. Because the student was focussing on the character design and style, with the time-frame available, the acting needed to be constrained. The student also wanted movement that was smooth and realistic according to the character's nature. Ideally, had this project continued, the same consideration of style and realism would have been applied to the motion. However, for the approaching deadline, the student was required to adopt a constrained, realistically informed, practical approach.

6. Accidental Uncanny



Figure 5: Accident Uncanny. Andrew Stairs, Massey University

The guard character was deliberately designed as a neutral character. His screen time was going to be short, his role was that of a nondescript movie-extra. However, the making and filming of this character produced an interesting and unexpected result. The student, in his attempt to remove characterisation, proceeded to model a reasonably realistic face for this character. As the student was concentrating on the two lead characters, he effectively did not notice the unintended realism of this supporting character until final renders were produced. The result was a character that sits well and truly in the Uncanny Valley. As this character is generic, less stylised, and therefore more realistic, he appears quite out of place in this short movie. Add to that theatrical lighting, an expression of fear, and the uncanniness is complete.

This accidental uncanniness demonstrates the significant influence that the computer tool can have on an artist's work. Because the computer allows for realistic modelling, and because the computer is designed to render as realistically as possible, the student created a realism he was not intending, even though he was conscious of this very issue. Stop motion animators never had this problem.

7. Conclusion

There are many examples of animation schools consciously managing realism and its uncanny side effects in their teaching and student projects. The best quality student work tends to have strong, deliberate visual styles, and, as witnessed in international festivals, the look and feel of 3D is being expanded. There is currently emerging a discernible effort to create stylistic uniqueness when using the tools of 3D animation. This must surely represent a maturing of the medium; when artists consciously endeavour to separate themselves from the inherent look and feel that the tools impose. While the artists are still taking advantage of the inherent believability that 3D rendering can give, they are also taking cues from other media forms, including 2D animation, and giving their worlds convincing and immersive realities.

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Author Biography

Gray Hodgkinson is a Programme Leader for the Institute of Communication Design at Massey University, Wellington, New Zealand. Gray has been developing animation education for 15 years, including New Zealand's first full-time 3D computer animation course.

Gray has given presentations on animation pedagogy at the Art Animation Symposium, Tainan 2005 (invited), ACM SIGGRAPH Taipei 2006 (keynote), Ed-Media Vienna 2008, and the FMX Festival, Stuttgart 2009 (invited).

Current research interests include exploring various relationships between traditional and modern forms of animation, integrating design research methods into the animation creative process, and investigating methods to build virtual sets for real-time compositing.