
September 2016

Virtual Actors, Help or Hindrance

Ryan Gordon

Cedarville University, rgordon@cedarville.edu

Follow this and additional works at: https://digitalcommons.cedarville.edu/idea_of_an_essay



Part of the [English Language and Literature Commons](#)

Recommended Citation

Gordon, Ryan (2016) "Virtual Actors, Help or Hindrance," *The Idea of an Essay*: Vol. 3 , Article 36.
Available at: https://digitalcommons.cedarville.edu/idea_of_an_essay/vol3/iss1/36

This Essay is brought to you for free and open access by the Department of English, Literature, and Modern Languages at DigitalCommons@Cedarville. It has been accepted for inclusion in The Idea of an Essay by an authorized administrator of DigitalCommons@Cedarville. For more information, please contact digitalcommons@cedarville.edu.

Virtual Actors, Help or Hindrance

Ryan Gordon

Ryan Gordon is a computer engineering student attending Cedarville University. He enjoys writing technical papers about subjects that he is studying. Ryan's other hobbies include reading about military and science fiction and also contributing to the field of engineering through programming.

Many of the actors moviegoers see in films are nothing more than digital deception. Virtual actors are replacing human actors. As described in AI Magazine's article "Towards Virtual Humans," virtual actors are "software artifacts that look like, act like, and interact with humans but exist in virtual environments" (Swartout et al. 1). Experts in this field use the phrases "virtual actor" and "digital actor" interchangeably to describe the same thing (Smith Reality 1). This essay explores the discussion surrounding the development of virtual actors in the movie industry and explains common arguments for and against their development.

The idea of virtual actors has been around ever since computers were able to help with movie production. The first attempt at making a digital human was in the 1986 film *Young Sherlock Holmes*. In this film, a digitally animated knight crashes through a glass window. Even though the knight's part was small, it proved that digital actors could be integrated into movies (Bath 1). From that point on, digital actors have been a fascination of Hollywood directors. Virtual actors have evolved alongside computers in their role in movies. As digital actors were used in notable films such as *Terminator 2: Judgment Day* and *The Crow*, the technology advanced even further. In *Terminator 2: Judgment Day*, the main antagonist of the film, a shape shifting terminator, was played by an actor, but every time it shape shifted, a virtual actor filled in (Bath 1). This is the first time a virtual actor switched places with a real actor during a scene.

During the filming of *The Crow*, Brandon Lee, the star of the film, died before his part was completed. In order to finish the film, the script was changed slightly and a virtual copy of the actor was used when necessary. This is significant because it was the first use of a digital human to replace an actor for an entire scene (Bath 1).

As virtual actors progressed, an interesting phenomenon called “the uncanny valley” was discovered. When most people watch a virtual actor that is almost humanlike, there is a sense of revulsion at seeing something that looks human but lacks true humanity. This phenomenon was given the name “the uncanny valley” by robotics professor Masahiro Mori in 1970. This term refers to a chart Mori made for his article “Bukimi No Tani,” which roughly translated means the uncanny valley (Mori 1). In his chart, Mori depicts two curves plotted along an x-axis and a y-axis. The x-axis represents human likeness and the y-axis represents the likability of the object. One of the curves denotes objects that remain still and the other represents moving objects. As both curves progress along the x-axis, they steadily rise along the y-axis until they reach about 80% human likeness. At this point, both curves descend into a valley of severe dislike and in the case of the curve representing movement, revulsion (Mori 2). Dr. Mori’s hypothesis as to why this phenomenon exists is that humans are programmed to stay away from humans that do not look healthy. Virtual actors that look lifelike almost resemble sickly humans in their movements and appearances (Mori 3). The best example of the uncanny valley is the movie *The Polar Express*. This movie was one of the first films to have human actors that were lifelike enough to trigger a dislike in the audience. Though the movie was well received, moviegoers still felt unsettled watching it (Mori 1). Virtual actors are in the uncanny valley at the moment but there are many scientists and animators working toward truly lifelike digital humans. Given enough time, virtual actors will be realistic enough to overcome the uncanny valley and look completely human to moviegoers (Perry 4).

Today virtual actors are used for many different tasks in movies, ranging from populating the backgrounds of scenes to being the main stars of feature length films. Digital actors have appeared in many large scale films as crowds, including *The Lord of the Rings* films and *300*. Most of the large battles in those movies have just a few extras and the rest of the scene is made up of digital actors

fighting one another. This is useful because it allows the directors to populate scenes without paying for extras and equipping them with all of the necessary costumes and props (Smith, Digital 2).

Digital actors are also being utilized in the stunt departments of major movies. Many notable blockbusters have used virtual humans to perform stunts that are too dangerous for humans to attempt. A couple of examples are *The Matrix* and *Mission: Impossible II*. Near the end of *The Matrix*, there is a scene in which the main character jumps into a moving helicopter from the top of a skyscraper (Bath 1). Due to the difficulty and danger of the stunt, the director decided that the stunt would be done by a digital actor. In *Mission: Impossible II*, many different stunts were turned over to virtual actors, including falling from large heights and taking bullets (Smith, Reality 2).

In some movies, audiences even see the main characters replaced by virtual actors. Some of the most famous examples of replacing an actor entirely include *The Strange Case of Benjamin Button* and *Tron: Legacy*. In *The Strange Case of Benjamin Button*, Brad Pitt played a person who aged in reverse. In order to achieve the effect of an older version of the actor, the director used a virtual human to replay the actor's motions on the digitally aged copy (Perry 3). In *Tron: Legacy*, a radically younger duplication of actor Jeff Bridges needed to be onscreen with his current self. First, the director tried a traditional approach using makeup and recording two takes of the scene. This resulted in an unrealistic performance, so the director ended up using a digital actor instead (Smith, Reality 3). As more movies use this technology, it will improve in both how easy it is to use and how cheaply it can be deployed.

Even though many people stress that virtual actors are almost perfect, there are those that disagree. They say that using virtual actors has severe consequences that are liable to get worse. Currently, people can start to see the results of replacing stunt actors with digital ones. Stunt actors are slowly losing their jobs as virtual actors are becoming cheaper to use and can do things humans cannot (Perry 4). If digital actors replace humans entirely, other jobs in the movie industry will be at risk as well. Jobs such as makeup artists and costume designers will become redundant without a real person to prepare.

The concerns about virtual actors taking over Hollywood jobs seem small at the moment, but digital actors are getting smarter.

The article “Toward Virtual Humans,” published in 2006, states that researchers have started working on making virtual humans that are able to make decisions and even perform like real humans by taking a script and acting it out (Swartout et al. 1). Some progress has already been made toward this goal. In “Developing Virtual Actors Inspired by Real Actors’ Practice” Rogerio Silva explains how a programmer could possibly implement an artificial intelligence to allow it to learn from an existing actor and eventually perform on its own (Silva et al. 1). This is a disaster for movie performers and even digital animators. If digital actors become smart enough to perform on their own, who would want a real actor that needs to be paid and negotiated with.

One of the chief problems with virtual actors is the legal issues that come up regularly. As “Digital Actors and Copyright – From the Polar Express to Simone” states, a prevalent question is who owns the rights to the virtual actor, is it the person the virtual actor is modeled after or the company that made it (Kurtz 2). If the company owns the rights to the virtual actor, then they can exploit them for all kinds of purposes. One example of this is if an actor does not want to work on a studio’s movie, the studio, since it already has a virtual copy of the actor on file, can use the copy to star in the movie without the actor’s consent and without paying him or her.

Another legal and ethical question is whether it is acceptable to make virtual actors out of dead film stars or historical figures. At the moment, computer animators are unable to create realistic humans without access to the actor. They cannot capture a person’s personality without being around him or her. When this does become possible, it will cause untold legal and moral problems. For example, suppose someone creates a virtual actor of John Wayne and has the actor endorse a product. At the moment, there is no legal recourse to solve this problem. In fact, creating a virtual actor is currently protected the same as if a person was making a painting or some other non-virtual recreation of that actor or historical figure (Kurtz 5). George Lucas, renowned Star Wars director, and one of the people who pioneered many of the computer effects we use today, states that recreating dead actors is a huge legal issue (“George Lucas” 1).

A continuing problem with digital actors is that they lack true humanity. As revealed by “Leaving the Uncanny Valley Behind,” a virtual actor is currently incapable of acting with true emotion

(Perry 3). When you stare deeply into their eyes, all you get is a blank stare. This lack of humanity is pronounced in movies that are completely animated, such as *Toy Story 3*, *The Polar Express* and even *The Adventures of Tintin: The Secret of the Unicorn*. In *Toy Story 3*, people do not notice the flaws in the toy characters, but the lack of humanity is pronounced in the humans of the film (Smith Reality 2). *The Polar Express* may be given a bit of leeway because it is an older film, but it demonstrates that even mimicking real actors' performances does not convey a true soul to the digital characters (Perry 3). Even in the modern film *The Adventures of Tintin: The Secret of the Unicorn* that has almost photo realistic humans, some people can still spot the lack of soul in the actors. George Lucas and Scott Ross are leaders in the field of digital effects. They say that a virtual actor will never be able to truly replicate the performance of a talented human actor. George Lucas says that "Acting is a human endeavor and the amount of talent and craft that goes into it is massive - and can a composite reproduce that" ("George Lucas" 1). Scott Ross, the CEO of the visual effects company Digital Domain, concurs with this assessment by stating, "One of the things that I'm mostly concerned about in terms of virtual actors is that there's been millions of years of experience in our genetic code. And I'm concerned that when you create a close-up of a virtual actor and look into its eyes, that it will take real skill to be able to give that virtual actor a soul. And I've not yet seen that" (Kurtz 2).

There are two different views on the subject of virtual actors and whether they should be developed further. Both sides present valid arguments as to why their side is right. The side supporting virtual actors focuses on how developing this technology has greatly improved the movie industry. The side against virtual actors focuses on how the expansion of digital humans has caused some people to lose their jobs and how this field has a myriad of legal and ethical issues surrounding it. In the end, virtual actors are like a double edged sword. They have the potential to change movies forever, but they come with many issues as well.

Annotated Bibliography

In today's movies, we see an exceptional amount of computer effects, but none have replaced the need for real actors. Recently though,

we have seen the rise of virtual actors. These constructs started out doing very simple tasks in cartoon movies, but have evolved into almost being a replacement to humans.

Academia has not let this change go unnoticed. Experts in many fields have written predictions and studies on the benefits and disadvantages to replacing performers in the film industry. Many feel that digital actors will never replace human performers, while others are less certain. Each person has his or her opinion as to whether this is a good thing or not.

Movie stars certainly have their concerns as to whether virtual actors will help performers reach new heights or outright remove them from their jobs. Many people have been concerned about unaddressed legal issues surrounding digital actors. One issue is who owns the virtual actor after it is made. Is it the human it is made from or is it the company that created it? This question and many others like it will become more prevalent as computing power increases and the cost of making digital doubles decreases.

Bath, Matthew. "Timeline: Virtual Actors." *Digital Arts*. 7 Jun. 2004. Digital. 23 Oct. 2014.

This site lays out the timeline of virtual actors in an effective manner. It will be used for examples of virtual actors in movies. This is not a scholarly source but most of the information can be confirmed by other sources.

Geigel, Joe. Marla Schweppe. "Motion Capture for Real-time Control of Virtual Actors in Live, Distributed, Theatrical Performances." IEEE International Conference on Automatic Face & Gesture Recognition and Workshops. Santa Barbara: IEEE, 21-25 Mar. 2011. 774-779. Print.

The article describes the most common ways human actors are working closely with their virtual counterparts. It will be useful for understanding how humans interact with virtual actors. This is a conference paper that may have the opinions of the presenters, but the authors are both accredited in their field.

"George Lucas - Speaks Out About Digital Actors." *Motion Capture Society*. 2014. Web. 14 Oct. 2014.

This interview reveals George Lucas's views on virtual actors. It will be used in showing the reader a reaction from Hollywood about virtual actors. This source came directly from an interview with George Lucas and quotes him directly without changing the original words.

Kurtz, Leslie. "Digital Actors and Copyright - From the Polar Express to Simone." *Santa Clara High Tech Law Journal* 21.4 (2004): 783-805. Digital.

The article addresses the legal ramifications of virtual actors. It will shed some light on the legal issues surrounding virtual actors. The source is scholarly because it is published in a peer reviewed journal of law.

Mori, Masahiro. "The Uncanny Valley." *IEEE ROBOTICS & AUTOMATION MAGAZINE* June, 2012: 98- 100. Print.

This article describes the phenomenon called "the uncanny valley" for the first time. The source will be used to talk about the uncanny valley and how it was discovered. This is a scholarly source because it has been published in two peer review journals and reviewed many times.

Mori, Larissa. "The Masters of VFX Weta Digital." *3D Artist* 70 Jul. 2014: 32-38. Print.

This article is an interview of a studio and the actors that this issue would affect. The paper talks about how the company Weta Digital is using virtual actors to enhance real actors' performances, not replace them. This is not a scholarly source because it is published in a magazine that is created for artists, not academics.

Perry, Tekla. "Leaving The Uncanny Valley Behind." *IEEE Spectrum* Jun. 2014: 48-53. Print.

This article provides an outlook of how actors can work together with their virtual counterparts to benefit them both. It also talks about how recent advancements in computer graphics have allowed digital actors to bridge

the gap from cartoon to lifelike. It will be used to highlight many recent advances in virtual actor technology. The source is scholarly because it is published by a journal that is peer reviewed.

Silva, Rogerio. Ido, Iurgel. Manuel, dos Santos. Pedro, Branco. Nelson, Zagalo. "Understanding Virtual Actors." *Games and Digital Entertainment* (SBGAMES). Florianopolis: IEEE, 8-10 Nov. 2010. 220-229. Print.

The paper defines what virtual actors are and how to train them using the same techniques that real performers use. The article explains how this might one day lead to replacing the performer with a virtual copy that is as convincing as a human. It will be used to talk about how virtual actors are hurting children's social abilities. The source is a conference article which may have an excess of opinion but is written by many authors to add credibility and reduce the overall bias.

Silva, Rogerio. Manuel, dos Santos. Ido, Iurgel. "Developing Virtual Actors Inspired by Real Actors' Practice." Workshop on Digital Media and Digital Content Management. Hangzhou: IEEE, 15-16 May. 2011. 146-149. Print.

This article is from a convention that discusses the advances in training artificial intelligence to take over the role of animating virtual actors. It will be used to outline the use of AI in the field of virtual actors. The source is a workshop article so it is not scholarly but it stays mostly unbiased.

Smith, Alvy. "Digital Humans Wait in the Wings." *Scientific American* Nov. 2000: 72-76. Digital.

This article provides an overview of a future where real actors are separated from movies and shows. The author discusses it from a positive perspective. The source will be used for showing the future of virtual actors from the pro virtual actors' side. The source is scholarly because it was published in a peer reviewed journal.

Smith, Alvy. "The Reality of Simulated Actors." *Communications of the ACM* 45.7 (2002): 37-39. Print.

The article talks about how animators are the digital age's performers and that they will soon be the only actors needed for the film industry. It will show how technology can go too far. This article was published in a peer reviewed journal, thus it is scholarly.

Swartout, William. Jonathan, Gratch. Randall, Hill. Eduard, Hovy. Stacy, Narsekka. Jeff, Rickel. David, Traum. "Toward Virtual Humans." *AI Magazine* 27.2 (2006): 96-108. Digital.

This paper provides a definition of virtual actor and also describes the future of virtual actors for training purposes. It will be used for defining terms and AI topics. This article is scholarly because it was peer reviewed by the journal it was published in.