Animation-It's Past, Present, and Future

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Animation is the art of movement. It is when a "series of images with slight variations are flashed in rapid succession before a human eye-causing movement" (Roland, 2012). According to Roland, an Art Education Professor at the University of Florida, this physiological phenomenon is called the "persistence of vision". Animation is an art form that can entertain people on simple to complex concepts that can be portrayed from clay, drawings, or even a collage. It is currently one of the most profitable film genres of the century. However, it has gone through numerous iterations and decades to get there.

A look in the past. There are different types of animation and it is not entirely certain when animation was created, but before film, many devices were created to give the illusion of movement or the so called, "persistence of vision". Thaumatropes were created in 1825 by W. Phillips. This was one of the early signs of animation in the form of a toy where pictures on the side of cardboard discs would be twirled by strings to form an image with the use of motion (Herbert, 2013). Roughly 10 years later, the Phenakisticope was created by Joseph Plateau, a Belgian scientist. Simon Stampfer, a geometry professor also created the stroboscopic disks at this time (Prince, 2010). Both of these inventions worked similarly; the disks were drawn on one side to be rotated in front of a mirror. These drawings would then appear to move when looked through the slits of the device (Prince, 2010). There were many other devices that contributed to the renaissance of animation, including the flipbook; however, the first noted traditional animation artist was a Frenchman named Emile Cohl. In 1907, Cohl created *Fantasmagorie*, which was 700 drawings placed in an illuminated glass plate to project movement. His film was known to be the first animated film created (Popova, 2011). Animation began to develop in Asian countries as well, including Japan. In 1907, *Katsudo Shashin*, a short animated film that

showed a young boy writing the characters "Katsudo Shashin" in Japanese was the first recorded animation in Asia (Iwamoto, 2011). With the animation contributions in the 1800 and early 1900's, Walt Disney was born in 1923. What was unique about the Walt Disney Corporation, was that their works were feature-length animated films that could be done by hand drawn methods. Previously, Walt Disney used various techniques such as cutouts, stop motion and silhouettes for their films but hand drawing was first done with their *Snow White and the Seven Dwarfs* feature-length film in 1937 (Iddon, 2015). When the digital age hit the 1950's, animation was revolutionized with the technology that was created in this era.

The transition from old school to the new. Walt Disney has become one of the largest corporations for digital animation. Starting from the hand drawn animation of *Snow White* in 1937, to their highest grossing animation, *Frozen* in 2013. To enhance the realism and fluid movement of characters, filmmakers worked with scientist to create a new form of visual effects using "software programs that simulate environments and objects whose behavior is rendered according to known laws of physics, the properties of light and of fluid, and particle dynamics" (Prince, 2010). Disney's Toy Story in 1995 was the very first computer generated imagery movie using CGI. Computer Generated Imagery (CGI) is "the process used for generating animated images by using computer graphics that encompass both dynamic and static images to compose scenes while the computer animation refers only moving images" (Paz, 2014). Digital animation is constantly upgrading. *Frozen* for example, had a challenge to depict snow realistically. In order to execute this task, the studio developed several new tools to render 2,000 unique snowflake shapes and the "sticky quality" of snow (Failes, 2013). Animation also developed rapidly in Japan where they coined the term, "Anime" for Japanese animation. With the digital era, Japanese animation also transitioned to using computer graphics. According to Huitula, the

differentiation between Anime and western animation is that Anime appears to be shot by a camera, using the same zooming and panning techniques to create the dramatic effects. By the 21st century and across the globe, almost all animation is computer generated.

The future of animation. Animated films now require powerful servers that provide large amounts of processing power to enable the CGI animation. Dwarf Lab's four minute animation for example, was 1.5 TB of data where each frame was 150-200 MB (Curtis, 2014). Animation is used not just for the entertainment industry but also for visualizing data. Data scientists and analysts utilize animation to observe the trends in numbers. For example, it is used in weather forecast to show the movement of the clouds and it is used to demonstrate the seasonal cycles of vegetation over the course of a year. Google, a data driven company, also relies heavily on animated charts and graphs to understand trends in their searches. Seemingly unnoticed, animation has found its way in people's everyday lives. The future of animation can be seen growing rapidly towards video games as well. With the VR and AR, animation is used to create an interactive project for the user. The user can view the animated environment inside a headset and it provides a sensation as if the user is actually part of the game (Failes, 2016). Computers are a valuable asset for the animation industry and as technology continues to grow, so will animation.

Conclusion

Animation was very math and science oriented from the beginning. Stroboscopic disks were invented by a Geometry Professor, Simon Stampfer. Now, digital augmentation gives back to math and science. It is used across all industries and is a valuable part of teaching for students. Animation can be used to render three dimensional graphics and allow data visualization for Google. Animation is getting more complex everyday and has come a long way from where it started. With the help of the digital revolution, it will continue to evolve. Animation is an art form, a visual poem and the creation of a new virtual world.

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