Engineering in the film industry and its impact on society

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Engineering in the film industry

Since the creation of the first camera, engineering and the film industry have been intertwined; if it wasn't made by nature, it was engineered. As we can imagine, engineering was involved in the creation of the first motion pictures in 1888. The father of cinematic effects, Georges Méliès, paved the way for new techniques as the film industry grew. King Kong, which was released in 1933, was based on such developments, and it has since evolved into modern films like Avatar: The Way of The Water 2022. Between 1888 and the present, the audience has also evolved, growing to be more selective when it comes to these special effects.
Movie: Is a narrative or event captured on film and broadcast on television or in a theater. A piece of visual art that uses moving pictures and audio to convey concepts, tales in addition to simulating experiences.

Engineers: Engineers are problem solvers who apply scientific, technological, and other discoveries made by other individuals in the real world. In addition to meeting client requirements and ensuring public safety, engineers must adhere to legal requirements, budget for projects, solve problems creatively, and work around any obstacles they may encounter.
How do they relate?

Computer software engineers and animation

Creates the technology needed for a visual effects (VFX) project. They design the systems that technical directors can use and adjust to meet artists’ requirements. In addition, they create new digital tools and ensure that they work with existing software.

Mechanical engineers and props

A mechanical or electrical engineering degree is frequently an essential prerequisite for a special effects specialist. The film industry uses licensed Mechanical Engineers to build intricate props and various flying, burning, and exploding special effects.

Audio Engineer

A sound engineer’s job is to create, mix, and manipulate sounds from various sources while producing eye-catching effects that enhance the overall picture.

The soundtrack engineer balances and modifies the sound, mixing and using audio effects. The recordings made can then be utilized for soundtracks to movies and TV shows.
King Kong
King Kong (1933)

Harold O'Brien, an American motion picture special effects and stop-motion animation pioneer, created the 3D stop-motion animation and developed the 1933 King Kong film based on his invention, and it was the first significant feature film to star an animated character.

For close-up shots, the special-effects team built giant arms, hands, and feet for Kong and men inside a giant model head of ape-operated cables and levers to simulate facial features. (Figure 1.2)

O'Brien's pioneering use of models and miniatures, stop-motion animation, miniature rear projection, and traveling mattes (which combined images of foreground action with a separately filmed background) became the basic techniques of movie special effects.

Since this was the beginning of the film industry, many new inventions came to light, and engineers had to come up with new solutions for the creation of Kong and his facial features since he had to move in some scenes throughout the movie. We can see that mechanical engineers were involved in the creation of the dinosaur in the movie (Figure 1.4) and the large upper body of Kong (Figure 1.2). This move required engineering because Kong had to be transformed into a massive gorilla (Figure 1.3).
Every aspect of movie sets in the past, such as roads, buildings, and fires, had to be constructed by hand by the Mechanical and electrical Engineers. There is a new method for creating realistic backgrounds, even though many movies set still need to be constructed by hand. (Figure 2.5) These days, green and blue screens are widely used to bring filmmakers' visions to life. During the editing process, images are added to the background after green screen filming. (Figure 2.6)
In the past, film cameras like the Super Parvo and the Mitchell Standard were the standard for film production. When the film in these film cameras ran out, it was necessary to reload them often. Because film is so thin, even the tiniest scratch has the power to ruin a whole scene. (Fig. 2.1) Digital single-lens reflex cameras (DSLR) have now supplanted film cameras. They make it possible to film movies in high definition, producing amazing visuals. (Fig. 2.2)

The cameras used to be big and heavy. (Fig. 2.3) These days, they're more manageable to carry and smaller and lighter. The director can also more easily determine their preferred ratios and focal lengths by using a viewfinder (Fig. 2.4)
These days, more sophisticated engineers were involved in every step of the Avatar creation process, from setup to audio to software. The challenge for director James Cameron was to find a way to film in the water. (Figure 3.4) This involved enlisting the help of mechanical and electrical engineers to collaborate to devise a plan that would eventually address the issue of how to film underwater in a controlled environment. (Figure 3.2)

Software engineers were involved because they had to create animations to turn the actors’ gestures and expressions into animated characters (Fig.3.1). Weta Digital created over 800 computer-generated characters, as well as 1,800 visual effects shots that boasted detailed CG settings.

To get the details of an actor’s facial expressions, the Avatar crew got up close and personal. Each actor wore a small camera, which was mounted to their helmet and directed at their face.
People may not always consider the role that engineering plays in our daily lives, but I can assure you that it is pervasive and that it has had a significant influence on the film industry. From O'Brian's early 1920s motion picture perspective manipulation techniques, which led to the creation of King Kong in 1933, to the ability to create extraordinary effects like computer-generated imagery (CGI) with just a green and blue background, these developments had a significant impact on how society viewed movies from the 1900s when the first full-length feature film was made, to the present day. Whether as a software engineer or by discovering new methods to improve it, engineering will undoubtedly continue to develop new ways to improve the film industry. This industry will continue to grow for the general public as long as people continue to stream movies on websites like Netflix, Hulu, HBO, etc.


