

# Analysis of the use of Technology and Innovation in Movies: Case Study Analysis

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## 1. Introduction

Almost every industry in the modern world has felt the spark of innovation and changing technologies over the years, and the relatively infantile nature of the film industry, when compared to others, shows just how expansive the effects of technology have been. From the analogous era of early stages of filmmaking to the advent of digital VFX technologies and computer-generated imagery, filmmaking has continuously been adapting and adopting. The dawn of the filmmaking saw innovations such as the Cinematograph, invented by the Lumière brothers, technicolour technology in the early 20th century, moving from silent films to films with sound, and animation in filmmaking. Movies and films, at their core, are art, that much cannot be contested. However, the method through which they have produced means that they are a technological art, and capturing motion in films require the use of increasingly advanced technologies. As newer technologies become more prevalent, predicting their success becomes a necessity, and artificial intelligence is the right tool to use in that regard.



Fig1. Out of the box film making technologies

## 2. Research Objective

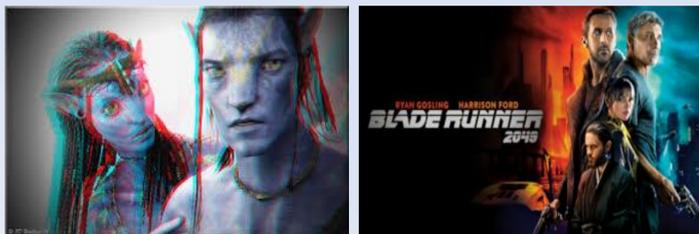
Which technologies can be used in movie production to best assist the filmmaking process, and how can we predict their success? As such, the objectives of this research are:

- To analyse the history of filmmaking technology since the inception of the medium.
- To collate the various technological innovations in movies and film and establish their success and failures.
- To determine an accurate predictive model of success in technologies used in filmmaking through machine learning techniques.

## 3. Literature Review

### Video

Stereoscopic 3D is one such innovation that rocked the film industry, and despite being a relatively new technology, improvements are continually being made. The highest-grossing film to date was Avatar, directed by James Cameron, who was the first to utilise 3D technology in film and has been adopted by many filmmakers and summer blockbuster movies since. The film, Blade Runner 2049, directed by the prolific filmmaker, Denis Villeneuve, is undoubtedly one of the most beautiful pieces of cinema in the entirety of film history, and it heavily utilises practical effects, lighting technology, and computer-generated imagery. The rise of video cameras as accessible commodities to the masses rather than bulky and expensive machines also put the power of filmmaking into the hands of others, and it has given rise to student-films, vlogs, and other methods of filming.



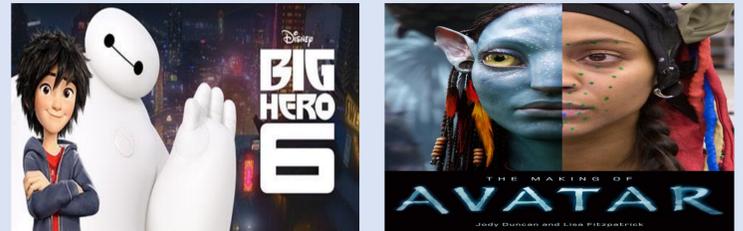
### Audio

Filmmaking used to be purely a visual medium, immersion came through a singular sense – that is, visual – and the use of dialogue was done through text frames. Since the inclusion of sound in the turn of the quarter-century in the 1900s, audio has also been in a state of constant innovation. One of the most innovative uses of audio was in Star Wars: Episode IV – A New Hope, released in 1976. Benjamin Burt, the sound designer of the film, utilised incredibly baffling techniques to film sound, such as using a hammer on an antenna wire to mimic a laser blast. Martin Scorsese utilised Point of View (POV) sound (Knecht, 2019) in his gangster epic, The Goodfellas, to incredible effect.



### Animation

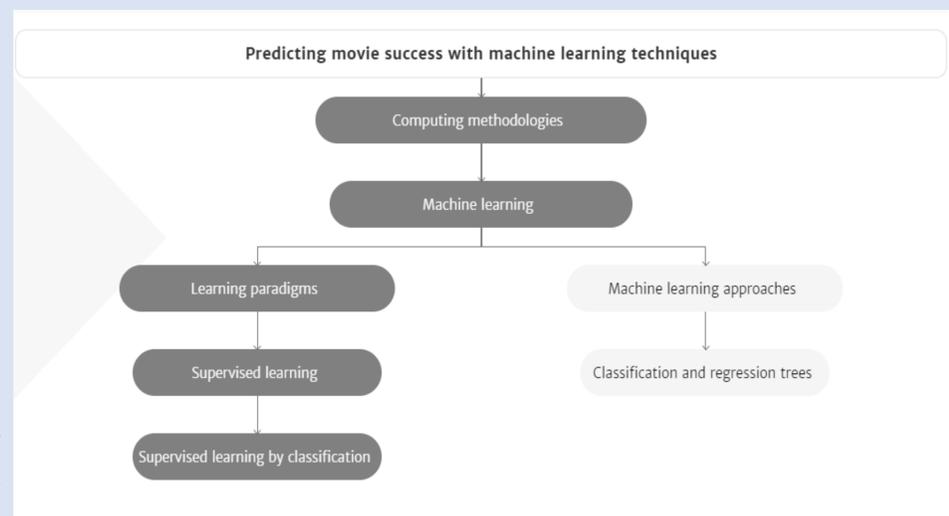
Visual effects industries and 3D animation also require the use of technology beyond filmmaking techniques. It is a multi-billion-dollar industry in the United States alone, and with multiple films grossing billions of dollars in a single year, this practice is only going to increase further. Rendering animation data is an expensive and time-consuming process, and rendering a single frame in an animated film can take hours. Supercomputers with thousands of processor cores are utilised, an example is Big Hero 6, a film that was rendered using a 55,000-core supercomputer. Compared to a personal computer, the average core count in CPUs is around 4, with some even still utilising two cores.



## 4. The Dataset

- A comprehensive data set from all the movies on IMDB for the past 10 years.
- The data points included are: Title, Genre, Description, Director, Actors, Year, Runtime, Rating, Votes, Revenue, Metascore.

## 5. Methodology



## 6. Technologies



## 7. Conclusion

Movies have utilised a wide range of technologies over more than a century. Where films stand today is widely different from where they began, and technological innovation has changed the medium continuously. This research will aim to analyse the various technologies used to document their usage for use in further studies and research.

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