

Chapter 12

Applications of Artificial Intelligence in Media and Entertainment

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ABSTRACT

Emerging developments in AI will have a tremendous impact on the world of media and entertainment. While the general public is focused on entertainment-related technology such as virtual reality and augmented reality, perhaps more significant is the technological transformation of how media experiences are created. Many of the signals about how and where these technologies will affect our lives are below the surface, deeper inside the pre-production and post-production process. This chapter will survey some of the ways in which AI affects the stories we consume, issues of ethics and equity surrounding the use of the AI in media, and early signals that presage a tectonic shift in the business of content production.

INTRODUCTION

The media and entertainment sector, valued at \$2 trillion/year worldwide (PriceWaterhouseCooper 2017), is integrating applications of AI techniques in research and deployed products at every scale and in every niche. It's important to note that the sector includes complex, distinct, yet intersecting industries, with many roles beyond that of a mythologized auteur/creator relentlessly pursuing their passionate vision.

Artificial Intelligence affects many aspects of pre-production, production, analytics and marketing for a sector that includes film/television production, streaming services, video games, music, and journalism. Advertising, and social media platforms (which generally derive the lion's share of their revenue from advertising) are a huge driver of exploration, with products ranging from analytics to full content generation. While fully tracking developments from the hundreds or thousands of entities active in this

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work is daunting, the chapter will provide a survey of topics worthy of much more investigation by researchers, media-makers, industry executives, and students.

A note on framing the analysis: while fascinating projects exist at the intersection of machine learning and the fine arts (Gatys 2015; Briot et al 2017), this chapter will explore emerging technologies in media and entertainment as a commercial sector. The first section will explore how AI for recommending and targeting content; the second will look at how AI influences the creation of media. The next section discusses critical issues involving the technology, including its use in tracking representation in media, the ethics of AI, and how trust intersects with human nature in machine-generated content.

AI for Prediction

The modern age is defined by a vast array of content across a multiplicity of platforms unimaginable to earlier generations of media-consumers. The sea of choices makes it hard for any particular piece of content to find an audience, and many of the traditional gatekeepers or aggregators have a diminished role in the selection-patterns of their viewers. AI presents an opportunity for incumbent and upstart entities to try to find and keep audiences through tracking interests, recommending media, and even generating targeted content aimed at individual tastes.

Pattern Matching, Analytics, and Consumer Behaviour

It may be a vast oversimplification to describe modern machine learning as pattern matching and extrapolation - but, to a first approximation, it's a useful one. And the media and entertainment sector has embraced the potential of pattern-matching at several levels. While conventional computational tools such as key-framing have been used in animation for decades, Sony applied for six patents around machine-learning tools used for the animation-process of the film *Into The Spiderverse* (Summers, 2019; Wired, 2019). In this case, animators drew and indicated examples of stroke-styles, weights, and techniques they preferred; the tools applied pattern-matching machine-learning to derive and understanding the features in question, and were able to generate suggestions for production that resulted in a massive savings of time and labour.

Where animation and digital effects may be the most visible aspect of technological change in the film industry, perhaps more significant efforts are applied to artificial intelligence techniques for consumer prediction, content analysis, and marketing. One of the more end-user-visible applications involves recommendation engines which suggest movies and television to viewers on sites like Netflix or YouTube (Hong et al, 2016) or songs and albums on sites like Spotify (Jacobson, 2016) and Amazon Prime Music (Nassif et al, 2018). Traditional film marketing might try to understand their audience using segmentation based on age-ranges, sex, or location (Schewe et al 2000). Compare this to the Video Genome Project: at the time of its acquisition by streaming service Hulu, it defined literally hundreds of elements that can be used to categorize a film or television show with a great deal of specificity (Video Genome Project 2016). The details of corporate AI experimentation are often hidden from the public- or peer-reviewed world, with evidence leaking from rare publications or, more recently, government testimony, as when Netflix released a statement to the UK Parliament that its algorithms categorize users based on how much of a film they screen: starters (less than 2 minutes), watchers (70% of run-time) and completers (90% of run-time) (Public service broadcasting in the age of video on demand inquiry, 2019).

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