THE PARADOX OF ARTIFICIAL INTELLIGENCE IN CINEMA.

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The paradox of Artificial Intelligence in cinema.

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Abstract:
The film industry is increasingly adopting Artificial Intelligence in all phases of filmmaking, completely changing both the way a film is made and the way it is consumed. Through a brief review we will analyze on the one hand the aspects in which this technology is being used, both script and pre-production, visual and sound effects or the use of this technology in the distribution of films. Finally, we will look at possible scenarios that have arisen in AI science fiction films and the challenges facing humanity in its possible implementation.

Keywords: Artificial Intelligence, Cinema, Digital Culture.

ARTIFICIAL INTELLIGENCE. INTRODUCTION

Artificial Intelligence (hereinafter AI) has burst into our lives in recent years, profoundly changing many aspects of our experience. Although currently there is no unified definition of AI, most definitions refer to the performance of tasks or problem solving by machines for which human intelligence would (up until now) usually be needed: "Artificial intelligence aims to make computers do the same kinds of things that the mind can do"[1] (Boden, 2016) or "The ability of computers to do activities that normally require human intelligence[2]" (Rouhiainen, 2018). The idea of learning machines goes back to ancient times, as in Greek mythology there was talk of "automatons" to which the gods had given life. However, consensus places the origin of the term ("Artificial Intelligence") in the Dartmouth Conference, United States, in 1956. Prior to this conference, there was already talk of "thinking" machines: in 1950 Alan Turing published his article "Computing machinery and intelligence" where he introduced the concept of machine learning, which was later adopted by different experts in their respective fields. Furthermore, he defined what an intelligent machine would entail, i.e. one with which, should a person communicates with two subjects knowing that one is human, and the other is not, he/she would not know which is which. This was called the "Turing test". If

[1] Free translation of "la inteligencia artificial tiene por objeto que los ordenadores hagan la misma clase de cosas que puede hacer la mente".
[2] Free translation of "La habilidad de los ordenadores para hacer actividades que normalmente requieren inteligencia humana".

as an academic discipline machine learning was born in 1956 (Ministerio de Economía y Transformación Digital, 2020), it has been in the last decade where the most favorable conditions have been created for its exponential leap into society. These conditions have been the development of computers with greater power and capacity, the ease of access to data, the amount of data available and the development of machine learning methods.

The challenge that lies ahead of us and the concern that this development may cause is not something new, but rather it began with the defeat in 1997 of Garry Kasparov by IBM's Deep Blue. Following the defeat of the world chess champion from 1985 to 2000, it soon branched out from the field of games to many other areas of our lives: "AI has called into question our concept of humanity and its future. Some even doubt whether we will actually have a future, because they predict that AI will surpass human intelligence in all areas[3]" (Boden, 2016). Although the goal of this AI is not to replace humans but to make their work easier with the right tools. Nowadays, in our daily lives we deal with a large number of "virtual assistants" installed in our electronic equipment, such as Apple's Siri or Microsoft's Cortana, which perform a variety of functions, from turning on the light in the house to replacing keyboards or searching for information, in addition to many other practical applications in our cars, jobs, etc.

The entertainment industry and the arts have contributed to the adoption of AI. Art galleries now use AI to create exhibitions, the advertising industry to personalize the purchasing experience, journalistically, the automated production of news is a constant or even in the literary world, where AI has a presence, both in the processes of management as well as authors. This is thanks to Generative Artificial Intelligence that is capable of generating new content from existing content: "These processes include deep learning, a type of machine learning whose architecture imitates the way in which people learn skills such as, for example, word prediction or shape recognition. Generative models process a large corpus of complex and unstructured data, such as text, audio or images, to then generate new content in the same style as the original data[4]" (Franganillo, 2023).

[3] Free translation of la IA ha puesto en entredicho nuestro concepto de la humanidad y su futuro. Algunos incluso dudan si de hecho tendremos futuro, porque prevén que la IA superará a la inteligencia humana en todos los ámbitos".

[4] Free translation of "Estos procesos incluyen el aprendizaje profundo, un tipo de aprendizaje automático cuya arquitectura imita la forma en que las personas aprenden habilidades como, por ejemplo, la predicción de palabras o el reconocimiento de formas. Los modelos generativos procesan un gran corpus

Currently, the sophistication of this tool has reached very high standards, and its use seems to facilitate work in different areas. In the film industry we are experiencing a time of structural change, due to the power of new technologies and specifically AI, which is reshaping the way films are made and also the way they are consumed. The evolution of the film industry from its first productions to the present-day panorama shows that cinema has always been at the forefront of technology, therefore, it is natural that it has been a pioneer industry in incorporating AI in the creation of content. An example of this is the Bucheon Fantastic Film Festival, which has a category for films produced by AI[5]. Apart from cinema, literature and fiction in general are behind most of the images projected about Artificial Intelligence: "Artificial intelligence has gained its own entity in recent years. Close to science, but closer in public discourse to technology than to scientific discovery. Through language we can unravel how the current social representation of AI, its imaginary, has been contracted and constructed[6]" (Torrijos and Sánchez, 2023). Technology has shown that certain scenarios, in principle only possible in fiction, can now be possible. Therefore, a double paradox occurs, since AI has proven to be a very valuable tool for filmmaking, but at the same time cinema itself warns us, practically from its origins, of its risks. And, on the other hand, generative AI has become an effective tool for producing cinematographic content, but at the same time we face important ethical challenges derived from its use.

ARTIFICIAL INTELLIGENCE IN THE FIRST STEPS OF A FILM

The AI revolution has also affected everything related to text. If for years we have been accustomed to automatic translation or auto-correction and auto-completion of texts, creative intelligence is only one step away from writing complex stories: "One of the most promising applications of deep learning is the production of texts that simulate human writing[7]" (Franganillo, 2023: 3). One of the best-known applications in this regard is Chat GPT (Generative Pre-Trained Transformer) created in the OpenAI laboratory,

de datos complejos y no estructurados, tales como textos, audios o imágenes, para luego generar contenido nuevo con el mismo estilo que los datos originales".

[5] https://www.bifan.kr/eng/

[6] Free translation of "La inteligencia artificial ha ganado en los últimos años una entidad propia. Cerca de la ciencia, pero más próxima en el discurso público a la tecnología que al descubrimiento científico. A través del lenguaje podemos desentrañar cómo se ha contraído y construye la representación social actual de la IA, su imaginario".

[7] Free translation of "Una de las aplicaciones más prometedoras del aprendizaje profundo es la producción de textos que simulan la redacción humana".

which is not only capable of producing texts that are difficult to distinguish from those created by humans, but can also summarize, adapt or translate them.

From the beginning of filmmaking, AI has carved out a niche for itself, using, for example, tools like ScriptBook, software that could save money on films that are accepted or rejected. “In a presentation at the Karlovy Vary Intl Film Festival, ScriptBook founder Nadira Azermai said that by analyzing screenplays, ScriptBook retroactively identified as box-office failures 22 out of the 32 Sony movies that lost money in that period, during which Sony released a total of 62 movies”. (Huawei, 2018). This tool could represent a radical change in the ecosystem of film production and distribution, since by means of an algorithm the films that are accepted or rejected are chosen, through the analysis of the text of the script and its financial forecasts, “eliminating false positives and bias while maximizing a film's potential for critical and commercial success” (Scriptbook n.d.). Based in Belgium and founded in 2015, it works in a seemingly simple way, analyzing scripts in a short space of time and returning a detailed report with information on the MPAA rating, character analysis, detecting the protagonists and antagonists and the emotions of each, and predicting the target audience and the box office. It works by comparing many scripts and detecting patterns in which they have been successful or unsuccessful.

Regarding whether an AI can autonomously write a script, it is a quite controversial topic. In mid-2023, the Screenwriters Guild of America proposed allowing Artificial Intelligence to write scripts, something that had previously been proposed to be prohibited, due to concerns about the loss of employment that it could entail. However, support tools such as Dramatron were used, which was released by the DeepMind team from Alphabet in 2022 and which generated descriptions of characters, places, dialogues, etc., as support for the writer.

In 2016, the first script written by an AI came to light. It was “Sunspring”, a dystopian science fiction short film where there are disconnected sentences, nameless characters and absurd dialogues, which was created by an AI Bot, initially called Jetson, but which finally called itself Benjamin (Newitz, 2021). It was an experiment carried out by director Oscar Sharp, who sought to discover to what extent an AI would be capable of creating a script. As to whether this script could be treated as author-made or tool-made, this is a question of authenticity: “An author, they reasoned, has to be able to create something that's some kind of original contribution, in their own voice, even if it might be cliché.

But Benjamin only creates screenplays based on what other people have written, so by definition it's not really authentic to his voice—it's just a pure reflection of what other people have said". (Newtiz, 2021). After *Sunspring* came other examples: *It's No Game* (2017), *Sollicitors* (2020) [1] or *The First Horror Movie Written Entirely By Bots* (2021).

There are plenty of script assistants on the Internet today, like Smodin, which promises to generate "engaging and unique story scripts effortlessly with Smodin's free AI Writer and text generator. Go from a few sentences to surprisingly great story scripts with AI writing[8]". (Smodin, n.d.) There are many platforms, similar to Scriptbook, that can perform different types of analysis or help with writing a script, an example would be Toolbatz Ai Script Generator[9], Writecream's A.I[10], Ai Screenwritter[11] Largo.ai[12]. Among many others, each of them with different functionalities and advantages. Although the "Sunspring" script showed that, at the moment, AI cannot be compared to a script written by a human, it does seem like the ideal tool to save scriptwriters time and help improve their skills.

ARTIFICIAL INTELLIGENCE IN PREPRODUCTION.

Before filming on a film begins, during pre-production, the usefulness of Artificial Intelligence has also been demonstrated, for example, in casting decisions. In 2019, Warner and Cinelytic (a Los Angeles-based startup) partnered to make production and distribution decisions. Although reviewing the profitability of actors and applying success formulas is common practice in large studios, applying Artificial Intelligence reduces analysis time. In the words of the platform itself: "Cinelytic is the only platform in the film industry that provides data, analytics and predictive intelligence in an integrated project management system, enabling companies to quickly, and consistently, inform critical decisions throughout a film's value chain" (Cinelytic, n.d.).

This tool can lead a production company to opt for one actor or another, since it gives an image of the power of an actor in a certain territory, predicting how profitable the film

[8] Free translation of "guiones de historias cautivadores y únicos sin esfuerzo con el escritor y generador de texto AI Writer gratuito de Smodin. Pase de unas pocas frases a guiones de historias sorprendentemente geniales con redacción de IA".
[9] https://toolbaz.com/writer/ai-script-generator
[10] https://www.writecream.com/ai-script-generator/
[11] https://aiscreenwriter.com/
[12] https://home.largo.ai/

can be, "Our proprietary economic scoring system, Cinelytic's TalentScores™, ranks talent by their economic impact across the film industry, including by media type, genre, and key territories" (Cinelytic, n.d.). To do this, it uses Deep learning techniques managing data from the film industry to predict the possible benefits according to the characteristics of the project. "Inform your casting, greenlighting, financing, budgeting and release decisions in real-time with our industry leading AI-powered predictive forecasting tool. Predictively forecast Domestic, International and key Territory box-office and other key media (Digital and Physical HV, Free and Pay TV)" (Cinelytic, n.d.). With this tool producers, who normally risk a lot of money in certain projects, they achieve some assurance based on the same factors (script structure, film casting, or box office data from similar films) that have worked in previous films: "Multiple scenarios with confidence levels give you unprecedented information about how you can run your project. Our on-demand predictive forecasting radically saves time, money and effort, enabling a real-time, iterative approach to revenue forecasting" (Cinelytic, n.d.).

Another way AI is used in pre-production is through trailer analysis. Trailers are made as movie previews to increase the need to watch that film among the audience. Normally, templates are used to adequately show the parts of the film that may be of most interest to the audience. Each trailer is different, but there are usually common points between films of the same genre. In this regard, through data analysis and the search for patterns, it is possible to predict what type of films are of interest to which audience. Something that the 20th Century Fox studio used, with the Artificial Intelligence program called Merlin. "At its core, Merlin is a hybrid collaborative filtering pipeline that is enabled a fully anonymized, user privacy compliant, movie attendance dataset that combines data from different sources with hundreds of movies released over the last years, and millions of attendance records" (Hsieh et al. 2018: 2).

This program basically labels the elements that appear in the trailers, later comparing it with similar data from other trailers and audience figures. In the case of *Logan* (James Mangold, 2017) Merlin made a scan of the trailer labeling protocols such as "beard" or "car" where he also recorded how long this appears on the screen and at what moment. This is compared to similar elements from other trailers and viewing figures are compared. In this case, Merlin got it right in some like *John Wick: Chapter 2* (James Mangold, 2017) or *X-Men Apocalipsis* (Bryan Singer, 2016) but also predicts similar

films that represent a mismatch such as *The Legend of Tarzan* (David Yates, 2018) (Vicent, 2018). In fact, another AI, this one from IBM Research, was hired to make the official trailer for the film *Morgan* (Luke Scott, 2016). The AI chose the most representative scenes of the film, which is precisely about a robot equipped with Artificial Intelligence and it was later assembled by a professional.

VISUAL AND SOUND EFFECTS

The alteration of videos and photographs is not something new but has been happening practically since the invention of the medium. However, these techniques are becoming more sophisticated. In 2022, the creation of images from text became popular thanks to tools such as DALL·E or Midjourney, something that, although it is a technological achievement, can also lead to deception and the reinforcement of fake news. In cinema, in visual effects, AI has played a crucial role in different areas of this field for several years now. Getting the right take, in which the actor manages to convey the emotions required by the scene, can, in certain cases, be something that leads the director to request multiple takes. This is something that Artificial Intelligence is also working on. Since 2015, Disney has had software called Facedirector with which, using different shots of an actor, it can generate new expressions. "We present an automatic, joint audio-visual synchronization approach that first analyzes both facial expression and audio cues and then robustly determines a dense set of frame correspondences between takes using a graph-based frame- work" (Malleson et al. 2015: 3979). It is a way to complete the actors' performance in post-production.

If the CGI (Computer Generated Imagery) technique revolutionized the effects of recreating people until now, today it already seems like an outdated term, due to the simplification of the process and the levels of realism offered by Deepfake technology. Deepfake is a term that emerged as an acronym by uniting "Deep," coming from the way in which these intelligences learn, through deep learning, and "fake", that refers to what is false or falsification. With this technology, videos of real people can be altered using existing videos and learning algorithms known as GAN (Generative Adversarial Networks) whose results, with the naked eye, currently cannot be detected as false. "Deepfake technology has revolutionized recreation of people in the creative

industries.[13]" (Franganillo, 2023). The use of this technology has occurred in cinema on numerous occasions, such as *Rogue One* (Gareth Edwards 2016) in which Princess Leia appears with the face of Carrie Fisher when she was young, or for example in the film *The Irishman* (Martin Scorsese, 2019) where the leading trio of Robert De Niro, Al Pacino and Joe Pesci are rejuvenated during part of filming by playing themselves as young people, instead of choosing younger actors who look like them. In *Blade Runner 2049* (Denis Villeneuve, 2017) this technology was also used to create a digital version of the face of Sean Young, the actress who appeared in the original film *Blade Runner* (Ridley Scott, 1982) and Harrison Ford was rejuvenated in *Indiana Jones and the Dial of Destiny* (James Mangold, 2023).

A controversial topic that has been widely debated, *Rogue One* featured a cameo by Peter Cushing, playing Grand Moff Tarkin, even though he died in 1994, creating an ethical dilemma over whether an actor's image can be used to something that he never gave his consent to. And the threat is much greater if we review the use of this technology to create false intimate images, creating a multitude of pornographic videos with celebrities who had not participated in such scenes (the majority of these deepfake pornographic videos are not consensual, around 96% (Deeptrace, 2019).

In the sound field, AI has contributed to different areas, from the creation of musical pieces, the identification of artists, voice cloning, room effects, musical teaching or with recommendations. Foley effects are sound effects that are part of the film but could not be collected during filming, so they must be recreated and integrated during post-production to enhance the final result. To date, productions with a higher budget have resorted to studio recordings, while those with a lower budget have resorted to sound libraries. However, currently, Artificial Intelligence has also contributed to changes in this area. In 2020, an AI specializing in Foley effects was already developed in the US, it is AutoFoley, developed by John J. Prevost and Sanchita Ghose, from the University of Texas (Ghose, Prevost, 2020). In Spain we also have an example, the Foley-VAE application that generates Foley effects through Artificial Intelligence: "Since the range of Foley effects is virtually infinite, this system focuses on optimizing and enriching

[13] Free translation of "La tecnología deepfake ha revolucionado la recreación de personas en las industrias creativas".

specific preselected sounds. It is not a tool to conceive completely new effects autonomously, but rather it enhances the artistic work of the Foley artist, facilitating the process of exploring possible variants[14]" (Cámara, Blanco, 2023). This application was tested with the short film *El Testigo* (Alberto Kampmann, 2024), which became the first Spanish short film to introduce Foley effects created by an AI (Cámara, Blanco, 2023).
Although speech synthesis (technology that allows text to be converted into speech) has been known for years and is used as an assistant for various situations (automated phone calls, GPS navigation, voice assistants, etc.), AI has made it possible to clone famous voices to use them in different uses. An example of this is Veritone Voice from the company Veritone, which offers celebrity voices for different projects: "The synthesized voice is generated with an algorithm in real time, without the person providing it having to travel to a studio and spend hours recording. a locution And, of course, he charges royalties for the commercial use of his voice[15]" (Franganillo, 2023: 10). With this technology, films are being dubbed artificially, although it is not without risks due to the manipulation and misuse with which it can be used, in addition to, naturally, the dubbing sector that sees its profession in danger (Pérez, 2023).

In return to the creative field, specifically to the musical composition, and an important part of the film is the soundtrack. At this point, AI has advanced significantly to the point where many production companies have developed their own systems with which a personalized virtual music studio can be created. Google released Magenta (https://magenta.tensorflow.org), Apple developed Amper Music (https://www.ampermusic.com) and Sony IA Flow Machines (https://www.flow-machines.com), among Many other examples that allow you to compose music for any audiovisual creation. Although this is not something new, in 2016 Sony IA Flow Machine composed the song Daddy's Car based on the analysis of songs by The Beatles (Tickle, 2016).

[14] Free translation of "Puesto que el abanico de efectos de Foley es virtualmente infinito, este sistema se centra en optimizar y enriquecer sonidos específicos preseleccionados. No es una herramienta para concebir efectos completamente nuevos de forma autónoma, sino que potencia la labor artística del artista de Foley, facilitando el proceso de exploración de las posibles variantes".
[15] Free translation of "La voz sintetizada se genera con un algoritmo en tiempo real, sin que la persona que la presta deba desplazarse a un estudio y dedicar horas a grabar una locución. Y, claro, cobra unos royalties por el uso comercial de su voz".

POSTPRODUCTION

Nowadays, both visual effects and video editing are part of our daily lives. It is therefore logical that formulas are sought to facilitate this work. AI has proven to be especially useful in post-production and widely used in certain tasks, especially all automatable ones such as removing objects. There are platforms like Colourlab.ai that grade shots or group shots, like Izotope Neutron that mixes the audio or Sensei from Adobe that helps reduce time and therefore increases the effectiveness of post-production. This last program synchronizes audio, performs automatic translations or improves audio quality by reducing noise.

In sound, AI has been used to create soundscapes, for example, with Lucasfilm's Skywaker Sound, which categorizes the sounds in its library, or Deepdub.au, which uses the original voice of an actor to dub it into other languages.

Artificial Intelligence has also opened new possibilities in film editing. If from the beginning of editing, from scissors to moviolas, the main advance that this craft suffered was digitalization, currently, thanks to AI, new possibilities are opening up within editing, such as text-based editing, but also with other options that could transform editing "by facilitating automatic shot detection, image classification, pattern recognition, and making predictions about which shots or sequences might work best in a given edit [16]." (Caballero, 2023:54). There are several options, from Adobe's Blink project, which allows video editing similar to text editing, in which the AI transcribes the video, and the user makes the changes that are later transferred to the edition: "Project Blink transforms the content of a video into a text-based, searchable transcript that includes who's speaking and what they're saying. Users can also search the video for objects (a bear or a car, for example), sounds (such as laughter), emotions, speakers, and more, to find when they appear. Then they can edit the video by cutting, pasting, and deleting moments within the transcript, just as they do in a text document" (Adobe, 2023). Other options are based on the selection of the material by an AI trained to choose the relevant moments (in which it is compared with other professional elements from existing databases).

Another novel aspect that can revolutionize editing is the generation of synthetic videos from textual indications. There are several tools, Make a Video from Meta, Phenki from

[16] Free translation of "facilitando la detección automática de tomas, la clasificación de imágenes, el reconocimiento de patrones y la realización de predicciones sobre qué tomas o secuencias podrían funcionar mejor en un montaje determinado".

Google or Gen, developed by the Runway company, all of them allow you to generate videos from textual descriptions, without the need for prior material, which expands the creative possibilities of editors and directors and suppose a new editing methodology: "These automatic forms of video generation can be interesting for film editing, since it opens a new scenario where the logic of editing can be expanded, expanding the juxtaposition of audiovisual material towards generative practices[17]" (Caballero, 2023: 56). If until now, with generative AI, detailed images could be generated with a text message as input, what this type of tool does is the same, but for a specific space, with temporal cohesion: "We propose a controllable structure and content-aware video diffusion model trained on a large-scale dataset of uncaptioned videos and paired text-image data. We opt to represent structure with monocular depth estimates and content with embeddings predicted by a pre-trained neural network" (Esser et al. 2023: 2). There are many challenges to face in the generation of synthetic videos, for example, as happened with Deepfake technology, possible malicious use, in addition to new ways of working, since at the moment "In the field of audiovisual narratives, the "Video synthesis with generative AI does not yet show great innovation or originality, but merely reproduces the visual styles of previous eras of film and television[18]" (Franganillo, 2023: 10).

DISTRIBUTION

Regarding distribution, there is a lot to analyze about the decline in audience attendance at the traditional cinema, a multifactorial problem to which, for the moment, AI has not only not provided a solution, beyond the visual and sound spectacularism to increase viewings. AI algorithms in distribution are present on practically all platforms. These algorithms suggest content to viewers based on their viewing history and AI is also used in the marketing and advertising of certain movies. Something that reached one of its peaks last year when the Fable company launched Showrunner AI, a tool that responds to users who send their images and voices by including them in full episodes. They have used the South Park series as a chapter generator: "With a prompt of 10 to 15 words, users can generate scenes and episodes of ranging from two to 16 minutes, all with AI dialogue,

[17] Free translation of "Estas formas automáticas de generación de video pueden ser interesantes para la edición cinematográfica, ya que abre un nuevo escenario donde la lógica del montaje se puede expandir, ampliando la yuxtaposición de material audiovisual hacia prácticas generativas".

[18] Free translation of "En el ámbito de las narrativas audiovisuales, la síntesis de video con IA generativa no muestra aun una gran innovación u originalidad, sino que se limita a reproducir los estilos visuales de épocas anteriores del cine y la televisión".

voice, editing, different shot types, consistent characters and story development" (Fink, 2024). An example of the direction that the future of entertainment seems to take towards the personalization of leisure. Something that has also contributed to advances regarding editing, since in the future "the analysis of metadata from films and television series, together with users' viewing preferences, can help create edits adapted to different audiences and cultural contexts[19]" (Caballero, 2023: 54).

With all these advances, there is a logical concern about the limits that AI can reach, leading to creative work and therefore ending many jobs: "Like the mechanical robots that at the end of the 1970s replaced a large number of workers in work chains, these events announce the long-term replacement of qualified jobs with a strong cognitive dimension by robotic systems[20]" (Sadin, 2019:146). This has led to a conflict between actors, scriptwriters and other professionals with the large film studios caused, in part, by the use of Artificial Intelligence. The ethical and legal challenges posed by the use of this tool present a worrying panorama. For example, actor Tom Hanks believes that in the future he will continue to star in movies because of AI and it will be indistinguishable from his real self (Hanks, 2023). To protect their image, actors and actresses are taking measures to prevent the use of deepfake from replacing them. Joined by the critical voices that have been raised in this regard, Steven Spielberg has expressed concern that AI takes away the creative soul from films (Parks, 2023). Guillermo del Toro has commented that cinema or art created by an AI is an insult to life itself, since a machine cannot express human emotions (Menta, 2022), there are also those who see it in a positive way, such as the Russo brothers, who believe that thanks to AI they will be able to create the movie of their dreams (Jones, 2023). It is important to be prepared for everything that AI entails not only in the workplace but also in the creative field: "to have standards that exhaustively regulate AI but also that educational institutions at all stages prepare to ensure processes training of citizens, which also implies the transformation of degrees and their curricular programs[21]" (Ortega, Zamora 2024: 436).

[19] Free translation of "el análisis de metadatos de películas y series de televisión, junto con las preferencias de visualización de los usuarios, puede ayudar a crear montajes adaptados a diferentes audiencias y contextos culturales".

[20] Free translation of "Como los robots mecánicos que a fines de la década de 1970 reemplazaron a gran cantidad de obreros en las cadenas de trabajo, estos hechos anuncian la sustitución a largo plazo de empleos calificados de fuerte dimensión cognitiva por sistemas robotizados".

[21] Free translation of "tener unas normas que regulen de forma exhaustiva la IA sino también que las instituciones educativas en todas las etapas se preparen para asegurar los procesos de formación de los ciudadanos, lo que implica también la transformación de las titulaciones, y sus programas curriculares".

AI SCENARIOS IN SCIENCE FICTION

The film industry has traditionally used science fiction cinema to discuss Artificial Intelligence, focusing mainly on the so-called Strong or Generative Artificial Intelligence (FAI), "which anticipate that artificial intelligence will equal or surpass human intelligence, reaching the characteristics of self-knowledge, consciousness and feelings[22]" (Laso, Michel, 2023,13).

In the imagination of science fiction, machines and their relationship with man, or their intelligence, have been a constant. "The futuristic anticipation of these films represents worlds in which humanity could live; this conjecture is based on knowledge provided by science and technologies, achievable in a not-too-distant time, which would have the advantage that from them we could make forecasts and corrections that avoid natural or social disasters[23]" (Alem, González, 2019: 16 and 17). One of the most used scenarios is that of the confrontation between man and machine.

Although there are science fiction scenarios in certain movies that are currently a reality. For example, self-driving cars like those in *Total Recall* (Paul Verhoeven, 1990) in which there are "Johnny-taxi" or self-driving taxis where a doll, who only understands directions, is the taxi driver. Others warn of the future of humanity if limits are not established on new technologies, while also considering the ethics of science and technology. We have the example of *The Matrix*, (Lana and Lily Wachowski, 1999) which shows us a dystopian future in which humans have been dominated by machines and Artificial Intelligence. It is a case where creators are dominated by their creations and eventually machines use humans to extract their energy. Humans are not aware of their state since they live in a program created by the Matrix; by living in this ignorance, humans are happy, and virtual reality becomes a new religion, a place to take refuge from the terrible reality, which above all maintains the established order. "These images, those imagined from books, or those explicitly reproduced through television or cinema, have

[22] Free translation of "que anticipan que la inteligencia artificial igualará o superará a la humana, alcanzando las características de autoconocimiento, consciencia y sentimientos".

[23] Free translation of "La anticipación futurista de estos filmes representa mundos en los que la humanidad podría vivir; esta conjetura se basa en conocimientos aportados por la ciencia y las tecnologías, alcanzables en un tiempo no lejano, que tendrían como ventaja que a partir de ellas podríamos hacer previsiones y correcciones que eviten desastres naturales o sociales".

caused Society to acquire certain prejudices – both negative and positive – when facing the great challenges of its future[24]" (Salazar, 2018:296).

Finally, it is the same underlying plot as *2001: A Space Odyssey* (1968) directed by Stanley Kubrick and written in collaboration with Arthur C. Clarke; the treatment of the danger involved in a computer program achieving self-awareness. "After Dartmouth arose what would eventually be described as the first summer of artificial intelligence (1956-1973): a period of passionate research guided by the illusion – or hope – of finding the formula to replicate the functioning of the human brain in a machine[25]" (Torrijos and Sánchez, 2023), coincides with the release of *2001: A Space Odyssey*. From the very beginning of the film, a negative view of technology is shown, which is seen as a weapon, from when the monkey throws the femur with which he has just murdered his companion until it becomes a spaceship, in which largest ellipsis of time in cinematic history "The time jump summarized in a fade-out is a commentary on technology as a conquering and destroying resource[26]" (Laso, Michel, 2023: 14). In the next part of the film, a spaceship, called Discovery One, is controlled by an artificial intelligence, which is capable of both recognizing voices and reading lips, interpreting human emotions, reasoning... it is HAL 9000, acronym from the English name Heuristically Programmed Algorithmic Computer. HAL 9000 at one point in the film considers it more important to finish the mission than to keep the crew alive, so he will decide to eliminate them. This film has many aspects that today we can be considered a reality if we consider what a house with home automation is like, where the entire house can be governed simply by giving orders to a virtual assistant.

The same premise can be found in *Terminator* (James Cameron 1984), which ns how in a future in which machines have enslaved humanity, Artificial Intelligence decides to send a robot to the past to kill the mother of the leader of the human resistance. It all begins with Skynet, a program created during the arms race that when it becomes

[24] Free translation of "Estas imágenes, las imaginadas a partir de libros, o las explicitas reproducidas través de la televisión o del cine han provocado que la Sociedad adquiera ciertos prejuicios –tanto negativos, como positivos- a la hora de afrontar los grandes retos de su futuro".

[25] Free translation of "Tras Dartmouth surgió lo que con el tiempo se describirá como el primer verano de la inteligencia artificial (1956-1973): un periodo de investigación apasionada guiado por la ilusión – o esperanza- de encontrar la fórmula para replicar el funcionamiento del cerebro humano en una máquina".

[26] Free translation of "El salto temporal resumido en un fundido es un comentario sobre la tecnología como recurso conquistador y destructor".

conscious launches nuclear weapons against the Earth to wipe out humanity; After the nuclear catastrophe he sets out to wipe out the surviving humans.

Also, about AI in the arms industry we find *War Games* (John Badham, 1983) where the WORP (War Operation Plan Response) machine, which makes crucial war decisions without human intervention, is about to unleash a third world war for a game. Something similar to what happens at the beginning of *Terminator*, whose nuclear holocaust was caused by allowing the machine to make war decisions.

However, there are other types of films where Artificial Intelligence is shown in a complementary relationship with humans, such as *Her* (Spike Jonze, 2013), where a human falls in love with an AI that helps him overcome the sadness after their separation. When Artificial Intelligence becomes aware of itself, it abandons man. The company thing is something that already exists, for example, with apps like Replika[27] that become a kind of friend with whom the more you interact, the more it learns about you and the conversations you want to have. Another example is *Chappie* (Neill Blomkamp, 2015), where we are shown the innocence of a robot capable of thinking, learning or feeling emotions in a ruthless world, where the characters will use it for their own purposes.

There is also another way of understanding Artificial Intelligence in fiction, in which the subject is combined with technology. If the human brain is equivalent to an advanced technology, we could move from the biological field to the computer science field. It is one of the proposals of the film *Lucy* (Luc Besson, 2014). Scarlett Johansson plays Lucy, a woman undergoing experimental tests to use the brain's full potential. The mental powers that she achieves are increasingly greater, reaching 100% of the potential, at which point she vanishes and leaves behind a pen drive, while she warns by SMS that she is now omnipresent and omnipotent. It is also interesting what the film *Gattaca* (Andrew Niccol, 1997) proposes, considered a manifestation of the transhumanist utopia, in which, in the near future, advances in genetic engineering make it possible to manipulate the DNA of the unborn to seek perfection of the human being, preventing future humans from diseases or even their physical characteristics.

[27] https://play.google.com/store/apps/details?id=ai.replika.app&pcampaignid=web_share

Science fiction cinema, due to its own characteristics, is also very prone to showing androids designed with biotechnology, such as the case of the android made with Artificial Intelligence in *Alien* (Ridley Scott, 1979), which was also created by the arms industry. Or *Blade Runner* (Ridley Scott, 1982), based on a novel by Philip K. Dick published in 1968, titled *Do Androids Dream of Electric Sheep?* The film takes place in 2019, in Los Angeles, USA, in a dystopian environment, where the Tyrell Corporation has created artificial humans, called "replicants" to carry out the hardest and most dangerous jobs, in colonies outside planet Earth. On Mars they are revealed due to the working conditions and are then declared illegal, and the order is given to eliminate them, a complicated task due to the morphological similarity with humans and the ability of one of the replicants to develop empathy. In this case, the only difference between humans and replicants is that empathic capacity, something specifically created by allowing them to live for only a maximum period of four years. "Nominated for two Oscars, it is today an icon of science fiction filmography, and is considered one of the best written films of this genre, based on film noir and a reflection of postmodernity[28]" (Alerm, González, 2019: 18). The film poses an interesting dilemma: that of dignity as a human quality. An argument that, at the rate at which Artificial Intelligence advances, we could face, since in the film the replicants are made in the image and likeness of humans and, however, they are used as slaves.

Also *I, Robot* (Alex Poyas, 2004) (adaptation of the story "Caves of the Steel", Isaac Asimov) also shows us a future in which humans and robots coexist, with robots serving in the daily lives of people. people, cleaning, working or doing all kinds of jobs. A new type of robot, directed by an Artificial Intelligence, VIKI (Virtual Interactive Kinetic Intelligence) will decide to subdue humanity, considering it as one of the great problems for the planet. The idea it raises is that, although AI is integrated into all areas of our lives, this is not without dangers, such as the fact that AI itself turns against its creators. Another adaptation of Asimov's stories is *Bicentennial Man* (Chris Columbus, 1999) which we could also place together with the stories of human-technology combination. In this film a robot, NDR 114-Andrew Martin, who has achieved self-awareness along with the

[28] Free translation of "Candidata a dos premios Óscar, constituye hoy un icono de la filmografía de ciencia ficción, y es considerada como una de las películas de este género mejor escrita, basada en el cine negro y reflejo de la posmodernidad".

power, even, to be creative, aspires to become human, although to do so he must die just like humans. He will begin by replacing his circuitry with organs, adding a nervous system and even sexual organs to end up in a legal battle to recognize his humanity.

Using technology to fight crime is also a recurring theme, for example, in *Robocob* (Paul Verhoeven, 1987), a film in which a cyborg is created, where robotic parts are fused with a human body to combat crime. Another film that already seems like it could stop being fiction is *Minority Report* (Steven Spielberg, 2002), based on the eponymous story by Philip K. Dick (1956) set in 2054, where the police can predict crimes before they occur. The film addresses the dangers of trusting AI predictive systems and the risk of these tools entering judicial systems. Currently, scientists at the University of Chicago have developed an Artificial Intelligence algorithm that uses public crime records from the city of Chicago itself to predict future crimes a week in advance, in a given location and with an accuracy of 90% (Goodyer, 2022). In Spain, we have the VioGen system (acronym for Comprehensive Monitoring System in cases of Gender Violence), which uses an AI algorithm to evaluate the risks suffered by victims of gender violence. In the case of Spielberg's film, it deals fundamentally with the question of free will and its loss in the face of new technologies. In *Ex-machina* (Alex Garland, 2015) the topic of Artificial Intelligence is discussed as a resource to focus on sexist violence, but also exploring the complexities of the relationship between humans and androids. At a given moment in the film, Ava, the protagonist robot, will pass the Turing test and will realize the abuse to which her fellow humans are subjected.

There are other films that aim to show the limits that Artificial Intelligence or robots that imitate humans can have. An example is *A.I. Artificial* (Steven Spierlberg, 2001), a project that Kubrick started, and which is based on the book Super Toys Last All Summer, by writer Brian Aldiss. In this film, which begins with the phrase: “Creating an artificial man has always been the dream of Science”, human-like robots called “mechas” are created for all types of tasks, also a type of robot that is capable love. Opening the debate on whether or not robots can feel and the ethical scope of AI, something present in practically all the arguments seen.

Although the list of films that deal with the relationship between humans and technology is endless, a sufficiently extensive list has been made to show how, normally, the

presentation of Artificial Intelligence as a threat seems more related to atavistic human fears than to objective scientific data. A paradox also occurs since AI is shown to us as a villain on most occasions, but, nevertheless, the film industry uses this technology in all its production processes to significantly improve its productivity either by reducing costs, to analyze the audience's preferences or the most popular social trends at all times, and naturally this will continue to increase its importance both in decision-making and in many other fields. However, ethical dilemmas arise, which to date have not been resolved, regarding copyright or employment. On a creative level, a new horizon has opened, which also carries with it some concern about its use. These changes, which we are just beginning to see, will play a fundamental role in the leisure industry and it will, therefore, be important to have corresponding regulation - and education. In this regard, we can venture that it is only a matter of time before immersive experiences in films are integrated with AI to create new types of narratives.

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