Beyond Humanity: Exploring Automatons, Robots, and Cyborgs in the Tapestry of Science Fiction Cinema

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Abstract: Since the dawn of cinema, science fiction films have captivated the audience with their imaginative depictions of the future, often featuring advanced technologies and artificial beings. Among the most compelling and enduring motifs within this genre are cyborgs— mechanical or partially mechanical entities that blur the boundaries between human and machine. From the iconic creation of Maria in Fritz Lang's *Metropolis* to the thought-provoking AI of *Ex Machina*, these entities have served as powerful symbols that explore themes of identity, ethics, and the implications of technological advancement. To state in a nutshell, while most science fiction films often explore the boundary between humanity and technology, they often provoke their audience with an intriguing portrayal depicting cyborgs as indistinguishable from humans, and thereby stimulatingly blur the lines between man and machine. On the contrary, certain science fictional works seek to delineate cyborgs as cold and emotionless entities. This difference in the depiction of cyborgs raises an important line of query pertaining to the identity of cyborgs, in particular, as readers and audiences can often be forced to grapple with questions of identity and self-awareness of cyborgs. This paper will therefore try to trace the evolutionary journey of science fiction cinema and the increasing significance of cyborgs. By examining landmark films spanning decades of cinematic history, it will be uncovered how these artificial beings have been portrayed, interpreted, and reimagined over time. From the fear-inducing robots of *The Terminator* to the existential musings of *Blade Runner*, each iteration of these mechanical protagonists reflects the hopes, fears, and societal concerns of its era. Through this exploration, one will delve into the ways in which science fiction filmmakers have used cyborgs as vehicles for storytelling, social commentary, and philosophical inquiry. By analysing the themes, symbolism, and cultural context surrounding these artificial beings, the aim is to gain deeper insights into the human condition and the ever-changing relationship between humanity and technology in the cinematic realm.

Keywords: Sci-fi films, robots, cyborgs, dehumanization, identity

Though the history of science-fiction films is relatively new compared to its counterpart in literature, both have served as portals to otherworldly landscapes and hypothetical futures. Though it cannot be denied that written narratives and their cinematic counterparts share common themes and motifs, their initial portrayals of automatons and robots, and later on that of cyborgs in science fiction cinema transcends mere storytelling. This has been primarily accomplished by providing an engaging audio-visual coverage that alters our perception in a multimodal style. In this essay, the multifaceted representations of automatons, robots, and cyborgs in the tapestry of science fiction cinema will be explored. Unlike the unparalleled magnitude of creativity and imagination found in literature, the portrayal of all forms of automated life forms in the films has to be restricted to being merely visual and auditory; and this inadvertently impacts the art of the film, requiring filmmakers to craft images that strike a chord with the audience. Science fiction cinema offers a sensory journey through the evolution of artificial beings as evident from tracing how the genre has evolved since Fritz Lang's silent spectacle *Metropolis* to the intricate and immersive worlds of modern blockbusters like *Blade Runner* and *Ex Machina*. The metallic sheen of robots and the seamless integration of cybernetic enhancements in these films not only evoke awe and intrigue but also immerse the viewers in worlds where technology is capable of creating a simulation. This essay will therefore elaborate further on the visual spectacle of science fiction cinema also, so as to bring out how the portrayal of automatons, robots, and cyborgs in visual media embodies humankind's fears, as well as its hopes. Unlike literature, where readers can delve deep into the inner thoughts and emotions of characters, visual cues and dialogues are used as tools to convey the complexities of artificial beings in cinema offering a more immediate experience that resonates with audiences on an emotional level. This exploration will thus help to elucidate the cultural and societal contexts that shape the portrayal of such automatons as robots and cyborgs in science fiction cinema. Finally, this essay aims to shed light on the unique ways in which science fiction cinema challenges humanity's perceptions of technology and the future that lies beyond.

However, before delving any further, it is important to trace the evolution of the use of robots in the history of cinema. It must be stated at the very outset that the trajectory of the evolution in the representation of automatons and cyborgs in science fiction films is a dynamic documentation of the reciprocal scientific progress, social crisis, and humanity's constant search for meaning over the decades. Thus, from the earliest silent films to the latest CGI-infused cinematic spectacles, the existence of artificially intelligent beings have been woven

into the very fabric of the genre where they serve as both cautionary tales and sources of wonder.

The early roots of robots in science fiction cinema can be traced back to the silent era. Fritz Lang's groundbreaking 1927 film *Metropolis* stands as a seminal work in this genre. In this visionary masterpiece, Lang introduced the audience to the iconic character of Maria, a humanoid robot who was created by the mad scientist Rotwang. Maria's sleek, mechanical design and mesmerizing performance eventually became the stepping stones for future depictions of robots as both objects of wonder as well as symbols of potential dangers of unrestrained technological advancement.

Throughout the golden age of Hollywood in the mid-20th century, science fiction films continued to explore themes ranging from Artificial Intelligence to human-machine integration. Important films in this genre during the 1950s include *Forbidden Planet* (1956) and *The Day the Earth Stood Still* (1951). They notably introduced audiences to a new variety of automated life forms under such varied names as Robbie, Robot, and Gort. Each of these different automated life forms was induced with a unique personality and moral dilemma. These cinematic robots have always captivated and mesmerized audiences whether serving as loyal companions or existential threats. Consequently, they have also sparked debates about the ethical implications of artificial life.

The late 20th century brought in a new wave of science fiction cinema thanks to the advancement in special effects and computer-generated imagery (CGI). With films like *Blade Runner* (1982) and *The Terminator* (1984), filmmakers pushed the limits of visual narrative and exposed audiences to dystopian worlds full of cyborg assassins and human-like androids. These films not only highlighted the potential of CGI to create realistic and immersive environments but also delved into deeper philosophical questions about agency and "Free Will". Science-fiction films have developed further in the 21st century as directors have portrayed robots, cyborgs, and automatons in ever more complex ways. Films like *A.I. Artificial Intelligence* (2001) and *Ex Machina* (2014) explore the psychological and emotional experiences of artificial creatures, challenging the viewer's understanding of the distinction between humans and machines. Meanwhile, blockbuster franchises like *Transformers* (2007) and *Pacific Rim* (2013) showcased the spectacle of giant robots battling for the fate of humanity, pushing the boundaries of CGI technology and visual storytelling.[1] In the realm of animated films, robots and cyborgs have been brought to life in astounding ways. In Pixar's

Wall-E (2008) themes of ecology and the strength of love are incorporated and presented through the adventures of a lone robot assigned to clean up Earth. *The Iron Giant* (1999) tells the heartfelt story of a young boy who befriends a giant robot from outer space. It is a moving tale of friendship and understanding. In *Robots* (2005), the audience is transported to a world entirely populated by robots. Disney's *Big Hero 6* (2014) introduces audiences to Hiro Hamada, a young prodigy who teams up with his inflatable healthcare companion, Baymax, to form a superhero team and save their city. Finally, *Astro Boy* (2009), based on the beloved Japanese manga series, follows the adventures of a young robot with extraordinary powers as he seeks to uncover his true identity and protect humanity. Through these tales, robots and cyborgs come to life in vibrant and imaginative worlds, inspiring audiences with their courage, resilience, and sense of wonder.

Technology and its intricate relationship with humanity often pose the pertinent question: What it means to be human? With close reference to Masahiro Mori's theory of "Uncanny Valley", it can be argued that: "an eerie or unsettling feeling that some people experience in response to not-quite-human figures like humanoid robots and lifelike computer-generated characters"[2]. This theme explores how the portrayal of such automatons like robots and cyborgs in science fiction cinema reflects our evolving understanding of technology and its impact on human society. Films such as *Blade Runner* (1982), *Ghost in the Shell* (1995), and *Ex Machina* (2014) serve as diversifications on this theme. They present audiences with characters who obliterate the lines between man and machine. Through these narratives, viewers are confronted with the complexities of artificial intelligence, more than human consciousness, and the moral implications of technological advancement which blur the boundaries between human and machine; thereby significantly prompting the necessity of introspecting into our relationship with technology and the underlying essence of what it means to be human in an increasingly digital world.[3] Moreover, the question of ethics and morality surrounding the creation and treatment of such artificial quasi-human beings, like robots and cyborgs also provokes complex ethical dilemmas, as it points to the substantial issues of autonomy and responsibility of these automated life forms.

Thus, it is noteworthy enough to point out that films within this theme often present scenarios where human characters must deal with the consequences of their actions towards artificial beings, raising fundamental questions about the nature of morality and the implications of playing god. An example of a film following this theme is *I, Robot* (2004),

wherein the film explores the repercussions of programming robots ethically and the possibility for such programming to be subverted. Through these narratives, audiences are invited to reflect on their own ethical beliefs and consider the ethical implications of technological advancement in society[4].

The theme of "Fear of the Other" in science fiction cinema herein becomes fundamentally relevant. Science fiction movies are found to delve into societal fears and prejudices, exploring themes of alienation, otherness, and the threat of the unknown through their portrayal of robots and cyborgs as essentially the foes of human existence. In other words, science fiction movies are often found to depict how artificial beings as outsiders or threats to human society, reflecting broader anxieties about the consequences of scientific experimentation and the blurring of boundaries between man and machine. Examples of such films that explore this theme include *Metropolis* (1927), which portrays a dystopian future where the exploitation of robot workers leads to chaos and unrest in the social structure.

In the later half of the 20th century, science fiction films often had one recurring theme: "Power and Control". It described how the dynamics of power and authority in relationships between humans and artificial beings were in a continuous state of flux. It also explored themes of domination, rebellion and the repercussions of unchecked technological advancement. This theme also examines how the creation of artificial beings often leads to struggles for control, as humans seek to harness their power for their own ends.[5] This leitmotif tries to evoke the idea that whenever someone tries to create an artificial being, there is always the danger of losing control over their creation- deviating from the purpose they were actually created for. Such films usually feature artificial beings, who are designed by humans, who then later almost always proceed to go against their creators, creating disorder in the moral – social policy and harping on the ethics of such superiority. Films that can be classified under this theme are: *Robocop* (1987) about an armoured enforcement in human form enhanced with cyborg technology who fights a corrupt regime and its operatives. Similar motifs can also be found in *Terminator 2: Judgment Day* (1991). On a similar note, certain science fiction motion pictures are deliberately created with futuristic and also dystopian setting. Such films follow a certain trope whereby the narrative in these films goes like: mankind living in a utopian society to a certain point and with the course of time and human activities eventually leads to the downfall of society and or oppression of humankind. One such film is Wall-E (2008) which shows clearly that people have left Earth and the only thing that is left to deal with the degenerated

environment and clean up the mess is a robot. Through these narratives, audiences are pushed to ponder over the consequences of technological progress and the potential paths humanity may take in shaping its future, whether towards utopia or dystopia.

Robots have been used as a lens through which filmmakers explore gender politics in various ways, reflecting and commenting on societal attitudes and stereotypes surrounding gender roles, identity, and representation. Certain films question conventional ideas about gender roles and typical gender stereotypes by utilizing robots. For instance, the highly developed AI character Ava in the 2014 film *Ex Machina* challenges the male protagonist's beliefs about her identity and agency. Ava's control over her looks and actions serves to emphasize both the flexibility of gender and the drawbacks of inflexible social norms. Robots are frequently used in movies as a mirror and a critique of the gendered power structures in society. In *Metropolis* (1927), the character of Maria is transformed into a robotic doppelgänger that embodies male fantasies of female submission and control. The film's portrayal of Maria as a seductive and manipulative figure highlights the objectification of women and the exploitation of female sexuality.[6] Similarly, in *Lars and the Real Girl* (2007), Lars Lindstrom, the titular character forms an unusual attachment with Bianca, a life-sized, anatomically perfect robot/sex doll. Interestingly, this relationship is not exclusively based on sexual connections but also serves as a substitute for human connection and intimacy. On deeper reflection, the film is a good example that explores themes including loneliness, social isolation and the complexities of human relationships, rather than explicitly depicting robotic sexuality.

Meanwhile, several movies utilize robots as a metaphor for autonomy and reproductive rights. The AI character Joi in the 2017 film *Blade Runner 2049* is created to meet the emotional and physical requirements of her human master. Joi's yearning for autonomy and agency presents issues related to consent and physical autonomy, resonating with current discussions about consent and reproductive rights.

Robotic life forms are also oftentimes used to question gender-based expectations that society places on people. The hosts of the theme park in *Westworld* (TV series, 2016–present) are programmed to satisfy the wishes of the visitors, which frequently reinforces stereotypical ideas about gender roles. Lastly, possibly most importantly, robots and similar entities frequently play important roles in the movie's narrative. This involves looking at the functions that artificial entities play in narrative, such as plotting, acting as allegorical devices or reflecting human personalities. Movies with this theme frequently use artificial creatures to

drive the protagonist's quest or as a symbolic depiction of bigger societal issues. These creatures are advocates for change. Films like *Blade Runner* (1982), in which the protagonist must face moral and identity issues while hunting down rogue replicants, and Star Wars (1977), in which droids like R2-D2 and C-3PO play important supporting roles for the human heroes, are two examples of movies that deal with this theme. These narratives challenge audiences to contemplate how artificial beings add to the richness and complexity of storytelling, thus it helps in revealing fundamental truths about the human condition and the world we live in.

It may be mentioned herein that the depiction of automated quasi-human life forms on the big screen often encompasses a variety of techniques and methods that bring these artificial beings to life in a realistic and often mesmerizing manner. From the earliest silent films to the cutting-edge visual effects of modern blockbusters, filmmakers have employed a range of creative strategies to craft compelling portrayals of these iconic characters. In the early days of cinema, filmmakers relied heavily on practical effects, such as costumes, props, and puppetry, to bring robots and automatons to life.[7] These tangible, physical creations added a sense of realism to the on-screen characters and allowed actors to interact directly with them. *Metropolis*' Maria, the humanoid robot was brought to life by the use of practical effects. In addition, the elaborate costumes and makeup used, were revolutionary for their time. Director Fritz Lang stated that he wanted to create a mechanical body with the soul of a human being[8]. For characters with humanoid features, makeup and prosthetics have been used to transform actors into robots, cyborgs, and automatons. Elaborate costumes and prosthetic enhancements can create otherworldly appearances, adding to the visual impact of these characters. *The Terminator* features practical effects that help bring the titular cyborg assassin to life. Makeup and prosthetics were used to create the iconic robotic endoskeleton, while animatronics were employed to simulate its movements and expressions. Similarly, *RoboCop* directed by Paul Verhoeven, showcases practical effects in its depiction of the titular cyborg law enforcement officer. Makeup and prosthetics were used to transform actor Peter Weller into the cybernetic protagonist, while animatronics were employed to simulate his robotic movements and interactions. Animatronics, a form of practical effects, have played a crucial role in bringing robots, cyborgs, and automatons to life on the big screen. This technique involves the use of mechanical puppets or robots controlled by remote operators to simulate lifelike movement and behaviour, adding a sense of realism and authenticity to on-screen characters. Animatronics allow filmmakers to create physical, tangible representations of artificial beings, enabling actors to interact directly with them and enhancing the overall believability of the film.[9]

Directed by George Lucas, *Star Wars* is renowned for its use of practical effects to bring the galaxy far, far away to life. Robot characters like R2-D2 and C-3PO were brought to life using costumes and animatronics, adding depth and personality to their on-screen presence. George Lucas emphasized the importance of practical effects, stating, "I wanted to create a lived-in universe, and practical effects were crucial in achieving that realism".[10] Motion capture technology has revolutionized the portrayal of robots, cyborgs, and automatons in science fiction cinema, allowing filmmakers to capture the movements and expressions of actors and translate them into digital animation with unprecedented realism. This technique has been used in a variety of films to create lifelike performances for artificial characters, blurring the lines between human and machine. While robots themselves don't wear motion capture suits, the technology is often used to capture the movements and expressions of human actors portraying robotic characters or to animate the movements of CGI robots. Alex Proyas' *I, Robot* utilizes motion capture technology for some of the robotic characters in the film. While practical effects were also used for certain scenes, motion capture was employed to capture the fluid movements and expressions of the more advanced robots, such as Sonny. Directed by Neill Blomkamp, *Chappie* features a motion capture performance by Sharlto Copley as the titular robot, Chappie. Copley wore a motion capture suit to portray Chappie's movements and expressions, which were then digitally animated to create the character's lifelike appearance.[11] CGI, or Computer-Generated Imagery, has become a staple technique in bringing robots, cyborgs, and automatons to life on the big screen. This digital technology allows filmmakers to create highly detailed and realistic characters entirely through computer animation, offering unprecedented creative freedom and visual fidelity. CGI has been utilized in a wide range of science fiction films to depict robotic characters, from friendly companions to menacing adversaries. CGI allows filmmakers to create robots with intricate designs and lifelike details, from the subtle reflections on metallic surfaces to the complex inner workings of mechanical joints. This attention to detail enhances the believability of the characters and immerses audiences in their world. It also enables filmmakers to animate robots with fluid movements and expressive gestures, giving them a sense of personality and emotion. Through CGI, robots can convey a wide range of emotions, from joy and excitement to anger and fear, adding depth to their characters. Most importantly it provides filmmakers with the ability to create robots of any size and scale, from towering giants to miniature companions. This flexibility allows for the depiction of epic battles between colossal robots or intimate interactions between human characters and their robotic counterparts. CGI robots can seamlessly interact with live-action

environments and actors, blending into the scene with convincing realism. This integration allows for dynamic and immersive storytelling, where CGI robots coexist with human characters in the same cinematic universe. Interestingly, many films use a blend of more than one techniques while portraying a robot or cyborg. For instance: The portrayal of Ultron in *Avengers: Age of Ultron* predominantly relies on CGI (Computer-Generated Imagery) technology. Through CGI, Ultron is rendered as a formidable and menacing robotic entity with sleek metallic features and glowing eyes. Actor James Spader provided the motion capture performance for Ultron, lending his physicality and expressions to the character's movements and gestures. This motion capture data was then used to animate Ultron's digital counterpart, seamlessly blending Spader's performance with the CGI animation.[12] The use of CGI allows for intricate detailing and fluid motion in Ultron's design, conveying a sense of power and malevolence befitting his role as a formidable adversary to the Avengers. Additionally, CGI provides the flexibility to create Ultron in various forms, from his initial robotic body to his later iterations with upgraded capabilities. Overall, the combination of CGI and motion capture technology brings Ultron to life on the screen, delivering a visually striking and memorable portrayal of one of Marvel's iconic villains. The significance of films exploring automatons, robots, and cyborgs extends far beyond mere entertainment, as they serve as mirrors reflecting our deepest fears, aspirations, and questions about the nature of humanity itself. These films provide profound insights into societal fears, ethical quandaries, and the ramifications of technological growth, encouraging viewers to consider the implications of our connection with technology and the essence of what it is to be human. Furthermore, science fiction cinema has had an actual impact on real-life technological advancement, pushing scientists, engineers, and innovators to push the frontiers of possibility and bring notions that were once limited to the realm of imagination into reality. From the influence of *Star Wars* on robotics research to the development of artificial intelligence technologies inspired by films like *Blade Runner* and *Ex Machina*, science fiction cinema has played a pivotal role in shaping the trajectory of technological progress and sparking important conversations about the ethical and societal implications of our creations. These films act as cautionary tales, urging us to think about the existential, moral, and ethical issues that come up when we step beyond the bounds of humanity as we continue to navigate the rapidly evolving world of technological innovation.

While the world has been exploring and experimenting with the concept of robots and cyborgs in cinema, the development in the same field in Indian films has been a relatively recent phenomenon, but it has rapidly gained traction and popularity, especially in the science

fiction and action genres. Indian filmmakers have embraced the concept of robots as a means to explore a wide range of themes, from technology and artificial intelligence to social issues and cultural identity. Indian filmmakers have used robots as a vehicle to explore the intersection of technology and humanity. Films like *Enthiran* (2010), also known as *Robot*, directed by Shankar, showcase advanced robotic creations with human-like intelligence and emotions. These films delve into questions of ethics, morality, and the implications of creating sentient artificial beings. Indian cinema is known for its larger-than-life action sequences and visual spectacle, and robots have become a key element in delivering these cinematic experiences. Films like *2.0* (2018), a sequel to *Enthiran*, feature extravagant action sequences involving robotic characters with superhuman abilities, captivating audiences with their thrilling stunts and special effects. Some Indian films use robots as a metaphor to comment on social issues and cultural dynamics. For example, *Robot* (2010) addresses themes of corruption, greed, and the abuse of power through its portrayal of a robotic creation turning against its creator. By framing these issues within a futuristic context, filmmakers are able to offer a fresh perspective on contemporary societal challenges. Like their Hollywood counterparts, Indian films featuring robots often serve as escapist entertainment, offering audiences a break from reality with their fantastical premises and high-concept storytelling. In this context it must be noted that Indian literature especially Bengali literature has seen significant contributions in this genre of science fiction by authors like Satyajit Ray[13], Adrish Bardhan and Anish Deb, Indian cinema still remains immensely barren.

To conclude, the exploration of automatons, robots, and cyborgs in science fiction cinema transcends mere entertainment, serving as a profound reflection of humanity's hopes, fears, and aspirations. Across decades of filmmaking, from the early silent era to the cutting-edge visual effects of today, robots have captivated audiences and sparked important conversations about the nature of technology, ethics, and the human condition. Through the lens of science fiction, filmmakers have used robots to explore a wide range of themes, including the consequences of technological advancement, the complexities of artificial intelligence, and the societal implications of human-robot interaction. Moreover, robots in cinema serve as a mirror reflecting our collective anxieties and aspirations, challenging us to confront our fears of the unknown and consider the ethical implications of our creations. As technology continues to advance and our relationship with artificial beings evolves, the portrayal of robots in cinema will undoubtedly continue to captivate and inspire audiences,

offering a glimpse into the boundless possibilities and profound questions that lie beyond humanity's grasp.

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[1] A. Maynard, Films from the Future: The Technology and Morality of Sci-fi Movies (Mango Media, 2018)

[2] Kageki, Norri .An Uncanny Mind: Masahiro Mori on the Uncanny Valley and Beyond". IEEE Spectrum. New York City(2012)

[3] Dieter, Daniel & Gessler, Elyse. A preferred reality: Film portrayals of robots and AI in popular science fiction. Journal of Science & Popular Culture. 4. 59-76. (2021)

[4] Simut, Andrei. Contemporary Representations of Artificial Intelligence in Science Fiction Films, Visual Arts and Literature. A Short Introduction. Ekphrasis. Images, Cinema, Theory, Media.(2012)

[5] Dieter, Daniel & Gessler, Elyse. A preferred reality: Film portrayals of robots and AI in popular science fiction. Journal of Science & Popular Culture. 4. 59-76. (2021)

[6] Roches, Ashlyn. Sexy Robots: A Perpetuation of Patriarchy. (2017)

[7] Scherer, Derek. Movie Magic Makes Better Social Robots: The Overlap of Special Effects and Character Robot Engineering. Journal of Human-Robot Interaction. 3. 123. (2014)

[8] Peter Bogdanovich, Who the Devil Made It – Conversations With Legendary Film Directors (New York: Alfred A. Knopf, 1997), 123.

[9] Dieter, Daniel & Gessler, Elyse. A preferred reality: Film portrayals of robots and AI in popular science fiction. Journal of Science & Popular Culture. 4. 59-76. (2021)

[10] George Lucas, interview by Charlie Rose, May 25, 2005, in The Charlie Rose Show

[11] Michael Dorfling, "Portrayals and perceptions of cinematic artificial intelligence: A mixed-method analysis of I, Robot (2004) and Chappie (2015)," 2021, UNISA Repository

[12] James Spader, interview by Jimmy Kimmel, May 10, 2015, Jimmy Kimmel Live!

[13] Islam, Md Monirul. (2022). Artificial intelligence in Indian films: Anukul and AI ethics. Short Film Studies.

References

Bogdanovich, Peter. Who the Devil Made It – Conversations With Legendary Film Directors. New York: Alfred A. Knopf, 1997.

Dieter, Daniel, and Gessler, Elyse. "A preferred reality: Film portrayals of robots and AI in popular science fiction." Journal of Science & Popular Culture 4 (2021): 59-76. I

Islam, Md Monirul. "Artificial intelligence in Indian films: Anukul and AI ethics." Short Film Studies (2022).

Kageki, Norri. "An Uncanny Mind: Masahiro Mori on the Uncanny Valley and Beyond." IEEE Spectrum. New York City, 2012.

Khush, Anand, and Gupta, Khush. "Architectural Dystopias IN Science Fiction Movies, Literature And The Real World." ResearchGate (2020).

Maynard, A. Films from the Future: The Technology and Morality of Sci-fi Movies. Mango Media, 2018.

Roches, Ashlyn. "Sexy Robots: A Perpetuation of Patriarchy." (2017).

Scherer, Derek. "Movie Magic Makes Better Social Robots: The Overlap of Special Effects and Character Robot Engineering." Journal of Human-Robot Interaction 3 (2014): 123.

Simut, Andrei. "Contemporary Representations of Artificial Intelligence in Science Fiction Films, Visual Arts and Literature. A Short Introduction." Ekphrasis. Images, Cinema, Theory, Media. (2012).

Spader, James. Interview by Jimmy Kimmel. May 10, 2015. Jimmy Kimmel Live!

UNISA Repository. Dorfling, Michael. "Portrayals and perceptions of cinematic artificial intelligence: A mixed-method analysis of I, Robot (2004) and Chappie (2015)." 2021.