

Chapman University

Chapman University Digital Commons

Film Studies (MA) Theses

Dissertations and Theses

Spring 4-16-2019

AI Film Aesthetics: A Construction of a New Media Identity for AI Films

Priya Parikh

Chapman University, parik108@mail.chapman.edu

Follow this and additional works at: https://digitalcommons.chapman.edu/film_studies_theses



Part of the [Film and Media Studies Commons](#)

Recommended Citation

Parikh, Priya Chetan. *AI Film Aesthetics: A Construction of a New Media Identity for AI Films*. 2019. Chapman University, MA Thesis. *Chapman University Digital Commons*, <https://doi.org/10.36837/chapman.000118>

This Thesis is brought to you for free and open access by the Dissertations and Theses at Chapman University Digital Commons. It has been accepted for inclusion in Film Studies (MA) Theses by an authorized administrator of Chapman University Digital Commons. For more information, please contact laughtin@chapman.edu.

AI Film Aesthetics: A Construction of a New Media Identity for AI Films

A Thesis by

Priya Chetan Parikh

Chapman University

Orange, California

Dodge College of Film and Media Arts

Submitted in partial fulfillment of the requirements for the degree of

Master of Arts in Film Studies

May 2019

Committee in charge:

Committee Chair: Kelli Fuery, Ph.D.

Patrick Fuery, Ph.D.

Federico Pacchioni, Ph.D.

This thesis of Priya Chetan Parikh is approved.



Committee Chair: Kelli Fuery, Ph.D.



Patrick Fuery, Ph.D.



Federico Pacchioni, Ph.D.

May 2019

AI Film Aesthetics: A Construction of a New Media Identity for AI Films

Copyright © 2019

by Priya Chetan Parikh

ACKNOWLEDGEMENTS

I would like to thank my parents, Sona and Chetan Parikh for their ongoing support of my academic endeavors and my professors who have allowed me to celebrate my passion for film through a variety perspectives and practices, Dr. Kelli Fuery, Dr. Nam Lee, Dr. Emily Carman, Dr. Erica Aguero, Dr. Federico Pacchioni, Dr. Carmichael Peters, and Dean Patrick Fuery. I am also extremely grateful for my Graduate colleagues who have turned into family over the past two years and my two roommates and close friends, Taylor Mavroudis and Arin Meyer, encouraging me every step of the way through my thesis, and who have made my time at Chapman University exhilarating and unforgettable.

ABSTRACT

AI Film Aesthetics: A Construction of a New Media Identity for AI Films

by Priya Chetan Parikh

Recognized as the fourth industrial revolution, Artificial Intelligence is poised to take the film industry by storm. While the current applications of it help streamline production practices, its escalating employment in the generation of film scripts and visuals complicates notions and functions of authorship and new media aesthetics. This thesis examines the unique junction of Cinema and Artificial Intelligence, where experimentation is not only celebrated, but also necessary in order to re-evaluate the conditions of new media. By analyzing the ways in which three films co-written by Oscar Sharp, Ross Goodwin and an AI negotiate with Foucault's theory of the author function and the aesthetics and existing circumstances of new media, this thesis begins to construct an identity for an emergent form of cinema, the AI film.

TABLE OF CONTENTS:

Introduction 1

Methodology 5

Constructing an AI Film Rubric10

Case Studies17

AI Authorship 20

AI Film Language24

Interface, Interaction, and Image27

Conclusion 31

Filmography & Bibliography34

INTRODUCTION

*The ship on which Theseus sailed with the youths and returned in safety, the thirty-oared galley, was preserved by the Athenians down to the time of Demetrius Phalereus. They took away the old timbers from time to time, and put new and sound ones in their places, so that the vessel became a standing illustration for the philosophers in the mooted question of growth, some declaring that it remained the same, others that it was not the same vessel.*¹

Questioning the implications of “sameness” or an outright repudiation of the ship’s existence, or validation of any kind of ship identity, the metaphor of the ship of Theseus provokes the frustration of pinpointing the identity-causing factors colored by growth and resulting in inevitable change.² This excerpt from Plutarch’s *Life of Theseus* introduces the dilemma of identity and change, challenging the notion that a ship with its parts all gradually replaced could be the same ship it originally was. Surely, the idea or the essence of the ship remains whether it continues to exist through its lost pieces or as an entirely refurbished vessel and the plethora of solutions provided throughout the centuries since offer insights into the practice and function of this evolution.

In the ever-evolving landscape of new media, perhaps this thought experiment lends itself most pertinently in terms of the constant inauguration of up-to-date technology since it brings about progressive complexity to the ways in which cinema is made, accessed, and perceived today. The infinite permutations of cinematic apparatus and medium directly influence the intimations of new media cinema. We begin to reflect on what it means to see that a movie we might have once travelled to a theatre to see, is now on our computer screens in less than a couple of clicks. In terms of production, cinema’s shift from analogue

² Meredith W. Michaels, *The Persisting Problem of the Ship of Theseus*, PhD diss., University of Massachusetts Amherst, 1980.

photography to digital and now to constant mediations between the two, and amongst other infiltrating media, begins to reveal the nuances of stylistic choice and how it may affect the meaning of the content, as well as its context.

However, the various conclusions of the “ship of Theseus” analogy must be revisited as cinema invites the developing industry and wide-ranging applications of artificial intelligence to influence, perhaps even control, its means of production. With the introduction of Artificial Intelligence (hereafter AI), cinema (as a ‘ship of Theseus’) undergoes a considerable reconstruction, preserving its outward appearance through its form. Its essence is crucially reconfigured through composites of updated technologies and the simultaneous rationalizations of its unique path of maintenance. Cinema makes the turn for yet another technological revolution reminiscent of the proliferation of the Internet not too long ago.³ AI invites the potential for streamlining and digitized manipulation, and perhaps most poignantly, like most nascent media, experimentation. The traditional preoccupation with linear narratives and cinematography turns to exercising the limits of mutability through the means of replacing parts of a production process with AI.⁴ Consequently, these efforts of cinematic evolution reveal the importance of sustaining the form of a movie but destabilizing the methods by which it is made in order to create a new type of cinema, definitely under the elucidations of new media, and now more particularly- AI films.

³ Erik Brynjolfsson and Andrew McAfee, *Race against the Machine: How the Digital Revolution Is Accelerating Innovation, Driving Productivity, and Irreversibly Transforming Employment and the Economy* (Lexington, MA: Digital Frontier Press, 2012).

⁴ Dirk Dallas, "Filmmaking, Artificial Intelligence & Machine Learning -," - At the Intersection of Design & Emerging Technologies, August 12, 2018.

While there are a number of current applications in the film industry that embrace this thread of what might be the “fourth industrial revolution”, many of them work towards making the digital hand’s work invisible.⁵ Companies like ScriptHop, ScriptBook, and RivetAI, to name a few, have developed the technology in order to cut the costs of manual labor in steps such as script coverage and breakdown, budget breakdowns, and the assessment of other pre-production variables. Furthermore, these companies strive to continue developing their AI in order to ultimately offer their services to partnering studios with even more ambitious projects that range from screenplay editing and consultation, interpreting and assisting in character arc development, and even estimating the box office success of a movie.

Paired with the looming anxiety that “AI might someday take over jobs”, such pursuits also bring about the concern that films made under these newer circumstances might fall into the trap of formulaic narratives and that algorithms will essentially turn stories into equations.⁶ However, these companies and several others strive to prove the opposite and that by bringing AI into the picture, the film and media industry have the advantage of becoming familiar with those same patterns that they critique and so wish to avoid in the name of originality.⁷

⁵ Schwab, Klaus. *The Fourth Industrial Revolution*. London: Penguin Random House, 2017.

⁶ Deniz E. Kurt, *Artistic Creativity in Artificial Intelligence*, Master's thesis, Radboud University, 2018. (Kurt outlines the variety of ways in this idea has taken on popularity. However this exact phrase can be found and verified in multiple online magazines and opinions forums and blogs.)

⁷ H. James Wilson, Paul R. Daugherty, "How Humans and AI Are Working Together in 1,500 Companies," *Harvard Business Review*, July 24, 2018,

This points to the need for a critical reassessment of AI and the gaps it can fill in the film production process, allowing evaluation of traditional practices and their aesthetic functions. Beyond the confining definitions of Artificial Intelligence’s potential influence on film aesthetics (as shared through various online forums, most explicitly by Bold Business) and the subsequent challenges to the landscape of “fine art”, Immanuel Kant’s philosophical theory of aesthetics identifies an object’s “form of purposiveness” and experiential value.^{8 9} A Kantian perspective offers a more useful clarification because it emphasizes the merits of expression and experience of a work that inform its formal aspects. This, in turn, enables recognition of an AI film’s distinctiveness, proving necessary in terms of setting up the premise of AI films as media that rely more on how meaning is rendered through user interaction and the intention of its novelty than the novelty itself. This explanation of a new AI aesthetic is achieved by how the collaborations between filmmakers (mostly experimental) and computer scientists (specializing in machine learning) tease out the roots and the reaches of this specific mode of entertainment. The stylistic foundations of AI films as a form of cinema broaden into an understanding of the extent and function of their corresponding experimentation.

The application of AI to cinema necessitates a reappraisal of the aesthetics of new media as the novelty of the technology relies on the encroaching of a new kind of creator,

<https://hbr.org/2018/07/collaborative-intelligence-humans-and-ai-are-joining-forces>.

⁸ “*Artificial Intelligence: A New Director In Film-Making*”, Bold Business, August 2, 2018, <https://www.boldbusiness.com/digital/artificial-intelligence-film-making/>

⁹ Immanuel Kant, *The Critique of Judgment*, trans. James Creed Meredith (Oxford: Clarendon Press, 1961).

language, and consequent viewing terms. As Jennings proposes, the weight placed on traditional attitudes towards narrativity (in terms of story and dialogue) and visuals (cinematography and stage directions/blocking) is compelled to reveal its inadequacy as standalone aesthetics within the landscape of new media.¹⁰ By introducing AI as part of the production process, the preoccupation with formal aesthetics turns into questioning the function of the changes in the methods of film production, *and* consequent exhibition, and spectatorship. This thesis aims to identify the subverted conditions of author function, medium and means of production, and the resulting aesthetics that are yielded by the developing identity of AI films.

METHODOLOGY

For the purposes of my thesis research, I have adopted a qualitative, exploratory methodology in order to incorporate the variety of developing perspectives on this stream of new media. Since the study is an intersection of two much larger fields in their own right, namely- Film and Media Studies and Artificial Intelligence or Machine Learning, it is important that this thesis consider the practical efforts made by both fields that eventuate in the proposition: *AI films* extend past the confinement of their technological convergence and offer an even more ‘meaningful’ way of recognizing the particular style and scope of this new cinematic form as one that is self-reflexive and demonstrative of the flexibility of cinema.

¹⁰ Pamela Jennings, "Narrative Structures for New Media: Towards a New Definition," *Leonardo* 29, no. 5 (1996): 345-347, doi:10.2307/1576398.

‘Meaning’, as used here, has less to do with only the interpretation of the dialogue and stage directions that AI films compose, but also refers to how the mechanisms of their practice and presentation enforce an alternative way of thinking about technology and cinema. This would require a thorough evaluation of first, the practices and distribution of the films at hand, and then a discussion of the theoretical and cultural effects of their construction. While this thesis is not exclusively concerned with a semiology of AI films, shared stylistic traits amongst them inform the cultural context of their production in that they uncover rationales of experimentation and advantages, as well as, anxieties of technological agency. Therefore, ‘meaning’ will uncover the relationship between the abstract, often futuristic content and visuals of AI films, and the structures of their production. This relationship, consequently, finds itself negotiating with set theorizations of new media, discussed further, that have yet to assimilate to the applications of AI.

In terms of theoretical methodology, this thesis will evaluate and apply Michel Foucault’s theory of the author function in order to address the problematization of authorship with the establishment of AI as a plausible *creator*. Such a shock to the insinuation of propriety destabilizes hierarchies of production and calls attention to the conditions of creativity in the circumstance of new media. To contextualize the Foucauldian author function within a new media illumination, I draw on Lev Manovich (2001) who proffers a rubric for the principles of new media. Manovich resituates the gravity of authorship by placing a heavier emphasis on the automative and virtual quality of new media, as detached from the influence of a single entity and bound to the combinations of digitized material.

It is pertinent that my research addresses the contemporary infrastructure of digital media that these AI films are able to flourish in and, therefore, will explore the spectrum of criteria delineating “new media” and offer a redefinition that stretches the perimeters of its current context to incorporate creative and communicative Artificial Intelligence. Mark Hansen (2004) offers a strong challenge to Manovich’s position, in that he finds that new media not only warrants changes in technology, but changes in the way users perceive technology. Hansen is concerned with the symbiotic relationship between the user and media at hand that is afforded by new media as inherently polymorphous. Hansen argues that new media necessitates interactivity and therefore the interface by which this is possible would assist in informing the identity of AI films.

These three sources serve to outline the impact of AI on the industry as a whole, with such impact being specified through three films “written” by an AI technology. The main case studies for this thesis are the three films produced by Oscar Sharp and Ross Goodwin-*Sunspring* (2016), *It’s No Game* (2017), and *Zone Out* (2018). All three films feature dialogue written by an AI that named itself Benjamin. Each progressive year, the film released inaugurates yet another capability of the AI tool posing concerns about the future of Hollywood, as expressed by numerous online magazines and forums. However, the producers respond to this impinging anxiety with even more optimism about the opportunities this opens doors for. These three films acts as synecdoches for the plausible future of AI films and therefore, by referring to them, this thesis acknowledges the embryonic effects of understanding new media technology and how AI’s intersection with film production situates itself within that landscape.

An examination of a variety of case studies that showcase the influence and application of AI in film production effectively enables a discussion of the larger, and more intersectional products of AI technology that motivate the question of authorship and expose reconfigurations of film aesthetics and accessibility. Since these cyclically influence one another, between a macro and micro-level of looking at AI technology and cinema, I will also employ the ideas offered by Michael Betancourt (2002) who focuses on the marriage between technology and art and the scrutiny of new-media avant-gardism that AI films currently find themselves at the frontline of.

Moreover, this thesis will expound on the emerging aesthetics of AI films by evaluating the reconstructed relationship between the three stages of cinematic experience I outline as- production, exhibition, and spectatorship. The structure of this thesis similarly follows this with the theory of Author Function and discussion of the Language of AI Films and Interface, considering the relational aspects of AI modalities in this new style of movie making. The Literature Review of this thesis introduces the ongoing discussion of current relevant artificial intelligent technology that has colored the spectrum of digital media. This will include a definition and survey of new media theories and explain *natural language processing* as a computer coded language and how it is crucial in the construction of an identity for AI films. Discussing the technicalities of the medium offers a necessary foundation to understanding the technology being used for the specific media and how it interacts with, borrows, and even digresses from traditional modes of lingual communication. Setting up these foundations makes way for a discussion of the destabilization of language as a system of collectively recognizable codes and how this subversion acts as a seminal feature of AI film identity.

The first part of my thesis discusses the dilemma of authorship in terms of dealing with intellectual property rights, the relationship between a creator and their work, and the imminent question of the purpose of this new mode of authorship. Foucault's "What is an Author" will prove seminal in helping flesh out the levels of authorship along with a variety of additional theories questioning the function of the author in emerging media platforms. The second part of this thesis introduces the topic of language as a necessary framework through which to analyse the correspondence between the modes of communication of dialogue, performance, editing and AI programs translation of codes into semantics. This will help expand on the essential novelty of the medium and its virtually transcendental nature. The third section covers the role of interfaces and corresponding narrative, discussing the significance of the virtual platform and screen spaces in the viewer's interaction with and resulting interpretation of the AI films. Each section addresses a component of the aesthetics of AI films and will present an addition to the developing distinctiveness of the medium.

Finally, I will conclude by synthesizing the collection of features akin to my case studies and the vast representation of AI media that they demonstrate. This will not only call attention to the industrial prospects of implementing Artificially Intelligent approaches in the production of forthcoming film projects but will underscore the cultural influence that a highly misunderstood and experimented form of new media has. As I find my research in two independent fields, respectively advancing into conversation with one another, my research will contribute to the negotiations that occur as technology with the illusion of agency begins to permeate the dualistically artistic and commercial construction of cinema.

CONSTRUCTING AN AI FILM RUBRIC

As this thesis works towards constructing the details of the identity of an AI film, it seems that the initial question to ask might be what does the recognition of a work's "identity" truly intimate? This might be split into a binary of significance- what does it mean in and of itself as well as what it means in relation to the periphery of artworks under the umbrella of new media. Considering the all-encompassing preoccupation with novelty between new media technology and artistic expression through cinema, it is imminent to this thesis to set up the structures for what is to be expected in terms of the concept of "novelty". In other words, *what's so new about new media?*

In *The Language of New Media*, Manovich suggests that there are five characteristics that make a work a product of new media. The first is "numerical representation" where "a new media object can be described formally (mathematically)" or "media becomes programmable"¹¹. In this criterion, Manovich is essentially looking at the "media object", as he clarifies, as a digitally transmutable thing by way of its numerical makeup and output. Second, new media adopts "modularity" in which the new media object takes on a "fractal structure" suggesting that it is constructed from a combination of independent media objects that each have their independent identity and utility.¹² The third factor is "automation" where AI becomes a more significant entity. With automation, new media incorporates technologies that aim for rapidity and agency in terms of both creation and access. Following this is the component of "variability" which suggests "a new media object is not

¹¹ Lev Manovich, *The Language of New Media* (Cambridge, MA: MIT Press, 2010), 30

¹² Manovich, 33

something fixed once and for all, but something that can exist in different, potentially infinite versions”.¹³ This is a seminal concept in identifying the key characteristics of AI film because of its reliance on experimentation and ensuing modifications. In culmination, media are curated into databases, and are applicable to a variety of interfaces, virtually affected by the user’s interactions with it.

Additionally, this includes the structure of *hypermedia* that is reliant on other media through hyperlinks and periodic updates and scalability that allow for a spatially and temporally mutable means of distributing media. The final component is “transcoding”, which Manovich describes as essentially bridging the gap between digital code and social code, emphasizing the idea that every permutation of code is saturated with meaning and virtual possibilities.¹⁴ With this, one can begin to recognize that a collection of numbers brings about a virtual effect or that a single click can open up an entirely new virtual space imbued with an entirely different anthology of meanings. Manovich’s particular focus on the technical aspects sheds light on how much a definition of new media is reliant on the circumstances of a piece of technology used to create, preserve, or distribute it. However, a general intimation seems to revolve around the idea that a dwindling of medium specificity presupposes the creator or viewer’s interaction with the contents of the medium. One of the necessary components within new media is that they become progressively more loosely bound to a vessel of distribution and more concerned with their own transcendence and

¹³ Manovich, 39

¹⁴ Manovich, 46

corresponding response to being interacted with.

Hansen discusses this as reflective of the “newness of new media” and how beyond its material makeup, the requisite component of it rests in the situation of the body that is interacting with it. Hansen provides the example of Virtual Reality and Panorama in which the viewer’s body becomes central to the validity and active functionality of the media at hand.¹⁵ Incorporating Artificial Intelligence to this framework, elicits the multiple bodies that must interact with it as an apparatus including those working *with* it to create a work and those viewing its cinematic output. While the Internet and computer screen, as media through which AI films are distributed, might not directly influence the body of work, they do play a seminal role in relaying the awe of experimentation and allowing for a space where these works can begin to interact with one another through viewer engagement therein making the viewer a seminal *part* of the process of validating an AI film identity.

It is not enough that new media is instituted as an evolution of older media, or that it merely represents technical innovation, but also that the dynamics of interactivity are consistently reconfigured. By requiring the user (or viewer) to become the means by which new media objects can be accessed, Hansen emphasizes the objective to “empower the body” and “acquire a more fundamental role as the source of the actualization of images”. Ironically enough, Manovich makes the claim that “cinema becomes a slave to the computer” by way of its reduction of cinematic spectacle and outreach.¹⁶ However, a

¹⁵ Mark B. N. Hansen, *New Philosophy for New Media* (Cambridge, MA: MIT Press, 2006), 20-47.

¹⁶ Manovich, 293

synthesis of these overarching claims of both Manovich and Hansen in bring to light the hierarchy of players that make the efforts of AI films manifest from the producers ideating, to the actors performance of AI direction, and the viewers access and consequent perception of the media object.

Manovich's rubric along with Hansen's ideas pair well with Henry Jenkin's convergence theory that proffers that media convergence occurs through technological development and, in some cases, divergence. Over media delivering content through a single device, convergence relies on the unification of various media functions, "participatory culture" or how the social discourse is affected by and cyclically influences media, and effectively, these changes become visible in the content of the new media, as well.¹⁷ This becomes a crucial characteristic in relation to the interface of the web that AI films are a part of since it encourages participation and the encapsulation of the users/viewers active role in both reaching for, making sense of, and further transforming the media object that are AI films show themselves in how self-reflexive the scripts become. This pattern of spotlighting the means of production through the exhibition of the product itself traces a seminal feature in the pursuit for novelty or "newness" in AI's position in new media.

The infatuation with novelty considers how the production of each of the case studies for this thesis was born out of the want to innovate and push the boundaries of what AI could do in a narrative landscape. The inherent "newness" embedded within this media object insinuates ideas of originality and therefore understanding what creativity might

¹⁷ Henry Jenkins, *Convergence Culture: Where Old and New Media Collide* (New York: New York University Press, 2016).

entail via the processes of Artificial Intelligence. Margaret Boden proffers that while creativity it is often associated with artistic practice, in its most universal sense it is a *problem-solving ability*.¹⁸ A product of creativity can be regarded as a creative solution in that it provides a new angle through which to revise a former area of concern.¹⁹ These concerns don't necessarily have to be negative, in fact, many of them are born out of creative agency- a want to offer something new, necessary, and perhaps most importantly, unique.

Boden outlines two kinds of creativity- historical (H-creativity) and psychological (P-creativity) which both uphold the value of novelty of an idea and a sense of surprise at its founding. Contextually, in H-creativity the idea is defined as one that is creative in its canonical contribution meaning that it must present something that deviates from former approaches to the same affair at hand. However, P-creativity presents the more compelling case of producing something that “may be novel only to the mind of the individual (or AI-system) concerned” and maybe even “the whole of previous history”. Therefore, H-creativity can be made a default result of P-creativity.²⁰ The implication of this for an AI system is vast because it takes into consideration previous creative endeavors and improvises continuously until it has successfully come up with something truly creative.

¹⁸ Boden, Margaret A. "*Creativity and Artificial Intelligence*." *Artificial Intelligence*, no. 103 (1998): 347-56. https://ac.els-cdn.com/S0004370298000551/1-s2.0-S0004370298000551-main.pdf?_tid=ac650e09-139b-48d2-8132-011997b080f0&acdnat=1523064747_76d79cffbbb77032b25600356967c22b.

¹⁹ Kugel, Peter. pp. 137

²⁰ Boden, 347-56.

Moreover, it offers reflexive way of approaching the same ideas Hansen puts forth about the necessary transformation of a medium in order for it to be new and hence, creative.

Simon Penny's *Making Sense: Cognition, Computing, Art, and Embodiment* (2017) offers a more comprehensive look at the technological roots of new media and how the introduction of new technology brings forth new artistic practices.²¹ Penny is concerned with the aesthetic function of new media technologies and what they intimate for future creative processes. In that respect, Penny's highly interdisciplinary approach to new media objects enables discussion of the role of the viewer as user and manipulator of the media object at hand, and perhaps most important the only source of actualization by means of interactivity.

Paired with this, Michael Betancourt (2002) exposes the "initial inferiority" of "disruptive technology" and its correspondence with avant-gardism.²² He suggests that the low commercial value of such practices is commonplace and perhaps more importantly, it contributes to its essential character of being "experimental". His argument contends that novelty has to diminish over time and it is essential that the function of new media is to work towards assimilating with, if not ironically *becoming*, a standardized form of art. Betancourt also discusses the stylistic attributes of the codependence between avant-garde and technology in that both seek aesthetics of "futurity". This becomes essential to the content and context of AI films through their exploration of topics that are self-referential

²¹ Simon Penny, *Making Sense: Cognition, Computing, Art, and Embodiment* (Cambridge, Massachusetts ; London, England: MIT Press, 2017).

²² Michael Betancourt, "Disruptive Technology: The Avant-Gardness of Avant-Garde Art," CTheory, May 1, 2002.

and furthermore, employ a futuristic style in order to communicate the novelty of their own identity. The films used as case studies are prime examples of this conversation between their artificially intelligent modes of production and the production design and costume alluding to a far off future generation.

Imbuing each stage of a film's production with this particular style that sets it apart from other forms of new media and calls attention to its novelty initiates a question about its canonization. This, in effect, raises what might be the most sought after challenge of introducing AI into the practices of fine arts, especially those that are riddled with economic inclinations like cinema- authorship. Foucault's theory of the author function can be applied here as it critiques the traditional importance placed on the author and suggests that what might be a more significant preoccupation is recognizing the *function* of the author. Foucault lays out four features that help elucidate what these functions might derive. The first seems straightforward enough that the author would be part of a legal system and their product an "object of appropriation". These now legally codified works become the property of an entity and any pursuit to copy or borrow from them would have to undergo legal scrutiny.²³

The second suggests that the author function is not universal or constant in all types of discourse. Therefore, a scientific text would differ in its allegiance to a single author while a literary text would be required to be associated with a name, raising interesting implications in the case of AI films where these might crossover. The third feature offers that the author function is not formed spontaneously but that it relies on careful, progressive

²³ Michel Foucault, "What Is an Author?", *Modernity and Its Discontents*; 1969, doi:10.4324/9781351226387-36.

construction in that it necessitates a standard level of quality and attempts to communicate ideas that “conflict with the doctrine expressed in others”.²⁴ Finally, the author function is responsible for engaging with the paradigms of knowledge concurrent with its message and therefore should not refer to a single individual but a series of meanings born out of multiple “authors”. Therefore, by approaching the text within the digital framework of AI, the function of the author or rather the implications of its new mode of creation and resulting reception call for a ‘medium-specific’ reappraisal.

CASE STUDIES:

This section outlines the three case studies that exemplify the altered circumstances of authorship, language, and interface that AI films institute. These films illustrate the formal aesthetic similarity of AI films as well as identify the implications of this strand of new media. Director, Oscar Sharp, and Ross Goodwin, an AI researcher at New York University, produced each of these films as experiments in performance and neural network training for script-writing or storytelling purposes and aimed to challenge the limits of generating narrative from numbers.

Their first film *Sunspring* (2016) is a short science fiction film that revolves around what might be a love triangle playing out in a futuristic space station. The three actors received a script that made no contextual sense and ascribed meaning to it by way of their dramatic renditions of the dialogue. With impossible or unreasonable screen directions like “he is standing in the stars and sitting on the floor” and “he goes to the skull” the actors

²⁴ Foucault, 307

played the primary role in saturating the film with possible meaning resulting in an absurd narrative and inaugurating the discussion of AI narrativity and its place in the new media landscape.²⁵ Such an approach to a script summons the ambivalence between whether the cause of meaning rests in the hands of the performers or is yet instilled by the glitches of Artificial Intelligence being allowed to infiltrate the screenwriting process. This interplay becomes seminal in discussing the politics of authorship and constructing a new kind of aesthetic that makes AI films distinct from other forms of new media.

Sharp and Goodwin's next film, *It's No Game* (2017), featuring David Hasselhoff as a bot (called Hoffbot), focuses on screenwriters who learn about the futility of going on a writers strike because of AI taking over the film industry and writing movies.²⁶ This film acknowledges the self-reflexive capabilities of AI films by way of its narrative revolving around the exact system that composed it. Both films, *Sunspring* and *It's No Game*, were written using a long short-term-memory recursive machine-learning algorithm that ensures that a program "remembers" its input in order to be able to produce sequences of related data temporally. Therefore, although the script might not make the most sense contextually, it is still syntactically in place and is able to refer back to previous dialogue and the data it has been fed as input for the production of the script. Along with self-reflexivity, the film raises questions about natural language processing (as a *computer* coding mechanism) and its parallels with overarching notions of language itself as an inherently codifying system.

²⁵ *Sunspring*, dir. Benjamin, prod. Oscar Sharp and Ross Goodwin, perf. Thomas Middleditch, Ars Technica, 2016.

²⁶ *Its No Game*, dir. Benjamin, prod. Oscar Sharp and Ross Goodwin, perf. David Hasselhoff, Ars Technica, 2017.

However, this elucidation will emphasize the intricacies of AI film “language” and the necessary route of futurist aesthetics as an essential part of the aesthetics of AI films.

The last film, *Zone Out* (2018), takes a different approach to the implementation of AI in its production. In this case, the AI technology became responsible for the film’s entire production pipeline. So the tool “cobble[d] together footage from public domain films, face-swap[ed] the duo's database of human actors into that footage, insert[ed] spoken voices to read Benjamin's script, and score[d] the film”.²⁷ By giving up what seems at face-value to be ‘complete creative agency’ to the computer, Goodwin and Sharp drive at the implications of the technological evolution within the film industry but also expose the necessity of co-authorship through the attention placed on the existing lapses evident between AI efforts and the lack of a seamless output. The glitching of the characters faces and imperfection of the dubbed dialogue point at the shortcomings of the machine yet still offer an interesting glimpse at a new form of visuals and dialogue.²⁸ This ties in significantly with the “principles of new media” put forth by Manovich that explain that one of the identifying qualities of a product of new media is it’s transparency by way of being so new and perhaps even deliberately exposing its contemporaneous imperfections.

All of the films were made under the specifications of Sci-Fi London’s annual 48 Hour Film Challenge with the recurrent LSTM neural network. They were also all debuted online through the website *Ars Technica* that covers news and opinion pieces on technology,

²⁷ Sam Machkovech, "This Wild, AI-generated Film Is the next Step in "whole-movie Puppetry"," *Ars Technica*, June 11, 2018, <https://arstechnica.com/gaming/2018/06/this-wild-ai-generated-film-is-the-next-step-in-whole-movie-puppetry/>.

²⁸ *Zone Out*, dir. Benjamin, prod. Oscar Sharp and Ross Goodwin, *Ars Technica*, 2018.

politics and society. These three films help assess the layers of AI film identity, namely the technology for and means of production as *experimental*, the message that it intends to convey via the script as well as its mode of exhibition as technologically progressive, and how it is accessed and received as a creative medium, all of which contribute to its status as a new media object. While uploading such films online puts them on a level playing field with other online content, the culture around their online presence supports their uniqueness. Therefore, along with, author function and aesthetics, Internet culture proves seminal in the way these films are received, circulated, and discussed as illustrations of the opportunities and anxieties revolving around Artificial Intelligence.

AI AUTHORSHIP

Filmmaking often finds itself at the conflicted crossroads of art and commerce, a conflict amplified with AI's dilemma of authorship. On one hand AI is being argued as an independent actor in a creative process and therefore a legally recognized author and on the other hand AI is seen as nothing more than a tool for a human author to write with. However, several arguments place AI authorship in the circuit of intellectual property rights and call for a more serious consideration of the entity as autonomous and a creative agent.²⁹ The greatest efforts have been made by reinterpreting the Made for Hire Doctrine where "(if) a work is made for hire, an employer is considered the author even if an employee

²⁹ Jean-Marc Deltorn and Franck Macrez, "*Authorship in the Age of Machine Learning and Artificial Intelligence*," Center for International Intellectual Property Studies Research Paper Series, 2018, , doi:10.2139/ssrn.3261329.

actually created the work. The employer can be a firm, an organization, or an individual”.³⁰ Even in that case, authorship extends far beyond the scope of ownership and in the manifestation of artworks it challenges viewers ideas of a media object solely through its association with the object.

The auteur theory, instigated by Andrew Sarris, suggests that a film is a tangible externalization of the tastes and ideas of a single auteur- usually the director.³¹ While many theorists consider this an outdated concept, the reverberations of it are ever-present. It seems common for people to respond to a director’s overall œuvre with a more or less consistent disposition. If a director’s name or recognizable style warrants canonization, then what does this mean for the film products of Artificial Intelligence in the future? Should AI be considered an individual entity constructive of its canonization, is it an instrument through which a true author is able to emerge, or should it be approached as a co-author or collaborator in the means of production of an AI film?

In response to Foucault’s theorization of the function of the proper name, it is interesting to note that the AI tool used to write the three films named itself Benjamin. What is significant to recognize in this act is that although the author is not “Benjamin” per se, it could be “an AI that named itself Benjamin” making a naked reference to its author *function* while ironically making a lighthearted jab at its autocratic act. Foucault goes on to

³⁰ Russ Pearlman, “Recognizing Artificial Intelligence (AI) as Authors and Inventors Under U.S. Intellectual Property Law,” Richmond Journal of Law and Technology - The First Exclusively Online Law Review, 2018. <https://jolt.richmond.edu/recognizing-artificial-intelligence-ai-as-authors-and-inventors-under-u-s-intellectual-property-law>.

³¹ Andrew Sarris, “Notes On The Auteur Theory In 1962”, in Gerald Mast & Marshall Cohen (ed), *Film Theory and Criticism: Introductory Readings*, 2nd Edition, Oxford: Oxford University Press, (1979), pp. 650-665.

complicate the veneration of a proper name and suggests that what takes centrality instead is his concept of *écriture* which turns the author “transcendental” and therefore oscillating between designation and description.³² In this sense, the authors name serves as a means by which a reader can identify a set of qualifications and qualities ascribed to the collection of work associated with their name. Therefore, rather than merely a unity of works produced by way of a name, the author function draws attention to a “resolution of contradictions” within an oeuvre or canon and works towards a criteria of soundness.

The practice of AI as author also evokes Roland Barthes’s theory of the death of the author in terms of the intimation of agency it places on the “reader”, or the viewer in this case.³³ Barthes’s proposal that the reader claims sovereignty in terms of the interpretation of a text just must meet the acknowledgement of the author as inextricably linked to the work because of the methods through which the work is produced. While the displacement of a proper name and a repositioning of the power of the author warrant a destabilizing of the dictatorial function of the author, it still heavily influences the message of the work produced- the work in fact, cannot exist without the organization and institution of the author. As “Benjamin” puts forth the collection of sentence templates into a script, they are glued to an algorithmic value. In fact, there is a direct correlate between a word that might appear on the script and the program of the AI tool. Therefore, examining the relationship between a variety of authors and the players who actualize their work by means of

³² Foucault, 302

³³ Dario Compagno, “Theories of Authorship and Intention in the Twentieth Century,” *Journal of Early Modern Studies* 1, no. 1 (2012)

performance (actors) and views (viewers) becomes central to identifying the new modalities of the author function in AI films.

One of the unique facets of AI is its dependence on a carefully curated dataset. For the production of the scripts of the three case studies, the program was fed a corpus of sci-fi film scripts and from there it took over. Additionally, Goodwin had control over the neural network programming they implemented in order for the script to be molded. However, by way of the inherent structure and purpose of agency of AI, it is important to ask whether the distinct operations at least merit canonization as an author function.

Foucault implies that the author is separate from the actual human being and that perhaps this distinction helps fragment the scope of authority over a text.³⁴ This might be a perfect metaphor for the process of AI creating art works in that truly the author is separate from the human being in a variety of ways. The AI is *not* human, it learns from the data a human programmer offers as input, it has no human propensities for emotion and is not conditioned by way of human experience and therefore cannot relay the same model of agency, and even that it is not necessarily a physical being and does not have an identical responsibility to the human by form or weight. The creative collaboration between Artificial Intelligence and human cannot be measured, at least under the conditions suggested by traditional rubrics of authorship.

³⁴ Compagno

AI FILM LANGUAGE

This section proposes an understanding of specifically the language of Artificially Intelligent films as inspired by Manovich in his elucidations of the “language” of new media.³⁵ The term “language” allows for a twofold insinuation. On one level, it underscores the technical lingua franca of coding through which such media is possible and manifest, and on another level, perhaps one more rooted in the social dynamics of media, I use “language” as a way to introduce the aesthetically bound intentions and interpretations that are born from the proliferation of this media object. Penny proffers that the “computer is a carrier of meaning”, in fact, that it is nothing but permutations of symbols signifying a universally accessible range of expressions that wait to be embodied.³⁶ This section will first introduce the technological description of computer language used for machine learning and how it is able to render content, its semiotic function that influences the ways in which this content is understood, and then an application of Manovich’s “language of new media” to AI films.

The ways in which a human-computer interaction would initially be enabled are through Natural Language Processing and (under its umbrella) Sentiment Analysis.³⁷ Understanding the scope and purpose of both of these sheds lights on the necessary foundations of computer creativity. Natural Language Processing algorithms are

³⁵ Manovich, 12-18

³⁶ Penny, 393

³⁷ Prakash Nadkarni, Lucila Ohno-Machado, and Wendy W. Chapman, *Natural Language Processing: An Introduction*, National Center for Biotechnology Information, 2011.

implemented to be able to analyze the pattern of syntax from a variety of input (unlabeled data) and consequently derive semantic value. Within sentence structure, it takes into account relationships between words and morphological input which include parts of speech, numbers, and gender.³⁸ Sentiment Analysis is the next necessary extension of NLP since it allows these tools to not only understand what data says, but what it means.³⁹

The implementation of sentiment analysis is broad and in high-demand because of its ability to assist the emotional compartmentalization of data.⁴⁰ It can also be supplemented with emotion recognition software like in the case of the film, *Zone Out* in which pictures of the actors' faces are selected to replace the actors in the older footage selected by the AI tool, Benjamin. However, semantic analysis works primarily with the organization of written text in order to render emotive dialogue and offer *some* kind of performativity that matches the tone of the dataset fed to the artificially intelligent tool.

Even more specifically, the AI script writing tool employed for the case-studies uses a programming technique called Long Short Term Memory (or LSTM), a recurrent neural network that creates a chain like linkage in between data input in order to be able to

³⁸ Jack Kulas, *"Philosophy and Natural-Language Processing,"* Philosophy, Language, and Artificial Intelligence Studies in Cognitive Systems, 1988.

³⁹ Tian, Ying-li, Takeo Kanade, and Jeffrey F. Cohn. *"Recognizing Action Units for Facial Expression Analysis."* IEEE Transactions on Pattern Analysis

⁴⁰ O'Donnel, Mick, and Alfonso Ortega. *"Compilers."* 2013.
http://arantxa.ii.uam.es/~modonnel/Compilers/05_1_Semantic_AnalysisI-attributes.pdf.

“remember information” for longer periods of time.⁴¹ Effectively, it is easier to be able to produce a cohesive script that refers back and forth to other sections of the script so that a narrative is able to emerge. Even with this neural network, the script ended up making little to no sense whatsoever. The algorithm skewed the lexicon completely out of context and it made for a ridiculous but humorous unfolding. I will expound on the discourse centering on this response in the next section on interface.

However, for the purposes of discussing the language of AI film, this media object presents an interesting relationship between narrative and dataset that Manovich describes as an essential feature contributing to the language of new media. He suggests that they seem to be “natural enemies” in the sense that a database is essentially a disparate list while a narrative seeks out cohesiveness and coincidence.⁴² Moreover, the database privileges taxonomies and categorization while a traditional cinematic approach might draw out linearity. Manovich provides the example of Peter Greenaway who attempts to blur the line between the two by creating movies that simply list out numbers or catalogue colors; likewise Dziga Vertov with *Man With a Movie Camera* (1929) presents “a database imagination in modern media art” by taking a highly self-aware account of the method of film.⁴³ Despite these attempts, the production of AI films is one of the most successful marriages of the two in that narrative and database become essentially indistinguishable

⁴¹ Niklas Donges, "Recurrent Neural Networks and LSTM – Towards Data Science," *Towards Data Science*, February 25, 2018, , <https://towardsdatascience.com/recurrent-neural-networks-and-lstm-4b601dd822a5>.

⁴² Manovich, 225

⁴³ Manovich, 237-243

from the other. In order for the script to be created in the first place, the screenwriting machine requires a database (a corpus of relevant, curated film scripts and prompts) and then is able to turn it into a linear, temporally located plot. Even once the script has been written and performed, the confusion that it elicits because of its technical imperfections *or* the sheer knowledge that a computer program was responsible for its fabrication establishes its absolute alliance with and “transcoding” or translation from the numerical language of a database.

Zone Out allows for a well-rounded consideration of the language of AI films through its transcoding of script, a variety of media footage (movies and recordings of the actors faces), music and voice/dialogue dubbing. The sense that the machine has complete “control” (through its employment in the majority of the production processes) over the construction of the film highlights the possibilities of working *within* the constrictions of a developing language. In that way, while the film might draw attention to its editing glitches, uncanny face-mapping, and peculiar dubbing, it also sheds light on its dependence on the existing template of cinema, therefore incorporating ‘older forms of media’, and its working towards simultaneity or a convergence of media platforms paving the way for the evolution of a new medium.

INTERFACE, INTERACTIVITY, & IMAGE

Setting up the framework or language of AI films encourages a reevaluation of not only the patterns of the medium, but the platform on which they can be recognized. From Alan Turing’s pioneering endeavors, the field of AI has worked rigorously towards

manifesting the goal of invisibility.⁴⁴ How can an artificially intelligent program be created whose work, or whatever mode of output, might be indistinguishable from that of a human creator? However, there exists a split in between the purposes of such a pursuit- are we looking forward to the creation of artistic products born out of a total replication of human cognition and consciousness or the advancement of AI as *tools* that support and propel human creativity? Moreover, the goal of invisibility seems to have taken a backseat as discourse of technology and the topical popularity of AI begins to emerge. The duality of AI films encroaching the media landscape occurs in two ways. One of the ways in which this is carried out is by making the films easily accessible via the internet and the other is by creating films that are highly self-aware of the means of their production, and therefore *by AI and about AI*.

There is a clear trend that calls obvious attention to films that have used Artificial Intelligence in their production. These films often adopt a wholly self-reflexive position and center on the anxieties and absurdity that AI brings to the table. Especially in the case of fine arts, where this experimentalism is invited, AI films represent not only their technological prowess by the means of marketing themselves as products of AI, but they present narrative renditions of the structures of their own coming into being. This is done as simply as coming up with a plot that revolves around artificially intelligent beings interacting with humans. For example, the trailer for the film *Morgan* (Luke Scott, 2016) was edited using an AI program that evaluated the arc of a sci-fi horror movie trailer and selected and organized

⁴⁴ Alan Mathison Turing, *Computing Machinery and Intelligence* (Oxford: Blackwell, 1950).

scenes from the film accordingly. The production used its narrative to inform its marketing choices and in turn re-orient buzz about the movie.⁴⁵

However, marketing is just one of the many influences AI has in the industry. For the three case studies of this thesis, AI seeps into the plot and style of the film in different ways, taking over more production roles in each progressive film. First, *Sunspring* adopts distancing and futuristic visuals and production design in order to communicate the sci-fi genre and effectively, emphasize the proliferation of a new mode and style of narrative. Even the dialogue of the film and online discussions around it pointed to the self-reflexivity of the new medium. While a human audience might not have been able to make sense of the dialogue, it was easy to recognize the repetition of the phrase “I don’t know” and “I don’t understand (what you are)” underscoring the existing gap and parallels between the technological efforts of AI and its possibilities, as well as the pursuit for the expression of meaning between and within both fields independently- AI and Film.

It’s No Game takes this dynamic to yet another level by referencing the contemporaneous writer’s strike in Hollywood through the synopsis of two screenwriters confronting the fact that AI screenwriters have taken over the film industry and are the future of cinematic storytelling. While Sharp and Goodwin assure viewers that the plot is but fictive, it still stresses the legitimized concerns of AI potentially taking over jobs.⁴⁶ If they

⁴⁵ Amelia Heathman, "IBM Watson Creates the First AI-made Film Trailer – and It's Incredibly Creepy," WIRED, September 02, 2016, , <https://www.wired.co.uk/article/ibm-watson-ai-film-trailer>.

⁴⁶ Sam Machkovech, "This Wild, AI-generated Film Is the next Step in "whole-movie Puppetry"," Ars Technica, June 11, 2018. <https://arstechnica.com/gaming/2018/06/this-wild-ai-generated-film-is-the-next-step-in-whole-movie-puppetry/>.

can provide a shred of hope, the film portrays the dangerous pitfalls of this kind of future and returns to its occupation of setting forth the sci-fi narrative as an entertaining thought and narrative experiment. On the other hand, while *Zone Out* might not directly allude to futurism or employ sci-fi visuals, but the technology showing itself through the work underscores the prospects of the same anxiety depicted in the two films before it.

Ross Goodwin, responsible for the production of the films and specifically for the creation of Benjamin the AI offered that “machines don’t replace us... they become extensions of us” and explained that the burgeoning of films like these intimates a steady approach towards using the medium as a technique of expression in the same ways traditional cinematic practices already do.⁴⁷ Hansen offers that one of the characteristics of an emerging media is the process by which users interactions with it entail a *becoming* familiar with the technology.⁴⁸ As a consequence, users preserve work by interacting with it and are responsible for the validation and proliferation of new media by means of necessitating it in order to evolve with technology.

It is important to note that the films’ online existence is crucial to the validity of their form since it is the only possible way for it to be accessed after their respective screenings at the Sci-Fi London Film Festival. By debuting the three films on the art and technology website, *Ars Technica*, and making it universally accessible on YouTube, viewers can come in direct contact with the media object and the new media propensity for participatory

⁴⁷ Ross Goodwin, "Adventures in Narrated Reality – Artists and Machine Intelligence – Medium," Medium, March 19, 2016, <https://medium.com/artists-and-machine-intelligence/adventures-in-narrated-reality-6516ff395ba3>.

⁴⁸ Hansen, 127-159

culture can be instigated. In that case, the act of pursuing or creating this form of art and watching and critiquing it begin to be blurred. Starting from the comments section, viewers discuss the confusion, humor, and fears that the films stir up, and effectively, influence the discussion of future AI creative projects. While these films don't necessarily solicit a collective construction of the medium, they inevitably organize the foundations of experiencing such a new form of media.

These films differ from other online content initially by the knowledge of their means of production with Artificial Intelligence, but the unique relationship between these two revolutions, the internet and Artificial Intelligence, underscores the interdependence between new media platforms to support their proliferation. Discussions about the novelty of the art form permeate the larger contexts of film production and the universality of Artificial Intelligence. By placing these films alongside other online content, one not only begins to recognize the gradual infiltration of a new mode of authorship and aesthetics, but also reevaluates the ways in which this content is consumed. Artificial Intelligence brings with it then the guise of personhood and challenges how we accept cinema as an extension of personhood.

CONCLUSION

In conclusion, this thesis makes the case for AI films as an emergent medium with distinct propensities that set it apart from media in its periphery or directly associated and contributory to it. By engaging with concurrent theorizations of new media technology and its cultural effects, AI films present themselves as an innovative form of cinema in terms of digital construction, virtual situatedness, narrative preoccupations, and author function. The

primary foundations for these are uncovered in the various systems that define themselves as new media setting up the structure for another technological revolution.

In terms of technology and *language*, AI films employ a radically unique method of production and require the knowledge of a technically distinct series of languages that enable machine learning and the makeup of neural networks. These exercises of natural language processing allow for a fruition of film scripts that work towards narrative coherence even in their current state of affairs. Moreover, they point to the patterns found in the works provided as curated datasets and expose the trends of cinematic narrative, opening doors for even more creative agency.

When it comes to understanding the significance of the platform on which this media can be accessed, the context in which it is received and the corresponding content that it relays become central to its essence. This relationship between the creators and the viewers calls for a thorough reflection of the ongoing discourse of new media accessibility and fluidity. Additionally, the means by which the films are constructed and the choices made along the way concerning performativity, outreach, and development unavoidably call attention to the responsibility and operation of the author or creator. Whether the association is by name, technology, or canonization, the multiplicity of the source of the creative agency emphasizes the complexity of proprietorship as well as artistic self-expression through new media.

Revisiting the metaphor of the 'Ship of Theseus', one can begin to unveil the necessary concern of technological evolution and its influence on the identity of film, especially under ever-evolving circumstances. This convergence of art and technology paves the way for an emergent medium that occupies the space of film form while simultaneously

destabilizing the structures that have historically defined it. The synthesis of the novel turn towards machine learning as a tool to either expedite the process or simply experiment with film narrative calls for a reappraisal of this kind of artistic practice. In that case, AI in the film landscape not only shifts approaches to narrative but also perceptions of it that emphasize inquiry into the essence of the medium. It begins to ask questions beyond just what it means to watch, or preserve, a film built by such a technology, but also how the terms and function of this new mode and resulting purpose of production, distribution, exhibition, and reception are a crucial component of the very identity of cinema as it continues to change.

Filmography:

Its No Game, dir. Benjamin, prod. Oscar Sharp and Ross Goodwin, perf. David Hasselhoff, Ars Technica, 2017.

Sunspring, dir. Benjamin, prod. Oscar Sharp and Ross Goodwin, perf. Thomas Middleditch, Ars Technica, 2016.

Zone Out, dir. Benjamin, prod. Oscar Sharp and Ross Goodwin, Ars Technica, 2018.

Bibliography:

"*Artificial Intelligence: A New Director In Film-Making*", Bold Business, August 2, 2018, <https://www.boldbusiness.com/digital/artificial-intelligence-film-making/>

Betancourt, Michael, "*Disruptive Technology: The Avant-Gardness of Avant-Garde Art*," CTheory, May 1, 2002.

Boden, Margaret A. "*Creativity and Artificial Intelligence*." *Artificial Intelligence*, no. 103 (1998): 347-56. https://ac.els-cdn.com/S0004370298000551/1-s2.0-S0004370298000551-main.pdf?tid=ac650e09-139b-48d2-8132011997b080f0&acdnat=1523064747_76d79cffbbb77032b25600356967c2_b

Brynjolfsson, Erik and Andrew McAfee, *Race against the Machine: How the Digital Revolution Is Accelerating Innovation, Driving Productivity, and Irreversibly Transforming Employment and the Economy* (Lexington, MA: Digital Frontier Press, 2012).

Compagno, Dario, "*Theories of Authorship and Intention in the Twentieth Century*," *Journal of Early Modern Studies* 1, no. 1, 2012.

Dallas, Dirk, "*Filmmaking, Artificial Intelligence & Machine Learning -*" - At the Intersection of Design & Emerging Technologies, August 12, 2018.

Deltorn, Jean-Marc and Franck Macrez, "*Authorship in the Age of Machine Learning and Artificial Intelligence*," Center for International Intellectual Property Studies Research Paper Series, 2018, , doi:10.2139/ssrn.3261329.

Donges, Niklas, "*Recurrent Neural Networks and LSTM – Towards Data Science*," *Towards Data Science*, February 25, 2018.

<https://towardsdatascience.com/recurrent-neural-networks-and-lstm-4b601dd822a5>.

Foucault, Michel, "*What Is an Author?*", *Modernity and Its Discontents*; 1969, doi:10.4324/9781351226387-36.

Goodwin, Ross, "*Adventures in Narrated Reality – Artists and Machine Intelligence Medium*," *Medium*, March 19, 2016, <https://medium.com/artists-and-machine-intelligence/adventures-in-narrated-reality-6516ff395ba3>.

Hansen, Mark B. N., *New Philosophy for New Media* (Cambridge, MA: MIT Press, 2006), 20-47.

Heathman, Amelia, "*IBM Watson Creates the First AI-made Film Trailer – and It's Incredibly Creepy*," *WIRED*, September 02, 2016, , <https://www.wired.co.uk/article/ibm-watson-ai-film-trailer>.

Jenkins, Henry, *Convergence Culture: Where Old and New Media Collide* (New York: New York University Press, 2016).

Jennings, Pamela, "Narrative Structures for New Media: Towards a New Definition," *Leonardo* 29, no. 5 (1996): 345-347, doi:10.2307/1576398.

Kant, Immanuel, *The Critique of Judgment*, trans. James Creed Meredith (Oxford: Clarendon Press, 1961).

Kulas, Jack "*Philosophy and Natural-Language Processing*," *Philosophy, Language, and Artificial Intelligence Studies in Cognitive Systems*, 1988.

Kurt, Deniz E., *Artistic Creativity in Artificial Intelligence*, Master's thesis, Radboud University, 2018.

Machkovech, Sam, "*This Wild, AI-generated Film Is the next Step in 'whole-movie Puppetry'*," *Ars Technica*, June 11, 2018. <https://arstechnica.com/gaming/2018/06/this-wild-ai-generated-film-is-the-next-step-in-whole-movie-puppetry/>.

Manovich, Lev, *The Language of New Media*, Cambridge, MA: MIT Press, 2010.

Michaels, Meredith W., *The Persisting Problem of the Ship of Theseus*, PhD diss., University of Massachusetts Amherst, 1980

Nadkarni, Prakash, Lucila Ohno-Machado, and Wendy W. Chapman, "*Natural Language Processing: An Introduction*," National Center for Biotechnology Information, 2011.

O'Donnel, Mick, and Alfonso Ortega. "Compilers", 2013.
http://arantxa.ii.uam.es/~modonnel/Compilers/05_1_Semantic_Analysis/attributes.pdf

Pearlman, Russ, "*Recognizing Artificial Intelligence (AI) as Authors and Inventors Under U.S. Intellectual Property Law*," Richmond Journal of Law and Technology - The First Exclusively Online Law Review, 2018.
<https://jolt.richmond.edu/recognizing-artificial-intelligence-ai-as-authors-and-inventors-under-u-s-intellectual-property-law>.

Penny, Simon, *Making Sense: Cognition, Computing, Art, and Embodiment*. Cambridge, Massachusetts ; London, England: MIT Press, 2017.

Plutarch, John Dryden, and Arthur Hugh Clough, *Plutarch: The Lives of the Noble Grecians and Romans* (New York: Modern Library, 1992).

Sarris, Andrew, "Notes On The Auteur Theory In 1962", in Gerald Mast & Marshall Cohen (ed), *Film Theory and Criticism: Introductory Readings*, 2nd Edition, Oxford: Oxford University Press, (1979).

Schwab, Klaus. *The Fourth Industrial Revolution*. London: Penguin Random House, 2017.

Tian, Ying-li, Takeo Kanade, and Jeffrey F. Cohn. "*Recognizing Action Units for Facial Expression Analysis*." IEEE Transactions on Pattern Analysis

Turing, Alan Maithison, *Computing Machinery and Intelligence*. Oxford: Blackwell, 1950.

Wilson, H. James and Paul R. Daugherty, "*How Humans and AI Are Working Together in 1,500 Companies*," Harvard Business Review, July 24, 2018,
<https://hbr.org/2018/07/collaborative-intelligence-humans-and-ai-are-joining-forces>.