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Semiotics, Artificial Intelligence, ChatGpt. Research Lines, Analytical Perspectives and Potential Applications¹

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Abstract

Given the rapid spread of artificial intelligence in our society, important questions arise about its nature and impact. In this essay, our objective is to explore various research lines for a semiotic approach to the study of AI. Specifically, the first part of the paper delves into the theoretical framework for analyzing AI from a semiotic perspective, investigating how AI is influencing and redefining traditional semiotic interpretative categories. The second part focuses on applied semiotics for AI, exploring recent semiotic studies that aim to analyze the underlying structures and codes that govern the communication and interpretation of AI technologies. Lastly, the third part of the essay concentrates on narrations related to AI, considering how film, advertising, and newspaper discourses contribute to shaping our perception of a world where an increasing number of users interpret and interact with AI and. By delving into these areas, we can gain a comprehensive understanding of the intricate relationship between semiotics, artificial intelligence and our socio-cultural context providing valuable insights into the impact of AI on language, communication, and human interaction. Finally, responding to the call for papers' question, the article reflects on how other fields and subfields linked to semiotics are studying AI, in order to develop a better understanding of the current research perspectives and foster further opportunities for an interdisciplinary approach that can nurture semiotics as well, transfer its knowledge and methodological approach across different disciplines, as part of the the rapidly changing research environment.

Keywords

Semiotics, Artificial Intelligence, Semiotics for AI, Narration, Interdisciplinary Studies.

0. Introduction

This paper aims to explore the potential of semiotic methodology for studying artificial intelligence (AI). Specifically, the focus lies on the primary semiotic research directions on AI, examining recent studies on the subject and contemplating the machines' capacity to interpret reality and aid us in its interpretation.

Many other concepts for more practical methodological approaches to AI have been put out in recent years. The article first provides a summary of such viewpoints described in the current literature before considering a descriptive and relatively specific typology of these various research perspectives. The first paragraph introduces the key theoretical and methodological aspects associated with the semiotics of AI. The study of AI from a semiotic standpoint poses significant challenges to semiotic theory, starting with the discussion of analytical and interpretative categories. The second

¹ This paper represents a part of a ongoing research carried out about the implications of AI in a variety of contexts and cultural texts from a semiotic perspective, such as advertising tourisms and gender biases. The article has been developed by the authors, as follows: M. Boero wrote paragraphs 2, 3, 4; C. Greco wrote the paragraphs 1, 5, 6. Introduction and Conclusions have been written together by the authors.

paragraph discusses the practical implications of a semiotics that encompasses AI, emphasizing the contributions semioticians can make in algorithm creation, language study, and other related areas. Finally, the third paragraph delves into discourses on AI. By analyzing media and scientific discourses on AI, we contemplate the narratives and ideologies that influence our perception of the world. This critical examination of AI discourse helps shed light on the societal attitudes and values that underpin the adoption and utilization of AI technologies. It reveals how the portrayal of AI in various media forms can both shape and be shaped by our cultural, social, and economic contexts. By engaging in semiotic analysis and exploring the multifaceted implications of AI, we gain deeper insights into the cultural impact of these technologies and their profound influence on our societies. Furthermore, the rapid advancement of AI technology has led to ethical considerations and questions about its impact on employment, privacy, and the overall societal fabric. People are worried about the possible job displacement brought on by AI, due to the automation of different work tasks. As a result, the work market may undergo an important transition, needing the development of new skills. Additionally, by gathering and analyzing an enormous volume of individual data, AI generates privacy issues and concerns. This is to say that society must address ethical issues and set rules to assure the ethical development and application of AI. These concerns add another layer to the discussion, highlighting the importance of integrating semiotic analysis with broader perspectives, considering the potential of interdisciplinary studies as a fruitful combination of skills and capacities that is extremely urgent in the reflection about AI and its implications.

These concerns add another layer to the discussion, highlighting the importance of integrating semiotic analysis with broader perspectives, considering the potential of the interdisciplinary studies as a fruitful combination of capacities substantial to the reflection about AI and its implications. In the last part of the contribution, we discuss this deeper. In this direction, we can ensure a thorough understanding of the social, cultural, and ethical aspects of AI by integrating different viewpoints. This deeper understanding of AI will also help us create AI systems that are based and consistent with human values. Therefore, it is essential to promote cooperation and communication among various academic fields in order to address the complex problems that AI presents.

1. AI Implications in the Research Process

Artificial intelligence is shaping the way researchers approach the object under study becoming a crucial aspect of the entire research process. Science has always been greatly aided by technology, and artificial intelligence is anticipated to push this trend much farther and improve the standard for academic inquiry to entirely new heights. For instance, Artificial intelligence (AI)-based algorithms are utilized to offer new viewpoints on analyzed topics. They can be used to generate and test brand-new hypotheses and link different parts of knowledge. The complex research problems that scientists have faced in the past and particularly in the present have all found solutions in this technology. They are now capable of solving these problems far faster and more successfully than people. Humans do not have to deal with the work of manually evaluating the large volumes of available data to discover patterns, uncover abnormalities, and draw relevant insights in the digital age, where a universe of information is there, with most of it living in cyberspace. Rather, these jobs are being made simple and effective with the aid of AI systems. Furthermore, AI could add biases into research by using biased datasets or algorithms, which could result in erroneous conclusions. In keeping with the goal of the paper, this article aims to broaden reflection to other disciplines and assess field initiatives in terms of variations in underlying methodological ideas held by researchers and the potential for semiotics' future development. In this regard, we believe that in order to both increase the caliber of research reports and the ease with which other field participants may understand them, researchers should be transparent about their methodological approaches while communicating study findings.

The study method is better understood because to this disclosure, which also makes it easier to spot any biases or constraints that might have existed. Additionally, researchers can encourage a culture of collaboration and knowledge sharing within the field of semiotics by candidly expressing their methodological choices. This helps the development of the field of study but also fosters critical thinking toward new research directions. A researcher might freely share their data gathering and analysis methods with other academics in the subject of semiotics, for instance. Additionally, conversations on methodological decisions can result in insightful learnings and advancements in study techniques, ultimately raising the standard of semiotic studies as a whole.

2. Semiotics of AI: theoretical considerations

Semioticians studying AI encounter an innovative object of investigation that challenges established epistemological methods and categories. Therefore, one fundamental area of semiotic research in the field of AI focuses on defining the theoretical framework for its investigation. Firstly, it is crucial to reflect on the objectives of an AI semiotics. What are the aims of a semiotics interested in AI? In this regard, attention is directed towards understanding how AI simulates human intelligence, whether and how it can be considered creative, and the ideological assumptions underlying its production and use (LEONE 2023). Secondly, the evolution of AI necessitates a reevaluation of interpretative and analytical categories within semiotics. With AI, new forms of narrativity and textuality emerge, challenging the principles of “attribution” and “authorship”. Concerning “attribution”, it becomes difficult to discern whether the discourse produced originates from a human or a machine. The absence of errors or contradictions in the text creates ambiguity regarding the enunciator’s identity. Control systems have been introduced to address this challenge, but they still exhibit significant margins of error and weak reliability. In some cases, attribution is facilitated by analyzing the language itself. For instance, ChatGPT’s lexical and syntactic choices are characterized by predictability and simplicity, leading to tonal leveling, whereas human language often displays variations in intensity². In the latter case, the issuer’s identity is sought within the text itself, expressed through the style of writing.

The issues surrounding attribution are closely connected to the discourse of authorship. Who can be considered the author of the text? Can we confidently attribute authorship to the AI technology? For instance, ChatGPT does not plagiarize, copy, or quote directly but revises and modifies existing data and texts upon request. This process of reworking can create an anthropomorphic illusion, akin to virtual avatars that appear human but are composed of mere pixels. If we draw an analogy, the pixel composition of a certain image on a screen is similar to that of a virtual avatar, but the difference lies in the fact that image represents a physical body while the avatar remains a construct. While understanding this distinction, it is important to emphasize the difference between the image itself and what lies beneath it. In other words, there is something real to which a photograph refers (such as a person) while an AI-generated image lacks this referential connection (BARTEZZAGHI 2023).

So, who can be considered the enunciating subject of the AI-generated text, according to Greimasian terminology (GREIMAS 1983; GREIMAS and COURTÉS 1979)? We know that AI tools do not produce original texts but rather revise existing ones created by other authors. Can we view the machine as the subject that produces a discourse by reworking and incorporating pieces of pre-existing texts, or should the status of enunciating subject be attributed to the author of the source text? If we assume the first hypothesis, we could see the machine as a subject that produces output even without creating content from scratch. This process mirrors what a human does when re-elaborating existing texts without adding anything original or personal, as seen in numerous works on the web or compilation-oriented projects. In this scenario, the human subject takes the innovative content

² See: <https://www.linguisticamente.org/chatgpt-le-macchine-parlano-come-noi-parte-i/> |retrieved 26.07.2023|

produced by other authors or reworks existing texts in an infinite process. Alternatively, if we adopt the second hypothesis, the author of the text is the individual who initially created the contents that the machine later elaborates upon. It is likely that this author is not a sole entity but rather a collective authorship, since the machine incorporates and reworks text fragments from a collective database.

To further explore these ideas, it is beneficial to consider the concept of “collective mind”, as Lotman associated it with the notion of AI (LOTMAN 1977). Understanding the essence of mental activity and the necessary investigations to comprehend its forms and properties is essential in defining the characteristics that any thinking mechanism, including AI, must possess. Studying the semiotic structure of culture, which acts as a mechanism of the collective mind, and analyzing the “memory of culture” along with the mechanisms for processing new information, allows us to examine the relationships between culture, individual minds, and artificial intelligence. It should be emphasized that the collective mind, serving as a model for artificial intelligence, possesses numerous advantages over the individual mind. The mechanisms of the collective mind, as shaped by human history, are more intelligible and evident in the languages of culture, documented in a vast number of texts, compared to the language confined within individual human brains. The study of individual cultures has yielded extensive material that has revealed mnemonic-mental mechanisms of particular interest through proposed interpretations.

Regarding “authorship”, we must consider how all of this challenges the concept of a model author, as outlined in Eco’s theory (ECO 1979, p. 63). The model author, as understood from Eco’s perspective, refers to a textual strategy or style. According to Eco, textual cooperation is a phenomenon that occurs between two discursive strategies, rather than individual subjects. The model author actively directs the interaction by guiding the reader, encouraging observation, proposing correlations, and so on. Can we consider ChatGPT to have a distinct and recognizable style, beyond the specific texts it generates, with their specific authorship?

The discourse of authorship is closely connected to that of “intentionality”. According to ECO (1990), there are three types of intentionality: *intentio auctoris*, *intentio operis*, and *intentio lectoris*. In semiotics, it is crucial to concentrate on the intentions of texts, as they can convey values and messages beyond the author’s original intent. By examining these different levels of intentionality, semiotics can gain valuable insights into the layers of meaning present in a text and how it interacts with readers or interpreters. However, considering AI generative technologies, what is the meaning of a machine-produced text? In the most efficient scenarios envisioned for systems like ChatGPT, we obtain texts generated by a machine that can process and assemble syntactically correct and semantically plausible phrases upon request. However, the pragmatic dimension is absent since there is no speech act involved. The machine’s response corresponds to its output based on the command to generate the text or the appropriation by the person eventually signing it. In a ChatGPT text, for instance, the enunciation is purely based on the sources that feed its database. It serves as a reservoir of common sense and the reworking of ChatGPT is different each time. Thus, the enunciation of the text is ambiguous.

Moreover, the advent of AI brings about a redefinition in the concept of “textuality” (POZZATO 2001, MARRONE 2022). Where does the text produced by AI begin and end? What type of text does it generate? While the system provides syntactically correct and semantically plausible texts, they originate from a non-human source, and thus lack the intentional aspect of human enunciation. Does this align with our understanding of what a text should be? These questions have significant implications for the relationship between humanity and the world. As language constructs our reality, we must consider what kind of world is shaped by the language of AI. What values and practices are embedded within this AI-generated world? Can we identify distinct ideologies that stem from it? In the years to come, semiotics will need to address these challenges and discuss the possibility to adapt its methods and descriptive tools, to effectively analyze and interpret the ever-evolving phenomena of our rapidly changing world.

3. Applied Semiotics for AI

Semiotics has been engaged with the topic of AI since the 1980s and 1990s, with a particular focus on the development of semantic models. During this time, semioticians sought to create models capable of capturing and representing meaning and semantics within artificial intelligence systems. The aim was to understand how machines could process and comprehend the meaning of signs, as well as to explore their ability to represent and communicate meaning in ways similar to humans. This endeavor led to the development of sophisticated semantic models capable of addressing the intricate nature of meaning within AI systems. Semiotics tried to provide a theoretical and methodological framework for tackling these challenges, emphasizing the analysis of signs and the processes of signification. Semioticians investigated how signs were represented, interpreted, and communicated within AI systems, while considering the interplay between signs, meaning, and context.

Pioneering scholars made significant contributions to this field. LOTMAN's work on collective artificial intelligence (1977), GREIMAS' reflections on machine translation (1966), and ECO's studies on information theory (1975) and semantic memory proposed by QUILLIAN (1968), have become classical studies that laid the foundation for the discipline. Over the years, this theme has taken a backseat to other lines of research, which are more closely related to the fields of planning, marketing, and design. However, this initial phase of engagement between semiotics and AI established the groundwork for further developments and research. In subsequent years, semiotics continued to explore the role of meaning and signs within AI, investigating topics such as sign interpretation, communication, semantic ambiguity, and ethical considerations associated with AI usage. With the increasing widespread of open AI systems such as ChatGPT, AI has once again emerged as an interesting and contemporary subject of study in the semiotic field, primarily due to its significant impact on daily practices, on communication models, and even on the semiotic key concepts of textuality, narration, and enunciation. In a recent publication by LEONE and SANTANGELO (2023), they attempt to outline the main aspects on which a semiotics for AI should concentrate. The goal is to demonstrate how semiotics can enhance the functionality of information technologies tools. With this purpose, GALOFARO AND ZENO (2023) have developed an algorithm that extends certain concepts and models from quantum theory to the field of information retrieval, such as entanglement and the correlation due to quantum interference. The authors explore the linguistic and semiotic implications of a quantum-type semantic theory, examining the relationships between their work and a broad range of studies that utilize statistical tools from quantum theory, applying them to human and social sciences. They conduct a case study by testing their algorithm on the Twitter debate surrounding Pope Francis' encyclical "Laudato Si". The authors show that the application of quantum tools is valuable in understanding how the quotation of a text on social networks, when linked to specific hashtags and themes, alters its original semantic profile. The algorithm is proficient in capturing these aspects, enabling the machine to make interpretations as intelligent as those of a human being.

In another essay of the book edited by Leone and Santangelo, FERREIRA LEITE DA SILVA (2023) discusses how ZILBERG's tensive semiotics (2006, 2012, 2019) can enhance the functionality of algorithms based on artificial intelligence, specifically transformer neural networks that conduct sentiment analysis on social networks. Ferreira Leite da Silva demonstrates how the traditional subdivision, classifying opinions expressed by users into positive, negative, and neutral, is inadequate in capturing the complexity of their discourses. Instead, he proposes dividing the opinions into six categories: redoubling, saturation, attenuation, minimization, extinction, and re-establishment. The Brazilian scholar applies his theoretical tools to a corpus of reviews received on Tripadvisor by a well-known restaurant in his country.

In this direction DELL'ACQUA and BELLENTANI (2023) explore how semiotics can improve the functioning of chatbots that utilize AI algorithms to simulate natural conversations. They focus on three aspects of designing such tools: defining the goals of the user and the chatbot, which may sometimes diverge; outlining a target or model user, along with their cultural and pragmatic context, and considering the possible interpretations the user can provide in response to the chatbot's interactions; creating personas that provide chatbots with recognizable identities, fostering engaging and sensible interactions. The authors demonstrate how Greimas's structural semiotics, Eco's interpretative semiotics, and pragmatics can be instrumental in creating IT tools capable of proposing pleasant and meaningful interactions. Another area where the usefulness of semiotic contributions can be observed is in video games, where artificial intelligence simulates human intelligence to provide players with a fun and interactive experience as if they were interacting with real individuals. GIULIANA (2023) asserts that the impression of engaging with men or women in video games is merely a sensory effect. The author explores various AI systems utilized in the gaming industry and reflects on the semiotic status of the commonly used notion of intelligence, which can be deduced from dictionaries.

All these studies demonstrate how semiotics can play a crucial role in enhancing IT tools to foster engaging and meaningful interactions. These studies serve as a foundation for further research, where semiotics can intersect with other disciplines, such as computer science, to better understand the implementation of language models and to control the impact on meanings, values, and interaction modalities. This opens up new avenues for discussion in which semiotics can demonstrate the analytical possibilities offered by its theoretical tools, opening up new horizons for understanding the intricate complexities of language, culture, and technology³.

4. Narratives on Artificial Intelligence: Cinema, Advertising, Newspapers

Another area of dialogue between semiotics and AI pertains to the semiotic analysis of narratives about AI. In this case, we delve into a more conventional field of investigation, where semiotics can provide valuable insights through the application of well-established tools capable of decoding values, meanings, and messages conveyed by texts that revolve around AI. Both fictional narratives (films, TV series, advertisements) and factual accounts (newspapers, scientific articles, documentaries) contribute to shaping our perception of a world where humans increasingly interact with new technologies. Semiotics can play a crucial role in this research area by examining the worldviews proposed by media discourses. In particular, greimasian semiotics (GREIMAS 1982) can offer a descriptive analytical contribution for the analysis of various texts discussing AI, unraveling the profound meaning of the text through narrative analysis and exploring the roles of humans and AI, such as Sender, Recipient, Subject, Object, Anti-subject, Adjuvant, and Opponent. Regarding artificial intelligence, the prevailing scenario that emerges, with expressive variations depending on the type of discourse, is predominantly dystopian in nature. From fictional universes to news stories, the focus lies on the negative aspects, fears, and potential consequences of increasing AI usage.

The fear that machines might overpower human beings has been a recurring theme in epic science fiction films. One of the most famous and unsettling portrayals of artificial intelligence is HAL 9000 from Stanley Kubrick's "2001: A Space Odyssey" (1968). This computer is characterized by a

³ In this context, it is worth mentioning the establishment of the MINDS research group at the University of Teramo (Italy). This interdisciplinary research project delves into the interactions between semiotics, epistemology, and computer science, particularly focusing on the study of AI and emerging language models. One of the group's primary goals is to showcase and explore how semiotics can effectively analyze language models and texts generated by AI, decode the veracity of AI-generated images, and contribute to the ongoing debate surrounding information and disinformation processes. Research group google site: https://sites.google.com/d/1XHoW168vKYU-xPYQFiAGfGuNgRcFw3GC/p/1ApcQBF3eFu3z7sz_Rk0gDe9Lj9Wi59_e/edit?pli=1 [retrieved 26.07.2023]

hypothetical ability to be error-free, human-like sensory and emotional perceptions, and complete control over the spaceship. However, HAL 9000 is not infallible, as accidents on the spaceship occur due to its concealed mistakes, eventually leading to its unmasking.

The dystopian scenario often evolves into a desirable one when the machine acquires human-like characteristics. A prime example is the film “Bicentennial Man” (1999) an American science fiction comedy-drama film directed by Chris Columbus, which depicts the growth path of the protagonist, initially an advanced machine capable of serving as an assistant, but who later embarks on a journey of growth and autonomy, ultimately becoming hybrid and, eventually, human. The film follows the life of Andrew Martin, one of the first prototypes of a positronic robot, purchased by the Martin family as a service robot. Over time, Andrew displays unexpected emotions and reactions, forming a strong bond with the family, especially the youngest daughter. As Andrew gains self-awareness, he seeks to be recognized as more than mere property and desires to attain freedom.

Similar narrative trajectories, from robotic/dystopian to human/utopian, are also found in advertising, where the inherent dystopia of robots/machines is diminished or eliminated by attributing human characteristics to the robots themselves, as seen in the commercial for the Peugeot 208, titled “Future is Sensations” (2014)⁴. The ad starts with a shot of a robot taking advantage of its inventor’s exhaustion, as he sleeps in the laboratory, and quietly snatches the car keys to go for a ride through the city streets. At first, the robot’s identity remains a mystery, but the appearance of characters like the Cat and the Fox quickly hints that it is a Pinocchio-like robot. Unlike Collodi’s Pinocchio, which was crafted from wood and belonged to the natural world, this robot is made from an unfamiliar material. This material is challenging to shape, giving the robot a cold, static, and emotionless appearance. However, when Pinocchio-robot sits behind the wheel and touches it, something magical happens. A surge of energy courses through the metal and wires, reaching its heart, which begins to beat strongly. This infusion of energy makes the robot come alive with human-like sensations, as evidenced by a tear that forms in its eyes while it drives. Through this magical machine, the robot starts experiencing intense and delightful sensations: the robot transcends its robotic nature and becomes a boy in its feelings and actions, even though its physical likeness remains unchanged throughout the narrative.

Presently, various media discourses are once again discussing artificial intelligence, driven by the widespread adoption of ChatGPT. This open AI system is described as unsettling by newspapers, as it can generate syntactically perfect content without making grammar errors. Interestingly an inverse process occurs compared to what is depicted in “2001: A Space Odyssey”. The real issue with machines is no longer their potential to make mistakes, but rather that they don’t make any. Newspaper headlines envision apocalyptic scenarios, where humanity may lose control over reality, continuously delegating roles and functions to machines.

In April 2023, the *Newsguard* report on misinformation related to AI⁵ triggered numerous newspaper articles discussing the risks and opportunities associated with the new version of Chat GPT. Analyzing a collection of articles from *Il Sole 24 Ore* newspaper, a strong emphasis on the dangers of this new medium emerges. Particularly noticeable in the article titles is the focus on the perceived clash between man and machine, which fuels fears and apprehensions often depicted in dystopian scenarios found in science fiction films. In an article titled “Parallel Intelligences: What Will Become of Us in the Time of Chat GPT?” (4.4.23)⁶, the author ponders humanity’s fate in this new context, expressing doubts and making it evident that the scenario envisions not coexistence but exclusion between the two elements, framed in an either-or logic.

⁴ <https://www.youtube.com/watch?v=t2T4ssHtmUU> |retrieved 26.07.2023|

⁵ <https://www.newsguardtech.com/it/report/> |retrieved 26.07.2023|

⁶ https://www.ilsole24ore.com/art/intelligenze-parallele-che-ne-sara-noi-epoca-chat-gpt-AEf5cGDD?refresh_ce=1 (title translated) |retrieved 26.07.2023|

This theme reappears in an article from April 14, which explicitly proposes the hypothesis of a clash, stoking the most alarming of scenarios. Titled “The Artificial Intelligence That Wants to Destroy Mankind” (accompanied by fear-inspiring images and a section titled “Attack on Mankind”) (14.04.23)⁷, the article emphasizes the machine’s intention to take over and eliminate humanity. The accompanying image, featuring a menacing expression on a robot, further reinforces this concept. In another article, readers are prompted to reflect on the potential roles that Chat GPT could play, raising the question of whether it will be a “Useful Servant or Dangerous Master?” (4.4.23)⁸, suggesting the possibility of human enslavement to technology. The possibility of the machine simply being an aid is less evident. However, another article takes a different approach, focusing on the urgency of establishing rules. Instead of dwelling on dystopian scenarios, this piece examines corrective actions necessary to address the situation. The title, “Chat GPT and Artificial Intelligence: Why Rules at EU Level Are Needed Immediately” (2.4.23)⁹, stresses the need for immediate action at the European, not just national, level, fostering reader reflection on the dangers of delayed intervention.

Two different models and worldviews emerge: one characterized by fear of technologies and the other in which technologies can bring improvement. Discourse analysis on AI shed light on the ideologies and perspectives that emerge from these media narratives, influencing our conception of reality and our relationship with it. As a result, these visions presented by the media contribute to the construction of a world where humans increasingly interact with machines and align with specific cultural models. This process gives rise to new myths that require scrutiny, as they underpin our understanding of what it means to be human in the age of AI. Apocalyptic scenarios, fueled by collective passions that intensify through social networks, can dominate the discourse, often overshadowing rational analysis and expert opinions. It becomes essential to confront these emerging narratives, as they deeply influence our perception of AI and its impact on society. By leveraging semiotics, we can better grasp the intricacies of these media discourses and their implications, facilitating a more nuanced and informed understanding of the complex relationship between humans, technology, and science in the era of AI.

5. The Essence of the Semiotic Perspective in the Light of an Interdisciplinary Studies Approach

Readers of the scientific literature in the field of AI must take other AI paradigms into consideration. In this respect, semioticians may benefit from understanding the disciplinary dynamics around their proposed perspective and push further the field of study. The following considerations do not aim to be exhaustive but put into questions some of the points so far discussed by semiotics and by other fields, highlighting topics and subfields that have the potential to be the focus of future interdisciplinary research projects. In addition, we have considered how well-versed the research problem is in the semiotic perspective for suggested techniques fusing various disciplines. We strive to identify viewpoints based on topic selection, methodological techniques in connection with semiotics, and fresh ideas by going in this direction, in order to inspire discussion about potential new uses for AI research.

Additionally, we will try to show the variety of concepts that have been developed within each perspective, imply that each perspective is fruitful in the context of an interdisciplinary scenario and argue that outcomes are frequently shared between these different approaches. One of the elements

⁷ <https://www.ilsole24ore.com/art/da-rightwinggpt-chaosgpt-famiglia-disfunzionale-dell-ai-generativa-AEfy2YGD> (title translated) |retrieved 26.07.2023|

⁸ <https://ntplusdiritto.ilsole24ore.com/art/chatgpt-utile-servitore-o-pericoloso-padrone-AEccObDD> (title translated) |retrieved 26.07.2023|

⁹ <https://24plus.ilsole24ore.com/art/chat-gpt-e-intelligenza-artificiale-perche-servono-subito-regole-livello-ue-AEkZYMCD> (title translated) |retrieved 26.07.2023|

that the analysis of the research perspectives highlighted as one of the most discussed categories even by semioticians is the duality natural (animal or human) /artificial intelligence. In this respect, theory of mind is a concept that has to do with artificial intelligence, in the sense that it shows human-like behavior, such as feeling, thinking, and engaging in human-like activities. Another interesting idea is the theory of machine, which can extract knowledge from humans in order to modify it into scenarios about how to socially interact with others and how to handle a variety of situations.

This involves a reflection on the human-like consciousness and the self-awareness such a type of machine. It entails the capacity to perceive, mimic, and act in ways that are humanlike as well as to consider and comprehend many circumstances. In line with this idea, in recent years, the concept of using AI for sustainable development has emerged as a means of tying AI to various technologies, regulations, and implementations. The numerous facets and uses of AI can be included within the framework of sustainable development, as evidenced by the triple bottom lines (TBLs) of sustainable development, which include social inclusion, economic development, and environmental performances. Although AI appears to be a product of advanced technology, human-related values have received significant attention. Humanitarian principles and humanistic perspectives were identified as correlating with "artificial" intelligence in several reflections, such as the one related to the gender stereotypes, their presence within the AI system and the call for action that has been developed within these years in order to raise the issue and start removing the social cultural bias embedded in AI by the human intervention. This has to do with the way people interact, perceive and re-produce. For instance, in a fundamental study developed by multiple investigations on human-computer interaction, Byron Reeves and Clifford Nass (1996) discovered that people interacted with televisions and computers in the same ways they interacted with other people. This study disproved common wisdom by showing that computer, television, and other communication technology interactions resemble real-world social interactions and spatial navigation. This is where the study turns to be interesting from a human being point of view, founding that people react differently to computer voices and that this difference is based on stereotypes, which is one of the findings relating the impact of enormous faces on screens and body space, motion on screens, and motion in real life. According to their findings, the authors concluded that the human brain has not changed quickly enough to take in technology breakthroughs from the twenty-first century. Over several development stages and decades, research and reporting have been done on how the public perceives AI, with a particular focus on the cultural texts and media discourses. The way AI has been covered in the media may be a reflection of public opinion on the subject, where semiotics gives an important contribution in understanding the profound meaning behind it and its reflection on the societal changes reflected by media and other social discourses. Fast and Horvitz (2016) conducted a long-term examination of the New York Times' AI-related articles from 1986 to 2016 and identified several broad themes. Since 2009, there have been an increase in discussions on AI, and more positive than negative ones can be discovered.

6. Semiotics for AI: Recommendations and Potential Applications

The problem of culture as a complex system, evolving and constantly redefining itself and its components through the integration of new ideas, appears again to be one of the most important areas to be considered in the light of a fruitful reflection on AI. Lotman's reflections about the semiosphere (2005) sheds light on these concepts, when it comes to consider the culture's facets. Lotman defines culture as a dynamic complex system made by a variety of components, constantly exchanging information in a continuous networking activity within its own sphere and outside of it and generating new meanings. starting for the existing ones. In our reflection about AI, this can be translated into the integration of new algorithms and technologies and their potential in shaping, redefining and

reinforcing cultural norms and values. In practice, this is a heads up in developing AI chatbots, taking into consideration the cultural nuance, sensitivities, differences, dynamics and avoid perpetuating stereotypes.

In line with what so far said, AI systems used in language translation should be continuously trained on a diverse range of linguistic patterns to capture the meanings attributed by different cultures. The examination of how groups of people could cooperate to develop intelligent systems was a crucial aspect of LOTMAN's work on collective artificial intelligence (1977), where he argued that artificial intelligence may be improved by using the combined skills and knowledge of a group. According to LOTMAN, these collective intelligent systems may solve complicated issues and reach conclusions more effectively than individual agents by cooperating and communicating. His reflections represent the foundation for further research focusing on collective artificial intelligence, that can be seen as well as new opportunities for the development of cutting-edge intelligent systems.

Another aspect where semiotics can provide expertise is in the idea of AI as a complex system where each component interacts with and influences one another. Semiotics can help analyze the meaning making created within the AI system, such as the language used, visual representations, and user interactions, to understand how the cultural expectations and values of different communities change according to it. By understanding the meaning of these systems and the cultural implications they generate, semiotics can provide a significant recommendation for developers to create chatbots that communicate with users from diverse backgrounds in a more effective manner. In addition to that, semiotics can aid in identifying biases embedded in the AI system, allowing for needed adjustments. For instance, the gender bias embedded in the AI system, such as assuming certain gender roles or using gendered language, can be identified through semiotic analysis. Further research regarding the presence of gender bias in AI systems and the social discourses built up against it are part of an ongoing project in line with the current one. An example, object of a forthcoming paper, are the awareness campaigns led by different actors, such as advertising agencies and research institute studying AI mechanisms. We may go through a deepen understanding of the social discourses surrounding gender bias in AI systems by conducting additional study and converting the semiotic perspective into recommendations. This enables designers to address some stereotypes and make sure the AI system does not reinforce those biases.

7. Conclusions: Ethical concerns and New Challenges

On March 16, 2023, a video spread on social media allegedly showing Ukrainian President Volodymyr Zelensky delivering a speech urging the nation to lay down their arms. However, President Zelensky later had to publish a statement on Instagram clarifying that the video was false and manipulated. Despite the clarification, the fake content circulated rapidly on the web, causing confusion and disorientation even among various news outlets. The video was a deepfake, a type of content created using artificial intelligence to mimic a person's appearance and voice. Deepfakes represent a dangerous frontier for fake news as AI techniques improve, making the content increasingly believable. Deepfakes represent a danger to public opinion, confidence and information credibility since they have the power to manipulate the reality and alter people's perception. An inflammatory statement made by a political candidate could be deep faked into a video, for instance, even though the politician never actually uttered it. The reactions generated by the video could quickly influence people's attitudes and eventually election results. Without proper attempts to recognize and fight deepfakes, public faith in information sources and the democratic process can be seriously eroded, which can cause societal divisions and a breakdown in democratic processes. Furthermore, a number of tools and algorithms are now readily available to help in the deepfake

recognition, reducing their potential dramatic effects on society. This is due to technological improvements as well as increased awareness. This and other similar episodes raise concerns about the ethical implications related to the massive use of AI technologies, as they have the potential to spread panic, alarm, and misinformation. It becomes challenging to determine what is true amidst the proliferation of deepfakes on social media, affecting the identity of the author, the accuracy of verbal and visual content, and the emotions these contents provoke. With the emergence of AI, there is worry about how its products can impact people, especially by promoting biases in human mental processes. People frequently worry that machines will advance in intelligence and eventually take over. In any case, AI is proven to be a potent tool for linking data and developing new theories. Examining the semiotics of AI necessitates thoughtful reflection on the practical and ethical implications of a society in which AI makes it increasingly effortless and accessible for individuals to produce media content that blurs the boundaries of self and others. One of the key strengths of semiotics will consist in its ability to reveal the inherent cultural and social biases that may be embedded in AI systems. Semiotics enables us to question the values and beliefs that underpin the design choices, algorithms, and data sets used in AI, allowing for critical reflection on potential biases, fairness, and ethical considerations. It has been claimed that AI has an impact on human nature, intelligence, and decision-making. Semiotics also offers a fruitful approach to studying the representations and discourses surrounding AI in media and popular culture. By analyzing the narratives, metaphors, and symbols employed in depictions of AI in films, literature, and other forms of media, semiotics allows us to uncover the societal perceptions and fears associated with these technologies. Moreover, by examining how different stakeholders such as scientists, journalists, and policymakers talk about AI, we can gain insights into the discursive practices that shape public understanding and acceptance of AI. Finally, semiotics provides a valuable toolkit for investigating AI from a multidimensional perspective. By employing semiotic analysis, we can unravel the intricate meanings, biases, and cultural implications that underlie AI technologies. This approach not only enhances our understanding of AI but also enables us to critically examine its societal implications, ethical considerations, and transformative potential. Through the lens of semiotics, we can navigate the complex terrain of AI and contribute to shaping a future where these technologies are designed and utilized in a responsible and meaningful manner. The nature of humans, their intelligence, and their ability to make decisions have all been claimed to be impacted by AI. As AI becomes more prevalent, people are worried about how technology might influence people, notably by feeding mental prejudices. One frequent worry is that machines would eventually outsmart people and take over. Nevertheless, AI is demonstrating to be a potent tool for linking data and generating novel theories. In addition, the semiotic perspective, and its ability of being in dialogue with other fields in an interdisciplinary scenario, enables us to comprehend how human speech, language, and cultural texts both shape and are molded by AI systems. Semiotics aids in our examination of the power relations at work in the creation and application of AI as well as the resulting ethical issues.

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