

Assessment of AI's Creativity in the Literary Text In Comparison with AI's Creative Compositions on Visual Art

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ABSTRACT

Artificial Intelligence (AI) has exerted significant influence on human existence for several decades. It has proven immensely beneficial across diverse sectors, including literature and art. Al's impact is evident in its ability to generate literary texts like novels and produce visual artworks like paintings. This transformation has seen a shift in computer science from merely assisting artists to taking on the role of creators themselves. However, an ongoing debate questions the creative nature of artworks produced by AI and whether AI's creative capacity can stand on par with human ingenuity. This study seeks to compare the emergence of creativity in human thought processes and AI-generated works, shedding light on novel perspectives for defining creativity within the realms of literature and art, driven by technological progress. The initial focus of this investigation involves critiquing AI's creative prowess in literary text creation, employing elements of novel analysis such as imagination and plot as evaluative tools. Subsequently, the examination extends to Al's imaginative capacities in the realm of visual art, particularly painting. Psychological facets such as emotional resonance and reasoning come into play during this assessment. Illustrative instances of AI-generated works include Ross Godwin's experimental "wordcar" programs, resulting in a unique book, and Harold Cohen's AARON, a drawing program. In conclusion, it can be inferred that AI-crafted artwork warrants recognition as a form of creativity. Nevertheless, while AI-generated visual art showcases this attribute effectively, AI-created literary text still has a considerable journey ahead before attaining the status of genuinely creative literature. Furthermore, specific criteria governing the development of literary works, such as narrative complexity and documentary authenticity, currently remain beyond AI's capabilities.

Keywords: Artificial Intelligence, human creativity, literary text, visual art.

1. INTRODUCTION

AI, or Artificial Intelligence, has been known for a long time as the replica of human intelligence. Kugel (1981) defines that 'artificial intelligence is a domain of computer science devoted to the exploration of the limits and the methods of using digital computers to perform functions carried out by human brains'. Most people are skeptical about its development and argue that human intellect cannot be replicated. Developing deep reinforcement learning (RL) in the technological industry, for instance, where learning machines try to find a possible pattern in making driverless cars safe to be driven on the road, is unfortunately difficult. Experts discovered that RL results are not easily reproducible, raising concerns about whether they can be relied on by AI to ensure road safety (Jones, 2018). However, the advancement of AI has been leading to numerous benefits, lightening and even replacing the work of humans. In some sectors, it even makes human jobs easier and more efficient, such as using AI in health care by utilizing the NLP application, which can read and differentiate clinical documents, facial recognition technology in the policing sector, detecting diseases of plants in agriculture, and many others. It is undeniable that the potential for AI to affect how life develops in the future seems strangely clear. Cox (2021) claims, 'the potential of Artificial Intelligence (AI) and robots to reshape our future has attracted vast interest among the public, government, and academia in the last few years'.

The use of this digital computer science is not merely limited to the science sectors but also the creative art's elements, including drawing or painting in visual art and poems or novels in the literary text. In 1985, Cohen (1995) introduced an AI program, namely AARON, to produce a work of art: painting. He states that AARON is a robotic system developed over many years by himself as a programmer and artist (Cohen, 1995). The program was designed to creatively generate a painting, beginning with a realistic portrayal of the object's shape of the human physical appearance. de Mántaras (2016) explains how AARON's work, stating that it 'draws people in a botanical garden not just making a copy of an existing drawing but generating as many unique drawings on this theme as may be required of it'. AARON can draw in acrylic, sketch it on the desktop screen, and the work produced will be printed afterward. Wilson explains that 'AARON #1 Drawing 1979 is a large, mural-sized landscape-format painting in acrylic on canvas' (Wilson, 2015). What AI does, including AARON, is basically reconfigure the existing works from the training data set while adding some new unique parts of a work of art. It is simply a matching process and not producing the original one. Therefore, considering and understanding how AI works in visual art, what can be argued is whether AI was creatively producing the work of art or just copying the existing one. Additionally, what differentiates AI's creative process and the imitation technique applied?

Finally, indeed, AI's advancement has rapidly grown in some industries, but its creativity in the art field is still arguable. Therefore, the purpose of this essay is to study the creativity arising from AI in producing works of art by comparing literary text with creative text and painting in visual art. The approach will focus on the psychological aspect of painting, e.g., *feeling, reasoning,* and *problem-solving,* and comprehensive research using types of the documentary novel with its elements, e.g., *imagination* and *plot.* Then, a piece of visual art used in this essay is focused on sample work from AARON trained by Harold Cohen and *l the Road* by Ross Godwin for the literary text's example. It is pivotal to comprehend AI's creativity in visual art and literary text since the popularity of the work created by AI in this field is rising. Therefore, this essay will allow artists, writers, and readers to have exact or even innovative perspectives in defining the creativity between human and AI masterpieces. It can also lead to further research on whether the process, techniques, and approaches applied by AI in producing the artwork are even possible to be pinned as the *original work*.

2. LITERATURE REVIEW

In terms of creative writing, Briegas (2018) argues that robotics is capable of writing poetry, stories, and even screenplays, showing that computers have gone from being tools to helping human creators become creative entities themselves. The example of *creative entities of* AI, as mentioned by Briegas, is printed and published writing entitled *I the Road* with the help of Ross Godwin and Kenric McDowell. Kundu (2012) clarifies that 'Ross Goodwin drove from New York to New Orleans in March 2017 with an AI in a laptop hooked up to various sensors, whose output the AI turned into words', which then, the writing is being sold on JBE Books website. All the same, the debate on the creativity that occurred in AI's literary texts is also doubted by most people. Human will use their knowledge, sense of imagination, and rational thought in creating a work of art, which undeniable robot has none. Simulating the rational human mind, particularly creative reasoning, is necessary to model artistic abilities. It will be challenging to accomplish this rational mind using either algorithms or information processing systems. Furthermore, computer science's capacity is limited and needs more and more input data to create the algorithms so that it can solve such complex problems. This method seems hard to be applied in creativity that is unpredictable and has limitless imagination. Pereira (2008) even argued, 'one of the most common criticisms made of Artificial Intelligence methods of problem-solving is their limited ability to deal with situations not predicted in the specification'. In detail, AI will only be able to deal with predicted situations based on the data given. It will most likely have difficulty in solving problems without structured *metadata*.

AI uses algorithm patterns to deal with problems reaching a particular conclusion; the program will barely continue its process without the pattern, 'in other words, such systems are hardly capable of performing what we normally call *creative behavior*, a fundamental aspect of intelligence' (Pereira, 2008). This debate keeps occurring even in recent years, discovering the limitation of AI in creative behavior since it is related to *divergent thinking and bisociation*, as found by Koestler (1976), who wrote about 'a related phenomenon named *bisociation*'. It also relates to the psychology theories revealed by Guilford, that 'concentrate it on the idea of *divergent thinking*', which is a process or method for generating creative ideas by exploring a wide range of potential solutions (Guilford, 1967). These *terms* are related to creativity originating from the human brain, which has complex patterns of thought to be adapted by computer science. Pereira (2008) admits that from the standpoint of computer science, modeling *divergent thinking* and *bisociation* appears extremely difficult, owing to the fact that it is not formally specified and, even if it were, would undoubtedly require cognitive capacities that computers do not yet possess.

3. METHOD

This research is grounded in a qualitative descriptive study, which resonates with the principles of constructionism and critical theories, as it seeks to interpret and understand the intricate nuances of AI-generated content. Denzin and Lincoln (2017) state that qualitative descriptive study is most compatible with constructionism and critical theories that employ interpretive and naturalistic methodologies. The aim is to comprehensively understand and describe the creative

output of AI in literature and visual art. Various works generated by AI, including the experimental book utilizing "wordcar" – an automatic narration from Brooklyn to New Orleans project – by Ross Godwin, and the drawings produced by AARON which was developed by Harold Cohen, serve as the objects of analysis. Document study involves gathering relevant texts, images, and records related to AI-generated creative works. For the literary aspect, excerpts from "wordcar" are collected, while visual artworks generated by AARON are assembled for the visual art analysis. These materials provide the foundation for the subsequent analytical stages. Dye (n.d.) points out that media content analysis is employed to systematically examine the collected documents. This involves reading, understanding, plotting, and identifying patterns within the AI-generated content.

The first analysis method involves critiquing AI-generated literary texts using the lens of the novel's elements criticism. This approach evaluates AI's creativity in the context of traditional literary elements. Quinlan and Mar (2020) disclose that imagination and plot are essential components of any novel, so it will be used to examine the AI-generated text in this research. The second analysis method delves into AI's imagination within the realm of visual art, specifically focusing on paintings. This analysis approach, as stated by Bande (2021), is rooted in emotion in psychological aspects—feeling and reasoning. The research probes how AI captures emotions in visual compositions and how it employs reasoning to create coherent visual narratives. Moreover, many experts in artificial intelligence teach computers to recognize not just what objects are in an image, but how those images make people feel —i.e., algorithms with emotional intelligence (Myers, 2021). Thus, by dissecting AI-generated visual artworks, this analysis method sheds light on the depth of AI's imaginative capabilities in the visual domain. Through the lens of the novel's elements of criticism and psychological exploration, this research seeks to unravel the intricacies of AI creativity in both literature and visual art. By critically examining the experimental book "wordcar" and the artistic drawings of AARON, this paper contributes to a nuanced understanding of AI's creative potential and its role in reshaping artistic expression across diverse mediums.

4. FINDINGS AND DISCUSSION

4.1. The Creativity of AI in Literary Text: An Assessment

A recognizable experimental novel was released in 2018 entitled *1 the Road*, accomplished in a project by Ross Goodwin, which can be evaluated regarding its creativity. Goodwin (2016) previously had many projects which 'focus on the *narrated reality* or the development of new forms and interfaces for writing, enabled by machine intelligence'. These projects help Goodwin with a code to develop a programming language for producing *1 the Road*. 'The system [...] which Goodwin calls "wordcar", includes code from his past projects and is the step in his practice that followed the creation of the separate NR camera, compass, and clock interfaces' (Heflin, 2020). Goodwin traveled from New York to New Orleans with his portable AI-writing machine that captured and wrote a movement, pictures, portraits, and sounds by calculating the location through the help of GPS installed in his machine learning. As a result, the manuscript was printed in a rolled scroll of receipts filling the car space. Most people tend to acknowledge its work as a 'first real book written by an AI [...] *1 the Road* imposes a new reflection on the place and authority of the author in a new era of machines' (Goodwin, 2018a).

4.1.1. Imagination in Creative Writing

It is necessary to ascertain the definition of creative writing before turning from creativity in visual art to literary works. The creative writing phenomenon appeared in the 20th century as stated by Dawson below:

Creative writing is a distinctly twentieth-century phenomenon, made possible by the transition in the common parlance of literary criticism from the faculty of imagination to that of creativity. (Dawson, 2005, p. 22)

This is acceptable that the root of creativity is coming from the imagination. Dawson then adds, 'imagination is a part of the mind capable of producing wild, irrational ideas or images with no corresponding object in reality, and of inducing delusion by tricking the senses' (Dawson, 2005). Considering that imagination is a mixture of the wild, irrational, and tricking the sense of the thought, the possible argument to be reflected is that; does AI imagine when regenerating the text? Does AI bring an irrational idea up and ignore the sense of thought? In fact, computer science relies on the data given, including when writing a novel, so it *indirectly* cannot be said to be *imaginative*. Parrish (2017) defines that 'the vectorization of language, or the process of placing linguistic data into a point in a high-dimensional space, is a way to represent that data numerically, which is a necessary step for making language legible to machine learning systems'. It will never produce a word that is never inputted and always relies on the given data. Therefore, it

can be justified that AI cannot trick the senses –as one of the essences of being imaginative. AI, therefore, is not creative in producing literary works because it merely calculates algorithms to create a literary text.

There is no sense of *imagination* in the scene from 1 the Road, which mostly shows the exact time, situation, and conditions in real time as scripted below:

Green leaves on trees and a small room and small garden with a counter to the right. The house is silent. A hill in the distance stood open, and a small stone was taken off the street and a bunch of boats were working on the platform. It was half past five o'clock in the afternoon, and the policeman pushed his head back with a pair of green shadows and his face twitched and was struck by the contemptuous s... (Goodwin, 2018b, p. 100)

It only writes a direction along the journey while describing the surrounding condition; it even lacks an ending or closing story, such as the letter 's..' at the end of the sentence. What does it mean? There are no additional words, phrases, or sentences afterward. This is how artificial intelligence (AI)-generates text; and writes down surrounding circumstances based on the natural connexion. Thus, the work cannot be defined as creative.

4.1.2. Plot in Novel

Burgess (2022) explains there are numerous kinds of novels, such as Gothic, Epistolary, Pastoral, Apprenticeship, Cult, Fantasy, Detective, Mystery, Proletarian, Documentary, etc. AI-generated writing entitled 1 the Road is a documentary novel. This kind of novel is then bifurcated into two types of genres: the fictional autobiography and the metahistorical novel. Foley (2018) emphasizes that the metahistorical novel refers to a historical process that stems from the assertion of factual verification itself. Therefore, 1 the Road can be determined as a metahistorical narrative in the documentary novel since its creation was based on factual verification of the NR camera, compass, and clock installed on the "wordcar". One crucial aspect of all the novel types, including a documentary novel, is showing puzzles in a story that encourages readers to read and ask questions more to solve those puzzles in the final stage, namely the plot. The plot is a device to propel a novel through a hundred or thousand pages (Burgess, 2022). Wade (n.d.) argues that one 'fundamental part of creative writing is a plot, where it carries the story forward, sets the scene, and develops the tension between the characters'. Without a storyline, it will be challenging to envision where a novel might go or how tension and conflict would develop.

Along with it, there are four parts in establishing events to be connected as illustrated by Freytag (1895)

that plot in creative writing 'has the following parts: exposition (inciting incident), rising action, climax (turning point), falling action, and denouement (resolution)'. For the first stage, the writer must provide brief background information about the events, characters, and settings. Then, the problem or tension of the story begins to emerge, leading to the story's climax or turning point. It is then followed by resolving the issue and revealing the related events, which then reach a conclusion or end of the story. The illustration is pictured in Figure 1.

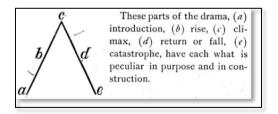


Figure 1 The plot diagram from the original translation of Freytag's Pyramid of the 1863 version of Freytag's Technique of the Drama.

As written in *1 the Road*, not all elements of the figures above are fulfilled. Analyzing from one chapter in this novel presents an introduction at the beginning delineating the place and time settings. However, the way AI reveals the aforementioned information is somehow vague due to the lack of connection between one event and another or between a place and time.

Coca-Cola Factory Montgomery: a building in Montgomery to his father study of the town in the same room, where the band was being sent off to the police car.

The time was one minute past midnight, but he was the only one who had to sit on his way back. (Goodwin, 2018b, p. 113)

The sentences are just a series of raw words without clear purpose and direction. This "wordcar" by Goodwin merely captured the way information is provided by NR camera, compass, and clock interfaces as the way it is. The story given after the following introduction is unrelated to each other: lack of rising action, climax, falling action, or even denouement (resolution). There is a similar type of writing style called modernist work. Walker (2016) explains that modernist works experiment with narrative text –challenging the traditional concept of plots such as time, character, and causation (among other things). However, these works are still logical or *make sense* and coherent between one idea to the other. Literary text by William Faulkner entitled 'A Rose for Emily', for example, describes Grierson's house in detail, followed by characterizing a character named Emily, which parallels the house's appearance. Then, the ending intercorrelates most of the *dots* in the story. Indeed, Faulkner uses *extended descriptions* that connect the description from one thing to another. In comparison, *1 the Road* texts also apply a descriptive approach but lack connecting one element to another. The information provided in the last paragraph is as follows:

The back of a black chair stood out in the corner of the car. The top of a black and white cat was the size of a child who had stood there with a great figure and a long coat of some perfume.

Phou Tau Bay: a Vietnamese restaurant in New Orleans. There were still young men in the city before the train was seated. LSUHSC Parking Garage: parking in New Orleans, a tall gallon garage with a stucco striped of water had been shredded and the dark color of a corn strain. (Goodwin, 2018b, p. 132)

These two paragraphs are very arduous to understand in terms of intercorrelations between one sentence and the following information. Comparing the introduction to the ending paragraph as written above suggests that both have no interrelation. It might be appropriate to state that the way "wordcar" addresses the story leads to a question for the reader owing to the puzzle given as a part of creative writing, but it does not mean that all the puzzles do not disclose each other and even lead to none. Thus, reverting to the initial debate, whether the literary text generated by AI can adequately be claimed as creative? Considering the imagination, plot, and process of incorporating missing *puzzles* altogether, AI unquestionably still needs to develop more to produce creative literature.

4.2. Visual Art and Technology (AI): Shifting the Nature of the Creative Process

4.2.1. The Nexus of Artistry

The occurrence of AI's work in visual art is quite interesting since it commences to change the way people see, enjoy, and analyze a painting. Although AI has begun to influence the work of art, some artists are not being exposed to the development of AI since they know that art is work that always needs the human touch of *thinking* and *creativity*. AI is merely a tool that can create artwork from the data given, which is taken from human thought. Niculescu (n.d.) implies that 'in art, the unlimited sensitivity, and creativity of the human being never seem to be threatened by the accelerated evolution of cyber processes. For this reason, some artists remain focused on their *touch* in producing the artwork, while others utilize AI to help them shorten the process and create more detailed and profound works of art. For example, a famous artist, namely Robbie Barrat 'trains his neural network on images of classic paintings and then has AI generate new images based on what it has learned' (AI in Art, 2022).

Besides the sensibility, AI-generated artwork tends to be *neutral* and *plain* without emotion, contrary to the artists who always bring a story behind their work, so it has a definite feeling that the art connoisseur can feel. Niculescu (n.d.) says that 'AI can process information and calculations with unimaginable speed but cannot yet generate certain mental states on its own (sadness, melancholy, fear, etc.)'. The strong point in the creative process here is between *feeling* in artists and *speed* in AI, which can be combined in *partnership* to create creative masterpieces at speed. For instance, artists who have an intuitive *sense of feeling* in their artwork can utilize AI to provide more complex work quickly and efficiently. As a result of this partnership, it will eventually create astonishing artwork. Niculescu (n.d.) mentions, 'if directed by a talented artist, Artificial Intelligence can work wonders. Then, we can classify the work as creative since it contains *human feelings* or *mental states*. AI advancements may allow artists to create works with human-like sensitivities, which can be defined as *creative*.

4.2.2. AARON by Harold Cohen

AARON can be pointed out as an example that AI demands more ability to raise its creativity. Drawing by AARON is still limited to the standard shape of the human body, though Cohen trained the program to draw creatively. de Mántaras (2016) states that 'AARON cannot "break" rules and will never "imagine" the possibility of drawing humans with one leg, for example, or other forms of abstraction'. It strictly draws a whole realistic part of a human body without being able to improvise, as shown in Figure 2. de Mántaras (2016) continues that 'AARON's creativity is limited and

very far from a human one'. Hence, combining computer science and the artist's soul does not necessarily bring a *soul* to the artwork. As a result, it keeps presenting doubt on the standard to define the creative piece of work by AI.



Figure 2 AARON, *Standing Figure with Decorated Background*, 1993, Oil on canvas, 78x54 inches. Photo: Becky Cohen.

The promising hypothesis is that the possibility of creativity developed in AI is highly possible once the requirement is fulfilled. The requirement in opening the chance to make machine learning creative is merely more pieces of knowledge (data) and relations (pattern), which AI can fulfill as far as it is given more and more input data. Boden argues that the origin of creativity is not real since the seeds have been represented in minds. She states in her book entitled Artificial Intelligence and Natural Man that creativity relates to some aspects:

The greater the knowledge and the experience, the greater the possibility of finding an unthinkable relation that leads to a creative idea. If we understand creativity like the result of establishing new relations between pieces of knowledge that we already have, then the more previous knowledge one has the more capacity to be creative. (Boden, 1987, p. 298)

Those two aspects –knowledge (*data*) and relations (*pattern*)– can be called seed, which leads to creating a *new* or *original* piece of work. To strengthen this idea, the argument from de Mántaras (2016) can be added, stating that 'creativity is an advanced form of problem-solving that involves memory, analogy, learning, and reasoning [...] and is, therefore, possible to replicate by means of computers'.

However, how visual art can creatively bring the viewers to related events sometimes requires other aspects such as the historical aspect, culture, and memory. Individuals tend to consider those attitudes in valuing a work of art, encouraging a painter to contemplate those perspectives and craft their artworks. de Mántaras (2016) says, 'this highlights the fact that the production process, and not just the outcome of it, is taken into account when assessing artworks'. AI programs such as "wordcar" and AARON are not designed and are incapable of connecting historical aspects, culture, and memory into their works, so they will be lacking in judging their creativity if only finite by those aspects. These elements might be indirectly present in a different way since the data given is by the human who has the historical aspects, culture, and memory. That is why one AI to another will have different specifications depending on their programmers, such as the way AARON and GAN paint, between "wordcar" by Godwin and other AI's writers will have their characteristics. However, we cannot claim that these elements purely come from machine learning; it is from the human aspect, not artificial intelligence. Bogousslavsky (2005) suggests one way to measure the Artistic Creativity of AI by 'analyzing the creative process which should involve outlined three stages of creativity: (1) perception processing, (2) extraction and abstraction, and (3) execution'. All in all, AI mostly follows these three stages in the creative process.

Besides, the creativity in AI can be proved by using the Turing test that can evaluate the "thinking machines" which are usually called "electronic computers" or "digital computers" (Turing, 1950). Although some people are skeptical about this test, it is one of some ways that can be used to measure AI's ability to *think*; problem-solving, learning, and reasoning. Chaitin believes that:

Turing not only made predictions but also offered a radical idea for future generations to consider: namely, that when we can no longer distinguish a computer from a person [...] we would have to consider the possibility that computers themselves were now "thinking". (Chaitin, 2009)

Surprisingly, de Mántaras (2016) reveals that The San Francisco Museum of Modern Art and London's Tate Modern have featured AARON's paintings because, in some ways, AARON passes a form of creative Turing test. He adds,

'AARON creations are excellent enough to be displayed alongside some of the best human artists'. Hence, when presenting creativity in a psychological approach —as creating something from the pieces of previous knowledge by learning, reasoning, and problem solving—followed by the Turing test and the exhibition, which stand with human work, the artwork of AARON can be accepted as creative. Up to this point, AARON represents that AI in the future has a chance to develop more in imitating the creativity produced by the human brain.

Moreover, painting by AI begins to be bought at a high price compared to the human piece of work, illustrating that the *value of* AI work is as precious as human drawings. Figure 3, for instance, depicts an AI-generated painting of Edmond de Belamy, which was sold for up to \$432,000 at the British auction house Christie. Lieber (2018) states that 'about 45 times its estimated worth, signaling that the art world will turn to computer-generated art [...] people take it seriously and are willing to pay for it'. It discovers that the artwork from AI is somehow interesting, unique, and valuable, and since it has a high value, it might be determined as *creative*.

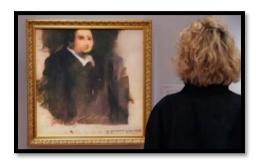


Figure 3 GAN, Edmond Bellamy, 2018, Christie's in New York. Photograph: Timothy A Clary/AFP/Getty Images.

5. CONCLUSION

Defining creativity in robots' work is as complicated as seeing the creativity in a human piece of work. However, it is more sensible to point to a creative part of human work by bringing the process or story behind it. In visual art, a work painted by AARON mostly follows the *creative process* mentioned by Bogousslavsky (2005), starting with processing all the previous pictures given, then extracting it into scratch lines to the abstract painting up to the execution in completing the drawing as well as the final touch by adding color. Additionally, seeing that the artwork by AARON completed the Turing Test and sold at an *excellent* price than predicted, it is acceptable to be categorized as creative work. Moreover, in visual art, each person tends to enjoy painting using a different perspective, as claimed by Niculescu (n.d.) that 'the way each person analyzes an artistic creation is subjective, and perhaps that is the beauty of the art'.

However, literary text generated by AI still needs a long way to be said as creative literature. Some criteria must be fulfilled in developing literary works, including narrated or documentary texts. The stages are not merely processing the given vocabulary and extracting the words into sentences but also need to use imagination, make it logical, have a plot that can be followed, and give a *soul* to the words as part of abstraction as well as final execution. Therefore, the most probable thing to be admitted is that AI can produce creative works in the literary text by a trial-and-error procedure in its development in the year after, but not for current development.

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