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ABSTRACT

With the recent development of various generative artificial intelligence program technologies and popular commercialization, media art creative cases using generative artificial intelligence are increasing. Just as the appearance of photographs does not replace existing painting works and exists in new art forms, media art expressions using generative artificial intelligence technology can also exist in new ways and forms. As in the cases created using the generative artificial intelligence programs listed in the paper, it is proved as a single work. Therefore, this paper aims to examine the meaning of artificial intelligence and examples of works using generative artificial intelligence that have been formed historically, and to analyze media art works formed based on generative artificial intelligence programs that exist in various forms. Through this, the creator freely uses the generative artificial intelligence technology that exists based on vast amounts of big data as a work of art, and it is intended to contribute to the production and methodology of media art displayed in various forms.

Key words: Generative Artificial Intelligence, Media Art, Digital Art, Cybernetics

1. Introduction

Tools are needed to express artistic ideas. Therefore, in art, tools were regarded as auxiliary means for creation. However, since 2012, the information processing process and results of artificial intelligence conducted in a deep learning method have evolved into a pattern that makes it inevitable to see it as similar to the creative act of an artist. Looking at the history of mankind, the emergence of new technologies coexisted with fear and novelty. As an example, the invention of a photographer seemed to cause the collapse of painting, but some artists not only created a new style of painting using photography, but also developed photography independently as an art genre and concept. Art using generative artificial intelligence such as Midjourney, DALL-E2, Stable

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Diffusion, and Runway Gen2 are being actively released. In his book, media scholar Levmanovic, known as the language of new media, said, "The possibility of creating a stable new language is destroyed by the introduction of new techniques that continue over time. Therefore, the new media family not only contains more optional specifications than the old media family, but also continues to increase. In a culture dominated by the trend of continuous demand for innovation, the artist accepts the newly given optional specifications and at the same time discards the ones that have already been used." Therefore, this paper examines the cases of art creation works using artificial intelligence images created based on text, discusses the works made using artificial intelligence, trends related to the production process, and explores the practicality and artistry of artificial intelligence technology through this.

1.1 The concept of Artificial Intelligence

Artificial intelligence is a technology that realizes human intellectual abilities such as learning, reasoning, perception, cognition, and thinking through machines, and is a field of computer information technology that allows machines to think and make judgments like humans. Artificial intelligence is what allows computers to imitate human intelligent behavior. In his book "Artificial Intelligence and Deep Learning," Matsuo Matsuo classified the level of artificial intelligence through four stages. The first stage refers to home appliances equipped with extremely simple control programs, and the second stage refers to intelligence when behavior patterns are diverse. The third stage describes typical machine learning in which the structure of reasoning or knowledge base is learned based on data, and the fourth stage describes artificial intelligence that accepts deep learning.

Table 1. The Four Names of Artificial Intelligence

Four AI Features			
1980s	1990s	2000s	2010s~
Simple Control Program	Classical Artificial Intelligence	Artificial Intelligence Accepts Machine Learning	Artificial Intelligence Accepts Deep Learning

1.2 The Beginning of Artificial Intelligence

The first interest in the relationship between art and artificial intelligence began in 1948 in Norbert Wiener's book Communication and Control or Cybernetics between humans and machines. Cybernetics is a theory about information, feedback, and entropy that comprehensively studies control and communication problems in animals, humans, and machines. The discussion of cybernetics, which has been actively taking place since the 1950s, has had a lot of influence on artists as well. Some artists called art that applied the concept of cybernetics to art "cybernetic art" and developed work activities in the area. In 1956, Nicolas Schoffer first showed art using cybernetics technology in his work CYSP-1 (a name composed of the first letters of CYbernetics and SPATiomatic). However, the creativity of such cybernetics was limited in saying that machines thought for themselves and created works because they acted according to algorithms that the artist had previously entered into the artificial brain.

Fig. 1. Nicola Schaeffer, <CYSP Ⅰ> Synesthesia

2. Generative Artificial Intelligence

2.1 History of Generative Artificial Intelligence Program

Generative artificial intelligence is a technology that generates new output results similar to or similar to inputs based on previously learned data. As a result of the output, there may be text, image, video, audio, and code. Even before various currently released generative artificial intelligence programs, works using natural language processing, speech recognition, and works that imitate human appearance and movement using expert systems appeared in various forms.

Table 2. History of Generative Artificial Intelligence Program

Year	Artificial Intelligence Program	Image
1970s	ARRON	
2006s	The Painting Fool	
2010s	DARCI	
2015s	Deep Dream Generator	
2016s	The Next Rembrandt	

2.2 Type of Generative AI Image Programs

Among the generative artificial intelligence programs, well-known models include DALL-E, Stable Diffusion, and Midjourney. This diffusion model is a model that generates data similar to learned data, and it is an algorithm that generates images using principles that occur in the process of learning diffusion and restoration for many images.

Table 3. Generative AI Image Program

Release Date	Artificial Intelligence Program	Logo
2021s 1m	DALL-E	
2022s 2m	Midjourney	
2022s 8m	Stable Diffusion	

2.3 Generative Artificial Intelligence Media Art Case

In recent years, artificial intelligence has been actively produced in the media art area where digital technology is actively used. Thanks to the open source released by each generative artificial intelligence program, artists can produce works using big data and artificial intelligence models away from filming or computer graphics artwork in the traditional way.

2.3.1 Mosaic Virus
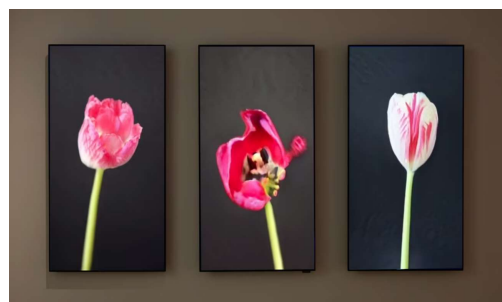

Fig. 2. Anna Riddler, <Myriad (Tulips)> Synesthesia

Anna Riddler's media art work Mosaic Virus, which was introduced in 2018, showed the constant evolution of tulips blooming by generative artificial intelligence through three monitors. The artist presented a work that compared the tulip blooming and falling by catching the similarity between the "Tulip Mania" incident, which dealt with the speculation of tulips in the golden age of the Netherlands in the 17th century, and the price phenomenon of modern Bitcoin. The artist took tens of thousands of pictures of tulips in the Netherlands for three months to learn data deeply and create works using generative artificial intelligence programs.

2.3.2 Unsupervised─ Machine Hallucinations

Fig. 3. Refik Anadol, <Machine Hallucinations>

Unsupervised is part of Refik Anadol Studio's ongoing project Machine Hallucinations, which explores data aesthetics based on a group's visual memory. The work has been deploying an unrecognized layer of external reality by utilizing DCGAN, PGAN, and StyleGAN algorithms trained on vast amounts of data. By deep learning 138,151 metadata from the Museum of Modern Art, StyleGAN2 ADA was used to capture the "perception" of modern art transformed in a multidimensional space and displayed at MOMA for one year from September 2022.

2.3.3 HOMOVIRTUS

Fig. 4. unzi, < HOMOVIRTUS>

The media art work "HOMOVIRTUS" on display in 2023 was produced using the generative artificial intelligence programs Midjourney and CHAT GPT. This work was exhibited in the form of a conversation between students in their 20s studying artificial intelligence composed of four different races and genders, discussing the world to be unfolded and the current issues that are being discussed. The virtual artificial intelligence characters took the form of being released from flat-screen cathode-ray television, and presented the audience with new fun and humanistic implications to consider in the future.

3. Conclusion

Art creations evolve with the development of technology and provide the audience with a variety of senses. Art creation using generative artificial intelligence technology has the specificity of interpreting and expressing the data of universal images that groups think about.

Therefore, for creators, generative artificial intelligence technology has opened a new horizon for new creative materials or the convergence of art and technology. It was also an opportunity to visually provide the audience with opportunities for various experiences with artificial intelligence images. Controversy over whether to view the role of artificial intelligence as a creator or as a part of a technological medium is expected to continue, but I look forward to seeing various media art works using generative art technology and facing works that combine developed forms of various art and technology.

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<국문초록>

생성형 인공지능 이미지를 활용한 미디어아트 창작 작품 사례 연구 -

김형기, 함유선

최근 다양한 생성형 인공지능 프로그램 기술이 발전하며, 대중적으로 상용화되면서 생성형 인공지능을 활용한 미디어아트의 창작사례가 늘어나고 있다. 사진의 등장이 기존의 회화 작품을 대체하지 않고 새로운 예술 형태로 존재한 것과 같이 생성형 인공지능 기술을 활용한 미디어아트 예술 표현 또한 새로운 방식과 형태로 존재할 수 있다. 논문에서 열거한 생성형 인공지능 프로그램을 활용하여 창작된 사례들과 같이 하나의 작품으로 증명이 되고 있다. 이에 본 논문에서는 인공지능의 의미와 역사적으로 형성된 생성형 인공지능을 활용한 작품 사례들을 살펴보고, 다양한 형태로 존재하고 있는 생성형 인공지능 프로그램을 기반으로 형성된 미디어아트 작품을 분석해보고자 한다. 이를 통하여 방대한 빅데이터를 기반으로 존재하고 있는 생성형 인공지능의 기술을 자유롭게 창작자가 예술작품으로 사용하며 다채로운 형태로 전시된 미디어아트의 제작과 방법론에 보탬이 되고자 한다.

<결론 및 향후 연구>

본 연구에서는 생성형 인공지능을 활용한 미디어아트의 창작 사례들을 살펴보며 생성형 인공지능의 정의와 인공지능 예술 창작과 밀접하게 연결되어 있는 역사적인 흐름 그리고 예술과 테크놀로지의 유기적인 관계를 바탕으로 형성된 사례들을 살펴보았다. 뉴미디어 학자로 알려진 레프마노비치는 그의 저서인 <뉴미디어의 언어>에서 "안정된 새로운 언어 창조의 가능성은 시간적으로 계속되는 새로운 기법의 도입에 의해 파괴된다. 그러므로 뉴미디어 계열체는 옛 미디어의 계열체 보다 더 많은 선택사양을 포함하고 있을 뿐 아니라 계속 늘어난다. 연속적인 혁신에 대한 요구라는 유행이 지배하는 문화에서 예술가는 새로 주어지는 선택 사양을 수용하고 동시에 이미 익숙해진 것들을 폐기하게 된다."고 서술하였다. 이처럼 생성형 인공지능 기술이 발전하며 미디어아트의 사례는 추후 보다 발전적인 형태로 늘어날 추세를 보이지만 영상 작업 뿐만 아니라 다양한 형태로 존재하는 예술 창작 사례들은 조명해보지 못했다는 한계점이 있다. 뿐만 아니라 다양한 참고 문헌을 바탕으로 연구를 진행하였으나 기술적, 미학적인 측면에서 선행연구가 부족했다는 한계점이 있다. 따라서 향후 연구에는 보다 미디어아트의 분야를 확장하여 영상 작업 뿐 아니라 다양한 예술의 형태로 존재하는 사례연구와 함께 생성형 인공지능 기술을 활용하는 미학적이고 기술적 방법론과 제작에 대하여 연구를 할 예정이다.

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