International Journal of Research in
Art and Design
Multidisciplinary | Biannual (June & December)

Received: 15 March 2023 | Accepted: 24 March 2023 | Published: 01 June 2023

Examining the Evolution of Computer Art towards Blockchain and Artificial Intelligence with Examples

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Abstract

In order to evaluate the outputs of artificial intelligence as art, we must first know what art is and what is considered art. Many paintings and sculptures that have survived from primitive life include the aesthetic transfer of human needs. The examples of art that change from society to society in every period and age have carried the emotional, spiritual, mental, and social needs of people. In addition to experiencing spiritual satisfaction, artists mostly mirrored the society they lived in, showed the undesirable to be seen or opposed the tricks of politics, and produced them as individuals who shed light on the society.

With the development of technology and industry, art has also undergone change and transformation. Art offers new meanings of the person and the role of the individual in society at a time when technology can do many things that people do. While the digital world introduces new living conditions and art products, the economic relations of people have also changed. It is necessary to investigate the dimensions of this change, what will be the difference between the individual and the machine, and which side will gain an advantage.

At the point where technology has come, will artificial intelligence be able to solve humanity's problems? Can these machines be creative? Can artificial intelligence make art? We must grasp the important issues of our time and imagine where humanity will end up at the end of its technological era and what kind of stalemate it has progressed to.

Keywords: Digital art, artificial intelligence, blockchain.

Paper Type: Research

Entrance

Art, in its most general sense, is understood as the expression of creativity and imagination. Throughout history, ideas about what to call art have changed constantly and some restrictions have been introduced because it has a broad meaning. When it comes to art, the first thing that comes to mind is visual arts. We see that the images depicted naturally by the people living in the cave are considered as the first examples of art, as well as the artificial products of today are presented as examples of art. Art is also an expression that contains creativity. With the development of computer technology, art has been transferred to the digital environment as our lives have been digitized. Thus, the IT sector and the arts have formed a unity, and progress has been made in this field. Computer programmers, coders and software developers contributed to the technological and economic progress of art and trained artificial intelligence algorithms in this sense.

1. Art and Creativity

The concept of art means 'art' (art-ificial: artificial) in English, as well as 'kunst' (künstlich: artificial) in German. It has the same meaning as the Arabic origin 'art' (artificial: artificial) words that we use in Turkish. It is understood from the roots of these words that art is an artificiality in its origin. Art: the meaning of a creative thought emerges as the forerunner of a person who thinks, designs and produces. The concept of creativity, on the other hand, has a complex structure on its own. It contains abstract meanings such as 'aesthetics', 'inspiration', 'foresight', 'curiosity'. Knowledge and experience are also required to produce creative products. When this knowledge and experience, various experiences and foresights are combined, it creates new products.

Creativity is intuitive and oriented towards solving a problem. Creativity in art means using all mental processes in this analysis process. Even if what is revealed is concrete, creativity should be considered both as a process and as a product, since it is expressed in abstract concepts. Design is a result of the creative process. As a result of the plans, programs and analyzes made while producing a solution to a problem, hypotheses are developed, and synthesis is made.

1.1. Visual Arts and Computer

All branches of art that appeal to the eye fall within the field of visual arts. For example, ceramics, painting, sculpture, photography and even industrial design, fashion design etc. types of art are evaluated in this field. The term visual arts include the fine arts as well as applied and decorative arts

and even crafts. While the artists of the Arts and Crafts Movement considered handicrafts as a part of visual arts, various art schools argued that craftsmen do not perform art.

Paul Henry (1921-2004) served as an editorial member of the Philosophy department at the University of Manchester. Virtual media visualizations with the computer technology of the 1960s by a machine are one of the main English contents.

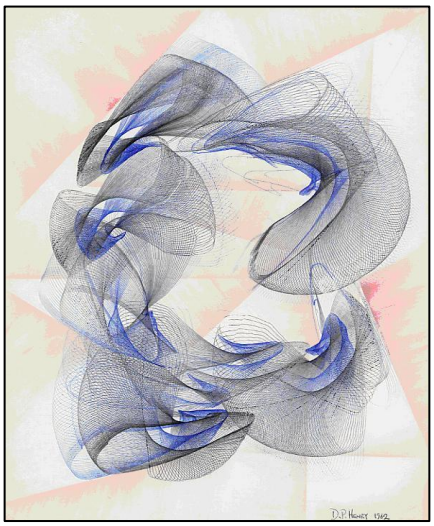

Figure 1: Done by drawing machine, Paul Henry, 1962.
Source:
https://en.wikipedia.org/wiki/Desmond_Paul_Henry#/media/File:Wiki.picture_by_drawing_machine_1.jpg

The machine-generated effects that Henry invented are similar to Microsoft's graphical abstract elements. These drawings, made by computers and drawing machines, allowed Henry to develop his machine in the 1970s. He went on to build a fourth and fifth drawing machine in 1984 and 2002, respectively. However, the machines he later invented were based on a mechanical pendulum design, not bomb vision computers (O'Hanrahan, 2005).

Figure 2: Henry with her analog computer connected to her drawing machine, 1962.

Source:https://en.wikipedia.org/wiki/Desmond_Paul_Henry#/media/File:Desmond_Paul_Henry_with_Drawing_Machine_1.jpg

American computer scientist Edmund Berkeley published a title called 'Computer Art' in the 'Computers and Automation' magazine. In the magazine he published in 1963, he published a 1962 picture of Ephraim Arazi (Israeli technology pioneer and businessman). Painting, which he described as computer art, led him to launch the first Computer Art Competition in 1963. This competition contributed to the development of computer art until 1973.

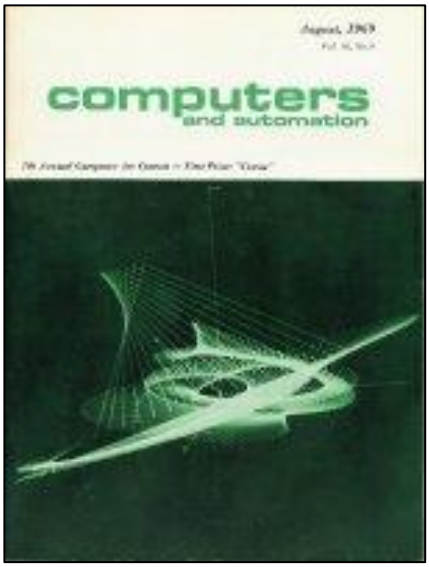

Figure 3: Computers and Outomation magazine cover, with computer drawing by E. Arazi, 1969
Source: http://dada.compart-bremen.de/docUploads/computers_and_automation_1969.pdf

1.2. Development of Digital Art

Digital works, also called digital art, are produced visually by the computer. Computer in the creation process; In addition to being used as a tool, they are also a supporting artist. After 1990, digital painters and printmakers started to produce more works thanks to computers, and they were accepted by many museums and art circles. These works, which are called 'new media art', have turned into works of art with the opportunities provided by digital techniques, together with the computer that the artists acquire as a tool. The effect of digital technology has shown itself in literature and music/sound art as well as in visual arts.

In addition to the use of digital art techniques by media and filmmakers, traditional artists have also started to use many computer programs to create their works. It is stated by the sources that the first experiments of digital art date back to the 1950s in the USA. American Art and Technology Experiments (EAT, 1966 New York), which brings together scientists and artists who specialize in technology, further developed computer technology and directed artists to this field.

Digital art can be entirely computer-generated, such as fractals and algorithmic art, or it can be taken from other sources, such as a scanned photograph, an image drawn using a mouse or graphics tablet, and vector graphics software (Christiane, 2006: 27-67). The transfer of art to the digital world has led to the development of computer operating systems, software and vector programs, tablets and smartphones accordingly. Paint software, which we used in the 1990s, offers the possibility of drawing in a much more advanced way today. Again, much software developed and released by Adobe provides the opportunity to make all kinds of drawings and designs suitable for the purpose.

The term digital art was first used by Harold Cohen in the early 1980s. The digital artist, who is also a computer engineer, has developed a painting program. This simple drawing and painting computer is similar to Paint Drawings, the first painting and graphics software of the Windows operating system. Digital storage of graphics and pictures is possible with files with Jpeg, Gif, Tiff, and PNG extensions.

Figure 4: Computer drawing, Harold Cohen, 1982.
Source: https://www.tate.org.uk/art/artworks/cohen-untitled-computer-drawing-t04167

In the modern sense, the art of graphic design has started to develop since the late 1800s. The first graphic design agency was established in Austria in 1903 (Rosenman, 2012). With the development of the printing press, these designs and drawings were printed. The term graphic design was first coined by modern designer William Addison Dwiggins in 1922. The artist, who introduced himself as a graphic designer, transferred his works to digital media. Famous American graphic designer Paul Rand has combined the world of informatics and graphic art. In the 1950s, with the development of technology and the Industrial Revolution, commercial concerns increased, and advertising products were put on the market for marketing and profit.

Figure 5: IBM logo, Paul Rand, USA, 1972.
Source: https://aineoh.github.io/AAD116-essay/essaypage.html

With the increasing importance of popular culture, various posters and comics have increased, and the effects of popular art and futurist movements have been seen. While the industrial and technology revolution of the 20th century leads us towards artificial intelligence, many traditional artists and new generation artists continue to produce digital art.

Figure 6: Chikd, Marta Frackowiak, Poland, 2023.
Source: Collection of Müberra Bülbül.

Today, art knows no boundaries. Art works prepared in the virtual environment can be exhibited in three-dimensional galleries and museums. Designs made with web3 and even web4 tools emerge with virtual universe and blockchain technology. Crypto signatures are used in order to know who the original owners of the works created in this virtual universe (metaverse) are and to make the correct reference. Blockchain, called a digital ledger, stores all virtual data. The images, sounds, music, videos recorded in this chain hold the copyright. NFT (Non-Finguble Token) unchangeable virtual assets displayed in the gallery have the value of a work of art.

A connection has been established between the real and virtual reality with the Virtual Reality applications created by computer. Computer generated image etc. The transfer of data to the outside world is provided by Augmented Reality. For example, presenting an environment that appeals to all our

senses in the cinema hall will increase the effectiveness and reality of the film with the augmented reality application.

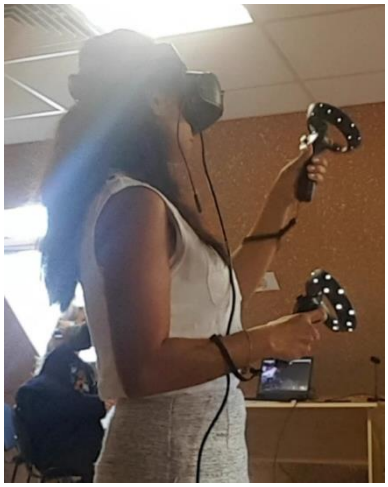

Figure 7: Virtual reality application, design work with a smart device, Müberra Bülbül.

2. Artificial Intelligence and Art

Artificial intelligence called 'Artificial Intelligence (AI)' in English, is a system in which a computer-controlled robot imitates human-specific intelligent behavior. It is a machine learning that can exhibit the perception, production, thinking and problem-solving abilities of human intelligence. In 1943, during the Second World War, reference was made to computers and artificial intelligence produced by electromechanical devices. Engineers who develop machine intelligence and the world of informatics have done many studies to develop artificial intelligence algorithms.

In today's Industrial Revolution, a relationship has been established between the Internet of Things and the machine and human. It is expected that new data built on old knowledge will be processed into these machines to produce creative results and possibilities. With the merger of computer science with AI, it was concluded that computers could also create a work of art. With Computational Creativity, which was introduced, computers were allowed to develop creative software. With the creative software produced, art products such as painting, music, and poetry have also become possible. At the same time, artists can create new and original works by using this software as a tool.

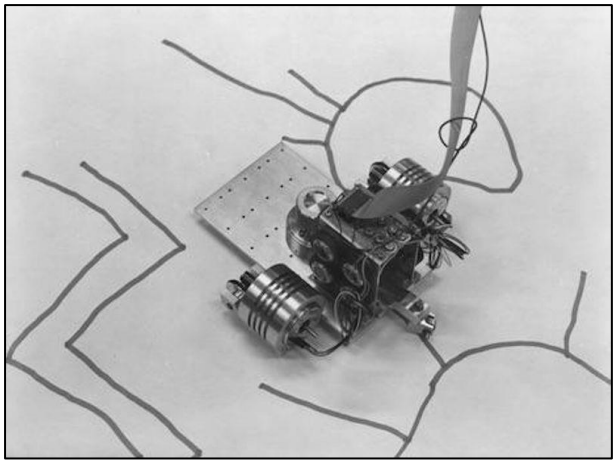

Figure 8: Turtle robot painting in the 'Drawings' exhibition, Harold Cohen, 1979.
Source: (Garcia, 2016).

Cohen, who developed a small drawing robot, which he called the 'turtle' in his own words, obtained drawings on the papers he placed on the floor. This artificial intelligence technology, which is a robotic machine, is a programming system called AARON. This robot, whose technology has been developed further, initially made black-and-white drawings, but later succeeded in making colorful abstract works. Modern robots, produced in the early 1950s, started to do more intelligent and creative work besides the simple tasks that humans can do. With the development of the robot industry, software that can produce art has taken its place in today's world.

Figure 9: First color image created by AARON, 1995, Computer History Museum Collection, USA.
Source: (Garcia, 2016).

The Balemy Portraits, exhibited as the first realistic artificial intelligence artwork produced by Obvious in Paris in 2018, are reminiscent of classical period paintings. Ai-Da, the first robot painter to

emerge in 2019, expresses modern art with the portraits he made in an abstract and colorist style. Artificial intelligence machines can also respond to all kinds of stimuli with 'deep learning'.

Figure 10: Portrait of the Queen, Ai-Da robot painter, London, 2022.
Source: (The Irish News, 2022).

2. Method

During the research process, literature was searched and national and international books and journals were examined. Interviews were conducted with digital and traditionalist artists. Internet resources were scanned and current foreign press news were taken into account. Interpretations were made through the applications I have made about the research.

3. Results

Looking at the international studies, it is seen that artificial intelligence is being developed more and more and can produce works of art. A Turing test performed by the Art and Artificial Intelligence Lab in New Jersey revealed that these machines produced works that met aesthetic and visual art criteria.

4. Arguments

Today, it is seen that a work of art created by artificial intelligence is not different from a work made by human hands. Will robots be able to replace artists in the workplace where many professions lose their importance and there is no human need? Art brings emotion and thought. Could these intelligent machines have human emotions? Will human values be taken into account in the scientific world where answers to these questions are sought? Or are commercial and political concerns trying to prove that machines will be superior to humans?

Conclusion and Recommendations

When we look at the birth of art to the age of enlightenment, from the contemporary art period to today's technology, we can make sense of the relationship between the individual and society, the living conditions and the role of the individual in society through various works. As a creative being,

man dreamed of getting rid of his physical workforce, investing more in his cognitive abilities, and creating a copy of himself, even more competent than himself. While the first computers were used with simple programs for calculation, today's world dictates digital life to us. While contemporary artists question their own role in this digital world, they also experience financial concerns. While some professions started to lose their effect due to the created robots, the artist had to leave his pen/brush in the hands of computers.

Andy Warhol opened his factory, where he produced digital copies, at the time when popular life culture gave birth to Pop Art. Contemporary artists have met with media art while continuing their search for new concepts. While computer programs and small robots have begun to facilitate the work of human beings in many areas, art has taken its share.

Visual artists have benefited from the blessings of digital technology while aiming to create new effects in their works. When simple coding is taught to machines, the resulting visuals resemble children's drawings. The programmers who developed these codes have processed certain forms and signs, certain knowledge and experience on a theme into these machines. This developmental process is similar to the development of creativity in human nature with knowledge, experience and various experiences. Artificial intelligence robots have applied their first drawings simply, just as an individual who receives visual arts education begins to draw with undetailed forms and simple shapes. Robots, whose algorithms were developed and trained within the framework of certain themes, started to produce realistic works later on. When we look at the development of art, there is a trend from realistic works to abstract art. While the art of artificial intelligence is developing more and more today, it offers us abstract descriptions in line with its experience.

Artificial intelligence robots that make creative pictures, write poetry and even compose music have been the protagonists of the creation. We should try to understand human creativity through computational creativity instead of approaching this situation commercially and putting humans in competition with robots. We must ensure that this software acts as a creative collaborator rather than a tool, and to produce programs for creative people to use.

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