

# THE ART OF ALGORITHMS AND ARTIFICIAL INTELLIGENCE (AI) AS TOOLS FOR CREATIVE OBJECTIFICATION IN THE VISUAL ARTS

By

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## **Abstract**

The application of algorithms and Artificial Intelligence (AI) in the design, creation and interpretation of creative objectification in the visual arts in the contemporary era is a crucial phenomenon. The visual artists in recent times often explore a set of rules and complex possibilities through computerized patterns to create unique and unpredictable outcomes, enabled and enhanced by the modern development of algorithms and Artificial Intelligence. The application and integration of the algorithm and artificial intelligence as tools for creative possibilities has therefore engendered visual art generation with unique and complex results. This paper, therefore, discusses the usage of algorithms and Artificial Intelligence in facilitating modern design creation in the visual arts. Thereby highlighting their importance in the contemporary visual arts landscape, especially in Nigeria. The paper examined the various areas of the visual artistic genre to ascertain the involvement of algorithms and Artificial intelligence in them. The research employs the combination of formalism, psychoanalysis and biographical research methods of art historical studies in the analysis and exploration of this modern tendency. It finds that the introduction of algorithms and Artificial Intelligence (AI) in contemporary visual arts creation has greatly enhanced modern design possibilities. In spite of these laudable contributions, the paper concludes that the role of human input in creating ideas, form generation and application of the computerized system in the creative arts processes is still a crucial element in the visual arts scene.

**Keywords:** Algorithms, Artificial intelligence, Tools, Visual Arts, Crucial, Creative

## Introduction

Since primordial times, man has continued to develop new ways of dominating his environment to keep him comfortable within his domain, which is constantly faced with new challenging conditions of living. Thus, he is in a steady movement to make his environment habitable by fashioning out utilitarian and non-utilitarian tools that could mitigate the environmental hazard. With the discovery and control of fire by mankind at about 1,000,00 BC - 400000 BC (Fossil Humid and History Stone age man), artistic and technological development began to soar. From the prehistoric age to the 19th century, art and technology have strived to pilot the initiation of material source of creation, projection and implementation of ideas by the artist for the development of human and material resources important for any given society' (Mamza, 2014). This effort of art and technology took a new leap with the discovery of computer technology in the 19<sup>th</sup> century especially the Artificial Intelligent Computers (Electronic Digital Computer; EDC) in the 1940s by John Vincent Alanasoff and Clifford Beryl (<http://www.Columbia.edu.JV.alanasoff>); and the first general purpose electronic digital computer known as electronic numerical integrator and calculator (ENIAC) designed by John Mauchly and J. Prosper Echert in 1946. However AI was debuted by Allen Newell and Herbert A. Simon at Dartmouth workshop in 1956 as "the Logic Theorist" and this is widely considered as the birth of AI. In the twenty-first century, AI gain interaction and acceptability in different aspects of human endeavour - which included the visual arts. Nevertheless, "the history of artificial intelligence (AI) began in antiquity with myths, stories and rumours of artificial beings endowed with intelligence or consciousness by master craftsmen" (the creative artist, History of Artificial [Intelligence.net](http://Intelligence.net)).

On the other hand, art has been with the prehistoric man since creation. As social, technological and artistic change went "hand in hand", Homo sapiens (wise man) developed complex cultures (Adams, 2002) which are only evident to and understood by modern man through the remains of fossils and artefacts. The application of AI has entangled every artistic genre the world over, and the contemporary Nigerian creative art space is not an exception. This paper, therefore takes an analytical survey of the usage and application of AI in contemporary Nigerian art. It examined its application and usage in the different artistic genre -painting, graphics, textiles, ceramics, and sculpture/metal design. The paper employed the formalistic, psychoanalytical and

biographical methods of art historical studies in analytical and explorative trajectory of the application of AI in the artworks.

### **Conceptual Framework**

The analytical survey is based on the conceptual framework of “use”. Ukweku (2022) opines that the concept of use has three indicators thus; useful, usable and used. Thus, a useful product is one that several users agree satisfies their needs. Therefore, a product that is useful is one that successfully and satisfactorily allows a user to accomplish a task or an objective (Alaster, 2002). It is important that there are a number of potential users who find a product useful. On the other hand, (Aido, 2002 in Ukweku, 2022) opines that “usable refers too usability of a product. It examines the way that product will be used and whether it enables the user to do job in a pleasurable, simple and effective manner” The “concept of use” is apt in this study as it perused the usability and benefits and usefulness of the AI application in the actualization of artistic nuances by visual artists in the creation of various artworks.

This study applied the formalistic, psychoanalytical and biographical art historical research methods in the analytical survey of the AI application in contemporary Nigerian artworks. Formalism is an art historical research method that pays attention to pure arrangement and etiquette guiding aesthetic rather than content, function and context. “They respond to formal elements and their aesthetic” (Adams, 2002), while the biographical method approaches the artwork in consonance with the artists' lives and personalities. And psychoanalysis is a 19th-century branch of psychology that began with Sigmund Freud. It deals with the past by reconstructing and interpreting the present. It examines the expressive imagery, history and creative objectivity of the process. It also reveals the unconscious mind and reworks personal imagery into new form that engages cultural instinctual energy. These methods helped the study to communicate the emotions and aesthetics quality that emanates from the artist to the viewer. It also espouses the lives of the artist as underlining text for the proper interpretation of the work. Thereby enhancing a better understanding of the focus of this study.

### **A Brief Survey of Artificial Intelligence (AI):**

As earlier stated above, artificial intelligence machines came into existence at the middle of the 19<sup>th</sup> century and they gained acknowledgment and approval in various facets of human activity. What then is the meaning of this new technology that has permeated the entire human existence? According to Copland (2024), Artificial Intelligence is the ability of the computer or computer-controlled robot to perform tasks that are commonly associated with the intellectual processes and characteristics of humans. Nikita (2024), however defines it thus. “AI is the simulations of human intelligence in machines that are programmed to think and act like humans”. This scientific discovery and development of digital computers that are programmed to perform very complex tasks is now an accepted means to solving human challenges. This technology has also been reflected in the artistic landscape. Artificial intelligence could therefore be regarded as the simulation and re-ordering process of human intelligence by advance computer machines in the production of artworks. Nevertheless, the introduction of machines activated human intelligence into art production has engendered a new creative essence in the visual arts domain. It is a revolutionary era where artists and machines are in collaboration using the AI algorithms enable computer machines. Algorithms is the main technology that enable the computers to analyze high amount of data, recognize patterns stored in its memory and offer predications or recommendations based on the information processed. The Algorithm inspired art could also be regarded as Digital Art as they often rely on pre-determined rules and parameters. The Artificial intelligence (AI) art universe is saturated with creativity and innovations which enables the artists to create unpredictable, complex and unique artworks through the use of human input and design; and machine leaning models and data. The application of AI in the creative industry could be categorized into five groups according to Anantrasirichai & Bull (2022). These are (i) Content creation, (ii) information analysis, (iii) content enhancement and post production workflows, (iv) information extraction and enhancement, and (v) data compression. They also highlighted the difference in the dynamic application of the AI as a creative tool and its inherent dexterity as a creator in itself. The Starry Night Garden (fig. 1) exhibited at Macau is a great example. It is a Van Gogh AI that explores how AI and Van Gogh’s iconic work can be put together to create a truly unique concept. It is a testament to the possibilities achievable when AI and Digital Art are used to create. William Lim’s artwork (fig 3) is also a worthy experience for the future of digital art.



Figure 1: “Starry Night Garden” exhibition at One Central Macau (Photo: Courtesy of Heiman Ng and William Lim)

### **A Survey of Creative Art**

Art is a highly contested concept (Andrew Brighton, 2006, in Thompson, 2006) that connotes different things to different people. However, overtime, several art writers have attempted various meanings and descriptions of art. Generally, art could be regarded as the expression of the inner mind via imagination, emotions, ideas and exploration of formal elements in the generation of aesthetic and functional objects. Egonwa (2007) opines that Art is the arrangement of an experience or experiences via some medium such as wood, fabric, metal or clay, for self and others by a sentient personality called an artist using elements of design. Danjuma (2004) refers to art as “creative skill compelled by personal drive caused by emotions, beliefs or ideas to produce a piece of artwork. It can take different forms and be produced for several purposes”. Art could be said to be self-expression, translated through thoughts, feelings and sensations into visual forms. Creative art could be divided broadly into two domains - the fine arts and the applied or industrial arts. (Functional or decorative arts). [Visual-art-cork.com](http://Visual-art-cork.com) in the encyclopedia of art education observed that the term Fine arts refers to an art form practised mainly for its aesthetic value and its beauty (art for art’s sake) rather than its functional value”. It includes drawing, painting, printmaking, sculpting, photography and architecture, While the applied or functional or industrial art refers to the application (and resulting products) of artistic design to utilization

objects in everyday use” They are usually concerned with the design and ornamentation of items; and are mostly functional with little or no intrinsic aesthetics character or value. These include graphics art, metal design work, book illustration, architecture, industrial design and many more.

Nevertheless, with the industrial revolution, standard machine -made products that have special attractive designs applied on them, easy to use, aesthetically pleasing to visual sensibility but highly functional began to emerge in the artistic domain. Thus, giving birth to technically inclined art works. This technological input has metamorphosed in contemporary time into the artificial intelligence which is currently being applied in every facet of art production.

[Arts.cork.com](http://Arts.cork.com) described the transformation processes thus: “applied art received its biggest boost from the growth in commerce during the 19<sup>th</sup> century, following the industrial revolution. Suddenly, competitive manufacturers and service providers needed to ensure that their products and services looked good as well as functioned properly”. This demand for improved aesthetics and function led to various technical and artistic innovation processes in the visual arts. These artistic innovations and processes in the various artistic genres are discussed below.

**Ceramics:** the art of ceramics (Pottery) could be regarded as the art of making pottery, which is one of the oldest craft in the world with its creativity profoundly embedded in philosophical ideas and a humanistic ambiance. Ceramic is a live and evolving form of art that seems to exhibit unlimited boundary. Its appreciation is crucial as its expansion is in most cases the activating energy behind economic development and the change of rural environment (Aduina, 2020). According to Zhang, (2024), the development of Zhang-(2024) ceramics marks a watershed moment in human history, accelerating the shift from basic to sophisticated civilization”.

In Nigeria, there are evidences from Dutsen Kongba rock shelter near Jos shows that pottery manufacture existed as early as the 4<sup>th</sup> millennium BC (Falunsi, 1992 in Odubiyi, 2008). However, the art of Pottery has survived into the present era and has also played significant role in the development of modern Nigeria. Prior to this contemporary time, Nigeria traditional potters used to engage the production of pottery with the manipulation of clay with their hand, a

potter's wheel and other processes manually. But in contemporary Nigerian art, ceramics artist has integrated AI and other digital tools into the production processes. The involvement of AI has led to enhanced creative processes and improved of ceramic design. It helps in the selection of clay composition to firing temperature, optimizing glaze formations and ensuring consistency and eliminating human errors while enabling the duplication of sophisticated design. The AI algorithms has also revolutionized traditional techniques and creative processes, and generated unique and complex designs, shapes and patterns which are transformed into physical artworks which sometimes involve the use of 3D printing technology. AI generated ceramics designs has enabled the exploration of new forms, textures and colour thereby pushing the boundaries of traditional ceramic arts in Nigeria. The AI algorithm and digital tool intervention has significantly enabled the spread of ceramics arts and formulated key support network for respective ceramic artist? which enhance the level of connection and engagement, provides more space and opportunity for development in ceramic arts (Zhang, 2024). The Nigerian ceramic art landscape has been rapidly revolutionized with the integration of AI.

Visual communication is simply the art of designing for print production (Adeyemi, 2008) meant for communication purposes. This could be divided into two broad domain-graphics art' which is printing and graphics design' also known as Design Communication. Printing according to Hornby (2001) is the art and science of producing letters, pictures, patterns and more on a surface by pressing a prepared matrix covered with ink against it, While Adeyemi (2008) opines that printing is the production of images on paper, parchment, plastic and others by various processes of multiplication either by hand or mechanical or photo-mechanical means. The use of AI| in the creation of visual artwork could be highly noticeable in the new digital imagery or art forms represented in image generation for photography, graphic communication and animation. The Images are first created and drawn by the artist before it is imputed into the computer system for "image to image translation or style transfer". This is because the image input and output, though with similar localize semantic content has diligent appearances. This involves mapping classed possibilities that "transforms the input image into the style of the selected artist by combining feature maps from different conventional layers". Thereby drawing and generalizing abstract concepts in a manner similar to science or type human (Nantheera and David, 2022) With the AI technology, two images, scenes or types can be

converted from map or sketches to real scene or coloured objects. The AI photography art of Timi Amah titled Looking Into the Future is a typical example.



Figure 2: Timi Amah, Looking into the Future, AI Algorithm Design, 2024 “16 by 14”.

The creative integration of AI in graphics design, animation and photography seems to have transformed the work, therein creating new possibilities and challenges in the art domain. This technological advancement has revolutionized the creative field in graphics design, animation and photography in very notable ways in contemporary Nigeria. This could be conspicuously seen in the graphic design, production processes, generation of logo, colour scheme or palette selections, and typography. AI also features greatly in image editing, manipulation of design streamline, rapid prototyping and iteration using automated design system. In photography, AI generative models help in creating synthetic images, blurring lines between reality and artifice. Its camera enhances image quality and automate settings, and advanced retouching and manipulation by editing software empowered by AI. Thereby augmenting

creativity by expanding designers and photographers' capabilities and increased efficiently for high level decision.



Figure 3: William Lim's artwork which features himself in a garden (Photo: Courtesy of Heiman Ng and William Lim)

**Painting:** Beginning from Aina Onabolu (1882 – 1962) and other great Nigerian artists of the past, painting has witnessed a brauendous advancement in the Nigeria artistic landscape overtime. The Nigerian painting genre has a rich cultural heritage with a history of vibrant colours, bold patters scenes and story telling through the arts. But in contemporary times, artists painters have begun to explore the new technology of Artificial Intelligence (AI) to articulate more boundaries and welcome new creative frontiers.



Figure 4: Timi Amah, Akassa, AI Algorithm Photo Design, 2024, “18 by 14”

They have used AI algorithmics to blend traditional techniques with machine learning to engender unique art works. They employ AI in colour palette choices, brushstroke simulation, composition to enhance creative process. They also engage AI powered software to create digital paintings with precision and detail in artistic style, iconographies essence, composition and aesthetic authenticity that moral tradition (regular) painting works. Thereby, exploring visual expression from choice colours, elements of art and design to create three dimensional effects with illusion of depth and visual accuracy.



Figure 5: Isi Agu by Osaz world limited (n.d) (<https://www.osazworld.com/product/igbo-isiagu-clothes-2/>)

**Textile Design Technology:** The Nigerian textile design industry like other artistic genre has also embraced the new technology of AI with product or art generation concept. AI is currently being integrated into the fabric through form generation and computational design, knitting, weaving, screen printing and dying. It could also be seen in textile pattern generation that could be used and optimized for certain objective. This unique textile AI algorithms generated patterns could be inspired by traditional and contemporary cultures (fig 5). They, in most cases showcase a special blend of indigenous patterns and foreign motifs from other cultures within and without Africa. In image-to-knitting/weaving, AI can potentially convert images directly into knittable programmes for textile production, revolutionizing the design-to-production processes. The adaptation of AI image generators like DALL-E or Midjourney, helps in the ideation and inspiration for new textile and garment design, thereby enhancing the design processes fig 6. In contemporary times, AI

appropriate technology could be noticed in the production of textile fabrics using the AI automated looms and form generation, and surface design translation.



Figure 6: Raffia mat/mask design Adaptation of Ikot Ekpene Woven Raffia Design by Ekamen, .J.E (2020).

### **AI-Generated Metal Design and Sculpture:**

The application of AI in art seem to be increasingly integrated with varied art forms, its usage in sculpture in began with artists such as Frieder Nake and Georg Nees who applied algorithms to generation simple sculptures. Thereby laying the foundation for future experimentation for CAD software usage in designing and fabrication of complex images, Machine learning, robotics and (GANS) Generative Adversarial Networks and other AI models. In Nigeria, AI involvement in sculpture is a more recent metal sculpture scene using different techniques applications, the AI algorithms seems to be more noticeable in the design and fabrication of sheet metal works especially in elaborately designed metal gates. The design is generated through CAD which is then uploaded into a computerized laser cutting machine with algorithms memory. This streamlines the design process, generate unique metal sculpture designs, optimized specific applications such as chasing and repousse, fabrication processes, welding, and pricing and sawing. Thereby allowing the artists to create complex shapes and forms. The metal designer explore the computer Aid Design (CAD) in generating design patterns and illustrations for the process of etching, chasing,

repousse, jounery methods and sumting. This enables visual expressions with three-dimensional effects on a flat metal surface. While also encouraging the production of complex three-dimensional forms (Edewor, Idenu and Onose, 2025).



Figure 6: Metal Grate with putout design patterns. 2024, 18ft by 8ft. Benin Photo: Felix Ophori.



## Conclusion

The paper has reviewed the historical background and application of Artificial Intelligence and Algorithm in the visual art scene. It also took a panoramic review of their exploration in the creation of various artworks in the different artistic genres. It observed that the synergy between

art and technology and their roles in the artistic development of Nigeria spans a long period of time and has come to stay. The application of AI and algorithms or digital art in the Nigerian contemporary visual art scene has opened new vistas of creativity, innovation and experiences that are testimonies to the uniqueness of artworks that can be achieved. It has transformed the knowledge and practical skill of art into more dynamic and comfortable living products by offering new tools and possibilities. As the Nigerian art world continues to evolve, the interaction of human imagination and AI's capabilities will continue to redefine the future of art through enhanced creativity and increased accessibility that can foster innovation. Moreover, it is crucial to note that the application of an AI algorithm is a complementary role to further enhance the creative objectification of Nigeria visual artists in our contemporary art era. Nevertheless, in spite of these laudable contributions, the artistic human input in these creative art processes of engendering ideas, form generation and exploration of computerised AI algorithms is still a crucial and significant element in the visual art landscape. This symbiotic collaboration, if properly engaged would create a great and better creative arts industry in this contemporary era.

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