

EXPLORING PATTERNS AND TEXTURE THROUGH ARTIFICIAL INTELLIGENCE ANALYSIS IN MODERN NIGERIA ART PRACTICE

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Abstract

Nigerian is a country rich in diverse culture and art forms. The synergy between the cultural heritage and innovative spirit of the people has birthed a dynamic fusion of the traditional and modern art elements in present day art expressions reflecting the cultural diversity, complex history and evolution in the Nigerian arts ecosystem. In recent years, Artificial Intelligence (AI) has found application across various sectors globally. In arts, the application of AI as a tool for art analysis plays a huge role in arts appreciation. AI can be trained for visual element recognition of artworks hence providing new insights into the meaning of arts and empowering art historians, curators and enthusiasts in unprecedented ways. Application of this technology in Nigerian arts poses significant potential and shows promise of revolutionizing arts in Nigeria and reposition Nigerian arts in the global scene. Careers in art may also witness an influx of practitioners as well as creation of new roles. This article explores the historical context of Nigerian art, emphasizing traditional motifs, the technology behind AI analyzers, the role of AI analysis in providing new insights into the Nigerian art using modern Nigerian artists, including Peju Alatise, Olamide Ogunade,

and Njideka Akunyili Crosby as Case studies. The conclusion highlights the implications of AI analysis for Nigerian art, including its potential to promote cultural exchange and artistic innovation raising concern on biases in AI technology then poses significant questions including is Nigerian art presently represented and included in training of AI? This paper recommends that utilization of the AI analysis in advancing Nigerian arts must begin with a collaboration between Nigerian historians, artists, curators and tech experts in curating of the unique tribal art forms that make up the Nigerian art and ensuring that AI tools for the purpose of art analysis are adequately trained with diverse arts that ensure inclusion and representation of all tribe arts.

Introduction

Nigerian art is a vibrant and diverse field, encompassing a wide range of styles, mediums, and themes. From traditional crafts to contemporary installations, Nigerian art is characterized by its rich cultural heritage and innovative spirit. The country's art scene is a dynamic fusion of traditional and modern elements, reflecting the complex history and cultural diversity of Nigeria. With over 250 ethnic groups and more than 500 languages spoken, Nigeria is a melting pot of creative expression (Carey *et al.*, 2024). In recent years, artificial intelligence (AI) analysis has emerged as a powerful tool for understanding and appreciating art. AI algorithms can be trained to recognize patterns, textures, and other visual elements in artworks, providing new insights into their meaning and significance. This technology has the potential to revolutionize the art world, enabling art historians, curators, and enthusiasts to analyze and interpret artworks in unprecedented ways. In the context of Nigerian art, AI analysis offers a particularly exciting opportunity for discovery and exploration. With its rich cultural heritage and innovative spirit, Nigerian art is a prime candidate for AI analysis. By applying AI algorithms to Nigerian artworks, we can uncover new patterns, textures, and themes that reveal the complexity and diversity of Nigerian culture. Moreover, AI analysis can help to promote Nigerian art on the global stage, providing a platform for artists to showcase their work and connect with international audiences. In an increasingly digital age, AI analysis can help to bridge the gap between

traditional and modern art forms, enabling Nigerian artists to engage with new technologies and push the boundaries of creative expression.

In this article, we will explore the potential of AI analysis in modern Nigerian art practice, examining how this technology can reveal new insights into patterns and texture in Nigerian artworks. We will also discuss the implications of AI analysis for the Nigerian art scene, including its potential to promote cultural exchange and artistic innovation.

The article will be divided into four sections. The first section will provide an overview of Nigerian art, exploring its history, styles, themes and will examine the role of patterns and texture in Nigerian art, discussing their cultural significance and artistic expression. The second section will introduce AI analysis and its applications in art, explaining how AI algorithms can be used to recognize patterns, textures, and other visual elements in artworks. The third section will apply AI analysis to Nigerian art, exploring how this technology can reveal new insights into patterns and texture in Nigerian artworks. The final section will discuss the implications of AI analysis for the Nigerian art scene, including its potential to promote cultural exchange and artistic innovation. By exploring the intersection of Nigerian art and AI analysis, this article aims to provide a fresh perspective on the role of technology in the art world. We hope to inspire a new generation of artists, curators, and art enthusiasts to engage with Nigerian art and explore the creative possibilities of AI analysis.

Nigerian Art and Patterns in Nigeria Art: An Overview

Nigerian art has a rich and diverse history, spanning over 2,000 years. The country's art scene is a dynamic fusion of traditional and modern elements, reflecting the complex history and cultural diversity of Nigeria. With over 250 ethnic groups and more than 500 languages spoken, Nigeria is a melting pot of creative expression. The earliest known examples of Nigerian art date back to the Nok culture, which flourished from around 500 BCE to 500 CE. The Nok people were skilled craftsmen, creating intricate terracotta sculptures that depicted everyday life and mythological creatures. These sculptures of well fired clay are renowned for their craftsmanship and represent animals naturalistically; human figures depicted with heads that are cylindrical, spherical, or conical (Carey *et al.*,

2024). The Benin Empire, which flourished from the 13th to the 19th century, was another significant period in Nigerian art history. The Benin people were skilled bronze casters, creating intricate plaques and sculptures that decorated the royal palace (Carey *et al.*, 2024).

These artworks are highly valued for their beauty and historical significance, and are considered some of the greatest examples of Nigerian art. In the modern era, Nigerian art has continued to evolve, incorporating new mediums and styles while still drawing on traditional motifs and themes. Today, Nigerian art is a thriving field, with artists pushing the boundaries of creativity and innovation. Some notable modern Nigerian artists include Peju Alatise, Njideka Akunyili Crosby, and Olamide Ogunade, who are known for their innovative use of materials and techniques. Nigerian art is characterized by its use of vibrant colors, intricate patterns, and complex textures. Many artworks incorporate traditional motifs and themes, such as the use of Adinkra symbols and Yoruba mythology (Thompson, 2017). Nigerian art is also known for its political and social commentary, with many artists using their work to address issues such as corruption, inequality, and social justice (Alatise, 2024). The Nigerian art scene is supported by a number of galleries, museums, and art festivals, which provide a platform for artists to showcase their work and connect with international audiences.

The National Gallery of Art in Lagos is one of the most prominent art institutions in Nigeria, and hosts a number of exhibitions and events throughout the year. In recent years, Nigerian art has gained international recognition, with many artists exhibiting their work in galleries and museums around the world. The country's art scene is a source of national pride, and is seen as a symbol of Nigeria's rich cultural heritage and creative potential. Overall, Nigerian art is a vibrant and diverse field, encompassing a wide range of styles, mediums, and themes. From traditional crafts to contemporary installations, Nigerian art is characterized by its rich cultural heritage and innovative spirit. With its long history, diverse cultural influences, and thriving art scene, Nigerian art is a fascinating and dynamic field that continues to evolve and innovate.

Patterns are a fundamental element of Nigerian art, appearing in a wide range of forms and mediums. From the intricate designs on traditional

textiles to the bold geometric shapes in modern paintings, patterns play a crucial role in conveying meaning and symbolism in Nigerian art. In traditional Nigerian art, patterns are often used to represent different aspects of culture and society, such as the Adire cloth patterns that symbolize Yoruba mythology and culture (Smith, 2018; Thompson, 2017). In modern Nigerian art, patterns continue to play a significant role, with artists incorporating traditional motifs into contemporary styles and mediums, such as mixed media installations and digital art.

Furthermore, texture is a vital element of Nigerian art, adding depth, dimensionality, and tactile quality to artworks. In traditional Nigerian art, texture is often used to convey meaning and symbolism, such as the intricate carvings on wooden sculptures or the rough, earthy texture of terracotta pottery. In modern Nigerian art, texture continues to play a significant role, with artists experimenting with a wide range of materials and mediums to create innovative and engaging artworks. From the smooth, cool surface of bronze castings to the rough, organic texture of woven baskets, Nigerian art is characterized by its diverse and complex textures.

AI Analyser and Application in Nigerian Arts

AI Art Analyzer is a GPT (Generative Pre-Trained) that focuses on the interaction of artificial intelligence and visual art, offering key features such as analysis and artwork enhancement (IBM, 2024). The analysis function goes beyond identifying basic art elements to highlight nuances, patterns and other intricate details hence providing historical and cultural insight into specific aspects of artwork much like an art expert would (D'souza, 2023). In general, AI Art Analyzer embodies a unique blend of technology and art, transforming the way we experience and engage with artwork. Its aim is to offer a deeper level of analysis and exploration, and to provide a novel tool for anyone interested in art. An uploaded picture of the artwork to be analyzed and a clear prompt. For instance;

Sample prompts

"You are an expert art historian and critic analyze my (painting) and tell me the patterns you see, explain the historical significance of these art elements."

AI Art Analysers offer series of prompt starters making it easy for users to navigate. Some existing AI Art Analyzers include ChatGPT Plus and Eden AI.

AI analysis can help identify and classify patterns in Nigerian art, revealing new insights into their significance and meaning. Using machine learning algorithms, AI analysis can identify patterns in Nigerian art based on their visual characteristics, such as shape, color, and texture. This type of analysis can help art historians and curators better understand the development of Nigerian art and its cultural significance. For example, an AI algorithm can be trained to recognize the distinctive patterns of Adire cloth, identifying their presence in modern artworks and tracing their evolution over time. This can help art historians understand how traditional patterns have been adapted and reinterpreted in modern art, and how they continue to convey meaning and symbolism in contemporary culture. Additionally, AI analysis can help identify patterns in Nigerian art that may not be immediately apparent to the human eye. For example, an AI algorithm can be used to analyze the use of color and texture in Nigerian art, identifying patterns and trends that may reveal new insights into the cultural and historical context of the artworks.

Some potential applications of AI analysis in Nigerian art include:

Pattern recognition: AI algorithms can be used to identify and classify patterns in Nigerian art, revealing new insights into their significance and meaning.

Art historical analysis: AI analysis can help art historians understand the development of Nigerian art and its cultural significance, tracing the evolution of patterns and motifs over time.

Art authentication: AI algorithms can be used to authenticate Nigerian artworks, identifying patterns and characteristics that are unique to specific artists or styles.

Art conservation: AI analysis can help conservators understand the materials and techniques used in Nigerian art, identifying patterns and trends that may inform conservation and restoration efforts. Overall, AI analysis has the potential to reveal new insights into the patterns and

meanings of Nigerian art, helping art historians, curators, and conservators better understand and appreciate this rich and diverse cultural heritage. Furthermore, AI analysis can help analyze and categorize textures, revealing new insights into their significance and meaning using computer vision techniques (Stork, 2024), AI analysis can identify and classify textures in Nigerian art based on their visual characteristics such as roughness, smoothness, patterns and materiality which reveals emotions, balance, rhythm, sophistication of the artwork among others.

An algorithm is a set of commands that must be followed for a computer to perform problem-solving operations. According to its formal definition, an algorithm is a finite set of instructions carried out in a specific order to perform a particular task (Upadhyay, 2024). For example, an AI algorithm can be trained to recognize the distinctive texture of carved wood, identifying its presence in modern artworks and tracing its evolution over time. This can help art historians understand how traditional textures have been adapted and reinterpreted in modern art, and how they continue to convey meaning and symbolism in contemporary culture. By analyzing and categorizing textures in Nigerian art, AI can help reveal new insights into the cultural and historical context of these artworks, and provide a deeper understanding of their significance and meaning.

Case Studies

Applying AI Analysis to Nigerian Art Several modern Nigerian artists have incorporated patterns and texture into their work, often in innovative and unexpected ways. For example, Peju Alatise's mixed media installations feature intricate patterns and textures that reflect her Yoruba heritage such as the use of Adire cloth patterns and cowry shells through ancient story telling (Alatise, 2024). Olamide Ogunade's sculptures incorporate traditional Adire cloth patterns into modern forms and mediums, such as bronze and wood (Akande, 2019). Njideka Akunyili Crosby's paintings feature complex textures and patterns that reflect her experiences as a Nigerian-American artist, such as the use of collage and layering techniques (Okeke-Agulu, 2019). AI analysis can help identify and interpret the patterns and textures in these artworks, revealing new insights into their significance and meaning. For example, an AI algorithm can be trained to recognize the Adire cloth patterns in Ogunade's sculptures, tracing their evolution over time and identifying their cultural

significance. This can help art historians understand how traditional patterns have been adapted and reinterpreted in modern art, and how they continue to convey meaning and symbolism in contemporary culture. Similarly, an AI algorithm can be trained to recognize the textures and patterns in Akunyili Crosby's paintings, identifying their relationship to her experiences as a Nigerian-American artist. This can help art historians understand how the artist's cultural background and personal experiences have influenced her work, and how she has used patterns and texture to convey meaning and emotion.

AI Art Analyser: Challenges and Concerns

Bias in AI systems refers to the systematic errors or prejudices that can lead to unfair, discriminatory, or inaccurate outcomes (IBM, 2023). These biases can come from different sources, like the data used to train the AI models, the algorithms themselves, and the decisions made by the AI developers.

Biased Training Data: If the data used to train an AI model doesn't represent the entire population or fails to cover in depth the historical timeline. Also, if data collected contains historical biases, the model may learn and continue these biases or perpetuate stereotypes that may widen inequality (Milaninia, 2021).

Algorithmic Bias: The choice of algorithms and their settings can introduce biases into the AI system. This has been reported in other applications of AI tools for instance, COMPAS, an algorithm used in the US criminal justice system to assess the likelihood of a defendant reoffending, was found to be biased against African Americans, predicting higher risks of relapse into crime for them compared to white defendants (Dressel and Farid, 2021).

Copyright Issues: The question of who gets the credit for the work done between the creator of the AI analyser, the curator who has used the AI tool or the AI itself may arise.

Uncertainty around the implication on human creativity and expertise: The uncertainty surrounding the implication of AI tools still persists. Many wonder how the expertise of the art curators will be limited and the implication over time as reliance on AI analysers increase.

AI Hallucination: AI hallucination is a phenomenon wherein a generative AI tool perceives patterns or objects that are nonexistent, like when humans make out figures in the clouds or imperceptible to human observers thereby creating outputs that are nonsensical or may seem logical but are inaccurate (IBM, 2024). These misinterpretations occur due to various factors such as training AI with a biased or unrepresentative data.

Maximising AI Art Analysers for Nigerian Arts: The Way Forward

Utilisation of high-quality training data: Generative AI models rely on input data to complete tasks; hence the quality and relevance of training datasets will dictate the model's behavior and the quality of its outputs. Therefore, in order to prevent hallucinations and minimize output bias, ensure that AI models are trained on diverse, balanced and well-structured data that represents the heterogeneity of Nigerian arts and covers the historic depth and timeline. This means in-depth research and collaboration between art historians and artists (IBM, 2014).

Application of Data Templates: Providing data templates and using predefined formats in prompting also reduces AI hallucination by creating output boundaries and helping the AI Analyser have a better understanding of the task.

Reliance on Expertise of Art Experts: The shortcomings of the AI provides an opportunity for the users to have diverse and in-depth knowledge of arts and arts history to enable them corroborate the output of the AI Analyser or detect when the output is wrong or a product of AI hallucination. Efficient use of AI tools requires more skill than we assume (Ernst, 2023). This contradicts the believe that AI usage will dampen the creativity and expertise of users

Conclusion

AI analysis offers a powerful tool for understanding and appreciating Nigerian art, particularly in the areas of patterns and texture. By identifying and interpreting patterns and textures in Nigerian art, AI analysis can reveal new insights into their significance and meaning. This type of analysis can help art historians and curators better understand the development of Nigerian art and its cultural significance, while also

providing new perspectives and interpretations for art enthusiasts and collectors. The use of AI analysis in Nigerian art can also drive Nigerian art appreciation, preserve cultural heritage and promote Nigerian art globally. By embracing this technology, we can unlock new insights and perspectives, and ensure that Nigerian art continues to thrive and inspire future generations. As we continue to explore the possibilities of AI analysis, we may uncover even more innovative ways to appreciate and understand Nigerian art.

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