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The Impact of Artificial Intelligence on Visual and Performing Arts: A Comprehensive Literature Review

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Abstract

The subject of Visual & Performing Arts is always involved in activities that generate creative products in the areas of music, visual arts, dance and drama. Further, the aesthetic taste of a human being will judge the quality of a creative product and this judgement is inherently subjective. For this judgement, the aesthetic attributes expected by one person, can be completely different from those expected by another. There are distinct aesthetic attributes for creative products. With the advancement of new technology, Artificial Intelligence (AI) is becoming a revolutionary force across all the fields including the generation of creative products in Visual and Performing Arts. There are different neural network models in AI such as Artificial Neural Network (ANN), Convolutional Neural Networks (CNN), Conditional Generative Adversarial Network (GANs), Recurrent Neural Network (RNN) and Long Short-Term Memory (LSTM) etc. in the form of Machine Learning, Deep Learning approaches which are applied for different smart systems to cater the requirements of the human beings. This research will focus on the impact of the use of AI technology in the areas of music, visual arts, dance and drama highlighting the ethical issues and the need to redefine the concept of creativity. To achieve this objective, the author has reviewed several research papers in this subject area and interdisciplinary areas to explore the idea from a broader perspective. The results of the study show that AI is not only enhancing the artistic behavior of creative products in different dimensions, but also invites us to think about the redefinition of the concepts of creativity, originality, and authorship of an artistic product.

Keywords

Artificial Intelligence, Creativity, Human-AI Collaboration, Performing Arts, Visual Arts

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Introduction

According to the conventional perspective, creative products are developed by human beings only. With the innovations, AI has become a trending technological partner with significant potential to help build smart systems that fulfill and simplify human needs. Accordingly, AI powered computers can produce musical arrangements, new graphics, novel visual compositions, choreographic patterns, and theatrical scripts that were once limited to human cognition and emotion. By challenging this historical dominance by human beings, AI has come forward and helped artists to enhance these production, performance and innovations in the form of competitive quality productions. Accordingly, art practitioners, scholars and viewers must shift their perspective to reevaluate the conventional idea of creativity, originality and authorship of a product. The goal of the current study is to evaluate how AI is challenging creative production and interpretation in the areas of Music, Visual Arts, Dance, Choreography, Theatre and Drama while synthesizing existing literature on the subject of AI's effects in the Visual and Performing Arts (Xiya, and Yu 2022).

Methodology

Qualitative literature review methodology was applied in this research by synthesizing peer-reviewed journal articles published for various applications in the subject area. Research papers and other sources were selected based on their subject relevance, credibility, and representation of interdisciplinary perspectives. Accordingly, research papers in the areas of Music, Visual Arts, image synthesis and analysis, art theory and performance studies were selected. Thematic analysis is the technique used to investigate new findings into key domains of application and concern.

Critical Review of Literature

In this section, it was reviewed research papers within the domain of Visual and Performing Arts and AI with the purpose of finding the theoretical background, main models or frameworks, applications, limitations and new recommendations which can be applied for the enhancements of creative industry and uplifting the professionalism of practitioners, academicians, and researchers in the subject area.

AI in Music

Music is a major field of study, which AI has made a significant progress in recent years. Accordingly, with the power of AI, music creation using AI tools is playing a key role using main technologies, models, datasets, evaluation methods which are applied for various fields. As we know, Music is a fundamental part of human culture and it is evolving over centuries by adapting to different cultures, styles and technologies (Zhu et al., 2023). At the exploration of history, it was noted that the complex task of generating music cords has been done by different methods (Dimitri Bouche et al., 2017). From 1990 onwards, the majority of the approaches were based on AI such as neural network, expert systems. Google's Magenta and OpenAI's MuseNet have demonstrated that neural networks can compose in a variety of styles, frequently making them indistinguishable from human composers. Further, the generation of music through AI models was improved with the advances of machine learning. In this context, as we move into the era of AI applied to music, chord creation emerges as an exciting and ever-changing area that merges human originality with computational power. Briot et al. (2019) highlighted a thorough review of deep learning methods for music creation.

AI Music Tools

In the practical context, musicians or music learners are really interested in applying AI for their music productions methodically to achieve their objectives. There are various tools available in the digital space and they have been developed for different types of applications. Therefore, users should select the most suitable application by identifying the features and limitations of available products to get the maximum power of AI for music generation. They can be broadly categorized as Parameter based, Prompt-based and Visual-based approaches and these categories reflect how the user interacts with the AI system to guide the music generation process (Zhu et al., 2023).

Parameter-Based AI Tools for Music

In this category, the user is given control to specify explicit parameters such as tempo, key, style, instrumentation, duration, or complexity by setting sliders, inputting values, or configuring settings. Some of the available applications are *Amper Music* (Users can choose genre, mood, tempo, and length), *Jukedeck* (Offered music generation based on selected moods and themes now acquired by TikTok) and *AIVA* (users should define genre, instrumentation, time signature, and more)

Prompt-Based AI Tools for Music

Text-based natural language prompts are used in this category to generate music, leveraging language models and multimodal learning. Accordingly, users have to input a prompt describing the desired music. Then, the model translates the language input into musical content using a deep learning model. Some of the examples are *Suno AI* (accepts text prompts and returns original music), *Google MusicLM* (generates high-quality audio based on text prompts but has not publicly released yet) and *Riffusion* (generates short audio clips from text by turning spectrograms into images).

Visual-Based AI Tools for Music

This category uses visual input (drawings, gestures, or visual scores etc.) to influence music generation. They often map visual patterns to audio features. The tool will interpret visual information as musical data (pitch, rhythm, texture). Then AI translates image features into sound. Some of the examples are *Google's NSynth Super* (interactive interface for exploring sounds via a visual grid) and *Drawn Sound tools* (interpret hand-drawn curves as melodies or modulations). The following diagram, in figure 01 illustrates a selection of additional AI tools used by individuals in the music industry to meet various needs.

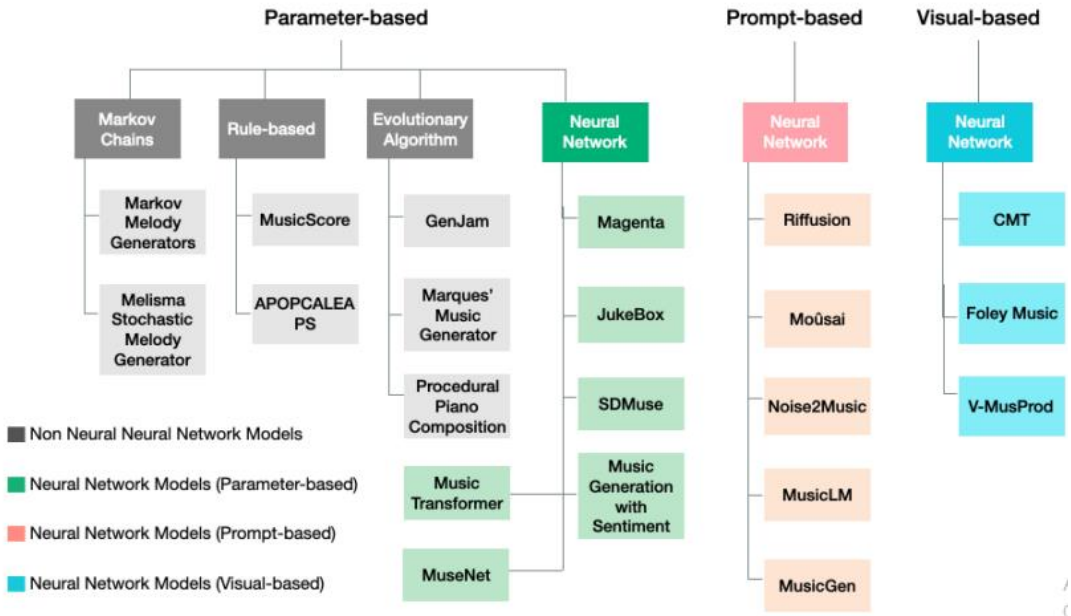

Figure 1: A Hierarchical Taxonomy of Music Generation Models [Reference: Zhu et al., 2023]

There are some debates related to open challenges in designing AI-based automatic music production. For instance, controlling music production is a challenge. In this context, one of

the main challenges in developing affective music generation (AI-AMG) systems is enabling users to specify the intended emotional content of the music, while ensuring the system can accurately control musical features to reflect the desired affective expression. AI-AMG systems generate music solely using the parameters and information they have acquired during training, in contrast to human composers who have the ability to modify musical ideas and patterns. Because of the limited transparency of the input, output, and their interdependencies, it is frequently challenging to regulate the features of such systems in order to create the intended outcome (Dash and Agres, 2023).

AI in Visual Arts

The subject area of Visual Arts is another major field where AI's power can be integrated. There are different applications for generating visual arts products with the influence of AI. Traditional ANN was used in generating images. But there were some issues in the area of visual data due to their inability to effectively capture spatial hierarchies and local features in images (Grossia, and Buscema, 2008). Then the advent of deep CNNs resulted in a transformative shift in the field of image generation as it introduced convolutional layers that apply localized filters across an image in contrast to each pixel as an independent input feature which is computationally expensive and inefficient in ANN (O'Shea and Nash, 2015). It will allow the network to automatically learn spatial hierarchies of features ranging from simple edges and textures in early layers to complex shapes and objects in deeper layers. This improves the efficiency of learning and feature extraction by the model and CNN became a key technique for the tasks involving image generation. Further, in the context of image generation, the requirement arises to have more advanced generative models. As a result, CNN helps to form the backbone of most modern architectures including Generative Adversarial Network (GANs) (Goodfellow et al., 2020). This resulted in building a family of models in the area of image synthesis, image-to-image translation (Isola et al., 2017) and sketch-based image generation (Chen and Hays, 2018). The researchers, Elgammal et al. (2017) highlighted the use of GANs for producing creative artworks. This technique is significant as it enables machines to create artwork by learning from a given collection of artworks created by artists. Accordingly, it will demonstrate how algorithms may learn artistic patterns and styles to produce new graphics.

AI has allowed artists to experiment with different dimensions of aesthetics using the concept of creative collaborator rather than merely using it as a tool to generate artworks (McCormack et al., 2019).

AI Visual Arts Tools

The idea of AI Visual Arts tools refers to any software and systems that use artificial intelligence to assist or automate the creation, enhancement, or interpretation of visual art. Artists, designers, and researchers use these tools to generate new images, transform styles, or explore new aesthetic expressions for various applications. The same categorization for Music AI tools can be considered in this context too as Parameter-based, Prompt-based, and Visual-based approaches in this creation process.

Parameter-Based AI Tools for Visual Arts

In this category, users are allowed to generate or manipulate visual art by setting explicit parameters, such as image size or resolution, color scheme, brush stroke style, composition layout, and abstraction or realism adjusting sliders, dropdowns, or inputs. Then, AI generates art, based on these settings. Some of the applications are: custom portrait, abstract art, or fine-tuning visuals for branding, design. Some of the tools under this category are: *Artbreeder* (users adjust genetic-style sliders to control features like facial expression, gender, or landscape elements), *DeepArt* (lets users control the intensity of style transfer), *RunwayML*(allows users to control image generation parameters for diffusion or GAN models).

Prompt-Based AI Tools for Visual Arts

Natural language text prompts are used as input to generate visual artworks based on the given description. The role of AI is to interpret the text and create an image. Therefore, this is currently the most popular and advanced category as it is an efficient and effective method. Some of the applications are: rapid concept art generation, book illustrations, album covers, and generative storytelling. Some of the tools under this category are: *DALL·E* (by OpenAI), *Midjourney, Stable Diffusion, and Craiyon*.

Visual-Based AI Tools for Visual Arts

Under this category, users should give visual inputs such as sketches, photos, or paintings as the basis for generating new art. Users can draw or upload an image. Then the role of AI is to analyze and transform the given input into a painting, 3D form, or photorealistic scene as the final output. Some of the applications are: interactive visual creation, teaching visual storytelling and transforming sketches into polished artwork. Some of the example tools are: *Scribble Diffusion* (turns doodles into realistic images using diffusion AI), *NVIDIA GauGAN*

(converts segmentation maps into realistic landscapes), *Google AutoDraw* (uses AI to recognize rough sketches and suggest polished icons), *Deep Dream*(enhances visual features to produce dream-like effects)

AI in Dance and Choreography

Dance is another Performing Arts area in which AI's power can be integrated for the development of creative products. AI's built-in capabilities have given artists including dancers and choreographers new opportunities to produce creative work and experiment with different approaches to the creative process. Artificial intelligence has provided dancers with platforms and resources that enable them to develop choreography that was previously impossible for humans to accomplish. In addition to processing dance movement data, this technology can analyze, alter, and create fresh, creative choreography. AI can be utilized to independently produce choreography, support the creative process, and immediately integrate with dancers in live performances, as shown by a number of worldwide dance initiatives.

The live, human-centered art form of theater is undergoing significant change as a result of digital technology, particularly artificial intelligence (AI). The moderate application of AI in theater production opens up new possibilities for audience involvement, performance innovation, and both reception and improvement. AI is revolutionizing the production, consumption, and dissemination of theater, the creation of screenplays, and virtual theater performances. These innovations make it possible to overcome logistical obstacles and reach new audiences around the world. Interactively, AI-controlled performances are exposing new facets of theater companies' narratives. Despite the advantages, there are also significant drawbacks. The replacement of artists, the effect of AI on creative work, and the excessive use of AI technologies are other ethical concerns. Other concerns, such as technological malfunctions or inability to access them, can result from an increasing reliance on technology. Performing human-centered live theater with massive digital involvement and interaction is a persistent problem. Artificial intelligence will alter the theater environment, but innovation must be brought while upholding morality and humanity to ensure that theater retains its core values in the technological age.

AI Tools for Dance and Choreography

AI is transforming choreography and dance creation by providing tools for movement generation, performance analysis, and even the production of dance animations. By using

machine learning to examine enormous datasets of dance genres, these tools help choreographers discover new possibilities and produce inventive routines.

Parameter-Based AI Tools for Dance and Choreography

In this category, users have to control outcomes by adjusting variables, sliders, or numeric inputs such as style, speed, tempo, and emotion level. Some of the applications are: AI-Generated Choreography from Music Features (by changing parameters such as Tempo, Dance style such as hip-hop, ballet, Motion complexity), Robot Dance Programming (programming robot dancers by adjusting joint angles, movement speed, and rhythm), Generative Dance Movement Engines (generate new dance sequences by tuning creative parameters), Some of the tools are: *AI Choreographer* **(**lets developers tune motion realism vs. diversity), *Dancing to Music* **(**uses motion parameter weights to map movement to beat), *RoboDance* **(**dance routines built from parameter-controlled movement libraries), *Choregraphe* **(**GUI tool to program robot dance using motion blocks and timing sliders), *Rhythmic Movement AI* **(**lets choreographers choose the balance of repetition vs. novelty), *Expressive Movement Design* **(**parameter sliders to affect movement character)

Prompt -Based AI Tools for Dance and Choreography

In this category, users interact with the system through natural language input (text prompts) to modify, and generate creative dance content. Then the role of AI is to support creative exploration, and idea generation. Some of the applications are: Choreography Idea Generation, AI-Assisted Dance Composition. Some of the tools under this category are: *ChatGPT*(provides descriptions of dance sequences based on themes, emotions, or music), *PromptChoreo* **(**a system that helps to train on dance datasets), *Dramatron* (adapted for movement-based works and originally for scriptwriting), *Co-creative tools with GPT***(**can generate choreographic blueprints from narrative or spatial prompts).

Visual-Based AI Tools for Dance and Choreography

Under this category, users will have to input video, images, and motion data. Then the role of AI tools is transforming dance and choreography by enabling creators to generate, analyze, and animate. These tools help in the area of motion capture and generative AI to assist choreographers, educators, and performers in crafting innovative dance experiences. Some of the applications are: AI Dance Animation from Video Inputs, Pose Estimation and Motion Capture, AI-Generated Dance from Images. Some of the tools under this category are: *Krikey*

AI Dance Generator (transforms user-uploaded dance videos into animated sequences featuring 3D avatars which are particularly useful for educators creating animated lesson plans or for content creators developing engaging dance visuals), *Viggle AI* (allows users to animate static images or blend characters into existing videos using preset motion templates, facilitating the creation of dynamic dance animations), OpenPose (these frameworks enable real-time tracking), VidWud Photo Dance AI(converts static, full-body images into animated dance videos).

Findings

As per the critical evaluation of the literature, the issue of the uniqueness and aesthetic value of the created artwork are two valuable characteristics from a traditional perspective. Accordingly, this study suggests that the aesthetic quality and distinctiveness of machine-generated art needs to be redefined in comparison to traditional artwork. However, by casting doubt on the possibility the works produced by unconscious entities could genuinely be considered artistic, this idea will spark a philosophical discussion concerning the concept of originality in AI-powered art. Concerns about autonomy and agency will also raise questions regarding authorship, another crucial aspect of consideration in relation to generative art. When a computer software creates an artwork, who is the creator? Thus, while we may describe the programmer as the author of the program, it seems that our commonsense notion of authorship should extend to recognizing the program itself as at least a partial author of the artwork in such circumstances.

Artificial intelligence (AI) is currently automating the creation of scripts, editing, stage management, and audience engagement. Theater is a very ancient art form and depends on live performances and audience interaction. With the aid of virtual actors, AI can solve and optimize jobs more effectively than in the past. This will answer the question of why AI tools are used by the creative industry: financial optimization and character optimization. However, questions about ethics, authenticity, and the originality of artistic creations also play a role. The use of AI in theater is a component of the digitally revolutionized Integrated Arts. Automation from AI challenges conventional wisdom about human performance by employing virtual actors in addition to scripts. The impact of artificial intelligence (AI) on the theater sector is expanding daily and altering how academics and professionals view theater practice in the modern era. As a result, there is a debate on how to combine performance theory, digital

humanities, and artificial intelligence in a way that preserves the human element while integrating AI into theatrical performances. AI is increasingly being used in theater and performance arts, from developing scripts to directing and even performing live. However, given the drawbacks that AI presents, the endeavor to include AI in creative processes appears to have received both favorable and negative feedback. Another finding at the critical review of the literature is that there are some AI tools that facilitate for functionalities in multiple domains. One example is ChatGPT, which can be used in various domains, including visual and performing arts as well as education (Samarasinghe & Prasangani, 2023). Accordingly, findings can be summarized as follows.

- AI systems have the power to generate art that is competitive with human-created works.
- The concepts of creativity and interactivity through Human-AI collaborations in music, visual art, dance, and theatre are encouraging new forms of definitions in the creative industry.
- Propose to rethink the concept of creativity as being defined under two categories: machine-assisted and co-generated expressions.
- There are ethical issues around ownership, authorship which still remain unresolved.
- There is a need to introduce culturally sensitive AI systems in the field of the arts.

Discussion

According to the literature, there are both opportunities and challenges when it comes to integrating AI into the arts. On the one hand, AI democratizes invention by providing non-experts with tools. However, there is a chance that it will disregard marginalized perspectives and undervalue traditional artistic techniques. Collaboration across disciplines is essential to ensuring AI complements human ingenuity rather than replaces it. Ethical frameworks must be developed in order to preserve artistic diversity and protect the privileges of human artists.

Future Enhancements

As future enhancements, more specific research can be initiated as either empirical or theoretical studies in the areas of practical implementation of AI-assisted creative processes,

and the development of robust ethical frameworks to safeguard the privileges of traditional artists.

Conclusion

The literature shows how the relationship between AI and the visual and performing arts is rapidly evolving. AI is reexamining human expression, authorship, and originality in addition to improving artistic undertakings. Even as technology opens up new avenues for creativity and interdisciplinary collaboration, it also demands a careful examination of the ethical implications and cultural impacts. Further research is needed to understand how AI will impact the arts in meaningful, inclusive, and expressive ways in the future.

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