Chapter 7
Practical Implication of Generative AI in the Science and Art Imaging Process:
Generative AI Is for Poets

Jean Constant
https://orcid.org/0000-0002-4941-3776
Hermay.org, USA

ABSTRACT

Generative art using autonomous systems like algorithms and mathematical rules offers unique visual experiences, often associated with aesthetic statements. A constructive dialogue is emerging around the legitimacy of this form of artistic representation, the AI's role in the creative process, and its ability to convey visual information of aesthetic value. This paper aims to contribute to this discussion by reviewing extensive literature on the topic and testing AI systems specifically designed to generate images with prompts or directives. Using traditional art evaluation criteria such as composition, originality, and technical skill, this research's findings provide valuable insights and encourage thoughtful reflection on the societal, legal, and educational implications of AI integration in art programs. Further, this experiment raises important questions about the definitions of creativity and authenticity. Such considerations are crucial for preparing students and future generations of professionals to express themselves both visually and creatively.

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INTRODUCTION

Generative art is often described as created using autonomous systems, such as algorithms, mathematical rules, AI, or randomization, to produce unique visual, auditory, or interactive pieces. The integration of AI into human activities is a relatively recent development. Its roots can be traced back to the 1950s, particularly the Dartmouth research project on artificial intelligence initiated in 1956. This project, headed by leading experts, explored the possibility of machines possessing cognitive abilities and laid the groundwork for future generative concepts.

Technological advances and the growing presence of computers in academic and professional settings allowed individuals to explore their research in artistic and generative art. Lejaren Hiller's renowned work, the Illiac Suite (1956), created at the University of Illinois Urbana-Champaign, remains one of the first significant examples of computer-generated art in music. Later, pixel-based images gained popularity in the 1960s, encouraging researchers and engineers to enhance existing technology. In 2014, Ian Goodfellow and his colleagues introduced Generative Adversarial Networks (GANs), a class of learning algorithms designed to generate data and realistic images, particularly in areas like landscaping and image conversion. (Giles, 2018).

As Moore's law predicted, accelerated advances in the generative technology stemming from the Transformer Architecture developed by Vaswani et al. l (2017) led to today's increased presence of systems such as Adobe Sensei and Firefly, Khroma color tool, which creates limitless palettes, Jasper studio, NVidia, or Canvas turning simple brushstrokes into realistic landscape images. Enhancing creativity, simplifying design workflows, and enabling users to produce distinctive designs in far less time boost innovation and maximize efficiency, allowing users to achieve results that surprise and stand out. Large Language Models (LLMs), and the pervasive integration of generative AI in the lab, the studio, and even the cell phone has created a shift in visual communication and perception that can't be ignored.

Researchers, scientists, and philosophers raise existential questions about how far we can let machines take over human-based activities and how they affect our larger perception of the environment as humans experience it. However, the consensus is that AI, without human interaction, cannot produce images by themselves that have meaning or purpose. As Computer scientist and Stanford AI Institute co-director Fei-Fei-Li highlights (2023): "*There is nothing artificial about Artificial Intelligence. AI is made by humans, intended to behave by humans and ultimately augment human contribution."* While media in search of impressionable audiences and well-intended authors focus on the potentially irreparable damage AI can cause to individual creators of images and society, throughout history, artists have debated the value of adopting new tools in their creative processes. In this context,