Chapter 14
Engaging Future-Minded Visualizations and Artful Aesthetics:
"Seeing Different" With Human-Machine Collaborations With Artmaking Generative AIs

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ABSTRACT

Artmaking generative AIs have been used to create visual works (still images, motion videos, and animated sequences, including simulations) that are photorealistic, high-fidelity, hyper-realistic, and emulative of the world; artful works are translated in style transfers derivative of known artist, artworks, art styles, schools of art practices, and defined visual styles. This work argues that artmaking generative AIs should not be about reproductions of the familiar but should be used for future-minded visualizations and future-minded aesthetics, through true collaborations between human and machine imaginations. Through generative AI, people should be "seeing different" to enable nouveau "thinking" and "doing" and "being" different… into the near- and far- futures. This early and exploratory work is based on research, year-long experimentation with multiple public artmaking generative AI tools, and abductive logic.

1. INTRODUCTION

A person looks at a two-dimensional, three-dimensional, or four-dimensional image co-created by a person and a generative AI. What is depicted? A scene? A person? An object? What are the interrelationships suggested? What are some suggested motion dynamics? Some aesthetic elements? What does the image even mean? Or what are various interpretations of the visual meaning? What is signal, and what

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is noise? Does the image evoke something as-yet unexplored? Does the image motivate a second look? A third? Does it open up paths to new understandings? Does it offer some concept that glimmers and shimmers? Is it something that encourages thought and musing? Does it suggest ideas for mechanisms and how-to's and processes? Does the visual challenge assumptions? Offer new ways of seeing? Often so!

Artificial intelligence (AI) refers to a broad category of tools that emulate aspects of human intelligence.

AI is "a set of techniques providing the machine with the ability to perform high-level cognitive or sensorimotor tasks, such as learning and making decision(s)" (Caramiaux, Alaoui, & Hsueh, Apr. 2022, p. 1). There is as-yet no general artificial intelligence that can emulate the whole of human intelligence (or "general intelligence" or "g factor"), but generative AI has come to the fore to create various digital contents based on learning from human creations. This is considered AI since it emulates human creativity, considered a "natural" (and even exclusive) endowment of people (Pragya, n.d.).

In recent years, generative artificial intelligence (GAIs) tools have harnessed big data for training datasets fed into large language models (LLMs) that are deep-learned through artificial neural networks (ANNs). Machine learning enables the computer to learn patterns without particular direct programming. Rather, the machine identifies patterns learned through layers of interlinked artificial neurons. The program can take that nuanced learning to generate new digital content from human-made (manual) prompts in text and image modalities and combined modalities. Researchers describe how artmaking generative AI tools function:

This kind of network is like a funnel, it takes an image as input, detects patterns at multiple levels, accumulating increasingly refined patterns until we arrive at human interpretable semantic associations: 'a cat on a mat,' and other more scientifically and aesthetically relevant derivations. Inverting this funnel allows for the creation of synthetic images. (Choi, DiPaola, & Töyrylä, 2021, p. 020501-3)

The complexity of this machine synthesis "leads to implicit statistical ambiguity" (Choi, DiPaola, & Töyrylä, 2021, p. 020501-3), limiting the explainability of this type of AI. Essentially, the output art is created by "extracting statistical patterns from existing artistic media" from the curated training data (Epstein, Hertzmann, Herman, Mahari, Frank, Groh,... & Russakovsky, 2023, p. 3). To address the "lack of interpretability" of neural network models, a research team designed a neural network with manual network weighting "coupled with explanatory visualizations as a form of creative control over the internal and lower level processes" (Ulberg, Llach, & Byrne, 2020, p. 508). The "hand-crafting networks" practice enables some Observable AI (OAI) (Zhu, et al., 2018, as cited in Ulberg, Llach, & Byrne, 2020, p. 508) to de-mythify some aspects of the technology.

The generative AI system continues to learn:

The machine holds the capability to learn by example as well as through past mistakes by making predictions about the data of entry through its features and previously observed responses; unlike conventional computing, the ANN (artificial neural network) system is cognitively responsive rather than being deterministic in its computations. (Pragya, n.d.)

How people use generative AIs may be captured and used to tweak the system outputs as well.

In the present age, the advent of artmaking generative AIs involves the making of still images, videos, and animated sequences. There are digital outputs for digital puppets (imbued with character design) that may be animated. There are polygonal works that may be used as volumetric forms in augmented