

Beyond the ghostwriter: reimaging generative AI as a diagnostic coach in creative media

Kayee Peng

American International School, Hong Kong, China

ingloodoge@gmail.com

Abstract. The generative Artificial Intelligence (AI) has completely changed the creative industries by allowing users to create advanced visual content with minimal effort, which leads to many beginner artists skipping the basics, such as observance, proportion, perspective and correction. This article evaluates the limits of current generative AI in creative education and proposes an approach where generative AI becomes a diagnostic coach instead. Drawing from the idea of skill degradation due to automation, the paper shows how overdependence on image-generating technologies can undermine artists from developing their artistic expertise. It further discusses how imaging technologies can be applied to analyze the drawings and find errors in composition and structure with the necessary feedback provided in real time. The AI-based application for drawing education can help students identify drawing mechanics problems while making sure the learner has the ultimate responsibility in making artistic decisions. A human-based model also works in cases where AI directs attention to problems without taking their place. In this article, it is claimed that instead of positioning AI as a mere instrument of automatic output, it is more reasonable to consider it as a guide for effective learning, which guarantees that skills can be developed whilst preserving the autonomy of creativity. Nevertheless, there are difficulties related to bias in datasets, diversity of styles, and excessive standardization which should be taken into account to make sure that these applications do not inhibit the personal way of expressing oneself artistically.

Keywords: generative artificial intelligence, creative education, diagnostic AI, computer vision, artistic learning

1. Introduction

In a hypothetical scenario, you are busy drawing as a newbie, experiencing a vague feeling that something is wrong but being unable to articulate the error in the anatomy. On the other hand, generative AI is taking top prizes in competitions and raising hot discussions. This is the example of a man who generated 3 artworks using AI image maker Midjourney and later took home the first prize with it [1]. The appearance of such programs has dramatically revolutionized the creative world because of their ability to create sophisticated images in a matter of seconds. However, they do not provide a chance to diagnose drawing errors in a learning context.

Thus, this article mainly addresses two research questions: How does current generative AI threaten to undermine the fundamental processes of novice artists becoming proficient in both technical skills and visual literacy? Furthermore, how can image analysis in generative AI be transformed into a diagnostic "coach" to pinpoint existing problems in students' creations while allowing them to maintain creativity and autonomy? These questions are significant as they are aimed at reshaping the discussion from rejecting the use of AI to integrating it into the artistic landscape with a human-centered approach.

2. How AI displaces foundational practices

To understand why a powerful training tool is necessary, one must first look at how generative AI has potentially threatened the places of human artists in today's ecosystem. Image-generating companies encourage people to rely on AI to generate finished products by marketing them as a convenience. This convenience, however, is not neutral. It is especially discouraging when social platforms reward AI-generated drawings with views and engagement while human-drawn artwork is constantly ignored and criticized [2]. Artists have therefore faced growing pressure to substitute algorithmic output for their own labor. While using AI to produce images itself is not concerning, it allows users, especially those in their early stages of artistic development, to bypass the painful but vital foundational struggle of sketching, measuring and correcting, which has historically been a vital process in becoming a skilled artist.

This concern echoes a long-existing phenomenon where automation tends to remove people from exactly the tasks that build the expertise needed to supervise or correct it [3]. Although Bainbridge's irony of automation is focused on the context of industrial control systems, it applies to the creative landscape as well. With the existence of software that creates images, artists will never struggle with foreshortening, proportioning or value structure, as AI models can render these on demand. Artists would not be able to identify when something is wrong, in either their own work or an AI's. Hence, the tool, which was originally designed to assist people, ends up displacing them and demolishing the unique competence users would have.

3. Internal algorithmic errors

Generative AI models are known to make consistent, characteristic mistakes. Image generators may occasionally produce anatomically unrealistic details like extra fingers, asymmetrical ears, physically inconsistent shadow and glitchy text in an image [4]. These errors can be explained with the lack of cultural understanding and statistical patterns of what typical images look like rather than an explicit model of anatomy, optics or perspective.

A trained artist or a sharp-eyed viewer can usually catch these flaws. A beginner, however, may not be skilled enough to identify these structural flaws and hence internalize them, mistaking algorithmic errors for artistic choices. Over time, repeated exposure to AI-generated images and the constant temptation to let software render complex details will lead to severe de-skilling in artists. Learners actively avoid practicing core disciplines like perspective construction and proportion, which will lead to a homogeneous creative landscape where unique personal artistic voices are replaced by generic machine-made aesthetics. The issue of visual literacy comes into play when it comes to identifying a minor flaw. For example, identifying an arm that is drawn unproportionally or shadowing and lighting that are inconsistent within an artwork is something that is learnt through experience, observation and correction over a prolonged period of time. Indirectly, image generator users deny themselves the opportunity to accumulate such expertise. The contradiction is that an artist has to be experienced enough to recognize the errors, but their dependency on AI is what's stopping them from becoming skillful. When we export that struggle to an algorithm, users lose the chance to build their own

structures. They may risk becoming mentally inactive, acting as passive verifiers instead of active thinkers [5]. To reduce the risk of being replaced by AI, instead of abandoning AI completely, we should redirect the technology towards a more educational purpose.

Currently, generative AI is mostly doing the opposite of teaching. By using the same image analysis technology as a coach instead of a ghostwriter, AI could better serve its purpose as an educator instead of replacing humans entirely. Instead of generating a finished picture, an AI model should be developed to observe students' own brushstrokes as they draw and compare the emerging artwork, in real time, to artwork patterns adopted from a large corpus of paintings and common beginner errors online. For example, as the user sketches a figure, the application would analyze the proportions, alignment and lines of the drawing in progress. If a shoulder is drawn too low, or if the eyes are not parallel, the app could hint by showing a soft "correction line" directly on the canvas with a brief explanation popping up on the screen as to why this change matters. For users still exploring their ideal artistic style, AI can offer a diverse range of color palettes for reference, empowering them to experiment independently. Compared to watching pre-recorded video tutorials online, this approach provides the same feedback one would get from a human art teacher but with more flexibility in time. Over time, the app would familiarize itself with the user's drawing techniques and build a personal curriculum. The struggles it notices would then be turned into short daily drills to fix those problems and effectively enhance the user's ability. Instead of fearing AI would replace them, users would gradually improve their skills. Such a system supports instead of substitute human intelligence, which aligns with Boden's [6] observations that computers are crucial to creativity when they assist instead of limit human endeavors.

4. The use of diagnostic AI beyond art

In fact, generative AI's ability to analyze images has been used in many aspects of the world. From analyzing X-ray scans to estimating when the next meteor shower is to giving a personalized diet based on a photo of your body, AI models have adapted the use of image analysis in many fields. In the medical field, the AI's role is fundamentally diagnostic. It compares an input against learned patterns of what is typical and flags deviations. However, in the creative media landscape, AI has only been used to create photos with direct prompts instead of diagnosing deviations in images. This outdated approach of generating artwork might share the same system that might be applied in diagnosing problems as well. Essentially, a program designed for evaluating drawings with the help of generative AI. In fact, studies are showing that this idea has been implemented. For instance, Cheung et al. [7] explained that applying generative AI to students' scientific drawings could provide students with substantial feedback and help students improve their drawings.

This implies that generative AI can evolve from a visual creating tool to one that indicates where improvements should be made. Nevertheless, the work of Cheung and colleagues is concentrated on scientific illustration instead of art or anatomical drawings. This should encourage us to investigate whether similar techniques can be applied to solving technical issues that artists may come across in the process of creating art. Instead of producing works with AI, we could use the capability of recognizing visual patterns to find issues in a student's work.

The difference between generative AI and diagnostic AI also has implications on the ownership of the piece of work. In the medical imaging context, the doctor is responsible for providing diagnosis and recommending treatment options, while AI only helps in pointing out the parts of the scan that call for attention. Thus, the input by AI does not replace the doctor's expertise but merely assists them by directing their attention to areas that are likely to be significant. On the other hand, if AI is used to indicate areas where the drawings do not

conform to certain patterns of realism and explain the reasons for it, humans would still be responsible for producing their artwork. As such, it would be polarizing to what generative art tools currently offer where humans contribute at most a text prompt.

5. The mechanisms of convolutional neural networks reading images

The underlying mechanism of how AI could process our paintings is owed to the Convolutional Neural Network (CNN). It has been demonstrated that deep CNNs have significant advantages compared to previous computer vision techniques in large-scale image recognition applications.

A convolutional neural network operated by processing an image in a hierarchical manner. In the earliest layers, the network would scan the picture in small patches, identifying the basic features like edges, curves and contrast. Afterwards, the detected properties are combined to obtain more complex features. For example, a curve and a shadow would indicate an eyelid, while several eyelid shapes and a rounded outline would be detected as a face [8]. Thus, the feature hierarchy enables it to compare human drawings with a database of labeled reference images and identify whether such combinations of features fall within the acceptable range.

However, there has been a common concern that this process could be overly rigid to possibly permit abstract or stylistic interpretation, as AI may impose mechanical guidelines like how eyes have to be one eye width apart. Yet, instead of following a clear-cut geometric rule, a CNN trained on a sufficiently broad and varied set of data develops a statistical sense of the limits of possible variations. This means that only drawings falling far outside this learned range would be marked as atypical [9]. Even so, these suggestions are free to be disregarded and the painter could continue with their intentionally abstract direction. The flag is just a cue for contemplation, not a restriction on the creative process.

6. AI's role in creative education

The use of a diagnostic AI creative tool is not merely about how well someone can draw, but the bigger picture of how the impact AI might have on modern society and the creative process of generations to come. The use of AI has brought fear in the job market and in households, along with the idea of having a creative identity. Some people view AI as a threat to be avoided, while others use it as a cheating tool. With the alternative of a diagnostic approach, it gives AI a completely different way of meaning. If applied as a ghostwriter tool, image-generating AI would take away the most valuable part of creative learning, where painters struggle before they master their own artistry, and prove Bainbridge's theory [3] of skill atrophy. The same principle of cognitive coaching can be used to facilitate student learning because it helps them see patterns they never noticed, just like a teacher, but still stresses the importance of using their own knowledge, as students must be the ones who learn from their mistakes.

However, it is crucial to recognize and understand the shortcomings of this concept. AI coaching would only be as good as the data it is being programmed on, and it could never replace human teaching methods, as they offer more than just coaching through art [10]. AI does not know anything apart from the database it is given, and the advice AI might offer may not match the expectation given that they are of different artistic styles. For instance, a student working on abstract art may receive advice that is useless in the context of their work. Hence, such a coaching model would only work if it is constructed with a sufficient source of materials that won't introduce a specific anatomy or composition to penalize less traditional styles.

7. Conclusion

To sum up, this article has presented the thesis that the most important future role of generative AI in creative education will likely not be to produce finished pieces of art but rather to assist learners in comprehending their own creative activities. In this day and age, the emergence of technologies for image generation is revolutionizing the process of creating sophisticated visual content, and yet the convenience offered by these technologies may have the adverse effect of making it easier for novices to skip vital learning stages like observation, perspective and resketching. The irony of automation proposed by Bainbridge [3] may suggest that automation is removing people from the process of developing their expertise and thus making them unable to evaluate and repair the system they are using. Therefore, in teaching art, it may prevent excessive reliance on AI, which will lead to students becoming dependent on technology and losing their abilities to find visual problems on their own.

In view of this, this article has presented diagnostic AI as a different approach by applying image-analysis technology to track users' drawings and flag areas with problems like anatomy, alignment or composition before advising on what to correct in real-time. Convolutional neural networks show that it is possible to process visuals hierarchically and check them against their training data, which makes it feasible technically. The results of using generative AI in scientific drawings have also confirmed the educational potential of AI-based visual feedback [7].

Nonetheless, the role of diagnostic AI should not be perceived as a replacement for human teachers. The recommendations made by AI greatly depend on the source and variety of experience it was exposed to during its training period and might thus favor conventional forms of body anatomy, composition or visual expression quite unintentionally. Therefore, the feedback delivered by AI must not be seen as enforced advice but rather a suggestion that is disregardable. In short, diagnostic AI does not discard artists as unnecessary but helps them become more attentive, self-reflective and skillful.

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