Artistic Autonomy in AI Art

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Abstract

The concept of art has transposed meaning and medium across time, with its context being a deciding factor for its evolution. However, human beings' innermost functionality remains the same, and art, to this day, serves as an expression of the subconscious. Accelerated by the conception of GANs in 2014, automation has become a central medium in Artificial Intelligence (AI) Art. However, this raises concern over AI's influence on artistic autonomy within the process of creativity. This paper proposes ethical care towards maintaining the artist's volition in exercising autonomy in AI Art and utilizes principles of self-determination theory alongside fundamental limits of creativity to do so.

Introduction

Ethical care to creativity and intent

The traditional role of automation in society served to make human lives easier by outsourcing mundane tasks, and, very traditionally, to replace human jobs that would cut costs and increase profits. Recommender systems, for example, utilize language models to engage users in predictive text systems. However, much criticism has fallen on this medium as it alters the way people write. These systems have been found to make people "machine-like" – which is evident given its intention (Varshney 2020b). This prompts ethical care on the implementation of automation within attributes that characterize humanity—one of which is creativity.

Indeed as early as 1964, invoking Goethe's *Sorcerer's Apprentice*, the scholar of technics Lewis Mumford had argued: "let me first challenge the notion that automation is in any sense a final good, so beneficial in every aspect that the process must be hastened and extended relentlessly into every field . . . If the human organism had developed solely on that principle, . . . man would have been left without a thought in his head" (Mumford 1964).

In psychoanalysis, creativity serves as the expressive element or natural human impulse that drives the artistic experience (Zweig 2012). It is what drives surprise within viewers for pushing the boundary of what is deemed to be the experience of reality. It is also surprise that drives creativity as examined by its use for intrinsic motivation in creative action-taking as implemented by the artificial creative system of curious robots (Saunders et al. 2010). AI Art, with emphasis on its support to human creativity through creative machines, falls under criticism for automating this very process, given that the trade-off to maintain creative autonomy is evident in the practitioner.

Much work in Computational Creativity (CC) argues for the importance of process rather than just products of creativity (Colton 2008; Jordanous 2016), and further work, has introduced the humble creative as a means of furthering human development through co-creative processes that cultivate human creativity through its advanced creative capabilities (Cassion, Ackerman, and Jordanous 2021). This comes to show certain feats CC has taken in advancing co-creativity by alluding the working definition of CC towards responsibility that is detached from the artist.

As a result, this perspective goes in line with much CC work, where in creating tools that could in itself be deemed creative, has led to autonomous systems that extend beyond generative adversarial networks (GANs) such as The Painting Fool (Colton 2019). However, reciting back to process, we focus on the co-creative interaction of generative deep learning algorithms that are responsible in co-creation, and as such navigate the role of these algorithms with emphasis on Generative Adversarial Networks (GANs) due to their foundational blueprint to existent and advancing role in the contemporary AI artist's toolbox.

As an agent of play to enact creativity, GANs are utilized as a black box for providing artistic result, where the feedback loop is based on the artist's alteration of the algorithm upon interpretation of results. Other deep generative AI modeling techniques such as variational autoencoders and normalizing flows have also been used in the same manner. Unlike creation where artists decide meaning and form in process, this form of AI Art limits artistic autonomy by basing the artist's process upon output i.e. generating multiple sessions of training and determining the artwork based on generated artifacts. The limitations exhibited by this phenomenon has since led to interventions in the chain of computations, and is primarily exhibited by in-training modifications of intervening in the GAN latent space (Broad et al. 2021). We take these exceptions to recover human autonomy into account (as per our proposal for new ethics in AI Art), and present human-centric means that led certain practitioners to do so.

With regards to design intent, GANs were originally fo-

cused on improving quality, stability, and variation (Radford, Metz, and Chintala 2016) in order to implement the style transfer of the input image. Since then, they have evolved from representation to visually indeterminate artifacts to create an AI Art identity (Hertzmann 2020). However, the implementation of this medium still surrenders the creative process as the artifact's varied intent (Ventura 2016) does not address the fundamental loss in autonomy that occurs within automation (McCormack, Gifford, and Hutchings 2019). In June 2021, a discussion series on AI research and social responsibility, titled Post-Human Creativity: The Use of AI in Art, featured artists who emphasized the need to strengthen "interactions between humans and machines ... instead of making technology more human" as to preserve "meaningful interactions with algorithms and push the boundaries of creative processes." (D<AI>DALOS 2021) With the concerns for AI's role in art in mind, we consider the ethical implications to the artist's creative autonomy via principles in self-determination theory and intent via fundamental limits of creativity.

Defining Creative Processes

Self-determination theory

Self-determination theory is a branch of psychology that suggests people are motivated to grow and change by three innate and universal psychological needs: autonomy, relatedness, and competence (Ryan and Deci 2000). Autonomy, or regulation by the self, is a phenomena that parallels other aspects of existence such as will, choice, and freedom. It is further augmented into liberty (independence from controlling principles) and agency (capacity for intentional action) (Ryan and Deci 2006).

We consider the limitation of AI Art to suffice liberty by considering abstraction in art as the mere generation of such artwork has led to a misuse of its abstract notion (Ventura 2016). In the style transfer of AI Art, artists often use forms that acquire a sense of talent, such as impressionism, to replicate the delicacy of the form's timeless novelty. However, when art is dictated in such sense, it transforms to a craft. Much like impressionism that emphasizes craftsmanship, AI Art then too becomes a craft that needs to be perfected through training, i.e. craftsmanship in training an AI model, which in the literal sense occurs via numerous iterations of training a model.

Historically, numerous iterations for craftsmanship was not the case. In 1979, Benoit Mandelbrot, a visionary mathematician and artist, introduced the "Mandelbrot set", a class of quadratic recurrence equations in the complex plane (Weisstein 2002). This development led to a renaissance of computer-generated art coined as *fractals*. Despite the recursive element that generates fractals, this early embodiment of computer-generated art was created to give form to mathematical revelation. The form was thus a byproduct of Mandelbrot's revelation of recursive structures revealing each other indefinitely, and can be attributed to his liberty to explore the depth of mathematics—a creative discipline much like art. Thus, as exemplified by early practitioners who embodied this liberty as a core element of their craft, current AI Art practitioners carry the responsibility of expanding their motive beyond sole mastery in order to embrace true creativity within the field.

On the other hand, taking a rather direct approach to abstraction in art, we explore creation that is rooted in Abstract Expressionism. Abstraction took time to develop appreciation due to the neglect for traditional talent per established artistic canons (Schwabsky 2009), let alone expressionism, which is expressive of the artist's inner feelings (Tejera 1965). In the 1950s, Abstract Expressionism led to two divergent stylistic tendencies: chromatic and gestural abstraction (National Gallery of Art 2022). In chromatic abstraction, the surrender to elements, such as color, shape and light, illuminate complexities to thought. For example, Mark Rothko painted what is simple, yet complex to express complexities in subtle form, see Figure 1.

Figure 1: Untitled, Rothko

In his process, each abstraction held specific and original meaning, whereas modelling his form of creation via AI Art would not suffice as it would craft, but not hold meaning on the basis of liberty for the artist's expression, i.e. the artist's inner world. The expression would be decided upon the resultant AI abstraction, reversing art's role as revelation to form, as well as the practitioner's role from artist to audience.

In gestural abstraction, creativity spurs from the artist at the moment of creation and stems from the inner spark, or according to the psychoanalyst Carl Jung, "not accomplished by intellect but by play" or to a larger extent the "daimon of creativity" (Jung 1977). This moment, much like the deep immersion that comes with it, is encouraged and developed by a constant interaction that need not be interrupted, regulated, or automated (Diamond and May 1996). Hence, if one were to create AI Art based on gestural abstraction, such as Jackson Pollock's action painting (Solomon 2001), see Figure 2, then the artist would lose its creative autonomy because of artistic interruption during the surrender of process to AI.

Therefore, in both divergent cases of Abstract Expressionism, it is the human element of the artist that drives the possession of form, and as such frees the extremes and complexity of human consciousness (Grey and Wilber 2001). Whether subtle or spontaneous, for AI Art to emulate these

Figure 2: Action Painting, Pollock

works within its training corpus would lack its core essence in conveying the emotion of the artist and the resultant liberty needed for the process of creation.

Defining Design Intent

Fundamental limits of creativity

In one interpretation, intentionality is the inspiration or desire to express the human intent (Collingwood 2013). The capacity for this action is captured by the need for agency in autonomy. Fundamental mathematical limit theories for creativity have detailed a limit theorem whereby tradeoff between novelty and quality for a given creative domain exists (Varshney 2019). To consider a limit theorem for creativity with intentionality, Claude Shannon's capacity-cost-function formalism, which captures limits of reliable communication, is modified to address the semantic problem of creativity. Incorporating intentionality, semantic creativity shows that requiring communicative intent may reduce the quality and/or novelty of creative artifacts that are generated (Varshney 2020a).

In practice, this inverse relationship between intent and novelty is paralleled by examples in Dada art, such as Duchamp's fountain, that, despite the utmost intent, garnered controversy on the novelty of artistic creation (Hutchinson 2015). This begs to consider the role of novelty in AI Art due to the compromise of intent, in part of autonomy, as characterized by human creativity (McCormack, Gifford, and Hutchings 2019).

Indeed, it is accepted that human-level intentional creative autonomy for a system is difficult to achieve. With the failure of symbolic CC (to act from meaning), and embodied CC (through situated cognition), current practices allude to non-anthropocentric CC systems rooted in systems with intrinsic motivations of their own (Guckelsberger, Salge, and Colton 2017). In the minimal model presented to address this question, one argues a system must constitute autonomy and adaptivity (to exhibit a novel and valuable response to perturbation) in order to be necessarily creative. As this is yet to find its way in existing CC framework and literature, we allude to co-creative processes that fall in the current domain for what is fundamental to intent.

In theory, intent is highly discussed in Wassily Kandisky's book, *Concerning the Spiritual in Art*, via inner artistic elements. In his synopsis, the inner need of the artist is built up of three elements, namely every artist as a creator (element of personality); a child of the age (element of style), and a servant of art (element of pure artistry) (Kandinsky 1977). The second element of style details every artist to express the spirit of the age, alluding to the leverage of AI into art. However, this calls upon careful inquiry as borrowing of method by one art from another (AI Art from its predecessors), can only be truly successful when the application of the borrowed methods is not superficial but fundamental to the artist's endeavor (Spector 2018).

Figure 3: Sketch for "Composition II", Kandinsky

For example, adapting of form to its inner meaning in Kandinsky's Sketch for "Composition II" which rids conventional aesthetic values for his time, as seen in Figure 3 above, cannot be the basis of visual indeterminacy of AI Art as it must find its own form to its inner meaning. Thus, in order to move beyond novelty, AI Art must incorporate the artist's inner and essential elements as producer (Jordanous 2016) to harness AI as a creative medium and create what is fundamental to its age.

New Ethics to Autonomy

We now propose a new ethics for artistic autonomy in AI Art that focuses on co-creative processes in line with our human-centric approach to autonomy. Accordingly, we present concrete ways to re-center human creativity and intentionality when co-creating with AI systems by attending to the approach of Collaborative AI, i.e. systems designed to support the creative practice of human artists (D'Inverno and McCormack 2015).

Re-centering creativity

To re-center creativity between AI and the human artist that will create fundamental art, the artist needs interaction, feedback, reminding, connection, stimulation and interaction from its AI partner (D'Inverno and McCormack 2015). An important tool that has opened doors and accelerated this connection has been multimodal prompt programming, or

programming in natural language for text-to-image synthesis, which originated in January 2021 with the release of the novel CLIP+VQGAN framework (Miranda 2021).

Not only did this framework democratize and increase accessibility to AI Art, but it also opened a new paradigm for natural language interaction with AI, much like the conversational interactions one would have with a human being that is deemed to be intelligent. The personification of the tool with natural language interaction has allowed AI artists to develop their own creative practice through a humanistic interaction via prompts that probe the generative model (VQGAN). As a result, this interaction has challenged, provoked and supported artists with re-centered creativity to synthesize images in way they are stimulated to do so.

To elicit re-centered creativity in prompt programming furthermore, we highlight distinctions offered by two of the four perspectives on computational creativity (Jordanous 2016). In process, the artist can take a holistic approach to image generation by viewing the synthesis of images at each time step as part of the creative process. Thus, re-centered creativity emerges for which the artist may even choose the desired image based on the emotion it invokes regardless of the training iteration. For the aforementioned exceptions, this is paralleled by intervening in the GAN latent space. Whereas in product, one can direct synthesized images to a desired environment that it deems beneficiary. For instance, a recent children's book set to expand upon a child's imagination with the expansive abstractions generated using prompt programming techniques (Issak and Varshney 2022).

Re-centering intent

To re-center intent in AI Art, one consideration would be to rethink novelty and aim for a simultaneous increase of creative autonomy and intent by alluding to a co-creative process that hands over creative autonomy. Although some argue this can only be possible given Metacreativity (giving creative autonomy to CC systems that possesses a self), the trade-off here alludes to aspects where automation in AI art is necessary for creative autonomy, and thus implements it to fulfill what one may not possess (Berns et al. 2021).

For instance, DARCI (Digitial ARtist Communicating Intention) is a creative system that exhibits creativity by noting the attribution of creativity with respect to system intentionality and autonomy (Ventura 2019). It has, thus far, addressed these difficulties and maintained to exhibit these characteristics to some extent (Norton, Heath, and Ventura 2010). Drawing back to the "black box" analogy for AI training and the resultant novelty, one may then consider the integration of intent within the co-creative process system by assigning the loss in novelty towards the artist.

In one way, this consideration can reveal surprising results that automation can afford. For example, the art collective aurèce vettier reinvents intent by exploring hybrid combinations of art and algorithms. In their work titled, *Brightly-Lit Stool, Four-eyed Cat*, see Figure 4, the collective displays a "painting/technology" to expand conceptual possibilities of AI Art. In doing so, they curate a dataset beginning from personal photos of their pet cat, generate images which wound up distorted in part of the training process, intentionally pick one in which a four eyed cat emerges, and transform the chosen image onto a canvas for painting (aurèce vettier 2020). This way, AI serves as a tool to create a component of the entire piece, whereas novelty arises out of the artist's greater autonomy to create meaningful interactions with algorithms that push the boundaries of creative processes.

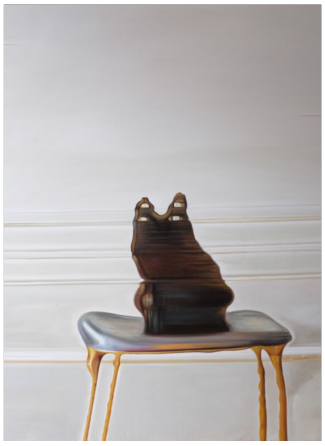

Figure 4: Brightly-Lit Stool Four-eyed Cat, aurèce vettier

Conclusion

The novelty of AI Art need not arise out of appreciation for AI's capability to create such works, but rather ask what the artwork entails in creativity and evidences in intent. As such, we encourage artists to re-calibrate the role of AI in their art by retaining their personal vision with an authentic foundation of creativity and intent (Grey and Wilber 2001). As proposed, such foundations may reveal the nature of the artistic process, incorporate room for interaction, explore insightful curiosity and perhaps unlock an inner creative in part of retrieved autonomy within the process of creation.

Future Work

While establishing ethics for re-centering creativity and intent, we also present the question of gestural abstraction in AI Art as it is yet to be addressed in the CC community. In line with our argument, perhaps this could be answered by rethinking the co-creative process for this art form. As this could be revealed in existing or future CC literature, we will keep these discussions in our thoughts.

Author Contributions

All authors participated in the curation, writing and fruition of this manuscript equally.

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