COMMENTS ON CAN COMPUTERS CREATE ART

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ABSTRACT. The article responds to *Can Computers Create Art?* by Hertzmann, 2016, which is briefly summarized in section 1.

I crticize that Hertzmann's definition of art being a social act is still unclear. Also, its arguments depends on an assumption, the detail of an art-creation machine is published to observers of its works, either explicitly or implicitly.

I presents the assumption in section 2 and shows that it might help to reduce the problem of what is the distinction between artist and non-artist to finding the difference occurs on our view while that assumption holds.

In section 3, I observe the difference by comparing with an analogous problem to decide whether an AI or its designer should be responsible for crime. With the same analogy, I also conjecture the capacity requires for a machine to be an artist.

1. BRIEF SUMMARY

In *Can Computers Create Art?* [3], Hertzmann tries to answer the question: "Could artificial intelligence be granted authorship of an artwork, and if so, what were the requirements?"

Hertzmann first presents some history about the interplay between art and technology, this gives some hints about how AI will affect art. Photography, once thought to replace artist, triggers Modern Art movement and now even is itself considered as an art-form. The history of film-making and computer animation proves that art and technology can challenge and inspire each other. The development of procedural artworks provides the current status of automating works done by (traditional) artists. However, even with the advance with modern AI technologies, those algorithms and AI techniques, still would not be seen as artists but only tools. On the contrary, authors of those technologies take the credit of authorship. Why would that happen? Could this situation changed?

To answer those questions, Hertzmann suggests that *art is an interaction between social agents*, where social agent is anything that has a status akin to personhood. Based on that, he claims that the minimum requirement for an AI to be granted authorship of an artwork is that we view it as a social agent. Such AI's do not need to have human-level intelligence, but at least have the ability to express their inner experience or consciousness.

Hertzmann also considers various perspectives of art, including the quality of produced artworks, simply supplying intention, and attributes of human artists such as creativity, growth, and responsiveness. He argues that the quality of artworks is unnecessary since even unskilled kids or amateurs could be seen as artists. He shows by example that a machine simply supplies intention of its works is considered insufficient to be an artist. He also debates that considering the attributes of human

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artists might not help in the problem. Those attributes are hard to be defined precisely, hard to predict how they would be implemented, and hard to decided how much of them is sufficient.

The conclusion is that current technologies are not going to be an artist. Claiming those technologies artists might be unethical and toxic. That would mislead people on the nature of art and deprive the AI designer's authorship credit.

Criticism. Hertzmann's definition of art relies on the definition of social agent. But, it is unclear about what constitutes a social agent. I found out that there is an assumption widely used in his discussion, which will be described in section 2.

It can be predicted what level of intelligence an AI requires to achieve to become an artist when the assumption doesn't hold as in [3]. However, if it holds, it seems that all AI's cannot artists instead of human-level ones. Digging into the assumption might help to determine the actual metrics we use to distinguish artists.

2. Transparency Assumption

The *transparency assumption* refers to the assumption that the inner working of an art-creation machine is disclosed to observers of its artworks.

This assumption is immersive in Hertzmann's arguments. He uses it to show that a machine that simply provides intent is insufficient to be an artist. The opposite assumption, such that observers are agnostic about the system, is also implicitly considered in his statement on social AI: " Perhaps, for many users, the system does not need to be truly intelligent, it just has to be perceived as a social agent …The day may come in which these agents are so integrated into our daily lives that we forget that they are carefully-designed software."

It seems that if we know exactly how a machine creates its works, we won't view it as an artist. What are the behind reasons? A quick deduction from the Hertzmann's viewpoint on art is that if we know its inner working, then there is no "inner" feeling and it can't be deemed as a social agent.

I discussed the issue with my colleagues and received mainly two potential explanations. One is that the produced artworks lack unpredictability. The other is that we admire the efforts done by the system-builder. Using the framework in [1], I argue that we are judging on the creative process in both cases, since the outcome is the same. Hence, what distinguishes an artist from non-artist could be observed in the changes of our views on the creative process when the transparency assumption holds.

3. Requirements for Artists

Now I have reduced the problem of finding the requirements for a machine to be an artist to *finding the difference of our views on art-creation process when transparency assumption holds.*

Origin of Intention. I obtain an insight by analogy with a similar problem, that is, who is responsible if an AI commits a crime, the AI itself or its builder? The argument is that, when on court, the prosecution must establish the motive of the defendant. So, the builder should take the responsibility if he builds the AI with the intention to commit the crime in mind.

It can be seen from the above analogy that we took serious about the origin of intention of an artwork. I argue that *when we are reading an artwork, we are*

backtracking its creating process, and the backtracking ends at the origin of the creator's intention (or motive).

In my knowledge about current technologies, the intention of an AI-produced artwork is either supplied by the system builder, or generated by technical tricks, or simply doesn't exit. If the transparency assumption doesn't hold, the backtracking ends at the intention of the machine since we can be fooled that the machine has it. Otherwise, the backtracking will go further into the system builder's intention.

Metacongnition. It seems impossible for an AI to be seen as an artist under the transparency assumption. My theory of origin of intention forbids any attempt to create a machine specific for being artist. In other words, if one tries to build such a machine, the intention of creating art then is from the system builder instead of the machine itself.

There is a loophole, however. We can create a machine that is not intended to to create art. What are the requirements? It is not hard to see from my theory that we should incorporate the ability to *originating intention* on its own of creating art into the machine.

Notice that the ability of originating intention is different from the the ability of supplying intention described in [3]. I will use the on-court analogy again to explain. The purpose for the prosecution to establish motive is to convince the judge that the defendant is guilty. The prosecution needs not prove the truth of that motive. This is like supplying intention, which is superficial and can be implemented by simple tricks such as fetching from the Internet. However, for the AI to be on court and hence is able to responsible for a crime, it must be accepted to have motive, that is, it can originate motive on its own.

What is the minimum requirement for a machine to have such ability? I conjecture that a machine can have its own motive only if the machine has *metacongnition*, the knowledge and understanding of one's own thinking. The on-court analogy supports this: the judge will consider the mental state of the defendant, whether he can understand his thinking while committing the crime, to decide if he is intentional or not. More simply, if one couldn't understand what it thinks, then how could it have the intention to do something?

Connection to Social Theory. The metacognition theory could supports Hertzmann's theory, where the social agent is defined as anything that has a status akin to personhood. The status of personhood might come from self-awareness of one's own thinking.

We could also use the metacognition theory independently and think what is missing. In my opinion, the metacognition is still insufficient because a machine should have the ability to communicate with its artworks' audiences, that is part of the social ability.

4. Conclusion

I have extended the discussion of [3] by considering the considering the transparency assumption. I showed that the assumption is the key to understand what determines an artist. Any discussion on a similar problem should includes that assumption.

In my opinion, who originates the intention to make an artwork should be granted authorship. We must incorporate metacognition into AI for it to have the capacity

to come up with the intention on its own. Except for that, the AI also must have some social abilities to express the intention.

Future Works. It is good to start experimenting with computational metacognition[2] in order to proves, fixes, or even disproves my arguments.

Metacognition itself is also interested. There is a branch of it called social metacognition, which includes the discussions about our judging on others' metal states[4]. Finding out the relationship between social ability and metacongnition helps give more details into the required abilities for an AI to be deemed as artist.

The argument in this essay heavily relies on analogy and Hertzmann's viewpoint. It is required to look into more discussions on the stated problems for completeness.

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