How is AI, as an upcoming technological medium and tool in art, affecting the contemporary art world and will this have a positive or negative impact upon it as it evolves in the future?

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Summary of Topic

This independent project will thoroughly explore how AI is utilised as a medium/tool in art, covering its applications and impacts on contemporary art. Chapter 1 focuses on how AI is used in art, Chapter 2 examines its positive effects on creativity and accessibility, while Chapter 3 investigates potential negative impacts like ethical concerns, ownership/authorship issues and emotional connection.

Introduction

This thesis aims to investigate the impact of AI on contemporary art. The integration of artificial intelligence (AI) into the realm of contemporary art has generated a transformative surge, challenging traditional artistic methods and expanding the limits of creative expression. This thesis delves into the complex relationship between AI and contemporary art, probing how artists utilize AI as both a medium and a tool and the complex positive and negative impacts of AI on contemporary art. The exploration covers various perspectives, ranging from historical pioneers like Harold Cohen to contemporary artists such as James Bridle, Refik Anadol, Taryn Southern, and Sougwen Chung.

Chapter 1 will explore how is AI used as a medium/tool in Art by examining the early innovators in AI art, such as Harold Cohen and will also look at diverse

contemporary artists like James Bridle, Refik Anadol, and Taryn Southern, each employing AI in different ways to create immersive experiences by challenging societal norms, and pioneering innovation.

Chapter 2 will look at the positive effects of AI on contemporary art by building upon the foundation laid in Chapter 1. It explores the creative innovation enabled by AI collaboration, emphasizing how artists push the boundaries of artistic expression through the relationships between humans and machine. The chapter also investigates into the heightened accessibility AI brings to the art world, making it more inclusive and diverse. Artists like Cosmo Wenman and innovations at the Musee d'Orsay in Paris, France, using AI technologies demonstrate the positive potential for larger audience engagement.

In comparison, Chapter 3 will explore the negative effects of AI on contemporary art by looking at the ethical issues linked with AI in contemporary art. The discussion includes concerns regarding privacy, biases, environmental impact, and issues related to ownership and authorship. The examination of these ethical problems highlights the need for responsible AI use, education, and governmental regulations to mitigate negative impacts on artists and the art community. Section 3.2 follows on from this to explore ownership and authorship issues in more depth, shedding light on the distorted lines between human and machine contributions in the creation of art. Furthermore, section 3.3 investigates emotional connection between audiences and AI-generated art, examining studies that indicate challenges in establishing the

same level of emotional connection with AI artworks compared to human made artwork.

Chapter 1: How is AI Used as a Medium/Tool in Art?

1.1: Harold Cohen

AI can be used in various different ways, as a medium or a tool, and Harold Cohen (1928-2016) is one of the first artists to successfully do this. He began exploring AI in the 1960s and spent 50 years developing a singular computer program, named AARON, that used AI to create a number of fascinating artworks that became more technical and impressive as the program evolved over the decades [1].

Cohen used AI in a truly collaborative manner due to the fact that he was the author behind the algorithms that gave AARON the ability to independently create art. This is very unique use of AI compared to present day where AI artists use programs developed by other people/companies. These algorithms that Cohen produced provided artistic rules that AARON would follow to allow for composition, lines, shapes, and later on in its development, as technology advanced, colour. AARON would produce elementary shapes during the earlier stages of its development and then Cohen would colour the images himself, which resulted in a more heavily collaborative piece, as seen in figure 1 below. In the later stages of development, decades later, AARON was able to produce figurative pieces of artwork that it could autonomously colour due to the evolution of technology and in turn more complex algorithms could be input by Cohen, as seen in figure 2 below. These more complex algorithms with new rules allowed AARON to make autonomous artistic decisions

about colour choice, paint application, perspective and composition/spatial relationships without human supervision. The result was artworks that feel like they have an energetic existence (Vass, 2023), (UC Berkeley Events, 2014).

Figure 1: No title, by Harold Cohen

Figure 2: *Aaron with decorative panel*

Cohen's use of AI to produce artwork changed over the years as he first believed that "AARON's work should be indistinguishable from the work made by human artists", but overtime realised he wanted AARON to produce artwork that would "produce an image that looks as if it had been made by somebody who is seeing the world for the first time", like a different form of intelligence with a different perspective from our own human experience. Cohen changed the medium that AARON would use from oil paint to fabric dyes to enhance this quality he was aiming for (Vass, 2023), (UC Berkeley Events, 2014). This illustrates further how Cohen used AI as a medium and a tool for collaboration to create an innovative and evolving body of work over decades. It displayed the artistic ability that AI is capable of, while also

showing that the human element is still needed because, while AARON was autonomous, the artistic rules it followed were a direct result of Cohen.

1.2: James Bridle

James Bridle utilises AI as a medium/tool in a completely different way than Cohen. His project the *Cloud Index* uses the machine learning algorithms of AI, specifically a deep convolutional generative adversarial network (DCGAN), to encourage the audience to scrutinize their relationships with technology, their reliance on its predictions, its consequences on society, politics and their own personal decision making (Chapman, 2016).

Bridle achieved this by using the data from weather satellite images and the results of the Brexit in the UK. By inputting this data into DCGAN it allowed him and the AI to analyse the data in a distinctive way to produce images that would link the two data sets creating potential complex relationship between what would usually be unrelated topics, politics and the weather, please see figure 3 below. The images produce a visual representation that acts as a metaphor in regards to the possible impacts that technology has on data used in politics. For example, data used to convince people to vote leave during the EU referendum because hundreds of millions of pounds could then be redirected to the NHS, which was found untrue and affected a lot of decisions. Bridle also wants the audience to question technology, AI specifically, and its predictions in general because it has become a reliance that can enforce a damaging amount of control on society (Chapman, 2016), (Bridle, 2016). Using AI as a medium/tool in this way, as previously stated is very different to

Cohen's approach and illustrates one of the vast amount of ways it can be utilised by artists.

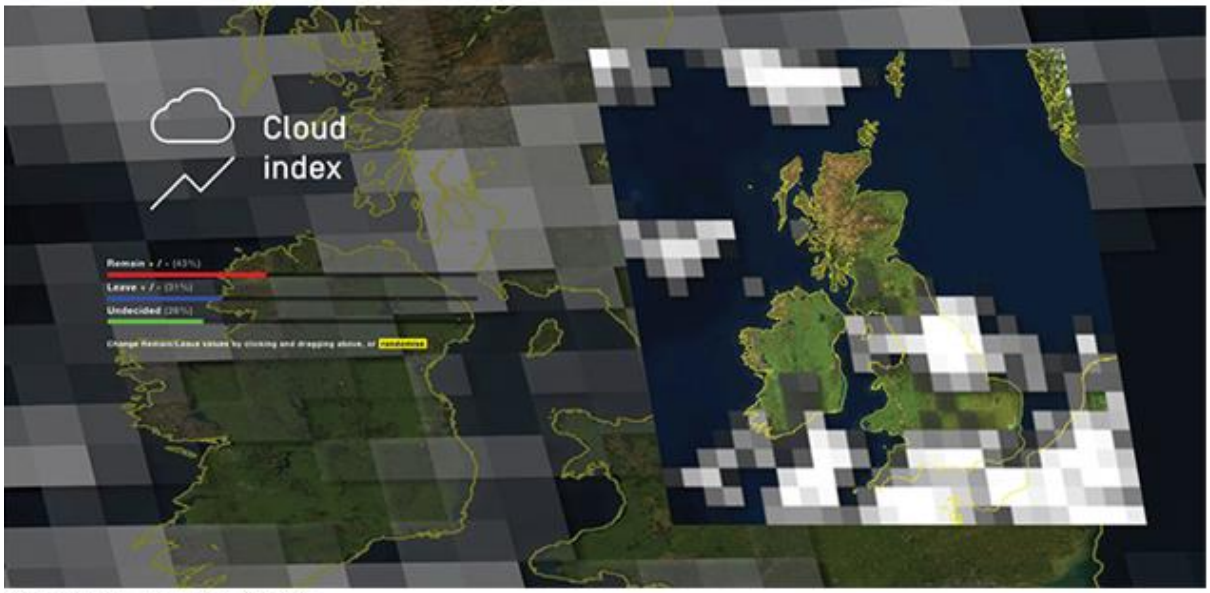

Figure 3: *Cloud Index*

1.3: Refik Anadol

Another way AI can be used as a medium/tool for art is to create large scale public installations that are innovative in their methods of creating interactive and immersive artworks. Refik Anadol is a director and media artist that investigates the connections that can be made between AI, live performances, projections, the human experience and extreme amounts of data. He does this using the machine learning of AI which he utilises to transform the built environment into large scale artworks (AIArtists.org, n.d.), (Anadol, 2020).

A great example of this is Anadol's project *WDCH Dreams*, please see figure 4 below, where he input 45 terabytes of data relating to the history of LA into machine learning AI that took this data and created an artistic visual assortment of different projections that would cover the entire building. Anadol, like Cohen, wanted the artwork to develop human like qualities, which he succeeded in. These projections, that were powered by AI intelligence, produced dream like artworks that would evolve and learn in response to environmental influences and time (AIArtists.org, n.d.), (Anadol, 2020). This resulted in a dynamic, immersive and interactive experience that challenged what was possible in the contemporary art landscape.

Figure 4: *WDCH Dreams*

Anadol's use of AI also illustrated innovations in the way art is consumed by the public. AI allowed him to give motion and life to public architecture that would otherwise be motionless. While the architecture itself is its own artwork, by adding the elements of machine learning paired with light projection Anadol is able to change the perspective and, as mentioned before, make a responsive, immersive

and interactive public installation. This helps unite the relationships between art, society, local history and technology in an evolving unpredictable future landscape (AIArtists.org, n.d.), (Anadol, 2020).

1.4: Taryn Southern

Taryn Southern has successfully established her work using AI in a completely unchartered way. Southern created the first album that was produced and composed using just AI by a solo artist. This pop album, titled *I AM AI*, is paving the way for AI music and it's assimilation into the mainstream music industry. She efficiently collaborated with the AI resulting in a unique synergy of technology, storytelling and society (AIArtists.org, n.d.).

Furthermore, Southern utilised AI as a tool in one of her other projects, which she got a streamy nomination for. This virtual reality project, run by AI (specifically Blocks AI) and Tiltbrush (a 3D VR painting experience), was an exceptional animated world where she created immersive and interactive viewing experiences within VR, which further showcased the eminence utility of how AI can be incorporated into artist projects challenging traditional artist methods within contemporary art (AIArtists.org, n.d.).

Chapter 2: Positive Effects of AI on Contemporary Art

2.1: Creative Innovation

This chapter will follow on from Chapter 1 in respect to outlining different ways artists utilise AI to enhance their own artistic ambitions through collaboration between human and machine, enhancing audience immersion, creating unique interactive experiences, showcasing perspectives from different intelligence other than our own and in turn challenging tradition methods of contemporary art in a positive way in the present and in terms of how art may evolve in the future in creative and innovative ways. MBA students at Wharton Business School, Pennsylvania, USA, preformed studies that found the AI ChatGPT to be more creative than the human counterparts in a test to see who could produce the most creative product ideas. Stern (2023) notes how the products generated by AI were, “lacking true innovation”, and argues that AI cannot truly be autonomously creative, but can be utilised by artists to enhance their own creative ability and that AI should never entirely replace the artist because it would lack emotional intent without the human input which could be argued is what gives art value.

For example, Harold Cohen's evolving approach demonstrated how AI can be a unique medium for collaboration, producing artworks that blend autonomous creation with human guided rules with his self-made AI AARON. James Bridle encouraged the viewer to question technology's impact on society and politics, highlighting AI's potential in creating an experience where the viewer will hopefully go onto critically evaluate the sources of information they see daily using technology. Anadol's work illustrated how AI can redefine and innovate public installations, adding motion and

interactivity to static architecture, uniting art, society, and technology. His collaborations with Google Arts & Culture on the *WDCH Dreams* project is a focal point in the relationships that can be made between artists and technology (Anadol, 2020). In Southern's virtual reality project, she utilized AI and Tiltbrush to create an animated, interactive world, challenging traditional artistic methods in a positive way. She is also extremely innovative with the first ever crypto currency song token in her *I AM AI* album which enabled artists to distribute/share royalties of songs they collaborate with (AIArtists.org, n.d.).

Sougwen Chung is an artist who has creatively and innovatively utilized AI, which she claims has transformed her practice. She states that the collaboration with a machine made her question previously fixed notions and sort to further explore the collaborative aspect between humans and machines to see what new narratives she could find. This is a great example, of how using AI could innovate the contemporary art world because this new medium can make you question your practice in ways you wouldn't expect, like it did for Chung (AIArtists.org, n.d.).

Chung innovated her own practice by incorporating hand drawn marks and AI generated marks made by a machine to illustrate this conversation between humans and machines challenging traditional artists practices. She successfully did this in works like *Omnia per Omnia*, *Drawing Operations (Duet)* and *Drawing Operations Unit: Generation 2* (see figure 5) (AIArtists.org, n.d.).

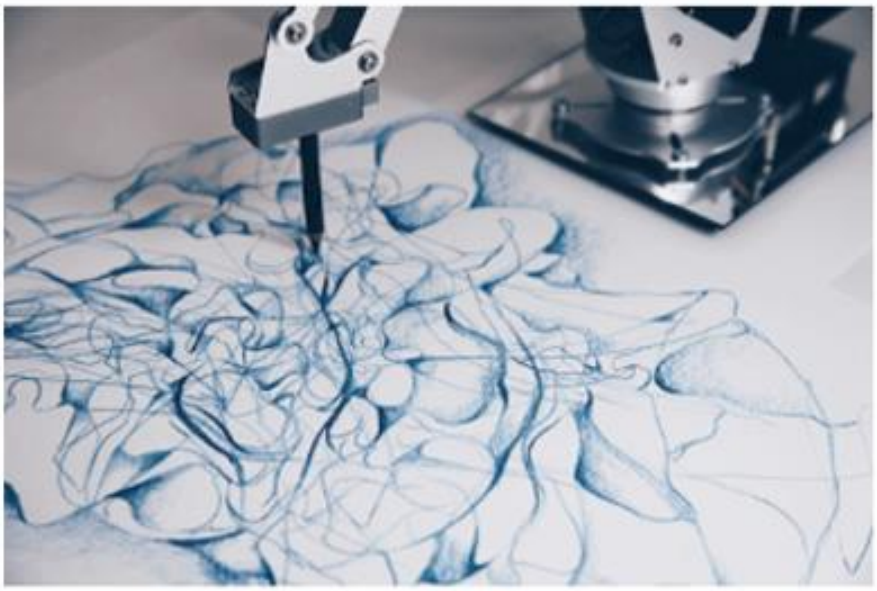

Figure 5: *Drawing Operations Unit: Generation 2*

These artists demonstrate how AI has positively impacted contemporary art by advancing innovative collaboration methods between humans and machines, redefining artistic processes, creating immersive and interactive experiences. The use of AI as both a medium and a tool has expanded the boundaries of artistic expression, opening up new possibilities for creative exploration and pushing the limits of what is achievable in the contemporary art world.

2.2: Accessibility

While AI has had very positive impacts on creativity and innovation, it's positive impacts on accessibility in the contemporary art world could be argued to be even more vast. For instance, there are many free AI image generators that only require you to make a free account to use them, making it an extremely affordable medium, which makes art accessible to a greater audience that otherwise may not of been able to access it. This helps create a positive impact on contemporary art because it

means there will be more diverse ranges of art by individuals and communities that may not have had easy access to the art world in the past due to it being a potentially costly privilege in most cases. Additionally, some of the more ethical AI services actually compensate artist for their original works if they are able to use it for the data that is input into AI systems to train them on art, such as Shutterstock (Nanou, 2023).

Cosmo Wenman is an artist, known typically for his 3D design and other complex forms of art, collaborated with blind researchers, Brandon Biggs, Lindsay Yazzolino, and Joshua Miele, to investigate how the AI Midjourney could be utilised to make art more accessible to the blind. This research tested how AI would react to text prompts inspired by different artists, like Leonardo da Vinci, Auguste Rodin and more, which resulted in what Wenman called “visually intriguing, albeit unsettling, images” that resembled the styles of these artists, but moreover diplayed that AI could be used by the blind to express their own atistic expression if used properly (see figure 6 below). The research also came to the conclusion that AI companies need to fine tune their controls for this form of accessibility to be more viable. This form of accessability is monumental in its innovation for blind people and could provide easier/a different form of acccess for the blind communitie to be apart of the contemporary art world making it more diverse (Schrader, 2023).

Musee d’Orsay's exhibition of Vincent van Gogh's last works included a lot of AI supported innovational technologies to make the exihbition more accessible, while

Figure 6: Second from left: Joshua Miele, Left and top centre: *Child with barely modelled body*, bottom centre and right: *Angled Left Arm*, and *Child sitting on a mound*

also being creating a more immersive and innovative exihbition experience. One of these technologies was an interactive Van Gogh powered by a AI system crated by Jumbo Mana. This interactive AI allows viewers to ask questions and will answer these questions based on accurate research of Van Gouh by profesionals. This form of interatative accessability shows how AI can innovate the exihbition experience by providing accurate knowledge of artists intantaniously while also looking at their artwork in personal as a joint experience. Furthermore, this could help expand the audiences of contemporary artists by attracting people who have not thought about going to an art exhibition before (Willsher, 2023).

Chapter 3: Negative Effects of AI on Contemporary Art

3.1: Ethical Issues

When it comes to AI there are a multitude of ethical concerns both in general and in relation to its possible impacts on contemporary art. Some of these issues are as

follows privacy, consent, environmental impact, biases/prejudices, accountability and uncredited work. These are just some ethical issues, but in the future there will need to be some form of education so that people can use AI responsibly without having to worry about the negative impacts it has on artists (Bridle, 2023), (Nanou, 2023).

AI data bases have been found to hold private images that are illegally sourced which are utilised when people use AI image generators. There is an obvious lack of consent which illustrates privacy violation. In an art context if you use AI image generators then you are at risk of accidently using these illegally sourced images. The impact of this on its use for art is immense, with the possibility of damaging an artist's reputation and credibility. This can also result in the devaluing of AI produced artworks, both economically and creatively, because of the seizure of existing content. It also sets a dangerous precedent where the original creator of the images used is uncredited, resulting in them being ignored and undervalued. This threat to the contemporary art world, by technology companies that produce these AIs, result in the unfair treatment of artists by stealing their incomes which could lead to a regression in artistic pursuits (Bridle, 2023), (Nanou, 2023).

Another ethical issue from AI that impacts the contemporary art world is the possible implications of the data used to train these AI machine learning technologies. The data used can potentially have bias and in turn the AI will learn these prejudices that can leak into the images it generates for you without you knowingly doing so. These bias and prejudices could be stereotypes, misrepresentations of different cultures, cultural appropriation or any other random bias or prejudices it has learnt. Instead of

challenging these bias and prejudices this instead leads to negatively impacting the inclusivity that art should have by strengthening these horrible bias and prejudices. Moreover, the data used by AI for these reasons needs to be more heavily regulated to mitigate this. This could be done by giving data sovereignty to these communities so that they have the power to reduce these negative impacts of digital colonialism and can take control of their representation (Bridle, 2023), (Nanou, 2023).

The use of AI for educational purposes also has its own ethical issues within contemporary art. For example, artistic expression could be compromised by the substitute of AI generated information about artists that would lack the artists voice, making it bland and therefore reduce the educational value for individuals trying to learn about art by taking away the need for personal critical thought and analytical skills. The trustworthiness of AI generated information about art should also be questioned because without verifying from credible sources then individual could be in danger of being exposed to inaccurate information. Therefore these educational ethical issues could really negatively impact contemporary art (Bridle, 2023), (Nanou, 2023).

The way in which AI is trained, when it is used and how the information it learns is stored is ethically very environmentally friendly. The servers that store the data used for AI to fundamentally work take a vast amount of energy and in doing so produce large amounts of fossil fuel emissions. This makes AI a very unsustainable art practice with its major environmental harm. These ethical issues show how AI can very easily negatively impact the contemporary art world through various different

avenues which demonstrates the need to be responsible, to educate yourself on these issue to personally mitigate what you can and the need for governmental regulation to ensure AI can be used ethically. Not just for the use of art, but the general use of AI as well (Bridle, 2023), (Nanou, 2023).

3.2: Ownership and Authorship

AI is a tool to be used in collaboration by artists, but to be more specific Coeckelbergh (2023) explores how AI is more than just a tool and should be seen more of an enhancement or extension of the artist's creative intent. However, does this give the AI too much humanity in terms of human intent to produce art as we know it? Coeckelbergh (2023) believes that the creative input of the AI could challenge the authorship of the artwork produced because where is the line drawn between the machine and human contribution to the final outcome. This poses issues like what should the AI be considered, because if it is considered collaborator then that could give the AI anthropological value which it doesn't have. Coeckelbergh (2023) suggest that AI should be considered quasi-other, which gives the credit of collaboration, because without the AI no art would have been produced, but limits it by illustrating that without the human input there would be no output of art of its own free will.

Two studies produced by Epstein et al (2020) help illustrate the importance of language when talking about AI artwork, specifically to do with anthropomorphism and its relationship with AI. The first study looked at the relationship between participants' anthropomorphic perceptions of the AI system and their assignment of responsibility, especially in response to positive and negative outcomes of AI-

generated artwork. Epstein, et al (2020) found that there is a positive correlation in this relationship, showing that individuals who place more anthropomorphic value on the AI will, in most cases, assign more responsibility to the AI resulting in a perception that ownership/authorship of the art produced is given more to the AI than it is to the human artist. This was particularly apparent with AI artworks that were less aesthetically successful. Additionally, the second study involved manipulation of anthropomorphism and sought to observe how the relationship would change in terms of allocation of ownership/authorship. Epstein, et al (2020) found that this study correlated with the findings of study 1. Manipulation in question was the language used to describe the AI, instead of being called AI it was called an agent. Participants in most cases again allocated the responsibility of the final outcome of the artwork to the AI due to the anthropomorphist language assigned to the AI.

The research by Coeckelbergh (2023) and these studies produced by Epstein, et al (2020) demonstrate how confusion of ownership/authorship could easily impact contemporary artists negatively. This is shown by how easily the credit and the responsibility of intent is assigned to the AI by the viewer of the artwork. This will be explored further in chapter 3.3 surrounding the topic of how the general public seem to be inclined to be less emotionally connected to AI produced work and in turn place less value on it. However, it should be mentioned that artists like Harold Cohen, as previously talked about in Chapter 1.1, stand in less of a grey area than other artists who use AI due to the fact he created his own AI, AARON, and taught it with his own algorithms to set artistic rules.

3.3: Emotional Connection

Art is very much about emotional connection, from what the artist felt producing it, what emotions they wanted the artwork to illustrate, to what the viewer feels and how they connect with whatever art they are looking at. When you bring AI into the mix it can become a bit of a grey area, because can AI produce art? What was the relationship between the collaboration? There are many questions, about ownership/authorship, which were investigated in Chapter 3.2, but what is the emotional connection and vale people put on artwork produced by AI? Mikalonyte and Kneer (2022) conducted two studies that investigate this.

These studies produced by Mikalonyte and Kneer (2022) look at how AI art is perceived by the public. They achieved this through the use of an AI controlled robot that had different control parameters to test people’s perception. These parameters were things like abstract against realistic imagery, accidental opposed to purposeful mark making and the main one being human versus AI controlled robot. Based on the study, people value art created by humans and art created by AI driven robots equally when they don’t know it was created by AI. The study also found that there was a significant difference in people's willingness to acknowledge robots as artists when they know it has been created using AI. People are less likely to attach artistic intentions to robots controlled by AI. The participants also seemed more inclined to call AI created outcomes art when the outcome was more realistic rather than abstract (Mikalonyte and Kneer, 2022).

These findings by Kneer (2022) show the complex and evolving relationship between AI and humans. Its impact on contemporary art suggest that artists who use AI will struggle to find an emotional connection with an audience and their work will be valued lower. In contrast, a notable fact to consider is that the AI artwork named *Portrait of Edmond Belamy* (see figure 7) was the first AI generated artwork to sell at an auction house, Christie's to be specific. It broke all expectations and estimations by selling for 45 time higher than its estimated value and sold for $432,500. This is groundbreaking as it clears the way for more AI artwork to be valued higher than expected and is possible sign that perceptions are evolving to accommodate this new medium/tool as people find ways to emotionally connect with these types of artwork (Christie's, 2018).

Figure 7: *Portrait of Edmond Belamy*

Conclusion

In exploring the multifaceted relationship between artificial intelligence (AI) and contemporary art, it becomes evident that AI serves as both a medium and a tool, presenting artists with unprecedented opportunities and challenges. The examples of Harold Cohen, James Bridle, Refik Anadol, Taryn Southern, and Sougwen Chung illustrate the diverse ways in which artists engage with AI, pushing the boundaries of traditional artistic practices and fostering creative innovation.

Harold Cohen's AARON exemplifies a decades-long collaboration between human and machine, showcasing how AI can evolve from a tool following predefined rules to a medium capable of autonomous decision-making. James Bridle uses AI to scrutinize societal relationships with technology, employing machine learning algorithms to create metaphorical connections between disparate data sets. Refik Anadol transforms public spaces through AI-powered installations, offering immersive and interactive experiences that redefine the relationship between art, architecture, and technology. Taryn Southern pioneers AI-generated music, challenging traditional norms in the music industry and creating unique synergies between technology, storytelling, and society. Sougwen Chung's exploration of AI's collaborative potential in visual art highlights the transformative impact on artistic practice, challenging traditional methods and creating new narratives.

In examining the positive effects of AI on contemporary art, it is clear that AI enhances creative innovation and accessibility. AI facilitates collaboration, pushes artistic boundaries, and provides new avenues for expression. The accessibility of AI

tools democratizes art creation, allowing a more diverse range of artists to participate in the contemporary art landscape. Additionally, AI-driven technologies contribute to more accessible and immersive exhibition experiences, broadening the audience for contemporary art.

However, the integration of AI in the art world is not without its challenges and ethical concerns. Issues such as privacy violations, biases in AI algorithms, environmental sustainability, and questions of ownership and authorship pose significant challenges. The potential for AI to generate artworks using illegally sourced images raises ethical questions about consent and credit. The environmental impact of AI's energy consumption necessitates responsible use and regulation. Questions surrounding authorship and ownership further complicate the ethical landscape, with concerns about the recognition and value attributed to AI-generated art.

Moreover, the emotional connection to AI-generated art remains a complex issue. Studies indicate that people tend to value art created by humans equally with that created by AI until they are aware of the AI's involvement, potentially hindering emotional connections and affecting perceived value.

In conclusion, AI's role in contemporary art is transformative, offering unprecedented opportunities for creativity and innovation while raising ethical concerns and challenging traditional norms. The evolving relationship between artists, audiences, and AI reflects the dynamic nature of contemporary art in an increasingly technologically advanced world. As the art world grapples with these challenges,

continued exploration, education, and responsible use of AI will be crucial in shaping a sustainable and ethically sound future for AI in contemporary art.

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