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Image Generation through StyleGANs: is it Art?

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Image Generation through StyleGANs: is it Art?

Sophie Dodd

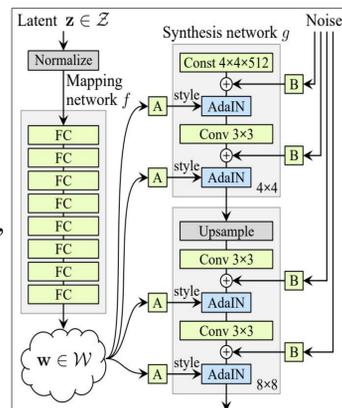
IPHS AI for the Humanities Fall 2019

Introduction:

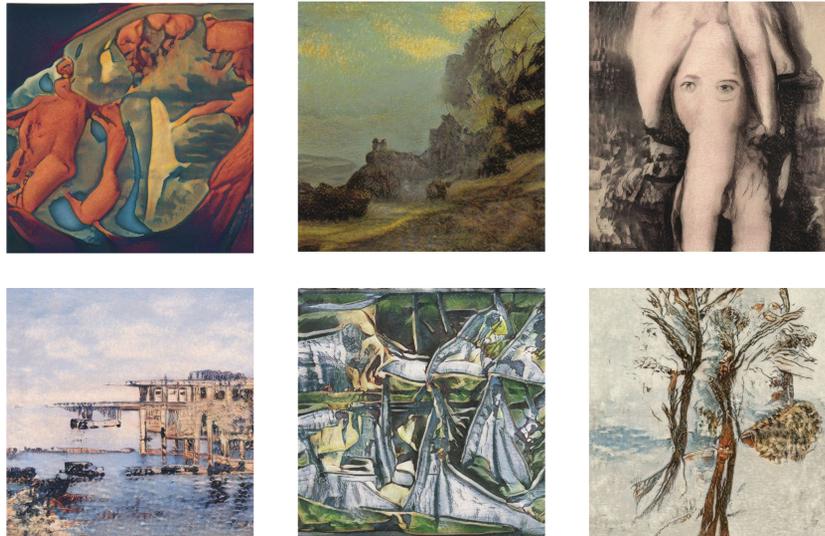
I wanted to explore how the role of artificial intelligence is developing within the art world and how current attitudes surrounding AI as a creative tool are changing. I want to experiment with AI generated images using GANs and then seek feedback on them from art and non-art students alike before telling them that they had been generated by an AI. I focused my research on examining the emotional responses people had to AI generated art and the overall question of “can an AI make art?”

Methodology:

To conduct this project, I used a StyleGAN trained on paintings from wikiart.org, and ran it on a Jupyter notebook in google colab.(2) Generative Adversarial Networks (GANs) are used to generate high quality images. The Style Generative Adversarial Network (StyleGAN) is an extension to the GAN network that allows for control over the style of the generated image. The only action necessary to generate an original image was to enter a new value for the random seed. It is capable of generating paintings in many styles, including abstract, portraits, and landscapes. Using the image search engine Yandex.com, I then found compositionally or stylistically comparable images to match those I had synthesized.



Paintings Generated:



Discussion and Conclusion:

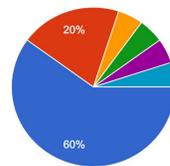
The majority of participants agreed that AI could make art, but within this group there were many who also stipulated that they didn't like it. The survey revealed that before knowing that the images were AI generated, five out of the seven AI generated images were given title cards over their human-made counterparts. The survey also revealed that after participants were made aware of the AI generation, they were, on average, able to determine which of the two had been generated. However, individuals that were incorrect on determining one image were often students less familiar with arts courses, and they were also more likely to guess incorrectly on all of the images, suggesting that those with a more keen artistic eye were more likely to guess correctly.

This project inevitably included discussions surrounding the meaning and classification of art and creativity. One central theme that keeps arising in media is whether or not art needs to be skill based. Those who oppose the creation of art through AI tools often resort to the defensive statement, “Where's the humanity behind it?” The humanity is behind the creation of a tool that allows for the democratization of a creative outlet that is exclusive based on physical skill. AI already plays various roles in therapeutic art programs today. Art therapy is only one example of potential practical applications of AI in the artworld, and its potential to bring artistic thoughts and concepts from those previously unable to do so should not be overlooked. However, it should be noted that one survey participant argued that part of what makes art is its exclusivity, stating that “if everyone could do it, then nothing is impressive or valuable anymore.” When asked if knowing that the images were generated changed their view of them, one respondent provided a statement that compiled many participant's views:

Results/Survey Data:

Do you believe that AI programs can create art?

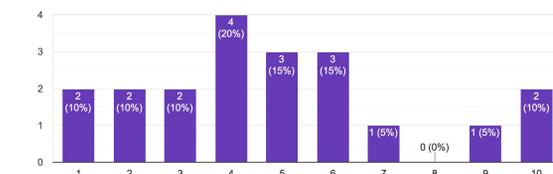
20 responses



- Yes
- No
- I think art serves a function for society outside of the artistic object produced. Art objects produced by computers...
- Yes if operated by a human.
- Yes but in a way that changes my perception of art.
- Yes, but for some reason I feel like they should exist in a separate cate...

Indicate how you feel about artists or art students using AI programs as tools for creativity.

20 responses



“My initial reaction is to say yes, it does change my opinion of the images as art. However, when I really think about it, I viewed these images as art before I was aware of them being created using artificial intelligence. Although this is something that makes me feel uncomfortable, this is a feeling I've had about other uses of technology in creating things usually made by human hands. Perhaps the world is changing, using technology for more tasks and art has now become a part of this trend. It doesn't leave me feeling great but, to be fair, I don't think I know enough about AI to fairly decide if this disturbs me or not!” -Survey Participant

Fear of AI seems to be a major determining factor in whether or not creativity can be attributed to it and the attitude with which it is viewed. However, understanding how AI works reduces discomfort. Fear of artificial intelligence (and its increasing role in the production of art) stems from the fear of AI being able to surpass human skill and ability. This is an event that has already occurred in some fields of AI programming, and necessitates a restructuring of our concept of creativity and how we use it. One participant stated that while retrospectively considering the role of AI in the generated images they realized that it changes their “relationship to the art insofar as it adds another thematic layer to what the art is doing (making me question the importance of authorship) but doesn't change my opinion that it is art.” AI is revolutionizing the meaning of art and our relationship with it.

References / Acknowledgements

- <https://machinelearningmastery.com/introduction-to-style-generative-adversarial-network-stylegan/>
- <https://colab.research.google.com/drive/1cFKK0CBnev2BF8z9BOHxePk7E-f7TtUi#scrollTo=dth87ejLUeRS&forceEdit=true&sandboxMode=true>

Survey

Using 14 images generated by the styleGAN, I conducted a survey that examined how participants responded to the images before and after they knew the “paintings” were generated using artificial intelligence. The first round of questions asked participants if any of the five shown generated paintings felt familiar in order to ascertain how comfortable participants felt with the images. The second question asked which image was their favorite based only on personal preference. The third round of questions asked participants to assign a made up “title card” (name and year) to either an AI generated painting or its human-made counterpart. The next section in the survey revealed that the majority of images had been artificially generated and asked how that made the respondent feel in retrospect. They were then asked to try to determine which image was ai generated from the same pairs to which they had just assigned ‘title cards.’ Lastly, the survey asked a series of questions about the participant's attitude towards AI generated art.



Some of the paintings used within the survey, generated using the StyleGAN.