

The Rise Of AI-Generated Ghibli-Style Images: Artistic Innovation and Cybersecurity Implications

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Abstract—The Artificial Intelligence (AI) technologies has drastically transformed a number of fields such as medical, sports, Health and Arts to name a few. This paper explores the impact of AI in the field of Arts specifically generation of Ghibli-style artistic images. Studio Ghibli is a Japanese studio which creates animation characterized by soft colors and playful visuals. OpenAI tool allows transforming images into Ghibli-style images. These AI-generated images have raised serious concerns in the artistic community relating to originality, intellectual property and cybersecurity risks. This paper deals with all these concerns in details and analyzes the technological advancements behind the generation of Ghibli-style images. A survey of 200 experts from diverse categories ranging from artists, researchers and general users have been done to understand the perception behind AI art and ethical concerns. The survey response is studied using mixed-methods approach to gain a holistic view of the AI-image generation trend. The qualitative analysis is combined along with quantitative analysis to understand the phenomenon.

I. INTRODUCTION

Artificial Intelligence (AI) has seen a tremendous amount of breakthrough. The recent advancements in generative AI especially Large Language Models and generative AI has transformed many sectors including entertainment and Arts. Several AI models have been developed which can generate realistic images. These models are also capable of transforming existing images into unique styles. One of the most notable trends in this regard is the transformation of images into Studio Ghibli's animation style. Studio Ghibli is a Japanese studio famous for creating animations with handmade drawings using soft colors and playful tone. OpenAI's image generation model now allows users to generate images which closely resembles Studio Ghibli's style. These AI-generated images are so

consistent with the original Ghibli style that it has blurred the lines between art created by human and AI. The AI-generated art is becoming very popular among the general users; however, it has led to debate regarding the ethics of AI-generated content. Sure, AI is a valuable tool for creating realistic and creative artworks, but it also threatens the integrity of traditional human made art. AI can replicate the human styles with such similarity and diversity that it has raised ethical questions over the ownership of the intellectual property rights. The AI models need to first trained with large amount of human made images which is often done without the consent of the image creator. These has led to what some call as unauthorized reproductions.

The risks associated with AI-generated art can be present in other ways. The AI-generated images are high quality and realistic. This can be used to create false information. These are the risks associated with cybercrimes. Cybercriminals may use generative AI to create fraudulent artworks which can be deceived by the buyers. This can increase in fraud of digital art. There is no way to verify the authenticity of the AI-generated images and this can create challenges for the artists to survive in the market. Thus, addressing the issues related to cyber fraud and cybercrimes is a must when dealing with generative AI.

The paper focuses on the technology behind the Ghibli-style images. The technology is mainly generative AI which is capable of generating images. The generative AI is capable of transforming the existing image into Ghibli style. The images show the innovative and creative prowess of AI and the advancement in the capabilities of the AI. There are some ethical considerations which must be taken into account while using this technology [9]. Security related concerns also needs to be highlighted. To

understand the perception of public, this study includes a survey of 200 digital artists, researchers and general to know about their views on the Ghibli-style images. The study also tries to understand the views regarding the potential risks of AI in the field of arts. The use of AI is being increasingly done in the diverse fields such as health, sports, Science, Commerce and Engineering. As discussed, it has the potential to create a huge impact in the field of arts as well. However, the impact can be both positive as well as negative. So, it is important to create a balance between using the assistance of AI and safeguarding the arts community [10]. The AI may offer new ways to create art but at the same time it is necessary to use it responsibly to avoid replacing artists with AI. While using AI in the field of arts, we need to discuss both the benefits as well as the risks associated with it.

II. AI AND THE EVOLUTION OF DIGITAL ART TECHNOLOGICAL FOUNDATIONS

There are various technologies which can be used for the purpose of generative AI. The most notable technologies are Generative Adversarial Networks (GANs), Convolutional Neural Networks (CNNs) and diffusion models. These technologies are used to create AI models that can generate new images. These models are trained on large amounts of datasets which allows them to create Ghibli-style images. There are several tools available which can generate images such as DALL.E, MidJourney and Stable Diffusion [6]. These tools allow the users to generate images by simple text prompts.

Generative Neural Networks (GANs) have the ability to produce new images [3]. These are advance neural networks which are trained on large amount of dataset which allows them to generate new images. These have two components - a generator and a discriminator. These two components compete with each other to create realistic images. On the other hand, Convolutional Neural Networks are simpler neural networks. These are mainly used in image recognition tasks and feature extraction. Another types of generative AI are diffusion models. These are the networks which use noise reduction techniques while generating images. These advance models can create AI images which closely resembles human generated images.

III. ARTISTIC BENEFITS AND CHALLENGES

The use of Generative AI has drastically transformed the creation of art. It provides several benefits for artists. Using Generative AI can help creators by simplifying the process of creation of art. It can help the artists by providing them an easier way to generate art. Using AI, artists can delve into new forms of storytelling. It will be easier for the artists to express their creativity. Artists can generate new styles in a unique way. AI can help the artists by expressing their imagination in an efficient manner.

The advancements in AI have definitely helped the artistic community. However, it also raises concerns over the artists getting sidelined due to generation of art using AI. The AI tools are capable of generating images and art by text prompts in any specified style even without having any skills in arts. This can significantly impact the role of artists in the creation of art. AI can generate images instantly, whereas an artist can take a long time to create the same art. This can cause a serious impact on the livelihood of artists. There are also concerns regarding the ownership of AI generated content. Should the credit be given to the AI model, its developer, or the original artists whose work has been used to train the model? There are no legal frameworks to answer such questions. This has led to uncertainty among artist community [4].

Another challenge which is being faced when using AI for generation of arts is homogenization of art [1]. AI generates art similar to the data it is trained on. It does not have the capability to create its own new styles as it is limited by the dataset it is trained on. This can lead to generation of art which is similar with no fresh creativity. Thus a stage may occur in long run where all the generated art is similar with no diversity in the art. This can result in dull and monotonous art without any fresh elements.

IV. ETHICAL AND CULTURAL CONSIDERATIONS

There also concerns related to representation of culture through art. Studio Ghibli's creation are inspired from the Japanese tradition and culture. The original images are created using hand drawing techniques keeping in mind the relevance with the Japanese culture. AI generated images may not align with the story being told and may not incorporate the nuance and details

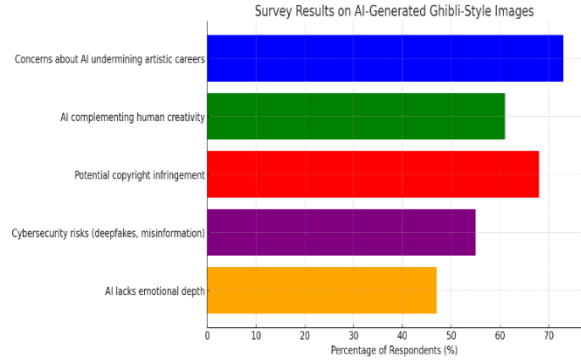
necessary to represent the scene. There is a risk of Ghibli legacy being endangered as people shift to AI for generation of art which threatens to undermine the efforts and work carried out by the creators. The challenges are many when using AI for generation of art. But, it also provides some valuable support when used in a responsible manner. There must be collaboration between human and AI when creating arts instead of replacing the artists [2]. This can help in achieving new levels of creativity and will benefit both the AI technology as well as artists.

V. SURVEY RESULTS

A survey was conducted among 200 respondents, including digital artists, AI researchers, and general users, to assess opinions on AI-generated Ghibli-style images. The survey focused on artistic value, ethical considerations, and cybersecurity concerns. The key findings are summarized below:

- 73% of artists believe that AI can pose a serious threat for the career of artists as AI becomes more capable.
- 61% of researchers believed that AI can rather help in creating art instead of replacing human artists
- 68% of participants believed that there is copyright infringement when AI generates Ghibli-style images for a general user.
- 55% of participants believed that there is risk of cybersecurity threat such as misinformation and fake images while using generative AI
- 47% of participants believed that AI generated content is not as good and creative as authentic human made drawings.

These results show how different opinions are provided by the participants regarding use of AI for generating Ghibli-style images. Some of the participants are enthusiastic about the use of AI, whereas some are concerned regarding the risks associated with ethics and cybersecurity.



VI. CYBERSECURITY IMPLICATIONS

The Generative AI is also prone to cybersecurity risks as it is a part of computer system. This system can be hacked and used for malicious purpose. There is a risk of cyberattacks associated with server where the AI model is deployed. AI can also be used to carry out fraud as it can generate fake content. Below are some of the key cybersecurity threats and their solutions

Cybersecurity Threats

1. Fraud and Fake content:

Generative AI can be used to create fake content including images and videos. Deep fake is a method by which fake videos of any person can be generated using AI which can be used to spread false information. Fake art can be created using AI which can be used to lure people and deceive them. Since the fake images are realistic it becomes very difficult to verify their authenticity.

2. Data poisoning attack:

AI models are created by training them on large amount of dataset. This data is collected from different sources. Hackers can gain access to the data storage and can corrupt the data. Biased data or invalid data can be fed into the model which can hamper the learning process. The model would not be able to train well if the data is not correct.

3. Copyright infringement:

AI models are trained on large amount of data. This data is collected from different sources. The data is publicly available however, it may be copyright data. Developers use this data without the consent of the owner. There is copyright infringement when such

methods are used to train the model on publicly available data.

4. Phishing and Social Engineering:

AI tools can be used to carry out phishing attacks. These attacks allow the attackers to create realistic content using AI leading the victim to believe it is original. These attacks can cause the victim to lose their sensitive details after being deceived by the attackers.

5. Adversarial attacks:

The AI models are deployed as part of a computer system. The attacker may target the model and may cause it to produce invalid output. The system may be forced to produce biased output or wrong information. The model configuration can be changed by the attacker to produce wrong output.

VII. SOLUTIONS AND MITIGATION STRATEGIES

The cybersecurity related issues can be overcome by following the measures given below-

1. Using watermarks and block chain: Watermarks should be embedded into the images generated by using AI. This will help to distinguish between human made and AI generated images. Block chain technology can also be used to track images generated using AI.

2. Data security protocols:

Attackers can harm the data collected from various sources for training AI models. Data poisoning attacks can be avoided by securing access to the data. Access control methods can reduce the risk of data tampering

3. AI detection techniques:

It is important to have some techniques which can allow to distinguish between human generated and AI generated content. This can be done by using specialized models which are able to identify AI generated content. Thus, fake images can be easily identified.

4. Regulatory framework:

Legal organizations should come and provide legal guidelines for generating art using AI. Legal

frameworks should also be established for policies on the use of intellectual property for training AI models.

5. User awareness:

Campaigns should be held to educate users and public about the use of AI generated content. Users should be made aware about the original creator of Ghibli style images and due credit should be given to the artists.

6. Transaction security:

There are risks associated with online transactions when trading digital arts. The online platforms should implement adequate security to facilitate secure transactions.

VIII. FUTURE DIRECTIONS AND RECOMMENDATIONS

Ethical AI policies

To ensure ethics and fairness when using AI for generation of image, it is important to set up policies on how data should be used for training AI model. There should be overview on training data being used to develop models. Artists should be given the option to opt in or out of dataset usage for training AI models. [7].

Authenticity measures

Measures should be taken to mitigate the risks associated with fraud and fake image generation. Watermarks should be provided on images generated using AI and more efforts should be focused on collaboration between human and AI when creating arts. This is possible when researchers, policymakers and cybersecurity experts come together and discuss the issues [8].

Collaborative efforts

AI has become capable of generating Ghibli-style images which used to create by humans through long hours of efforts. The instant generation of similar images means that value of human efforts can go down as organizations shift to AI for creation of art. This can impact the lives of artists. Thus it is important to think about safeguarding the lives of artists instead of AI becoming threat to them. Collaborative ways can ensure both AI and humans exists in harmony with each other [5].

IX. CONCLUSION

The generation of Ghibli-style images shows how AI has impacted the field of arts. The sudden rise in popularity of AI for generating images shows its potential in the field of arts. The AI images are realistic and closely resembles the original Ghibli-style. However, this popularity also raises some concerns related to ethics and cybersecurity. A survey was conducted for 200 people which reveals the general opinion of public. While some participants feel AI can help the artists by aiding them, others believe that cybersecurity risks needs to be handled while using AI. Some measures were discussed to overcome the challenges associated with ethics and cybersecurity to allow a sustainable future for AI in arts.

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