Electric Dreams of Ukiyo: A Series of Japanese Artworks Created by an Artificial Intelligence

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This opinion piece provides insight on the creation of artistic visuals using artificial intelligence. It describes how 3 artists evolving in this field decided to use technology in a derived way, with the help of researchers and enthusiasts working open source, to talk about how our society is developing with regards to technology adoption.

We are Obvious. An artistic collective of three friends, one of whom is a researcher in machine learning, fascinated by the philosophical questions raised by the algorithms we interact with in our everyday lives. Our creative process makes use of Generative Adversarial Networks (GANs), with which we develop interesting, yet somewhat useless, physical manifestations of these algorithms. The images we have created in our different collections contain the hallmarks of the originals, so a first glimpse at the patterns does not unveil the mystery. Only a closer look reveals that perhaps the artist isn’t human. The curiosity of an observer leads them to look beyond the obvious and engages them in the conversation around the nature and implications of machine learning processes. We believe that these discussions need to be had not only in the scientific world, but more broadly as a society.

By exploring our art heritage using algorithms, we want to shed a new light on our culture and how it inspires us to create day after day. After a series of classical European portraits, we decided to explore the Japanese culture and extremely rich art patrimony.

Ukiyo (浮世, “floating, fleeting, or transient world”) describes the urban lifestyle, especially the pleasure-seeking aspects, of Edo-period Japan (1600–1867). The genre gave rise to the Japanese woodblock prints known as ukiyo-e, or “pictures of the Floating World,” depicting scenes associated with the culture. In our last collection, the inhabitants of the floating world, a land of dreams and passions, discover electricity. We asked ourselves questions about how this period of transition, between the Edo era and the Meiji era (circa 1868), would be affected:

What happens when the traditional encounters the new? To explore this, we gave an artificial intelligence (AI) a selection of the famous ukiyo-e, and, through eleven characters and eleven places, we catch a glimpse of its dreams.

From the dry harbor, which was cursed to be parched after a brave diver stole a magnificent pearl from the Dragon King; beyond the mist volcano, famed as the training ground of Fuji, the ancient goddess of fire; to the sacred heights, home of the crying red ogre, our collection explores the relationship between the land, the people, and the technology as it spreads. Okuni of the Shadow Village, creator of Ukiyo’s thriving Kabuki theater, quickly grasps the power of electricity and aspires to control the force that will change the shape of Japan. The more traditionally minded Hayao of the Memories Glacier, a Rikishi sumo, and Bulma of the High Red Pines, a Geisha, fear the perils of the new technology and hold themselves and their livelihoods apart from it.

We embarked on this project in the spirit of reflection; as electricity began to change the lives of the Japanese people in 1868, so the rise, and increasingly ubiquitous presence, of artificial intelligence is transforming the world as we know it today. According to the inventor of the GANs we use, Ian Goodfellow, these algorithms are able to replicate inventiveness, which is a first step toward being able to replicate creativity. Discovered in 2014, these algorithms have reshaped the research field in machine learning, with an increasing share of the papers being written on the subject.

What we don’t see, in our opinion, is an equivalent impact on our society. We believe there is immense potential for improving processes across all industries, but application has been limited and is most often driven by commercial, rather than human, values. Our work has predominantly been made possible by the open source community and the collaboration of diverse actors throughout the world, being researchers themselves or simply tech enthusiasts and art lovers. We see this kind of creative process as the key opportunity in realizing the potential of machine learning to benefit society.

Without the work done by others preceding the beginning of our mission, the algorithms we used to create the artworks might not have been sufficiently developed to enable us to create our collection. In a way, those who designed the algorithms were the early murmurs of the conversation we now hope to have with our audience about how GANs operate and how we integrate them into our culture. In the same way that a group of enthusiasts would share their discoveries in terms of brushes, pigments, and canvases, open source enables each and every artist to use the same state-of-the-art tools for artistic creation.

We wish to balance this consideration with the observation that the capacity of an artist to create depends highly on the resources they have available and, in the case of artificial intelligence, the computational power in particular. In order to achieve the inclusive goals of open access collaboration, we need to bear in mind as a society that access to technology is not universal and that this reinforces divisions already present in cultures across the globe. The open source organization of knowledge and creativity, we hope, will be part of the solution to this challenge, and we will continue using...
it to communicate with the world through our art with and about the most efficient tools in machine learning. By putting our creativity at the service of this mission, we intend to make the applications of artificial intelligence more widespread and recognized.

In our approach, which is artistic and experimental, we manipulate and experiment with lots of different machine-learning, data-augmentation, and post-processing tools. In addition to working with the latest GAN models with the purpose of exploring machine creativity, we have a large panel of algorithmic tools at our disposal, allowing style transfer, image integration, and video creation. There are also many derived ways of using these algorithms, leading to an infinite combination of processes for creation, not to mention the equally large variety of subjects we can address. For example, we currently use large datasets of free-of-rights paintings to create our main series. However, we can also mix different datasets that look alike in order to trick the algorithms into creating something that doesn’t exist. We can also train on the frames of a video in order to obtain a reinterpretation of the algorithms in the form of a video of the evolution of a latent space, which is a map of images created by the algorithms.

We might make some discoveries through serendipity, which would allow us to participate in the research being done in this field. We also hope that this aspect might take a greater place in our activities in the future, and that someday our art will allow us to finance our research, as we have some idea for how the algorithms we use could be improved simply because they are the tools we use every day. The two main fields for progress we identified for now are the generation using GANs on three-dimensional models and the implementation of GANs for video creation. Within the two-dimensional space, there is also work to be done in terms of diversity of what a GAN can produce, as well as in the development of tools and software that facilitate the use of GANs.

Our future aspiration is that our work will act as an intersection between art and science, as has been observed many times in history. We hope to match the impact discoveries such as perspective, pigments types, and photography had on what we see as being art today. Our motivation is to enable machine learning to enter those hallowed halls and impact art in the most beautiful manner by allowing the creation of unique visuals and by generating new feelings in the audiences who encounter this type of work.

In October 2018, the famous auction house, Christie’s, began to engage with what we see as a new art movement. As a result, one of our pieces generated with GANs and printed on canvas was sold for USD $432,500, exceeding the estimate by more than 43 times. This first result on the global stage gives us faith in the future development of this movement. Since then, other events have given more stability to this type of work. An interactive installation involving artificial intelligence and two of our other artworks have gone under the hammer at Sotheby’s, another very well-regarded auction house. Art created using artificial intelligence has also made its way into exhibitions in several world class institutions, such as, in our case, the Hermitage Museum in Russia, the National Museum of China and the Museum of Civilization in Quebec.

Whether we see these successes as causes or consequences, the number of artists working with this type of tool is increasing. We see more and more creative projects involving artificial-intelligence-created visuals, and a few organizations are already experimenting together with artists to start using these new tools.

We have the advantage in this movement of an ever-growing volume of our key resource: data. They are increasingly being gathered by product manufacturers, service providers, and even specialized companies, so the pool of inspiration for creative algorithms is getting larger and larger. The algorithms themselves are getting more diversified, allowing the creation and combination of visuals in a way that has never been experienced before, enlarging the palette available to creatives, and allowing them to work on new mediums such as video and 3D. While GANs allow the creation of an original and recognizable type of visuals, their primary function is to create new examples based on a curated database. This way, GANs allow the creation of art at the intersection of the entirely new and the already existing.

We also believe that the future will contain trends toward personalization. Where art has always been about an artist delivering a message in an original way, audiences are becoming increasingly interested in getting that message delivered to them, and in a sense, by themselves. We, whether it be people or organizations, are looking for art that reflects our personalities, our values, and our tastes. Although these notions are hard to grasp through data collection only, we are getting better and better at doing so with increasingly efficient collection and analysis tools.

As the Obvious collective, we are fascinated to see how the desire for personally tailored art comes to life but for now will hold to the original purpose of art and include it as a founding principle in all our future endeavors. We plan on continuing to use technology and art to convey our message. Technology has always been at the service of human ambitions and limitations; the technology itself doesn’t have any impact on our society, nor on our lives. It is the way humans use it that will shape the future of our society. This is why Obvious focuses on highlighting the emergence of benevolent and harmless ideas by demystifying artificial intelligence, promoting alternative uses for it, and unveiling its true creative potential.

This will be reflected in our future projects, as we intend to keep revisiting our cultural heritage from a new standpoint—one of algorithms. We hope to provide a fresh perspective on different eras, cultures, and human inspirations while respecting the traditions of the art we are working with. We also want to keep engaging in the dialogue about artificial intelligence and its impact on our society and keep building our artistic universe, which is something we have been doing since the very beginning with our first and our second collections.

About the Collective
Obvious wishes to explore, use, and share the different ways machine learning algorithms can empower our natural creativity. By staying up to date with the latest research and finding artistic applications for the tools being discovered, we bring knowledge and future perspective to the world by reducing the gap between research and applications. We also wish to demonstrate once again the complementarity between science and art. Technology has always been at the service of human ambitions as the best tool to push our limits. This is why Obvious focuses on accompanying the emergence of benevolent and harmless ideas by promoting alternative uses for technology and unveiling its true creative potential.