Discovering Culture with AI

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The past few years have seen a rapid development of AI capabilities and applications, including in the fields of art and culture. Machine learning tools now find a variety of uses in cultural institutions, such as improving accessibility, aiding research, and providing new forms of audience engagement through roaming robots, deepfake installations, chatbots and interactive image processing applications. At the same time, museums serve as venues for AI art exhibitions and discussions about technology ethics. This paper provides an overview of creative AI practices by cultural institutions, showcases artistic exploration with AI, and considers tools for public engagement with museum collections.

To begin the overview of artistic exploration with AI, I present Anna Ridler's *Mosaic Virus* (2018), a work I commissioned for the Impakt Festival *Algorithmic Superstructures* in 2018.[1] To make this work, Ridler came to the Netherlands, bought tulips, and proceeded to take 10,000 photographs of them, making a dataset, which she could then classify and use to train a generative adversarial network (GAN) to produce images of tulips. In doing so, Ridler controls the dataset aspect of her work. Her work also shows innovation with respect to user experience: alongside the tulip videos generated, Ridler exhibits hundreds of tulip photographs from the dataset.

Next, I look at the artist Ben Snell, whose sculpture *Dio* (2019) is based on a dataset of sculpture from antiquity to modernity used to train a GAN.[2] What is special about Snell's artwork is that he destroyed the computer that made the AI design to dust and proceeded to make the sculpture out of it, recalling artists from the twentieth century who similarly incorporated destruction into their artwork.

NonFacial Portraits (2018) by the Korean artist duo Shinseungback Kimyonghun is an artwork that looks at facial recognition in a completely different way so as to mainstream an art practice that normally highlights privacy and surveillance concerns from the activist community.[3] Instead, the two artists asked portrait painters to produce a portrait that would not be recognized as such by the facial recognition

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[1] http://annaridler.com/mosaic-virus (all URLs here accessed in August 2023).

[2] http://bensnell.io/dio.

[3] https://ssbkyh.com/works/nonfacial_portrait/.

model. The series of artworks show the portraits made by artists alongside the video of their drawing process: as soon as the facial recognition system detects a face in the artwork, the artists need to 'correct' the painting to make it unrecognizable to the machine. Meanwhile, Tom White explores object recognition in his series *Perception Engines* (2018) by developing images of categories that would contain the visual essence of that category as seen by most AI image recognition models of that time, sometimes with abstract shapes that bearing no resemblance to the way humans would distil an image of that particular object.[4]

There are also various artists working with AI tools in a deeper cultural context. For example, Minne Atairu in her work *Igún* (2021) explores what the cultural output from the Benin era might have looked like through an artwork that showcases a latent space of heads, created by training an AI on a dataset of looted bronze works from museum collections, including ceremonial heads and non-figurative objects.[5] The duo Oxia Palus, consisting of the physicist George Cann and neuroscientist Anthony Bourached, together with the artist Jesper Eriksson, used AI to reconstruct the figures of two wrestlers unearthed by X-ray in the layers of a Van Gogh artwork.[6] The underpainting was initially discovered a decade ago and is referenced in a letter Van Gogh sent to his brother in 1886: 'This week I painted a large thing with two nude torsos—two wrestlers … and I really liked doing that.'[7] Here, AI is used to develop the image more fully whilst adhering as far as possible to the style of Van Gogh in order to enable audiences to enjoy the work.

Meanwhile, Egor Kraft in his work *Content Aware Studies* (2018) reconstructs lost fragments of statues with the help of AI, showcasing how these tools can be used for knowledge production and new interpretations of antique statues.[8] The artist Refik Anadol works with art datasets in a different manner: using 380,000 images of 180,000 artworks from the MoMa collection, he has produced a generated stream of images reimagining the connections and development of art.[9]

Recently, new tools have become available to artists with the development of text-to-image models, which focus primarily on a text prompt to generate an image, as opposed to compiling datasets and training GAN models. These tools present artists with new opportunities for creative expression and imagination. For example, the artist Sofia Crespo has been experimenting with the potential of these tools to generate images of a crossover between a zebra and a flamingo, resulting in one

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[4] https://aiartists.org/tom-white.

[5] https://www.lumenprize.com/2021-global-south-shortlist/igun.

[6] https://www.oxia-palus.com/.

[7] https://www.ucl.ac.uk/news/2022/sep/x-rays-ai-and-3d-printing-bring-lost-van-gogh-artwork-life#:~:text=%E2%80%9CThis%20week%20I%20painted%20a,from%20the%20X%2Dray%20data.

[8] https://egorkraft.com/.

[9] https://refikanadolstudio.com/.

image of a flamingo with zebra stripes and another with zebra wings reminiscent of the animal's torso.[10] As humans, we typically might imagine a crossover between images differently and it is therefore useful to be able to access additional forms of imagination.

Apart from pure image generation, some artists have been developing more elaborate concepts to stand out in this tidal wave of text-to-image art. Mario Klingemann's *Botto* project (2021–ongoing) consists of an AI system that, based on a number of algorithms such as VQGAN + CLIP and GPT-3, generates images that the project's community of 5,000 users then vote on so as to select one image for sale as an NFT on SuperRare each week. Botto learns from community feedback and develops art from its findings.[11] The artist duo Varvara & Mar investigated the potential of text prompts and 3D models to create a form in their series of sculptures titled *Psychedelic Forms* (2022). Using ancient sculpture as input, Varvara & Mar stylized the mesh with a text prompt and proceeded to 3D print the items in ceramics, adding physical material and artisanal craft techniques to create a unique work in an era of reproduction.[12]

In addition to artists working with generative models and text-to-image models, there are others who focus on different AI techniques, frequently in order to highlight their issues. Gretchen Andrew's series *Internet Imperialism* (2018–ongoing) presents an artist individual's attempt to hack the search engine system. By creating a series of physical paintings for a particular search string, Andrew employs search engine optimization skills to ensure that her paintings are the top image results for searches such as 'Contemporary Art Auction Record' or 'Cover of Artforum'. The artist comments:

> I believe AI is creationary, not just predictive. It creates our future as much as it anticipates it. By injecting my Vision Boards, which represent my visual hopes for the future, into the developing brain of big tech's AI, I am teaching our computers to dream wider than our current world. I am educating AI based on the world that I want and not just the one I've lived so far.[13]

Meanwhile, *ImageNet Roulette* (2019) by Trevor Paglen and Kate Crawford highlights the biases in AI systems by presenting a web experiment in which users can upload pictures for classification.[14] Some of these classifications are needlessly negative such as 'clown' and 'buffoon', based on existing labels assigned to images in the original ImageNet database. In her work *Salaf* (2020), Nouf Aljowaysir tackles bias

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[10] https://pin.it/7fs3iWg.

[11] https://www.botto.com/press.

[12] https://var-mar.info/psychedelic-forms/.

[13] https://www.galloire.com/on-show/growthhacking.

[14] https://paglen.studio/2020/04/29/imagenet-roulette/.

by removing colonial stereotypes from her images, then training a GAN on the resulting dataset with black and white photographic images with parts of the image erased to remove the British colonial gaze and instead present a vision more in line with that of her ancestors.[15]

The second section of my contribution looks at the creative AI explorations conducted by cultural institutions and technology companies. A winner of the Tate IK Prize 2016, *Recognition* is a project by Fabrica that links contemporary photojournalism with British art from the Tate collection using various AI techniques such as object and facial recognition, and composition and context analysis.[16] Some interesting connections are made, with eunuchs applying make-up in India being linked to Peter Lely's *Two Ladies of the Lake Family* (circa 1660), or with Henry Moore sculptures being compared to car seats. This theme of interlinking artworks is developed further in Google's *X Degrees of Separation*, an interactive web-based tool that enables users to chart the pathways between two artefacts through a chain of artworks, sometimes from completely different object categories, thus helping to uncover unknown and surprising works.[17] Similarly, *Gen Studio*, a collaboration between Microsoft and The Met, uses a GAN to explore the space between two pieces from the collection.[18]

Additional applications of AI focus on making collections more accessible to everyone regardless of their location or mobility. The Van Abbemuseum has a remote-controlled robot able to roam through the museum, making it possible for those unable to attend physically to see the artworks.[19] The Dalí Museum in St Petersburg, Florida, has been at the forefront of cultural experimentation with AI. The past couple of years have seen the *Dalí Lives* video installation, which showcases a deepfake of Salvador Dalí who greets visitors,[20] and more recently *The Dalí Dream Tapestry* project, which uses the latest text-to-image tools to weave together multiple images.[21]

Most recent explorations have been carried out with text-to-image tools. For example, Instagram has a 'Museum of the Future' filter, which enables users to insert themselves into a virtual art gallery, where they can experience the artworks as if they were inside them thanks to the Outpainting tools, which use text prompts to

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[15] http://www.noufaljowaysir.com/thoughtworksai/.

[16] https://www.tate.org.uk/whats-on/tate-britain/ik-prize-2016-recognition.

[17] https://artsexperiments.withgoogle.com/xdegrees/8gHu5Z5RF4BsNg/BgHD_Fxb-V_K3A.

[18] https://www.metmuseum.org/about-the-met/policies-and-documents/open-access/met-microsoft-mit.

[19] https://vanabbemuseum.nl/nl/collectie-onderzoek/onderzoek/zoek-in-onderzoek/special-guests-onbeperkt-van-abbe-unlimited-van-abbeonvergetelijk-multizintuigelijk-spraakmakend-open-je-hart.

[20] https://thedali.org/exhibit/dali-lives/.

[21] https://thedali.org/the-dalis-dream-tapestry/.

expand the original canvas. In a different application of this technology, *The Design Generator*, a research project from Birkbeck, automatically generates design objects based on the V&A collections from text prompts.[22] This tool enables users to combine diverse categories such as periods, styles, materials, and techniques in order to imagine new museum objects, thus helping audiences to improve their understanding of design history and its possible futures.

To conclude, artists, cultural institutions, and technology companies have all been exploring various creative AI tools, including GANs, object recognition, and text-to-image models, to reimagine art-historical connections, define the creative possibilities of the technology, investigate its limitations, and use it as a tool for good.

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[22] http://www7.bbk.ac.uk/vasari/2022/09/24/the-design-generator/.