



## Neural networks: from Google gimmick to creepy, beautiful, uncanny art

Artists, like the rest of us, are working to grasp the point of programming in art.



In a tiny art gallery attached to Boston's Green Street subway station hang two peculiar prints. Each is a portrait, brimming with an expression and detail that draw the viewer in, especially the one on the right, which depicts a woman in a wash of color, her lips parted slightly and her gaze turned up, as though she's focused on something just outside the frame.

It's hard to say precisely what, but there's no question that the woman's expressive eyes evoke something — maybe longing, or concern, or a private joke, or a subtle mix of those feelings. But though the effect is heartfelt, neither the portrait's subject nor its creator are real humans. Instead, it was generated by a neural network that Google researcher and visual artist Mike Tyka trained to produce similar portraits by feeding it images of real people.

As recently as two years ago, when Google held a show in the Mission District of art generated by artificial intelligences, the results still felt gimmicky. Now the work is starting to mature, with artists like Tyka producing more nuanced collections and, just as importantly, artists outside the enclaves of big tech starting to experiment with the same tools. This show at the Boston Cyberarts gallery, titled "Artificial Creativity," looks at work by both groups — and sometimes, during its best moments, you catch a glimpse of a strange future that leverages the combined creative power of humans and machines.

"An exhibition like this can make what people are really doing now with AI accessible in a different way," said Caitlin Foley, the gallery's assistant director. "This exhibition is about the artwork, but also about giving people access to this technology."

Foley isn't a coder by trade. Her background is in printmaking, and she's been drawn to AI by its similarities to that medium: you can set up a print, she says, like feeding data into a machine learning system, but the product of those inputs is often unpredictable. In a piece she's been working on lately, Foley and a collaborator have been collecting audio recordings of people's "worries" — money, relationships, war — and using them to train a neural network to produce new fears. She played me a clip of the unfinished product, and though it wasn't quite forming full words, the strings of sound it mumbled, in a sluggishly human-sounding voice, indeed carried an aura of anxiety.

Though it's been in the work for decades, the creative power of AI has exploded in recent years — even since Google's 2016 gallery show. A few months ago, a pair of musicians used a neural network to create a heavy metal album that sounds like a bona fide genre piece. A community of developers who call themselves Botnik have used AI to generate madcap facsimiles of a Harry Potter chapter, an X-Files screenplay and a fact sheet about otters. Most of these creations still feel like party tricks, but extraordinarily impressive ones — and ones that are increasingly beginning to produce category-defying results.

The Cyberarts show came about as a result of a conversation between George Fifield, the founder of the gallery, and Martin Wattenberg, a researcher at Google and a data science pioneer. Wattenberg was impressed by the growing capabilities of neural networks, which with the right training data can produce eerily human-like outputs, yet are simultaneously accessible to people with little advanced programming experience.

"Neural networks are a different kind of programming," said Fifield, who founded Boston Cyberarts in 1999 to explore the growing role of digital tools in art. "Usually when we think of programming, we think of someone sitting down and writing code. Neural networks don't work that way. You build a sort of code structure, and then you feed it with thousands and thousands of examples, and it learns, and then starts doing — hopefully — what you want it to do."

Google eventually agreed to fund the exhibit, which runs until February 18 at the Green Street space. Other work on display at the show includes Moth Generator, a Twitter bot that produces images and whimsically Latin-sounding names for imaginary species of moth; and a virtual reality piece by artist Jessica Brillhart that filters 360-degree video vignettes through DeepDream, a Google algorithm that identifies and enhances patterns to create surreal, hallucinogenic imagery.

A few pieces are genuinely powerful. I found a video by Munich-based artist Mario Klingemann to be particularly haunting. In it, an endless loop of sad-faced sketches, some clearly human and others warped into simian or Easter Island caricatures, emerge from the center of the screen to a soundtrack of sad orchestral strings, drifting outwards as they dissipate like wisps of smoke. It gave me a sense of fading away in the face of an ever more automated world, and after I left the exhibit I found myself pulling it up on YouTube again and again, drawn back by its melancholy.

Many technologies, from Auto-Tune to Photoshop, have prompted backlash from critics who say they serve as crutches for less capable artists, and art created by AI has been no exception. Fifield isn't impressed by that criticism, though. Aristotle, he points out, believed that the written word would destroy memory. And an extemporaneous opponent of the printing press argued that it would lead to information overload, calling the device "confusing and harmful." Also, while neural networks can overcomplicate things that are relatively simple with regular digital tools — say, creating a portrait — they can remove a lot of technical friction from more intensive projects and lead to places even the artists can't predict. Klingemann's video, for instance, might be painstaking for a single person to produce by hand, but a neural network can generate something entirely new from a pile of existing, unrelated stuff.

In the end, Fifield and Foley argued, the power of any technology depends on who wields it. Fifield related a story about Manfred Mohr, a seminal digital artist. In 1973, Fifield said, Mohr — who confirmed the story — was giving a lecture about his work at the University of Paris when students started throwing eggs from the crowd.

"How dare you use a computer in your art," one of them shouted. "Those are war machines!"