

The Creative Side of Big Data

Although it's easy to imagine artificial intelligence the way movies like *Terminator* present it (i.e., attempting to drive humanity to extinction), machines appreciate the finer things in life as well. This resource will demonstrate how machine learning technologies work, and specifically how they apply to creative endeavors like art and music. Utilizing Big Data to train smart machines opens a new world of creative opportunities. Below are just a few examples!

What is machine learning and how does it work?

Video Introduction: [What is Machine Learning and How does it Work?](#)

Definition: Machine learning is a form of artificial intelligence (AI) that utilizes the process of intaking information and learning from it to attempt to replicate humans' thought processes without being explicitly told how to. Machine learning doesn't require much human interaction other than supplying the algorithms and data AI uses to learn from. Big Data is often the source for this input due to the vast amount of information the process requires to accurately identify or reproduce human thoughts.

What is AI and how does it work?

Artificial intelligence (AI) mimics human intelligence, through various methodologies. Some include machine learning, neural networks, deep learning, cognitive computing, computer vision, and natural learning processing. AI can identify input and generate whatever the human wants ... with limits of AI's intelligence. There are two main functions of AI that we will be talking about: identification and production. AI identification is utilized in the way it sounds, for AI to be able to recognize different objects/words/sounds and report what they are. Facial recognition on your cell phone is a form of AI identification. AI can also produce new items by taking in data from humans and learning from it with the goal of copying the style of the input.

[Check out the examples of AI identification and production on the next page:](#)

What is Quick, Draw! and how does it work?

Identification

Video Introduction: [Quick, Draw!](#)

Definition: Quick, Draw! is a game built with machine learning, which you just learned about. After being given a prompt of an object to draw, you begin your doodle on the screen. Meanwhile, a neural network, which is an AI methodology that uses machine learning techniques, tries to identify what you're drawing. It matches lines you draw, and the order in which you draw them, to determine which of its known drawn images your doodle most closely resembles. Of course, it doesn't always work. But the more you play with it, the more it will learn. This is because Quick, Draw! is an open source program, meaning the data is freely given and freely available. Specifically, this program keeps every drawing that is created in order to optimize its ever-evolving "definitions" of each object drawing. This identification-based AI utilizes big data, which is necessary to increase its accuracy of prediction.

-- [Image of 111,610 bird drawings](#) ---

Other AI Applications

Production

You were just introduced to the application of identification-based AI through Quick, Draw!. This neural network used big data and machine learning to identify objects based on previous data. There are other strategies of AI such as production AI. This AI tries to generate things from drawings to sentences by learning "rules" or trends from data it receives. In effect, its goal is to recreate those things based on the rules it learned. Here are some applications to explore production AI.

- [Open AI Jukebox](#): a neural net that generates music
Learn more about OpenAI Jukebox: [Take on Me by AI](#)
- [Artbreeder](#): Generative Adversarial Networks that allow for new forms of creativity and collaboration in visual art. Learn more about Artbreeder: [Introduction to Artbreeder](#)
- [Google AI Experiments](#): other experiments by Google that utilize AI

Ethics of Creative AI

These kinds of applications of artificial intelligence are fascinating, but could there be unforeseen consequences that come with them? Like any other scientific field, big data and machine learning have many ethical implications, and many of these questions remain unanswered. For example, if an image-generating AI learns from previous works of art, how much credit do those past artists receive for the AI's creation? Should the writer of the AI's code own the copyright for the image? Though questions like these seem unimportant, as creative AI becomes more common and useful, governments and the general public will need to reach some sort of solution.

- [Pamphlet of information](#)
- An [article](#) written by a patent lawyer who is an expert in artificial intelligence
- A helpful [explanation](#) of deep fakes from MIT Sloan School of Management