DeepDream reveals the connection between art and mathematics

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In 2014 the GoogLeNet team within the framework of the ImageNet Large Scale Visual Recognition Challenge [1] made an important step in the development of deep convolutional networks. DeepDream as a computer vision program that go deeper with convolutions was released in 2015. The goal was to improve the process of image classification, as well as the detection of image content. The success of the program was in its computational efficiency and improved ability to analyze images using multiple levels of coding.

With regard to the interpretation of two-dimensional digital images, this branch of machine learning, based on neural networks, and more commonly known as deep learning, can be represented as a complex data filtering system that processes the information layer linearly, and the algorithmic layer by a nonlinear method. DeepDream is an attempt to uncover through visualization, what happens in the "black box".

The Google project focuses on the visualization of functions, which was defined as the ability of the network to respond to questions by generating examples. In fact, function visualization is a term that can be used to describe the process and product of visual analysis of DeepDream image.

Soon, visualization was turned into an "augmented paintbrush," and this was an unintended but interesting consequence of the study, which switched DeepDream's focus away from the goal of exposing the processes of the neural network during image classification [2]. In February 2016, the Gray Area Foundation held an exhibition of works created with the help of a special tool DeepDream Generator. The main idea of the exhibition: "...machine knowledge is an innovation that will profoundly affect art" [3]. Tech-literate artists took notes, and once the code was released, many produced their own Deep Dream images. A few of them went on display at the exhibition. And this emphasized the collaborations between the arts and technology.

But what really distinguishes Deep Dream is the machine learning techniques used to generate the images, rather than the images themselves. And we still have to answer the question: "Is this an art?"

References

[1] http://image-net.org/challenges/LSVRC/2014/eccv2014;;

[2] https://edoc.hu-berlin.de/bitstream/handle/18452/19403/Spratt%20-%20final.pdf?sequence=1;

[3] https://medium.com/artists-and-machine-intelligence/what-is-ami-ccd936394a83.