

DEEP DREAM

UNLEASHING THE IMAGINATION OF
ARTIFICIAL INTELLIGENCE

CSE457

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WHAT IS DEEP DREAM ?





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DeepDream is a computer vision program that uses a convolutional neural network to find and enhance patterns in images via algorithmic pareidolia, thus creating a dream-like appearance reminiscent of a psychedelic experience in the deliberately overprocessed images.



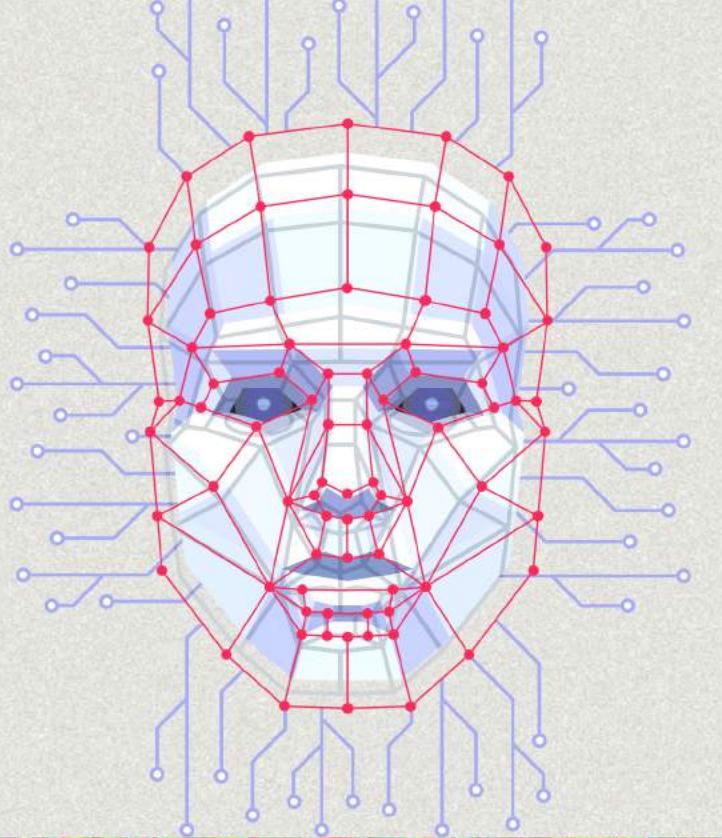
A DeepDream image showing a distorted landscape with various colors and patterns, serving as a background for the title.

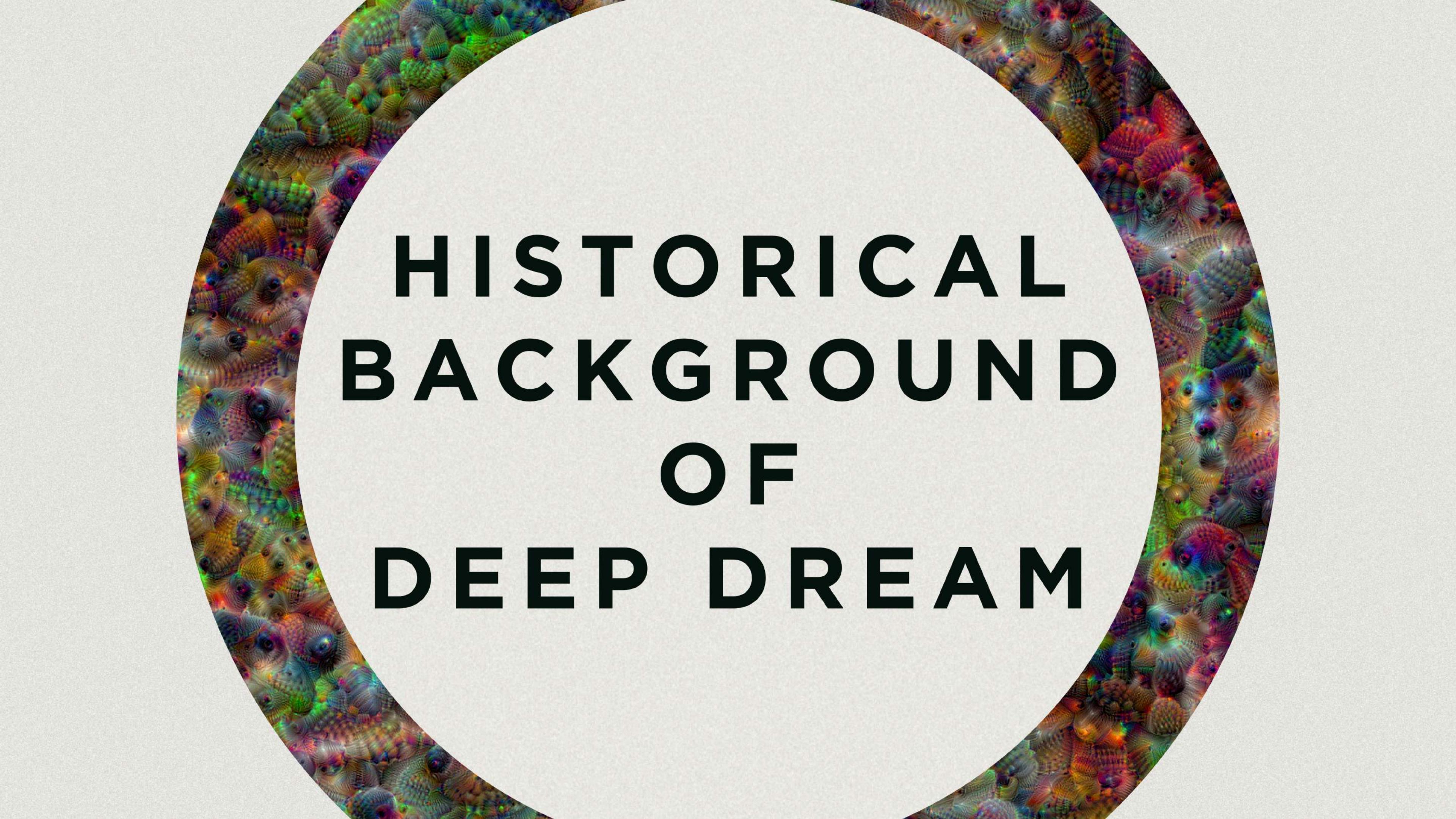
PURPOSE OF
DEEP DREAM

PURPOSE OF DEEP DREAM

To provide insights into how neural networks perceive and process visual information.

To create surreal and hallucinogenic images.





HISTORICAL BACKGROUND OF DEEP DREAM



HISTORICAL BACKGROUND OF DEEP DREAM

Created in 2015 by
Google researchers, led
by Alexander Mordvintsev



Alexander Mordvintsev

HISTORICAL BACKGROUND OF DEEP DREAM

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Alexander Mordvintsev Research Scientist
May 18, 2015 to Google.com



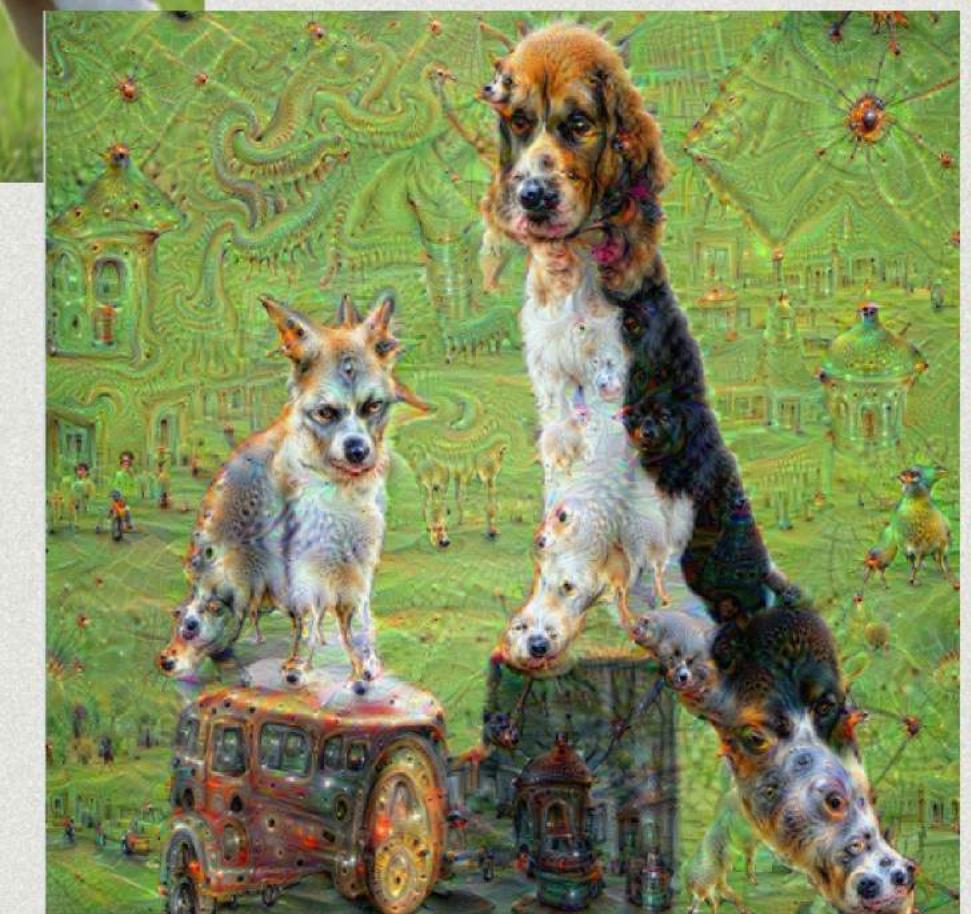
Not sure if it was a good idea to try DNN image enhancement at 2 am. How do I sleep now?

Should we make it a Google Photos feature?

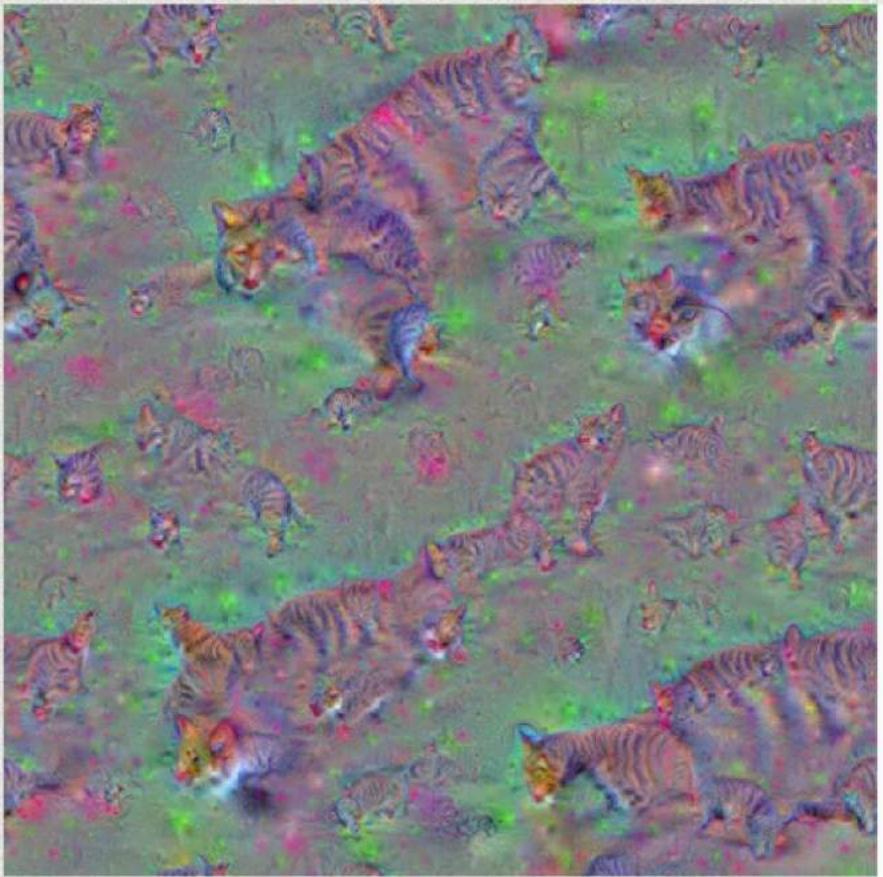
HINT: Look closer!



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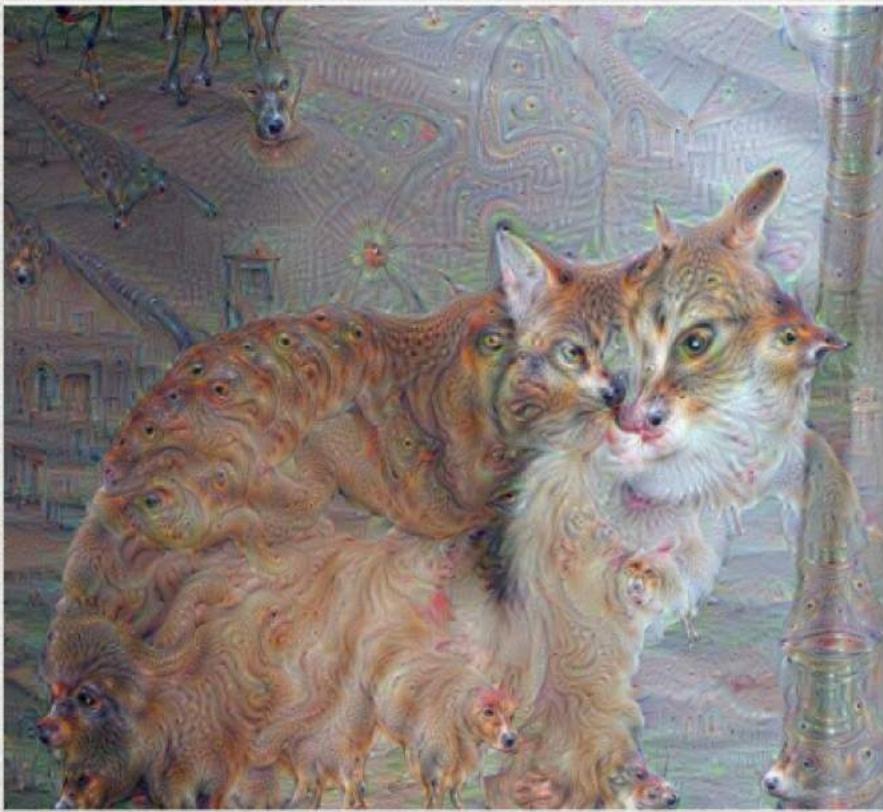


First post of Alexander Mordvintsev about his research.



Cats

One of the first images ever enhanced with Google DeepDream.



Father Cat

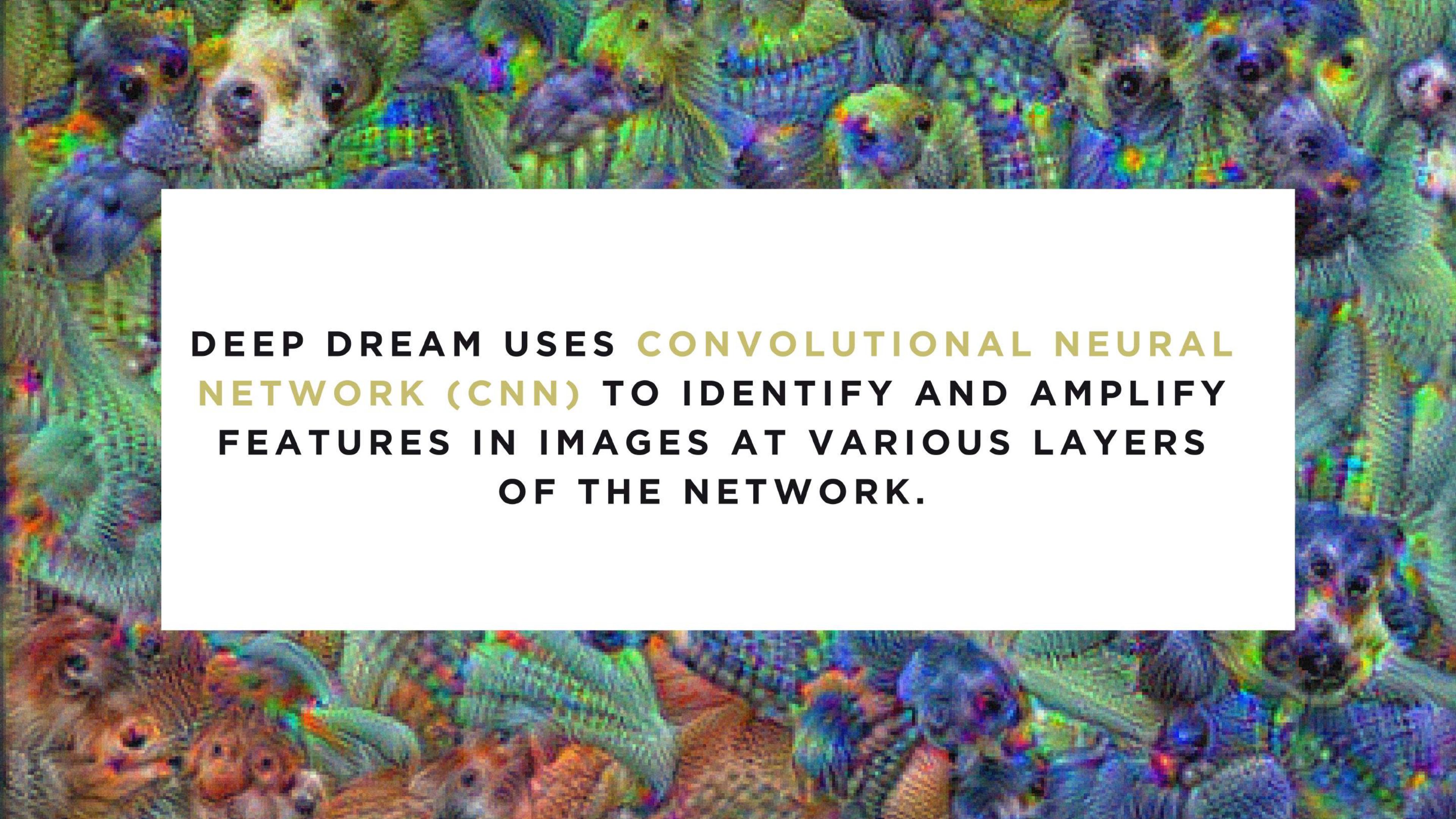
One of the first images ever enhanced with Google DeepDream.

- The concept of neural networks "dreaming" became popular with Google's DeepDream in 2015.

- Though the idea is older and similar methods existed, Google's open-source release led to the creation of various tools for users to transform their photos.



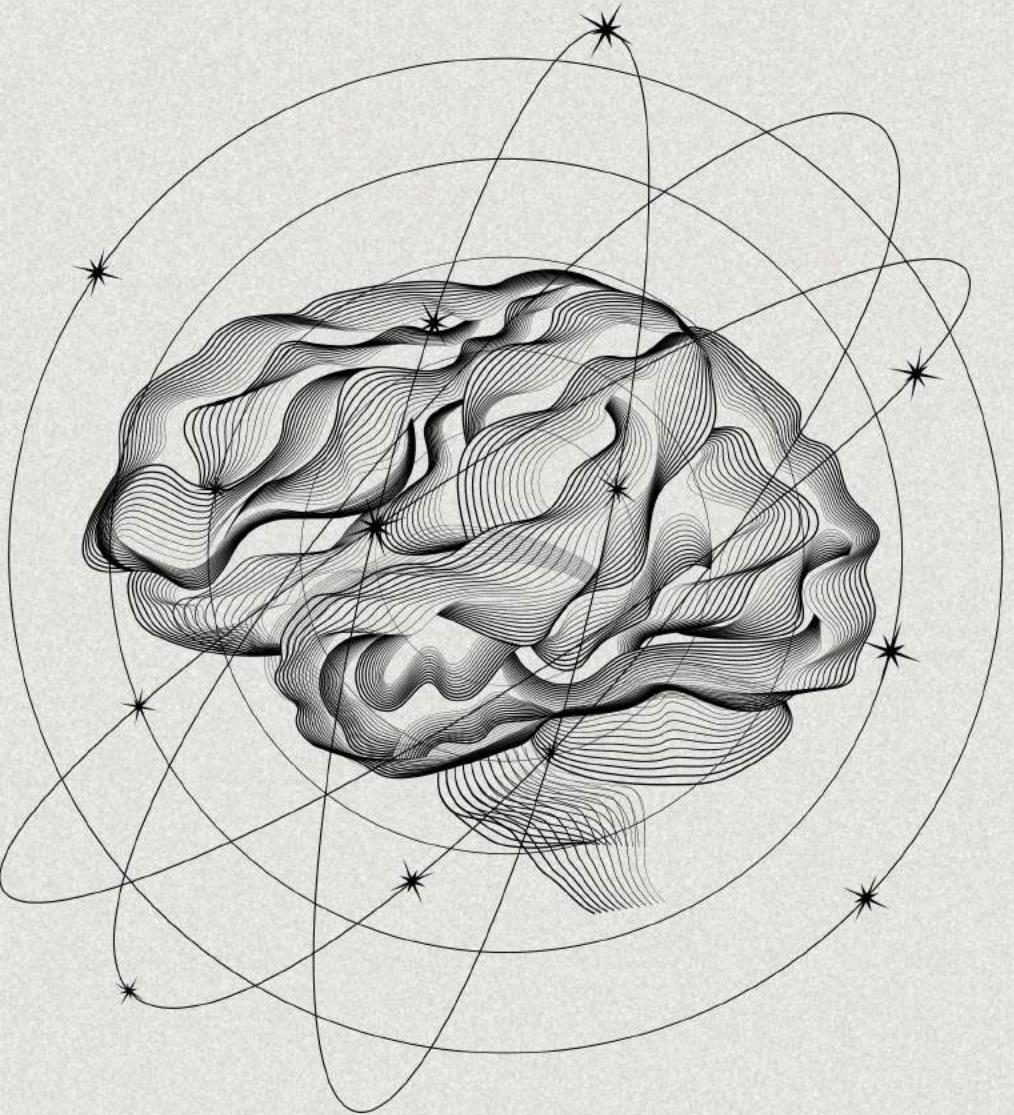
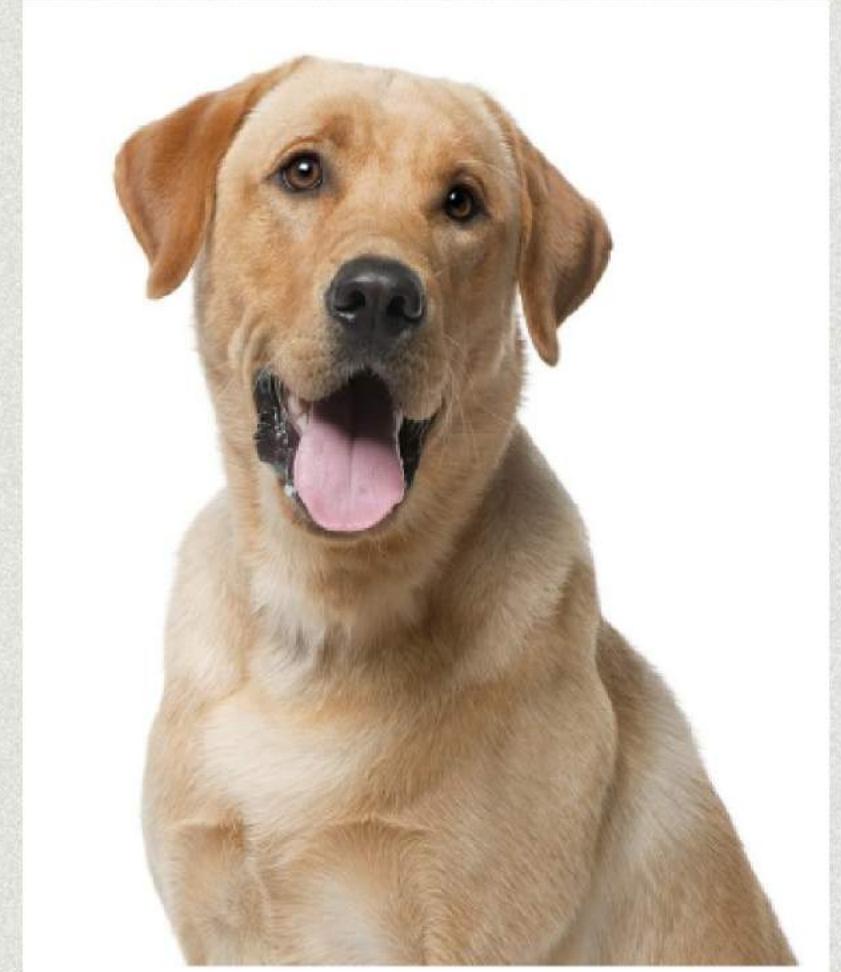
**WHAT IS
CNN?**



**DEEP DREAM USES CONVOLUTIONAL NEURAL
NETWORK (CNN) TO IDENTIFY AND AMPLIFY
FEATURES IN IMAGES AT VARIOUS LAYERS
OF THE NETWORK.**

WHAT IS CNN?

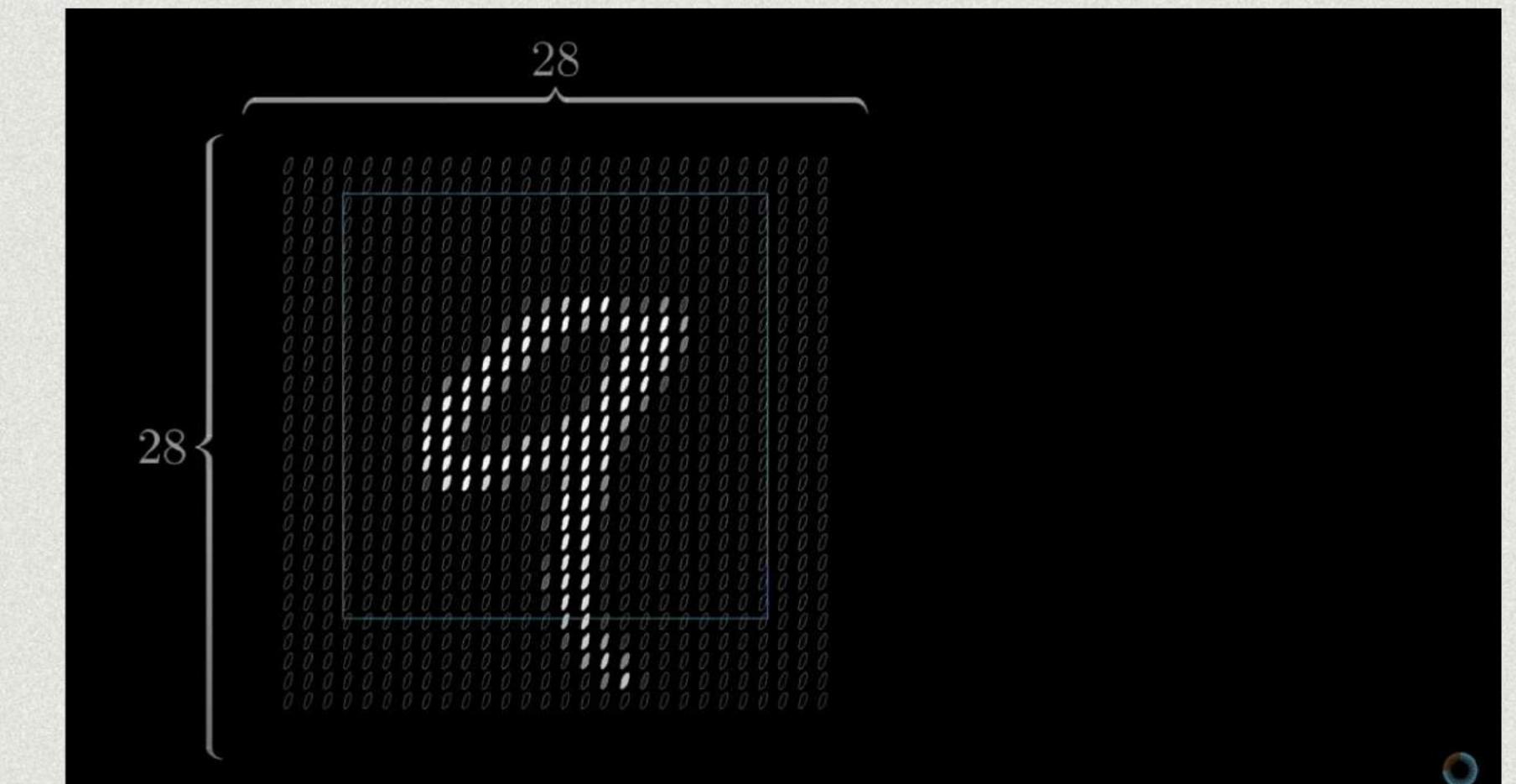
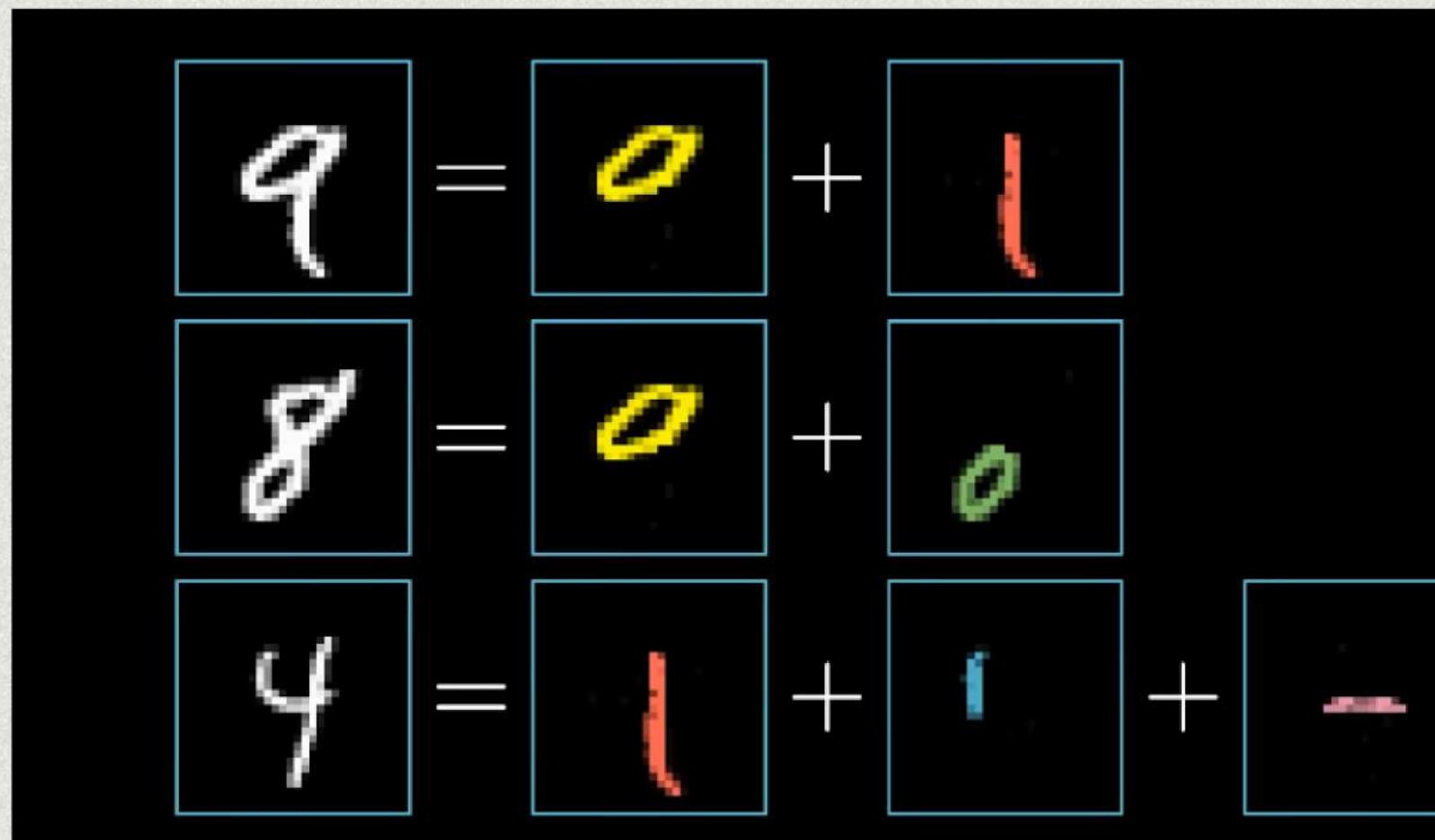
Humans identify things they see by processing visual information in the brain, comparing it with stored memories, and using contextual clues.



*specific
feature*

CONVOLUTIONAL NEURAL NETWORK

is a deep learning model that uses filters to automatically detect and learn features from images for tasks like recognition and classification.

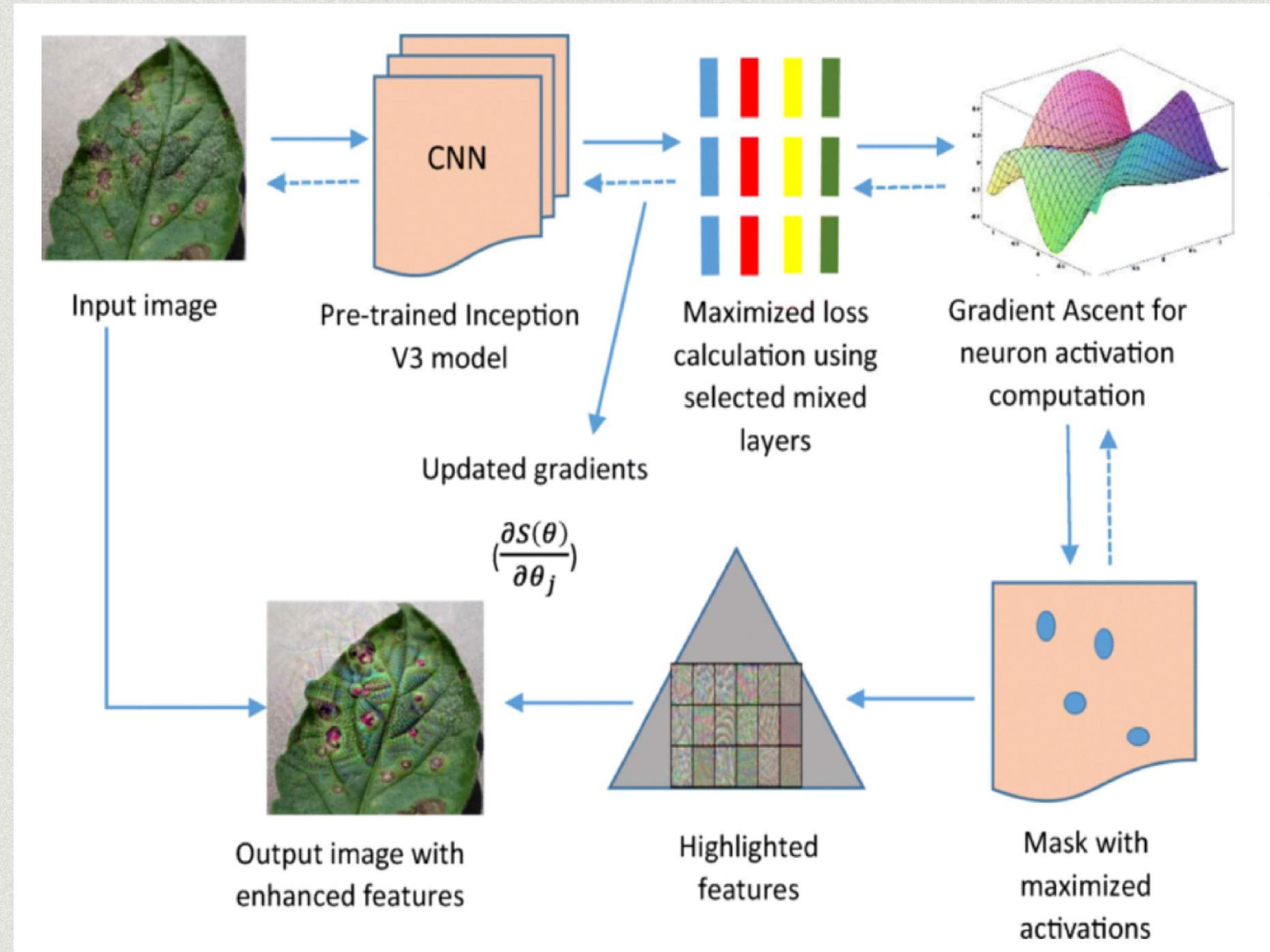


A highly distorted, colorful DeepDream image of a lion's face. The features are overemphasized with bright, swirling patterns of red, orange, yellow, green, blue, and purple. The text is overlaid on this abstract background.

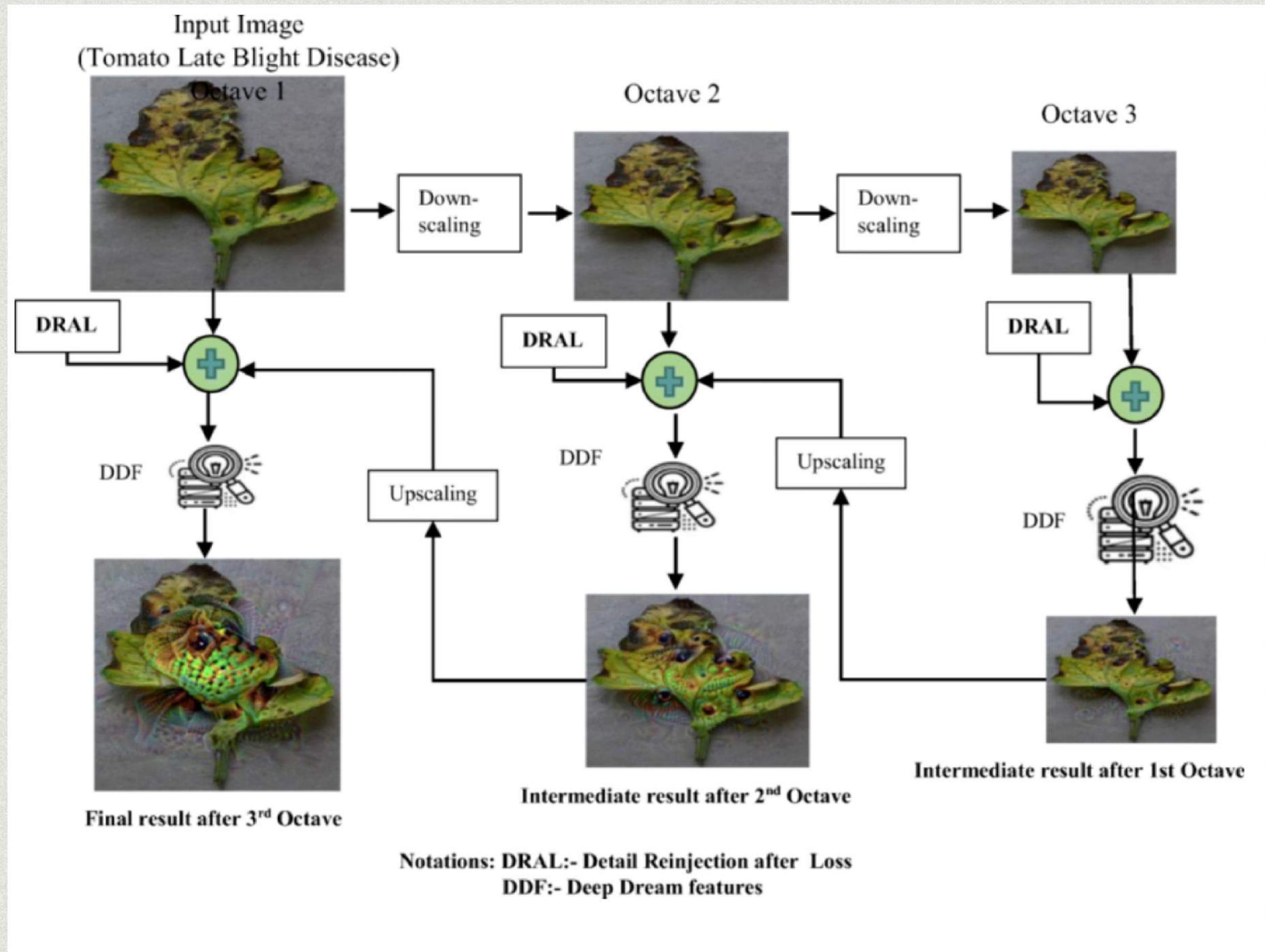
HOW
DEEPPDREAM
WORKS?

HOW DEEP DREAM WORKS

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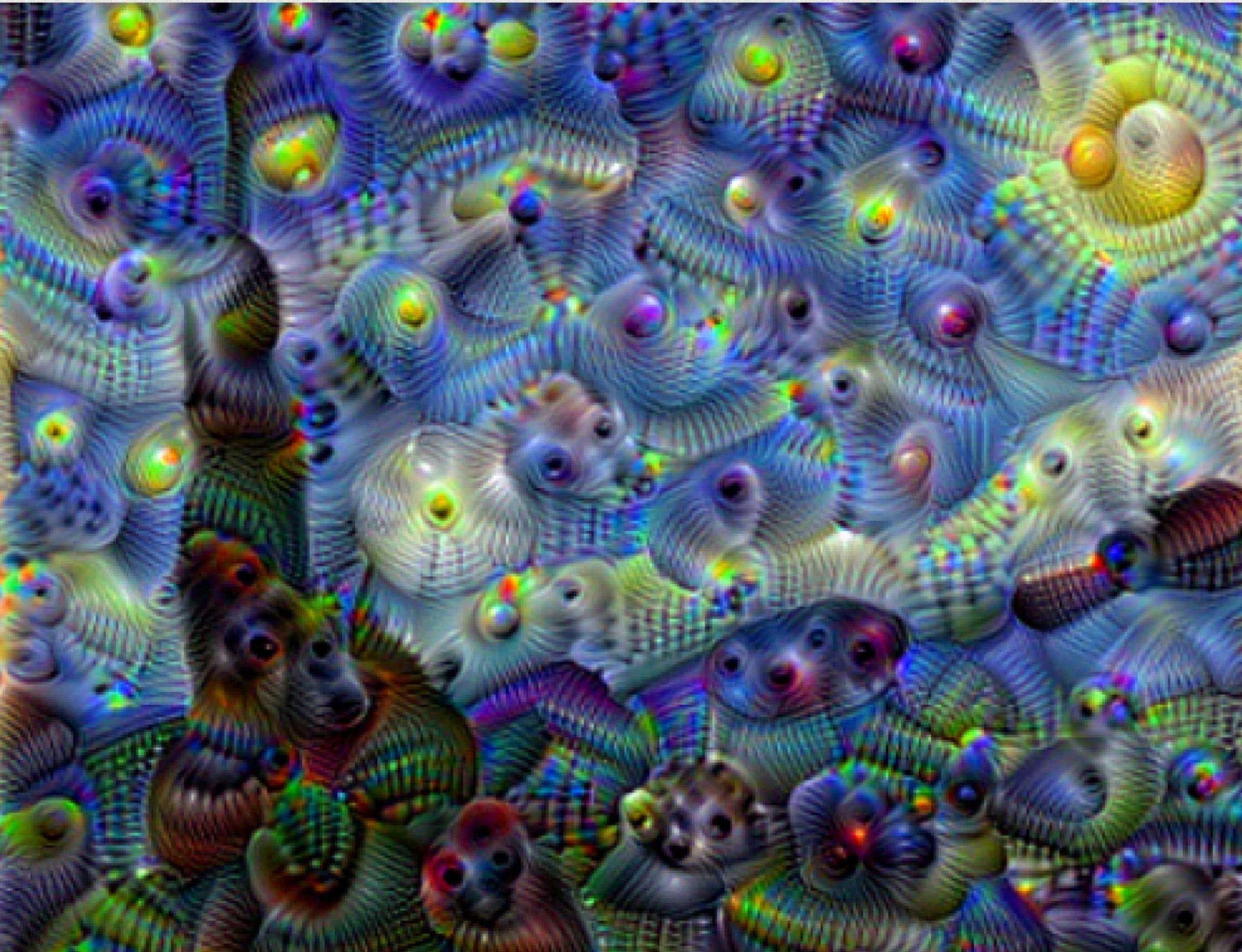
HOW DEEP DREAM WORKS



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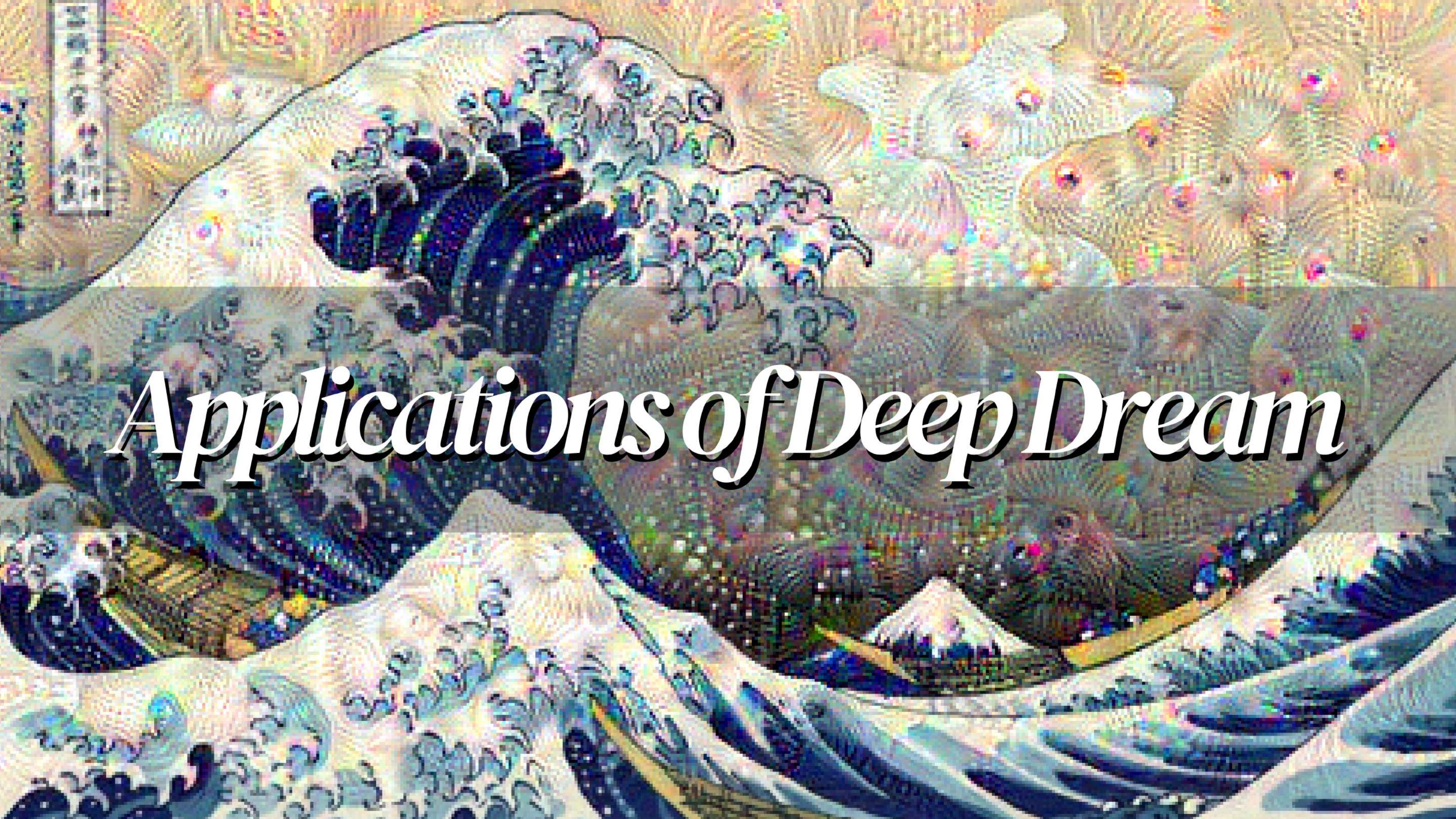


HOW DEEP DREAM WORKS

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DeepDream tweaks the image to make those recognized patterns even more prominent. It essentially exaggerates what the network finds important. This process is repeated over and over again, each time enhancing the features the network finds most interesting. The more it iterates, the more the image takes on a dream-like, psychedelic quality.



Applications of DeepDream

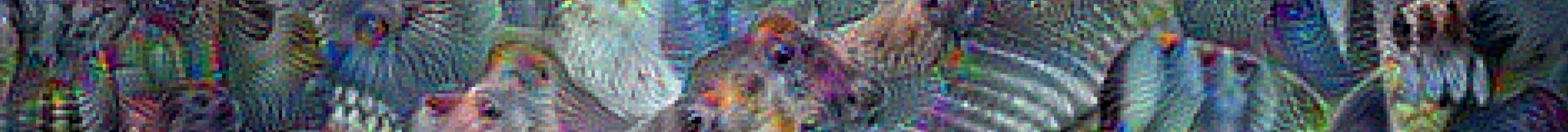


Used by artists to create unique and surreal artworks.

A heavily DeepDream-
processed photograph of three
men in a pool



The Scream by Edvard Munch with
DeepDream effect using VGG16
network trained on ImageNet



Used by artists to create unique and surreal artworks.



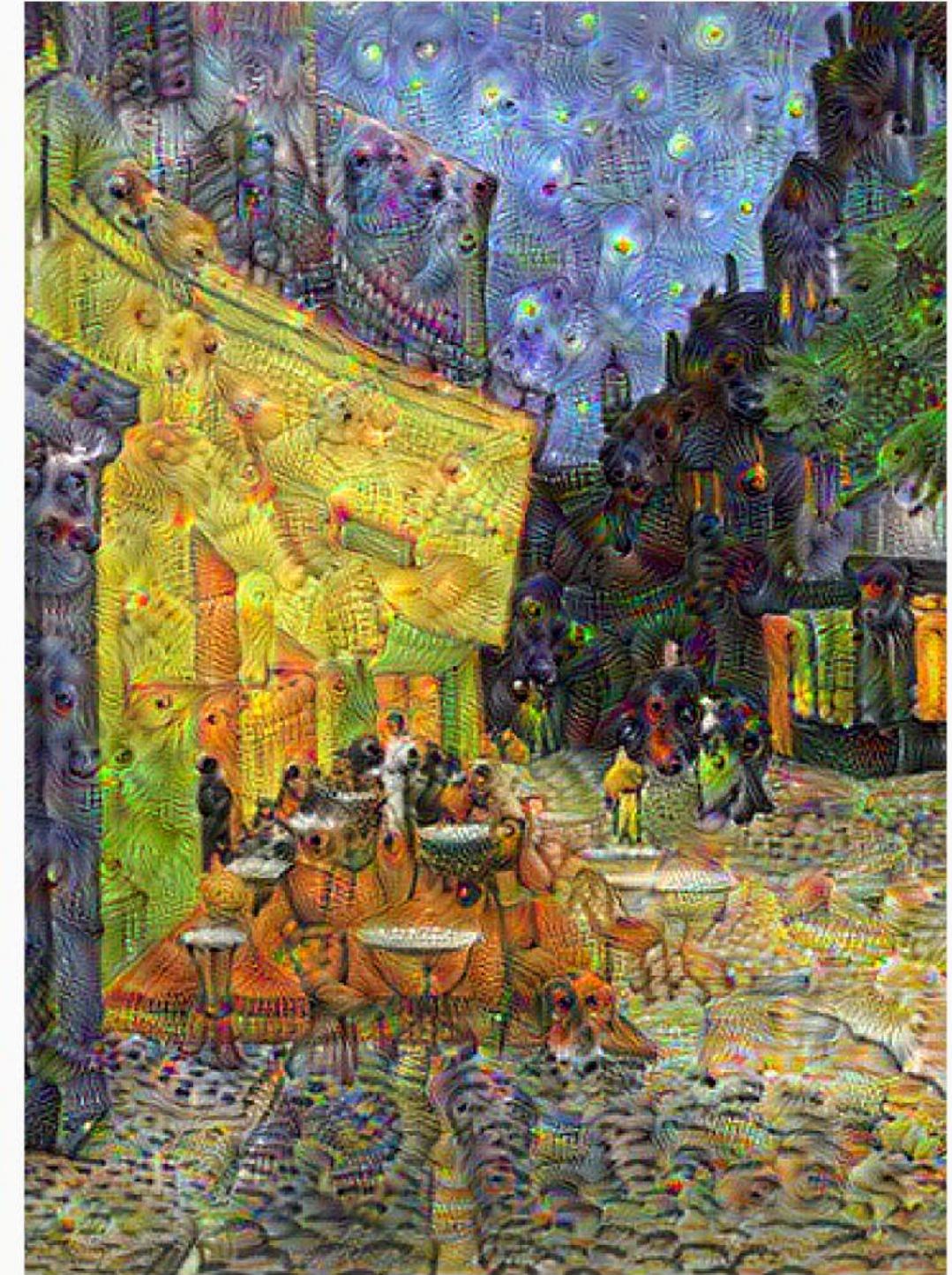
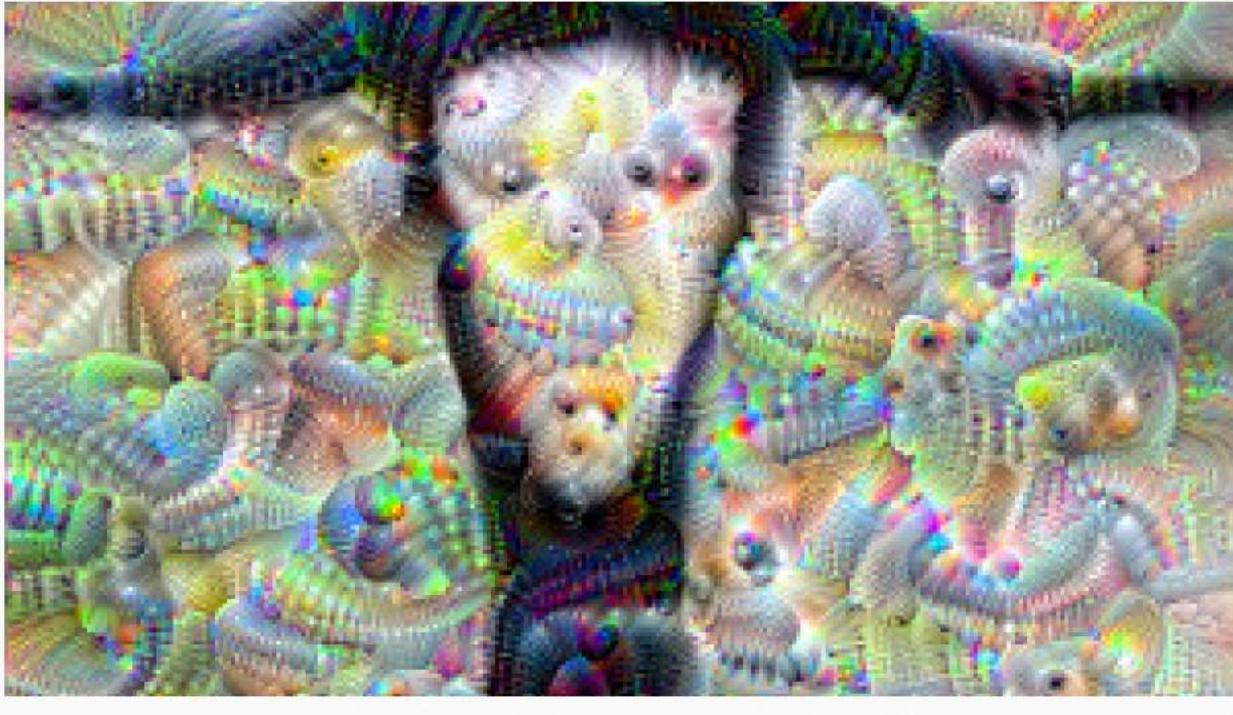
DeepDream was used for Foster the People's music video for the song "Doing It for the Money".

Research and Education

Helps in understanding the inner workings of neural networks.

Educational tool for illustrating neural network concepts.







A landscape photograph of a forest path. The foreground is covered in fallen leaves in shades of brown, orange, and yellow. A small wooden bridge spans a stream in the middle ground. The background features dense trees with vibrant autumn foliage in reds, oranges, and yellows.

Thank you