
GENERATIVE AI

Generative AI enables users to quickly generate new content based on a variety of inputs. Inputs and outputs to these models can include text, images, sounds, animation, 3D models, or other types of data.

Whereas traditional AI algorithms may be used to identify patterns within a training data set and make predictions, generative AI uses machine learning algorithms to create outputs based on a training data set.

How Does Generative AI Work?

3 Terms:

MACHINE LEARNING

DEEP LEARNING

NEURAL NETWORK

Neural networks is actually a sub-field of machine learning, and deep learning is a sub-field of neural networks.

Deep learning can ingest unstructured data in its raw form (e.g., text or images), and it can automatically determine the set of features which distinguish different categories of data from one another.
This eliminates some of the human intervention required and enables the use of larger data sets.

Machine learning is more dependent on human intervention to learn. Human experts determine the set of features to understand the differences between data inputs, usually requiring more structured data to learn.

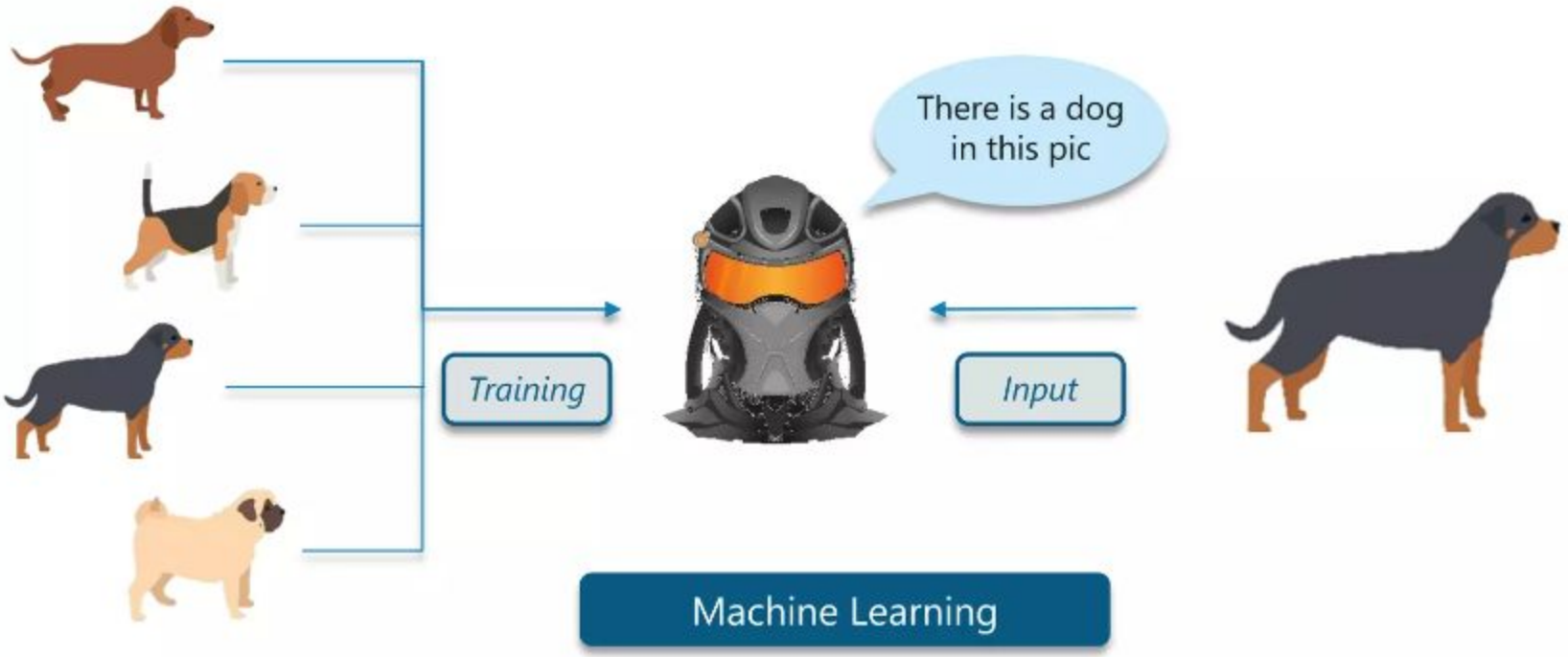
Neural networks, or artificial neural networks (ANNs), are comprised of node layers, containing an input layer, one or more hidden layers, and an output layer. Each node, or artificial neuron, connects to another and has an associated weight and threshold.

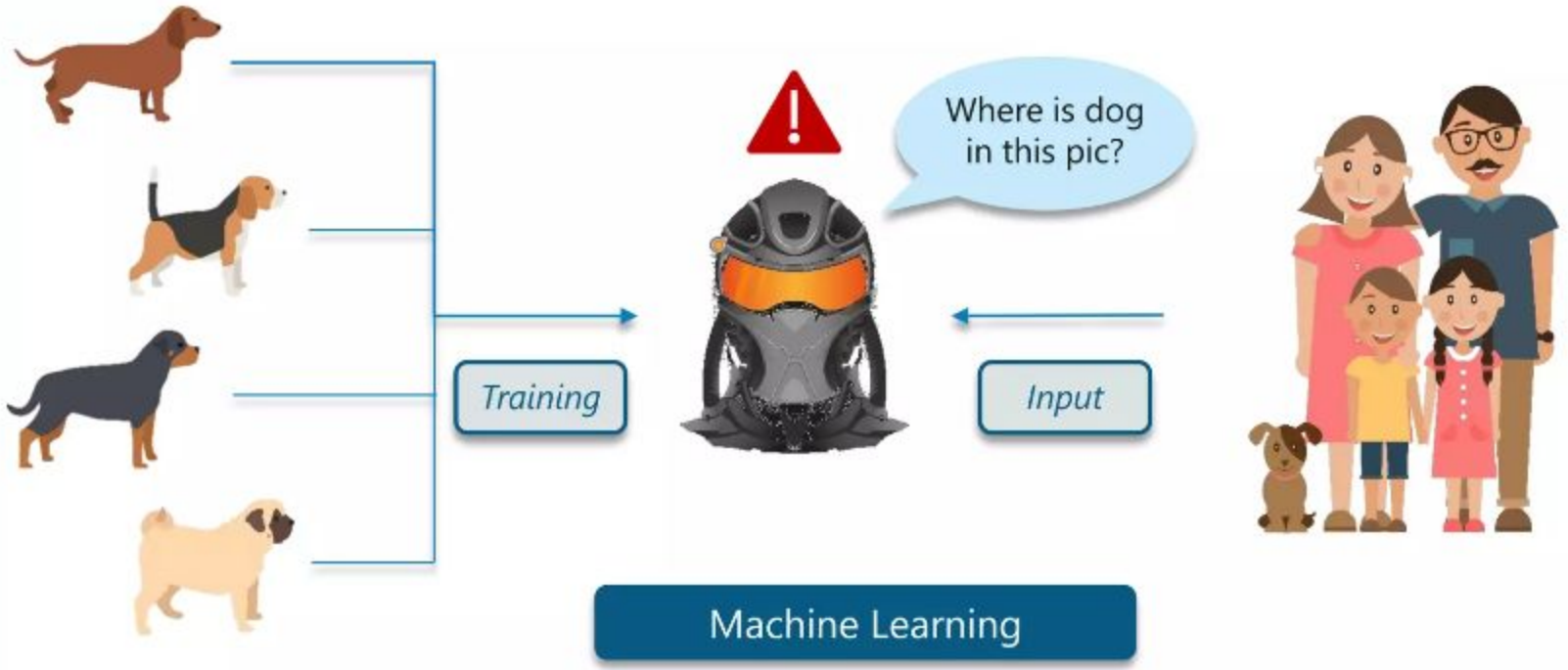
If the output of any individual node is above the specified threshold value, that node is activated, sending data to the next layer of the network.
Otherwise, no data is passed along to the next layer of the network by that node.

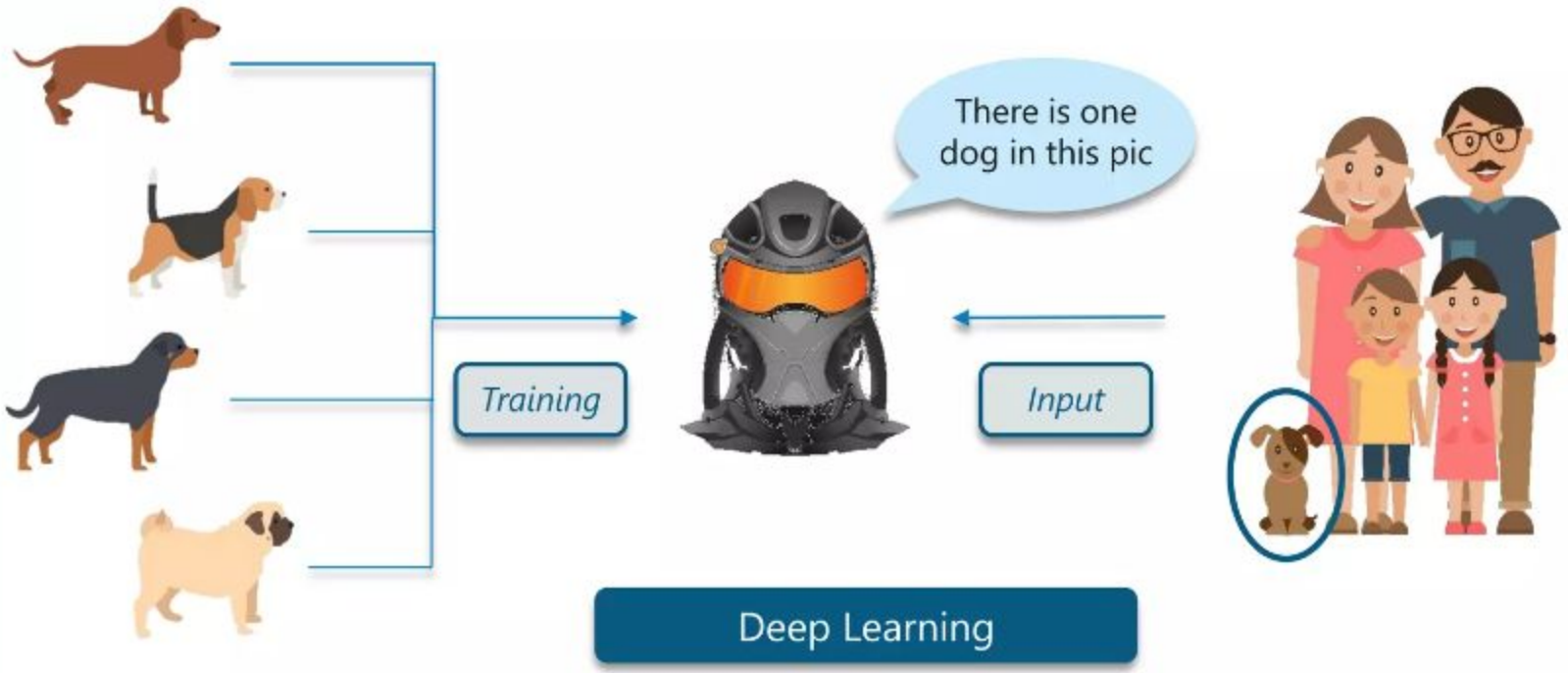
The “deep” in deep learning is just referring to the number of layers in a neural network.

A neural network that consists of more than three layers—which would be inclusive of the input and the output—can be considered a deep learning algorithm or a deep neural network.

A neural network that only has three layers is just a basic neural network.


There is a dog in this pic
Training
Input
Machine Learning


Where is dog in this pic?
Training
Input
Machine Learning


There is one dog in this pic
Training
Input
Deep Learning

MODELS

Diffusion models
Variational autoencoders (VAEs)
Generative adversarial networks (GANs)

Diffusion models: Also known as denoising diffusion probabilistic models (DDPMs), diffusion models are generative models that determine vectors in latent space through a two-step process during training. The two steps are forward diffusion and reverse diffusion. The forward diffusion process slowly adds random noise to training data, while the reverse process reverses the noise to reconstruct the data samples. Novel data can be generated by running the reverse denoising process starting from entirely random noise.

Variational autoencoders (VAEs): VAEs consist of two neural networks typically referred to as the encoder and decoder.

When given an input, an encoder converts it into a smaller, more dense representation of the data. This compressed representation preserves the information that's needed for a decoder to reconstruct the original input data, while discarding any irrelevant information. The encoder and decoder work together to learn an efficient and simple latent data representation. This allows the user to easily sample new latent representations that can be mapped through the decoder to generate novel data.

GANs pit two neural networks against each other: a generator that generates new examples and a discriminator that learns to distinguish the generated content as either real (from the domain) or fake (generated).
The two models are trained together and get smarter as the generator produces better content and the discriminator gets better at spotting the generated content. This procedure repeats, pushing both to continually improve after every iteration until the generated content is indistinguishable from the existing content.

MY PROJECT

Creating a JARVIS AI 3.0 Virtual Assistant AGI using Voice Recognition , Natural Language Processing, Powered By GPT-3
AI-powered personal assistant just like J.A.R.V.I.S. For that, you will need OpenAI API, text-to-speech library, speech recognition library, and generative AI.