Introduction to Deep Learning

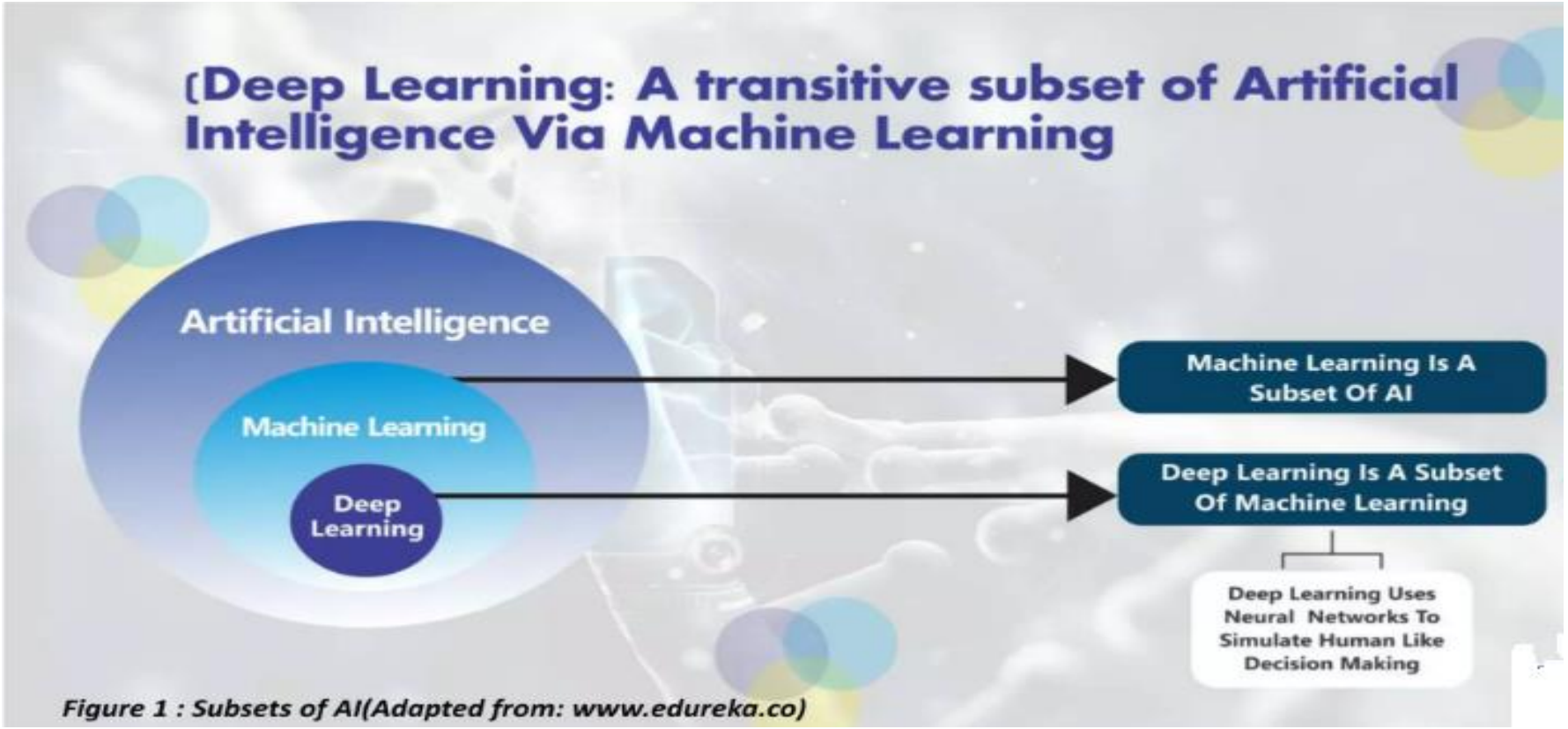

Figure 1 : Subsets of AI(Adapted from: www.edureka.co)

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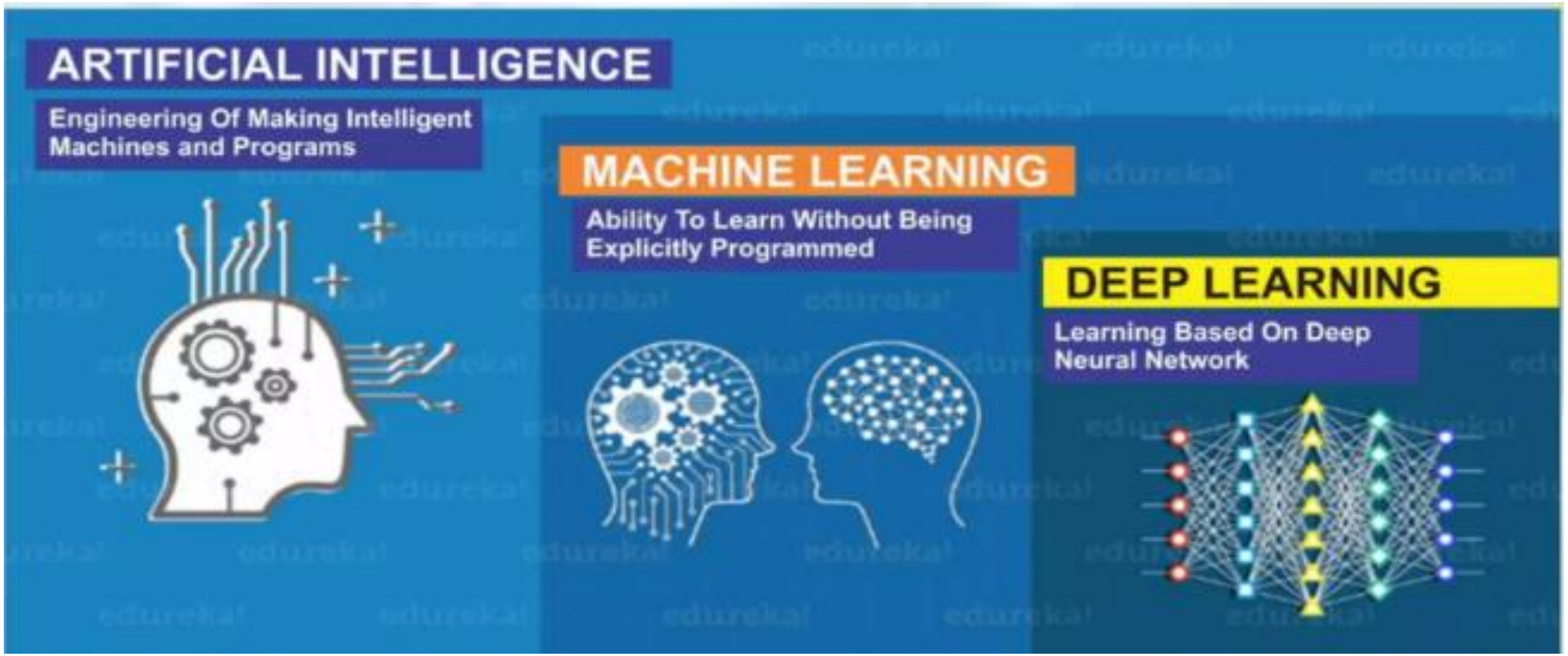


Limitations of Machine Learning

One Of The Big Challenges With Traditional Machine Learning Models Is A Process Called Feature Extraction. For Complex Problems Such As Object Recognition Of Handwriting Recognition, This Is A Huge Challenge.

Deep Learning To The Rescue

Deep Learning Modes Are Capable Of Focus On The Right Features By Themselves, Requiring Little Guidance From The Programmer.
These Models Can Also Partially Solve The Dimensionality Problem.

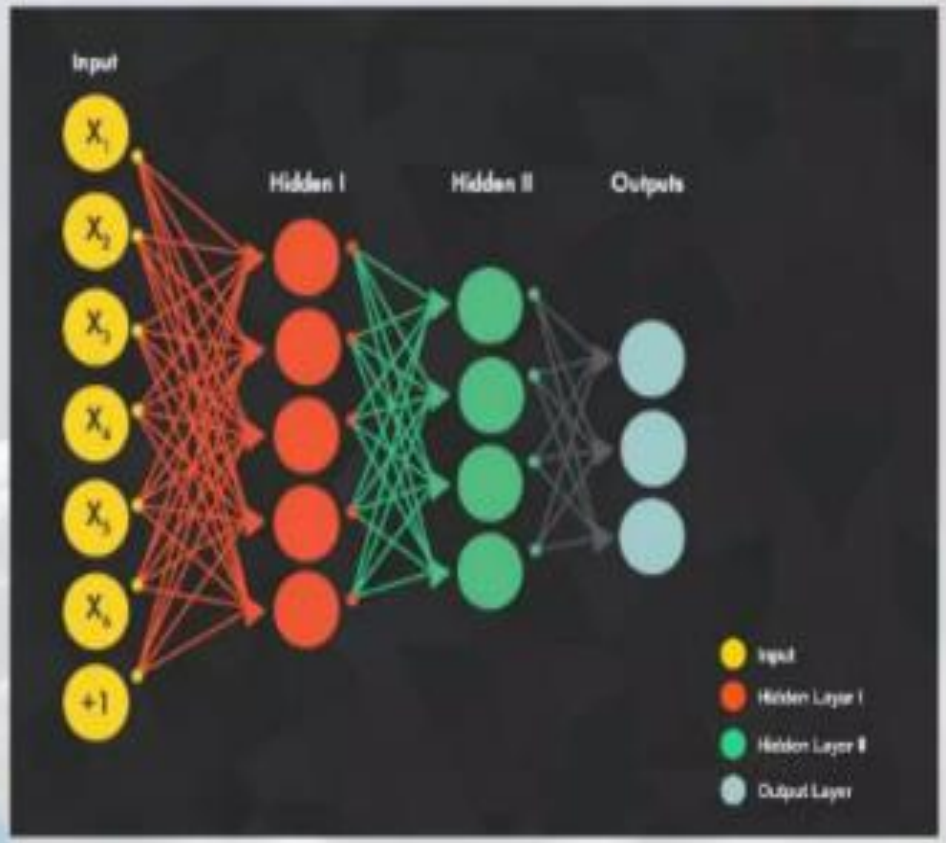
The Idea Behind Deep Learning Is To Build Learning Algorithms That Mimic Brain

Figure 5: Limitation of ML (Source: www.edureka.co)

What Is Deep Learning?

- A class of machine learning techniques that exploit many layer of non linear information processing for supervised or unsupervised feature extraction and trasformation and for pattern analysis and classification (Deng & Yu, 2014)

- It typically uses deep artificial neural networks.



Unique Characteristics Of Deep Learning

- Automatic feature extraction
- Makes use of High-dimensional data for training
- Defines higher level features from lower level features obtained from the previous layer
- It is a representation learning method
- Can solve real-world or unconstrained problems such as NLP, image recognition etc

Some Deep Learning Software

The Following Are The List Of Some Deep Learning Software's But Not Limited To:

- Tensorflow
- Theano
- Torch
- Keras
- Blocks
- Caffe
- Caffe2
- MxNet

- MatConvNet
- Microsoft Cognitive Toolkit
- Deep learning 4j
- Dlib

...but not limited to these.

Building Blocks of Deep Networks

Building deep networks goes beyond basic feed-forward multilayer neural networks.

Three specific building blocks:-

- Feed-forward multilayer neural networks
- RBMs
- Autoencoders