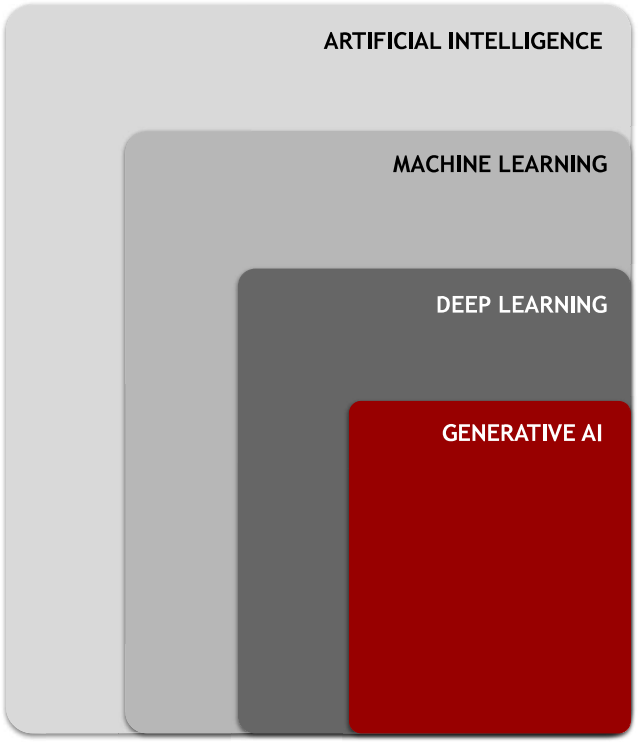
Machine Learning is a type of AI, and Generative AI (GenAI) is a type of machine learning



1956 Class of problems we can solve when ***computers think/act like humans***

1997 ***Make predictions*** based on relationships inferred from historical data

2012 A ML Technique in which layer of ***neural networks are used to process data***

2020 ***Generate a wide variety of content*** using complex models trained on enormous datasets

Overview - What is AI?

It is the quest to build machines that can reason, learn, and act intelligently, and it has barely begun

MIT

Artificial intelligence (AI) applies advanced analysis and logic-based techniques, including machine learning, to interpret events, support and automate decisions and take action

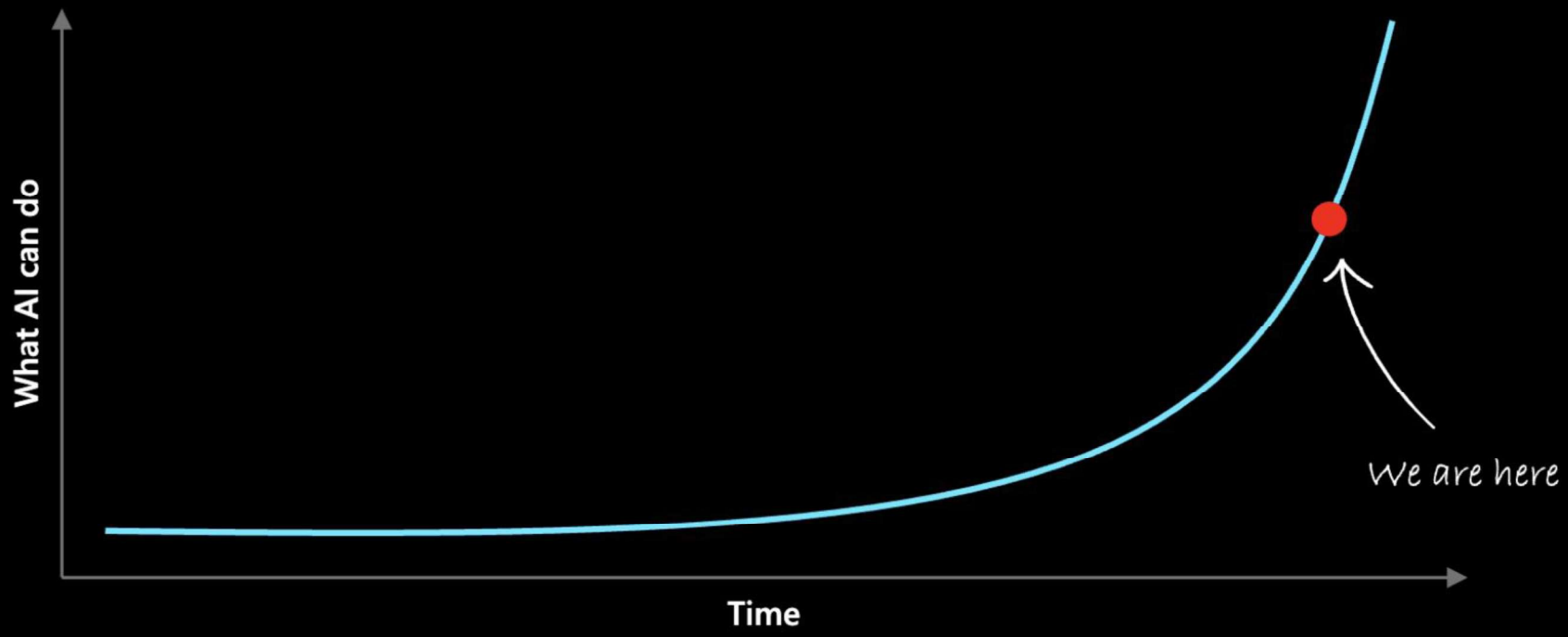
Gartner

AI is computer programming that learns and adapts. It can't solve every problem, but its potential to improve our lives is profound

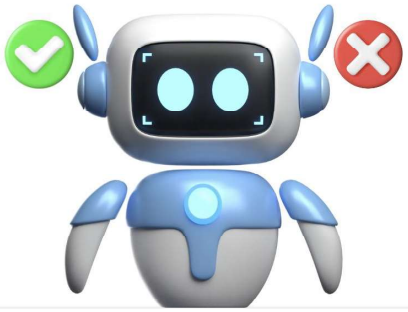
Google

It is the capability of a computer system to mimic human-like cognitive functions such as learning and problem-solving

Microsoft

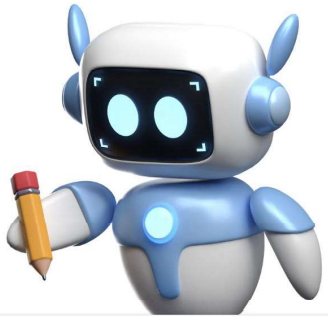

What AI can do
Time
We are here

Key ML Types



DISCRIMINATIVE MODEL

Used to classify or predict



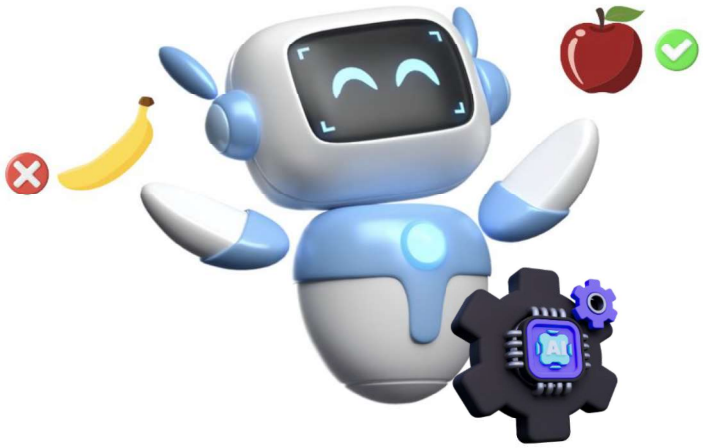
GENERATIVE MODEL

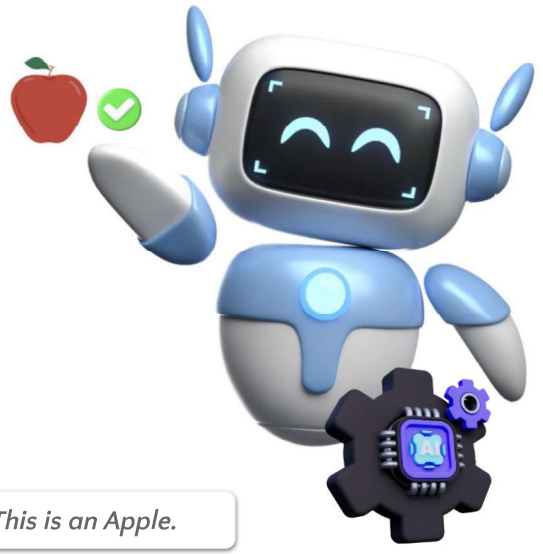
Generates new data

Discriminative Model

This is not an Apple.

This is an Apple.

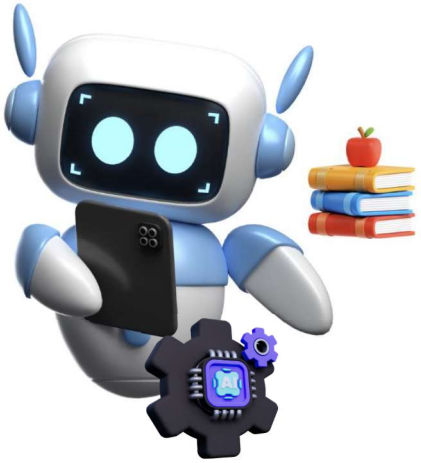




This is an Apple.

Generative Language Model

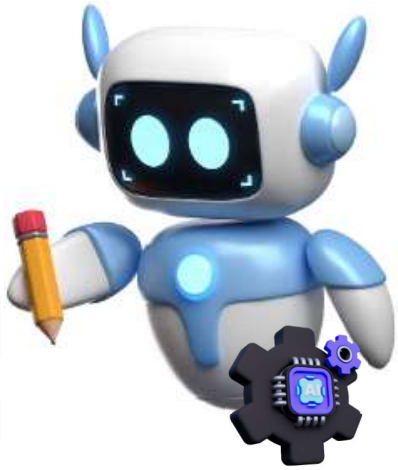
Read this huge pile of books on apples



So, you have read about apple and its various types

Now tell me what is an apple?

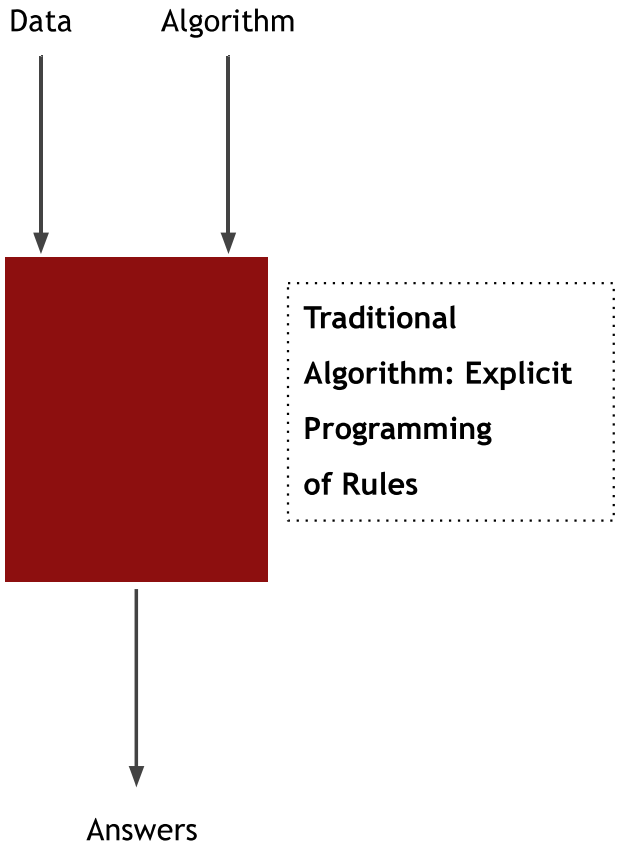
An apple is a ...

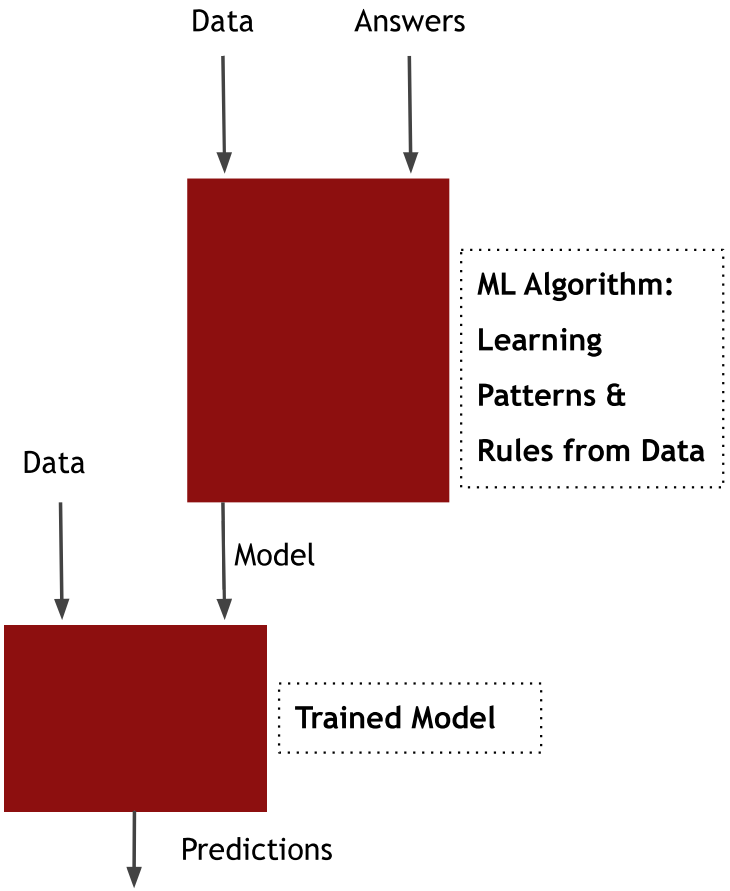


Machine learning allows computers to learn without explicit programming

- In traditional programming, the programmer writes the code to perform a task
- In machine learning, algorithms are trained to make predictions using historical data
  - Computers iterate over the algorithm making adjustments to find the best solution

Traditional Systems vs Machine Learning based AI Systems



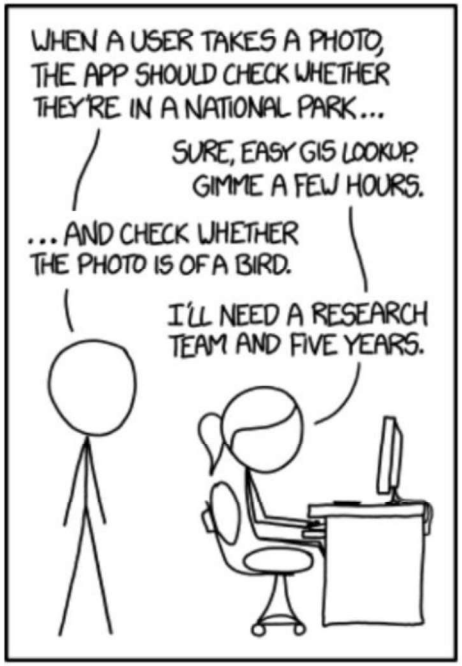


Example of Spam Classification using Traditional Systems

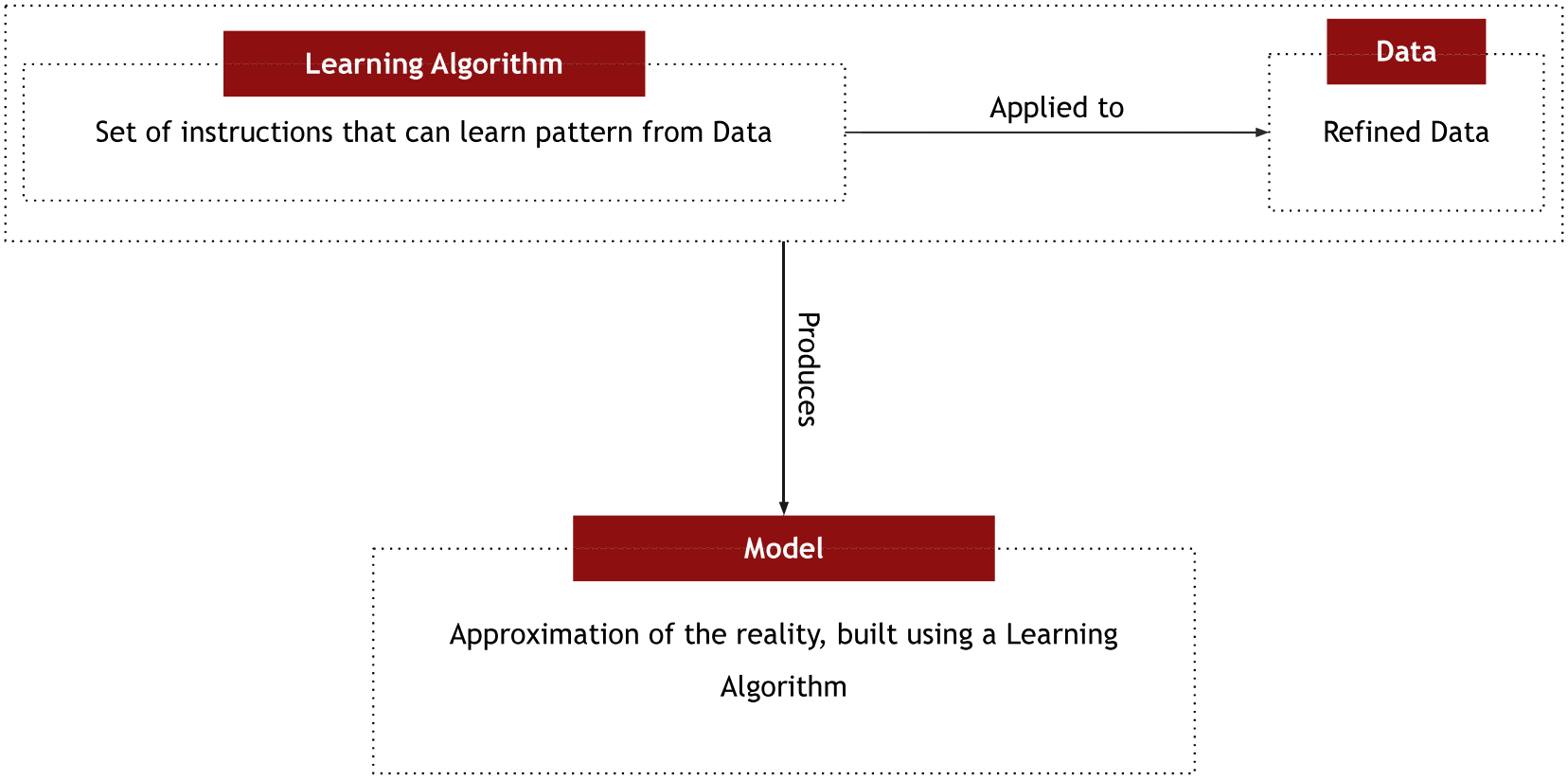
```
#!/usr/bin/env python

import sys
for line in sys.stdin:
  if "Make MONEY Fa$t At Home!!!" in line:
      print("This message is likely spam")
  if "Happy Birthday from Aunt Betty" in line:
      print("This message is probably OK")
```

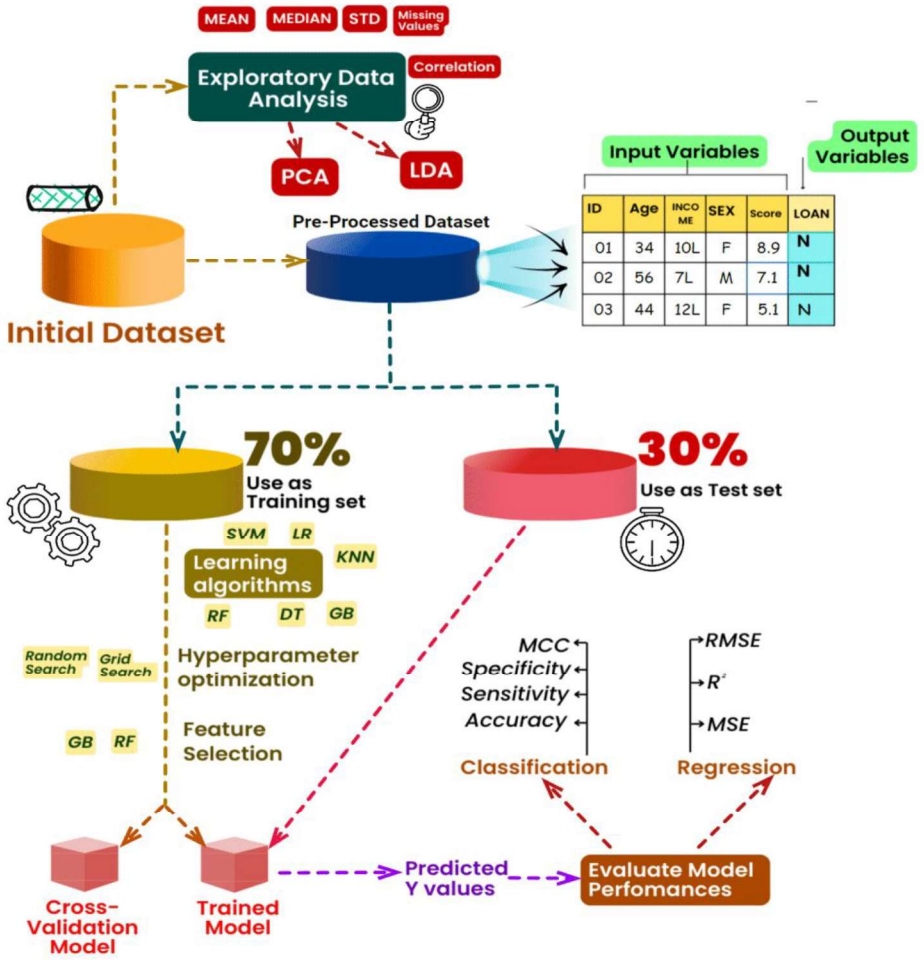
Impossible to solve Computer Vision Problems using Software Engineering based approach

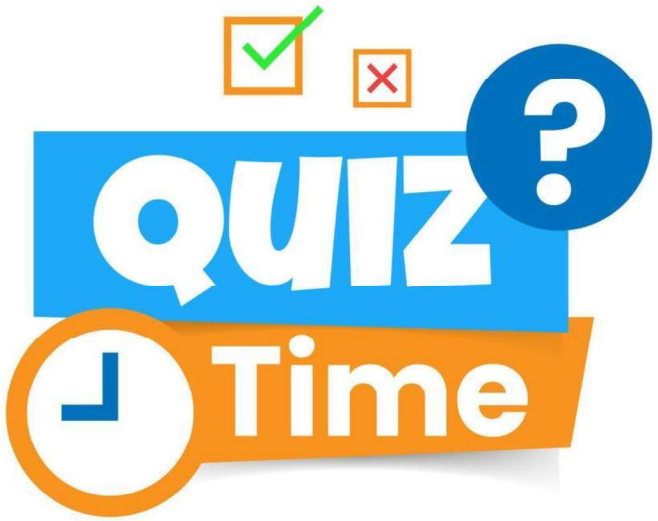


Learning Algorithm vs Model



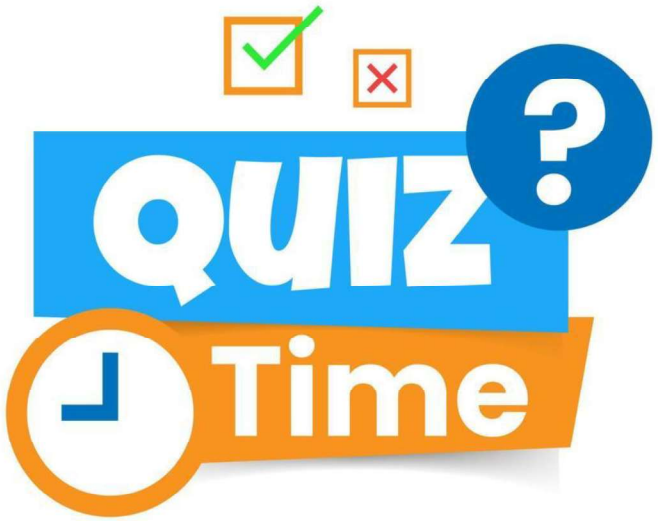
Supervised Machine Learning at a glance!





You are a data scientist at SocialNet, a fictitious social media company similar to Facebook. The company receives millions of comments daily and wants to classify them automatically into categories such as "positive", "negative", or "neutral". Which approach would be best suited to handle the immense volume and variability of these comments?

A	Designing a conventional programming algorithm that classifies comments based on predefined rules and keywords.
B	Implementing a machine learning based system that can be trained on labeled examples and adapt to new patterns over time.



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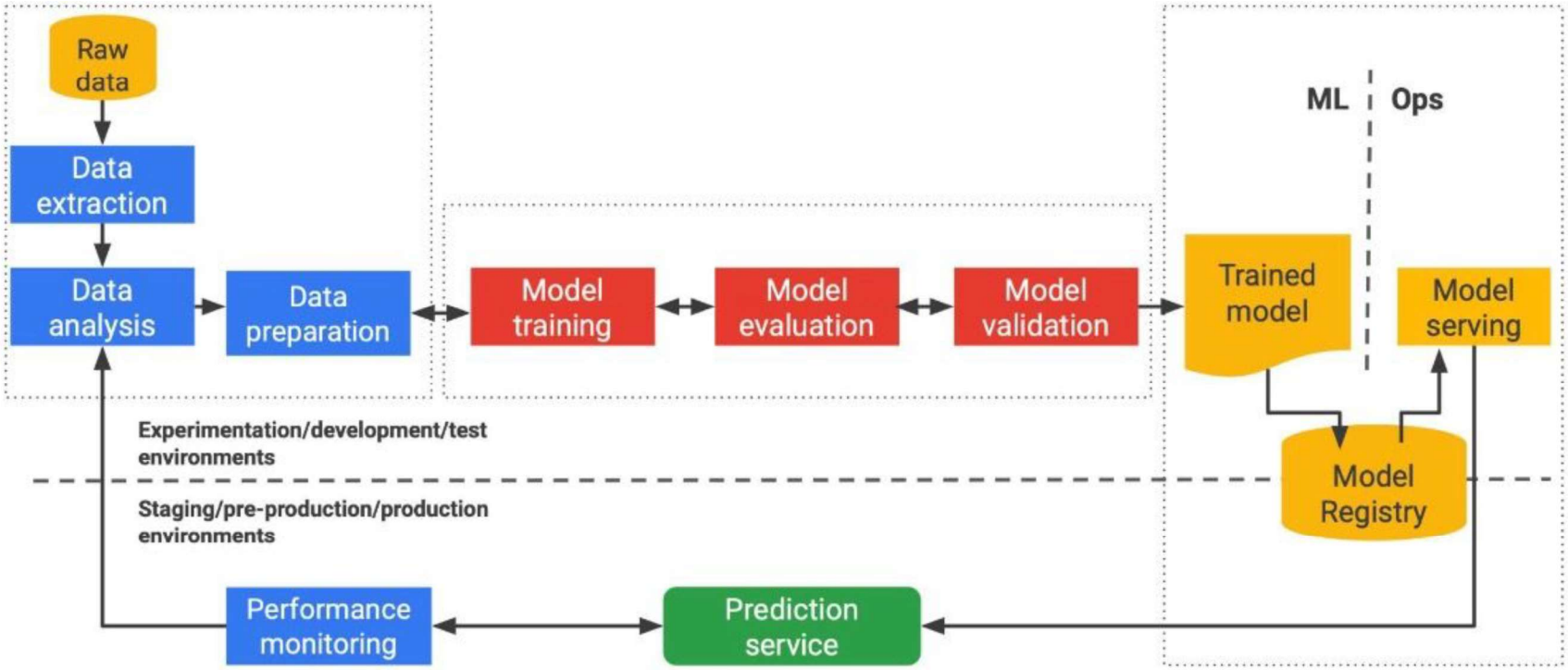
Machine Learning Pipeline



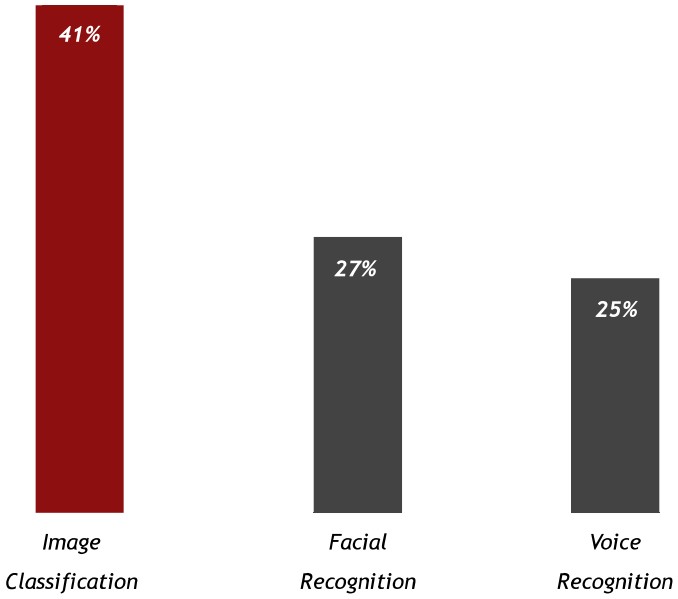
Machine learning use cases include:

- Image recognition
- Sentiment analysis
- Speech recognition
- Fraud detection
- Customer segmentation
- Recommendation systems
- Content Generation
- Text Summarization

Deep Learning

Deep Learning often outperforms traditional ML methods

% reduction in error rate achieved by deep learning vs. traditional ML methods

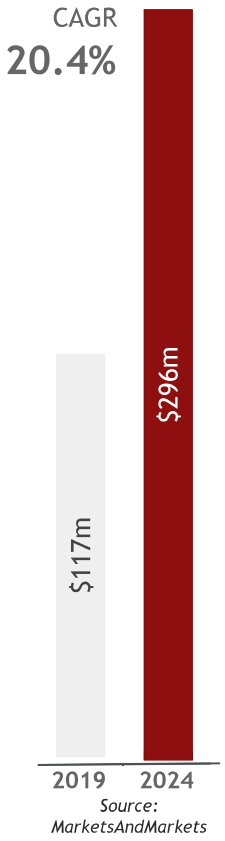


Source: Mckinsey

Deep Learning can find complex patterns from the data and produce more accurate results than traditional ML approaches

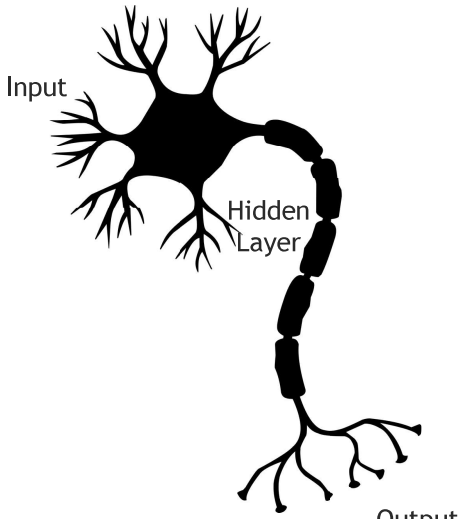
Deep Learning - Artificial Neural Network

The Global market for ANN applications is projected to grow from $177m to $296m by 2024, at a CAGR of 20.4%.

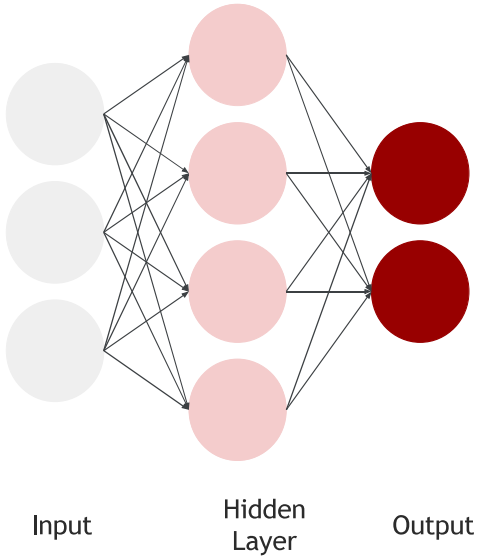


Artificial Neural Networks are a very rough imitation of the brain's structure

Human Brain Neuron

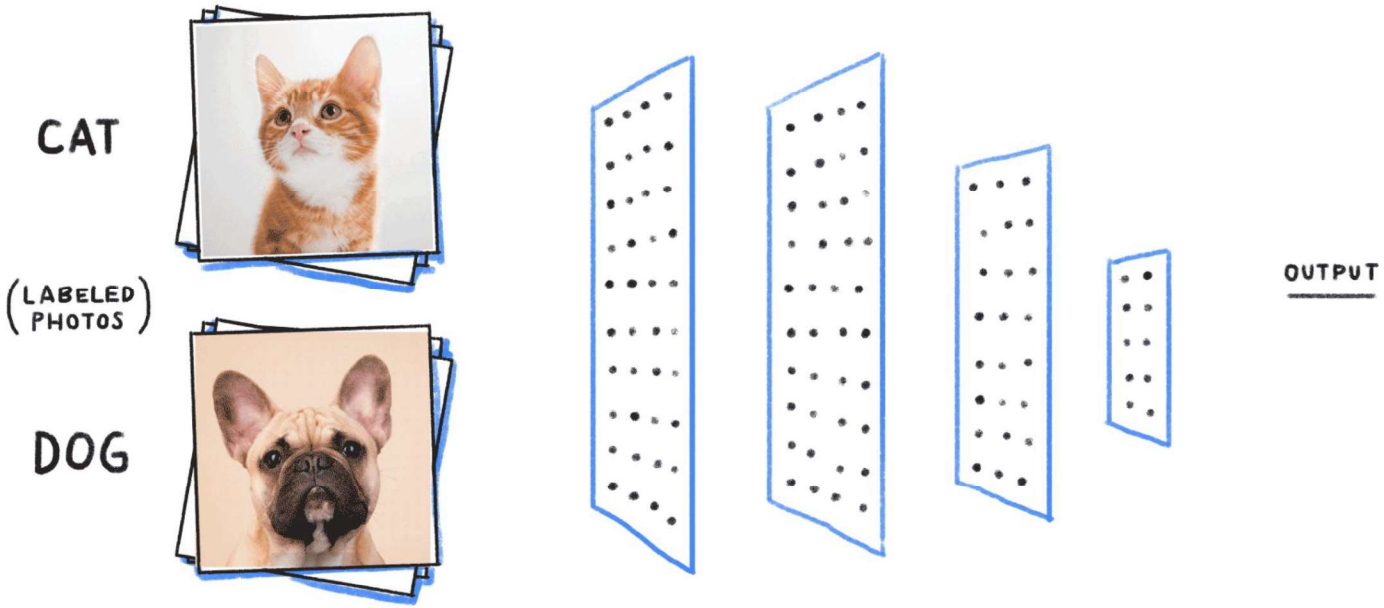


Artificial Neural Network



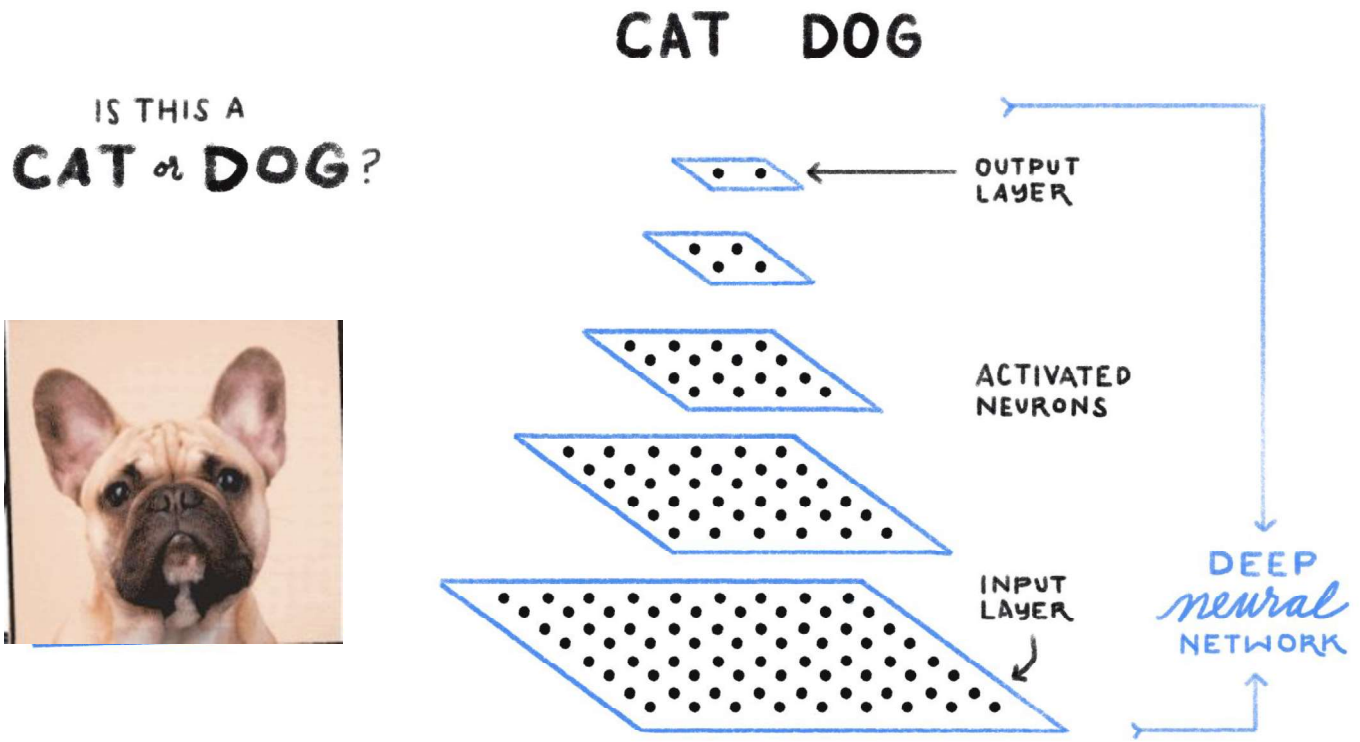
Deep Learning - Artificial Neural Network

"Profound Learning and Artificial Neural Networks (ANN) have fueled the adoption of AI in several industries, such as aerospace, healthcare, manufacturing, and automotive. ANN is substituting conventional machine learning systems to evolve precise and accurate versions" - Grand View Research



BecomingHuman.ai

Deep Learning - Artificial Neural Network



Ways to perform AI/ML

Requirements, Skillset, Compute, & Availability of Data influence the choice of approach