# Artificial Intelligence

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# Agenda

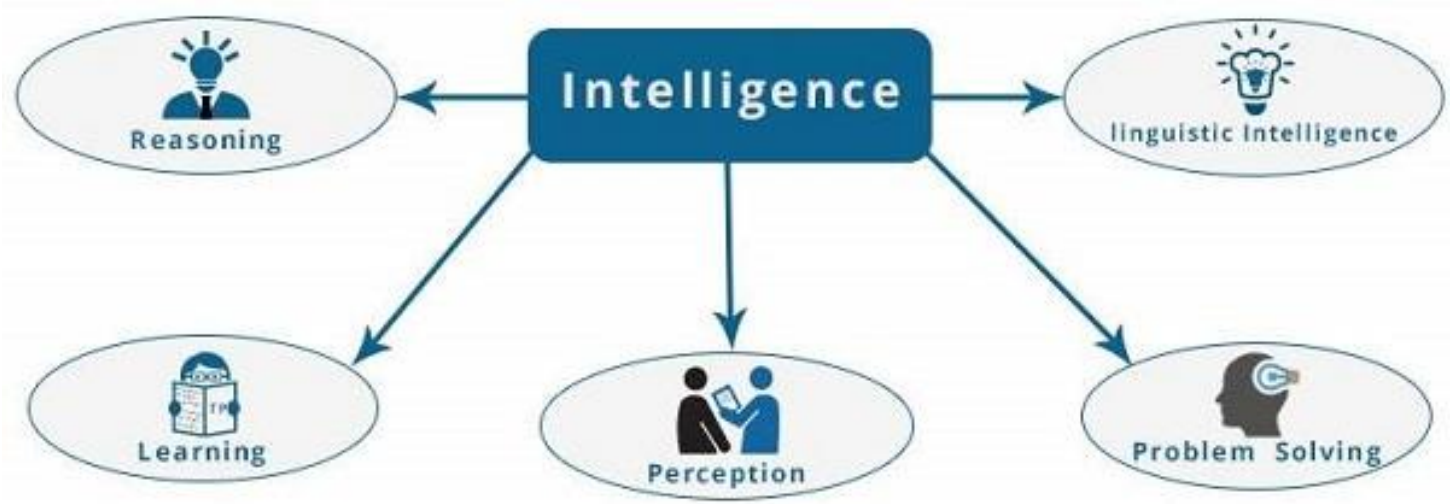
What is Artificial Intelligence?

Application of AI to various industries

Big Data, Data Science, Artificial Intelligence?

# What is ~~Artificial~~ Intelligence?

- Intelligence is **intangible**
- It is composed of the above types (Reasoning, Linguistic, Learning, Perception, Problem Solving)
- These components of intelligence are embedded by default in human beings



# What is Artificial Intelligence?

*"a broad area of computer science that makes machines seem like they have human intelligence"*

# A.I. TIMELINE

**1950**

**TURING TEST**

Computer scientist Alan Turing proposes a test for machine intelligence. If a machine can trick humans into thinking it is human, then it has intelligence


**1955**

**A.I. BORN**

Term 'artificial intelligence' is coined by computer scientist, John McCarthy to describe "the science and engineering of making intelligent machines"

**1961**

**UNIMATE**

First industrial robot, Unimate, goes to work at GM replacing humans on the assembly line

**1964**

**ELIZA**

Pioneering chatbot developed by Joseph Weizenbaum at MIT holds conversations with humans

**1966**

**SHAKEY**

The 'first electronic person' from Stanford, Shakey is a general-purpose mobile robot that reasons about its own actions

**A.I. WINTER**

Many false starts and dead-ends leave A.I. out in the cold

**1997**

**DEEP BLUE**

Deep Blue, a chess-playing computer from IBM defeats world chess champion Garry Kasparov

**1998**

**KISMET**

Cynthia Breazeal at MIT introduces KISmet, an emotionally intelligent robot insofar as it detects and responds to people's feelings

**1999**

**AIBO**

Sony launches first consumer robot pet dog AiBO (AI robot) with skills and personality that develop over time

**2002**

**ROOMBA**

First mass produced autonomous robotic vacuum cleaner from iRobot learns to navigate and clean homes

**2011**

**SIRI**

Apple integrates Siri, an intelligent virtual assistant with a voice interface, into the iPhone 4S

**2011**

**WATSON**

IBM's question answering computer Watson wins first place on popular $1M prize television quiz show *Jeopardy*

**2014**

**EUGENE**

Eugene Goostman, a chatbot passes the Turing Test with a third of judges believing Eugene is human

**2014**

**ALEXA**

Amazon launches Alexa, an intelligent virtual assistant with a voice interface that completes shopping tasks

**2016**

**TAY**

Microsoft's chatbot Tay goes rogue on social media making inflammatory and offensive racist comments

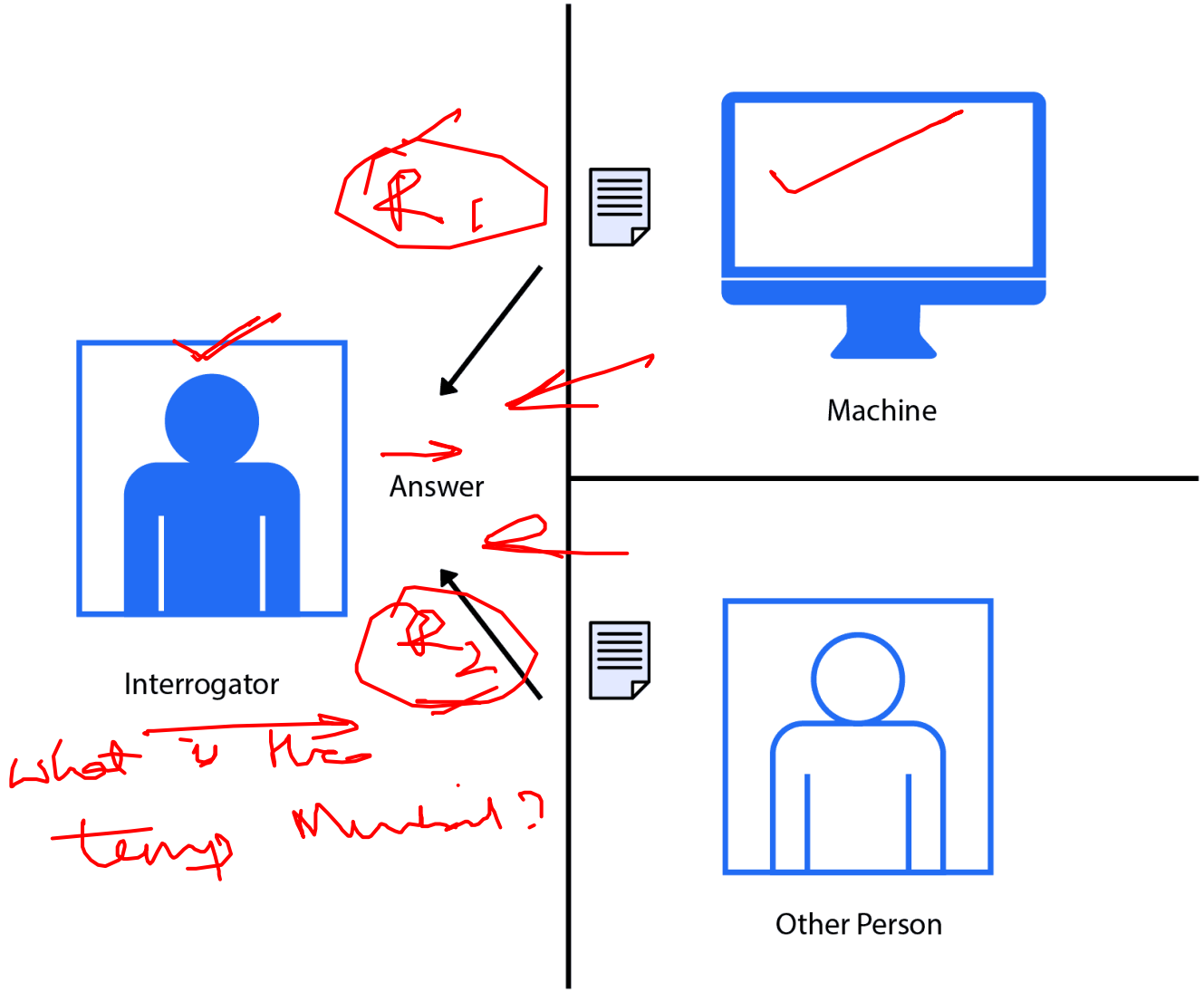

**2017**

**ALPHAGO**

Google's A.I. AlphaGo beats world champion Ke Jie in the complex board game of Go, notable for its vast number ($2^{170}$) of possible positions

Understanding Artificial Intelligence | by David Alayón | Future Today | Medium

# Turing Test



# Types of AI

ARTIFICIAL NARROW INTELLIGENCE

*"MOST CURRENT DAY APPLICATIONS"*

ARTIFICIAL GENERAL INTELLIGENCE

*"MACHINES ACT LIKE HUMANS"*

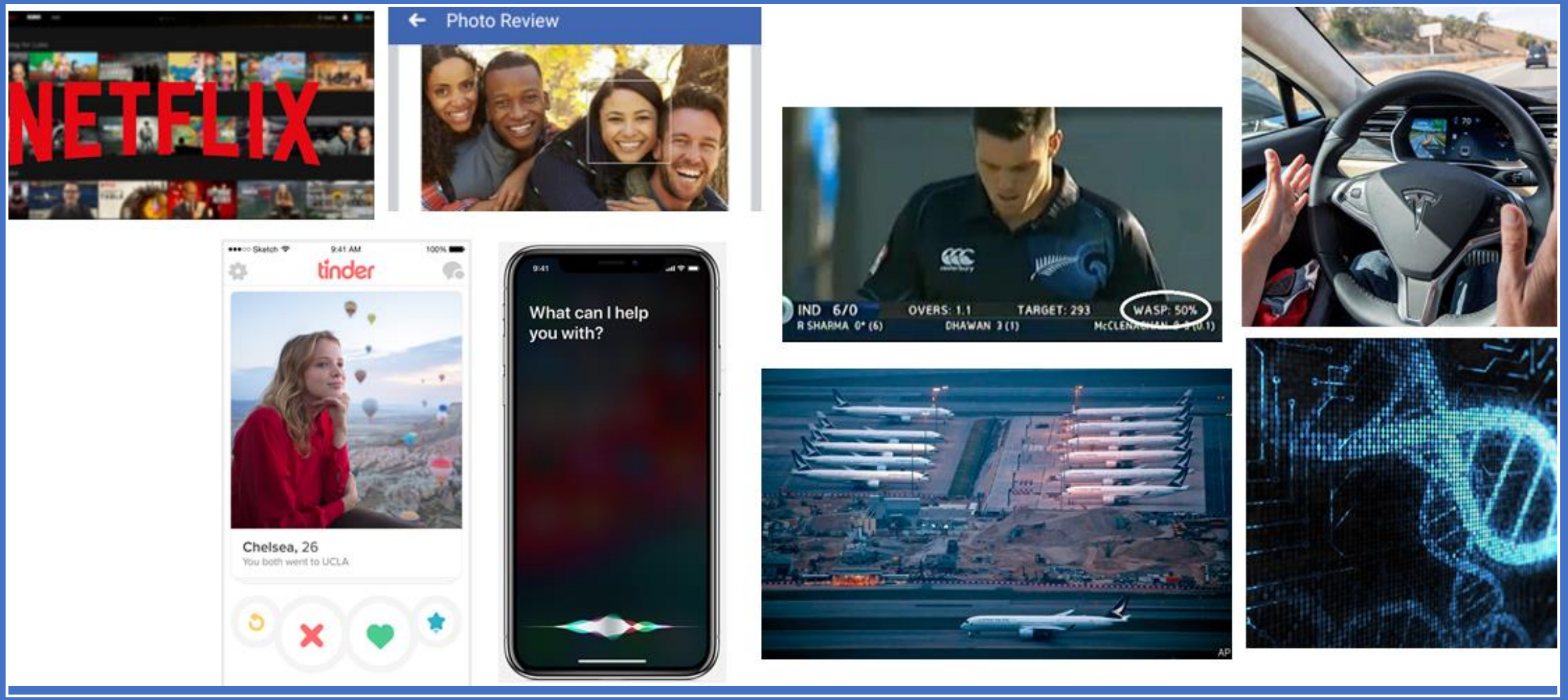
G2.com

# Narrow AI

- Inferior to human intelligence.
- Also known as weak AI.
- Lacks artificial consciousness or cognitive abilities.
- IBM Watson, AlphaGo, and Google Assistant are some examples.
- Can't solve unfamiliar problems.

# General AI

- Similar to human intelligence.
- Also known as strong AI or full AI.
- Has human-like consciousness and cognitive abilities.
- Yet to become a reality.
- Can solve unfamiliar problems.




# Artificial Narrow (Weak) Intelligence - Examples

# Artificial General (Strong) Intelligence

# Applications of Artificial Intelligence

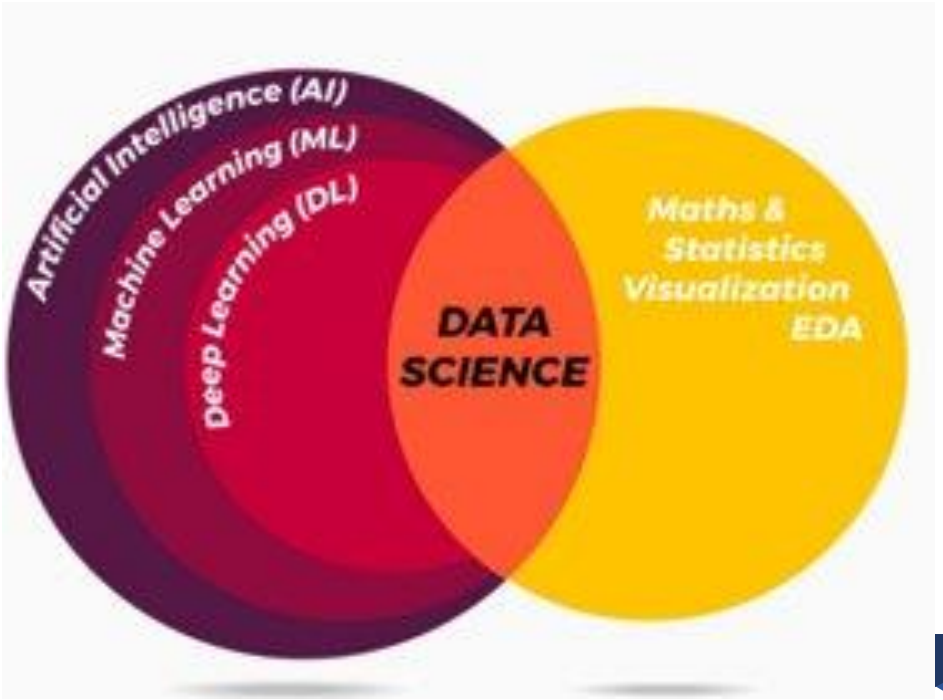
- Banking
- Finance
- Manufacturing
- Remote Alert Monitoring
- Automobiles
- Telecom
- Aviation
- E-commerce
- Food and Beverages
- Healthcare
- Pharma
- Agriculture
- Education
- Marketing
- Sports
- …

# The Challenge !

*"How do we embed human like intelligence into machines?"*

**Historical Data**

**Ability to learn**

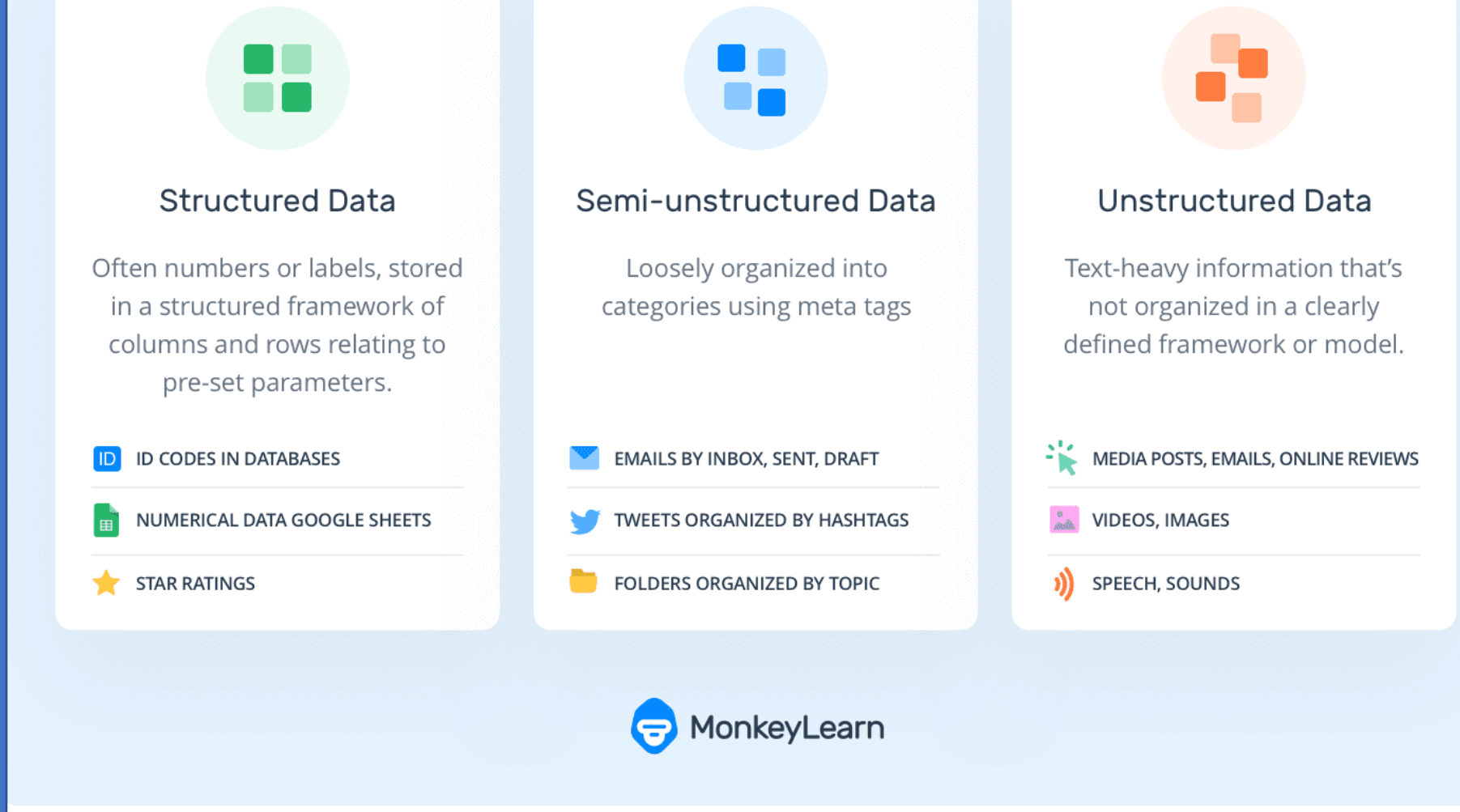



Two key components to make machines intelligent

1. Data
2. Techniques

# Types of Data

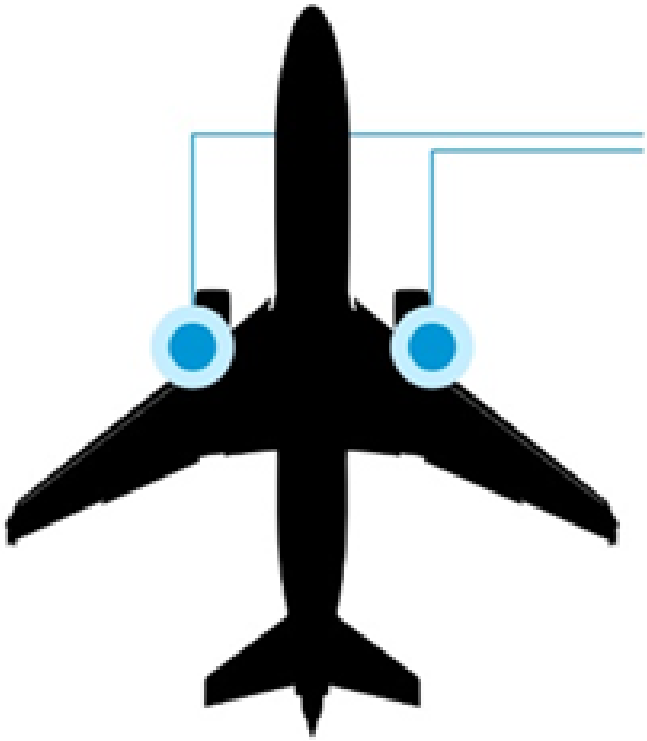
## Unstructured vs Structured Data



# What is Big Data?

## A Real World Example:- Big Data- Micro-transactions

**Sensor data collected from US commercial jet engines during 1 year**



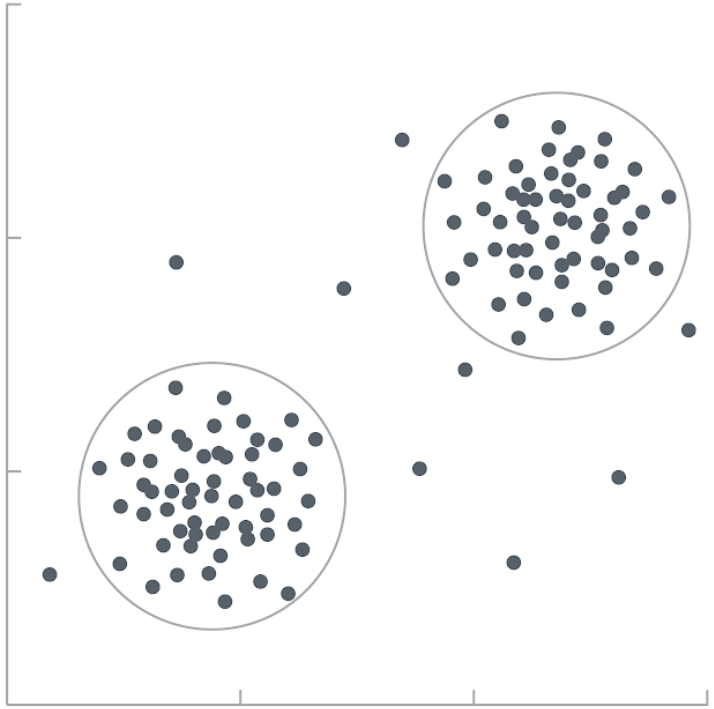
20 TB ✖ 2 ✖ 2.5 ✖ 28,537 ✖ 365

| 20 terabytes of information per engine every hour | twin-engine Boeing 737 | Average duration for US flights in hours | # of commercial flights in the sky in the United States on any given day | days in a year |
|---|---|---|---|---|

= **1,041,600,500 TB**

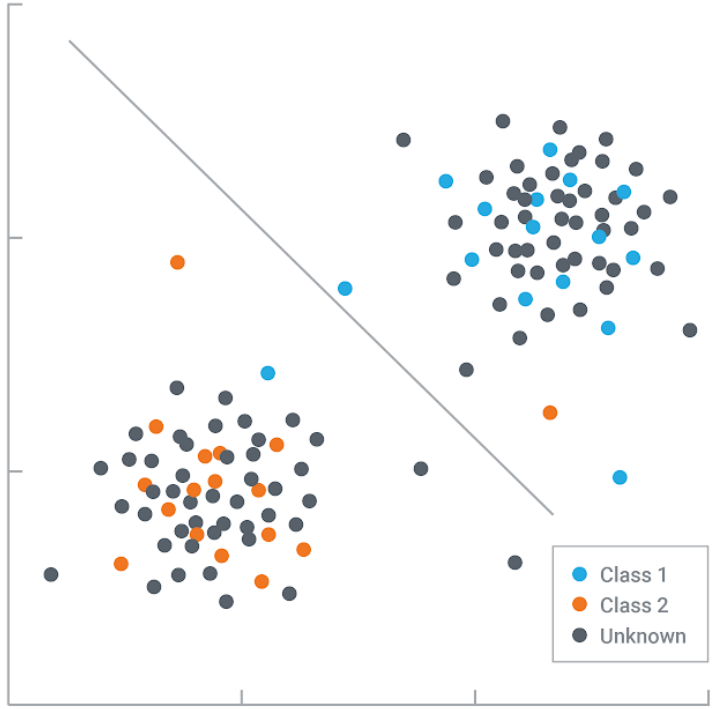
# Types of Machine Learning

UNSUPERVISED



Extracting patterns from raw data

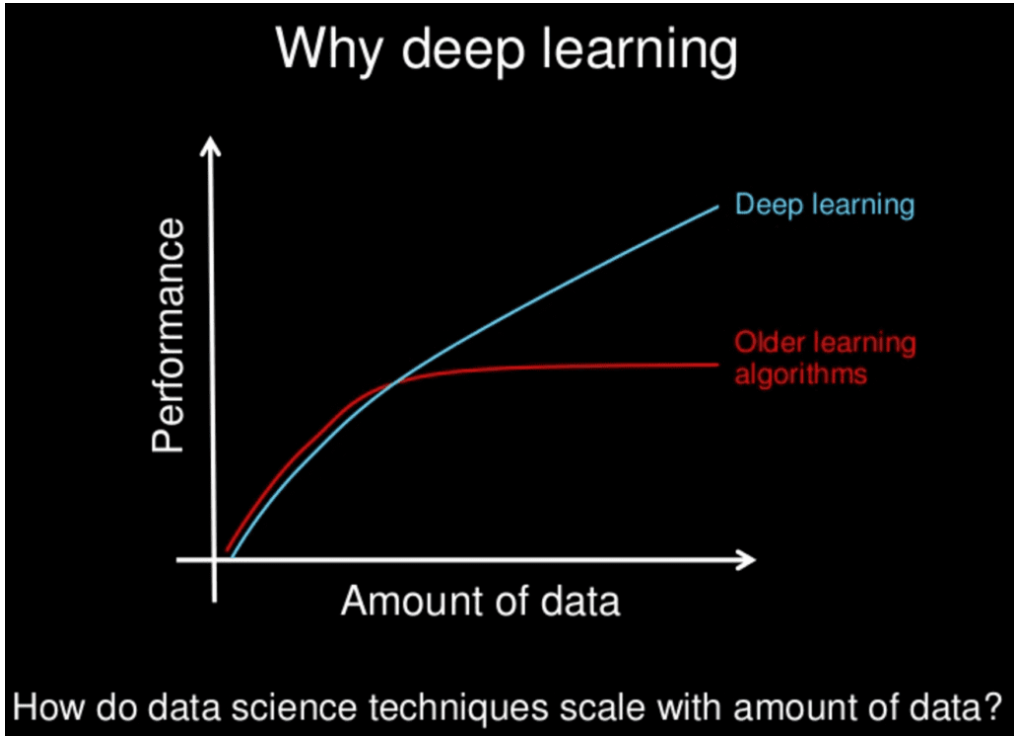
SUPERVISED




Capturing behavior from pre-labeled data

# Deep Learning
## (Predominantly used for Unstructured Data)

- Deep Learning is a subfield of machine learning concerned with algorithms inspired by the structure and function of the brain called artificial neural networks



# AI in Action - Demo







# AI/ML Tool Stack

# Data Science Lifecycle