Machine Learning

Algorithms that analyze data, learn from it and make informed decisions based on the learned insights.

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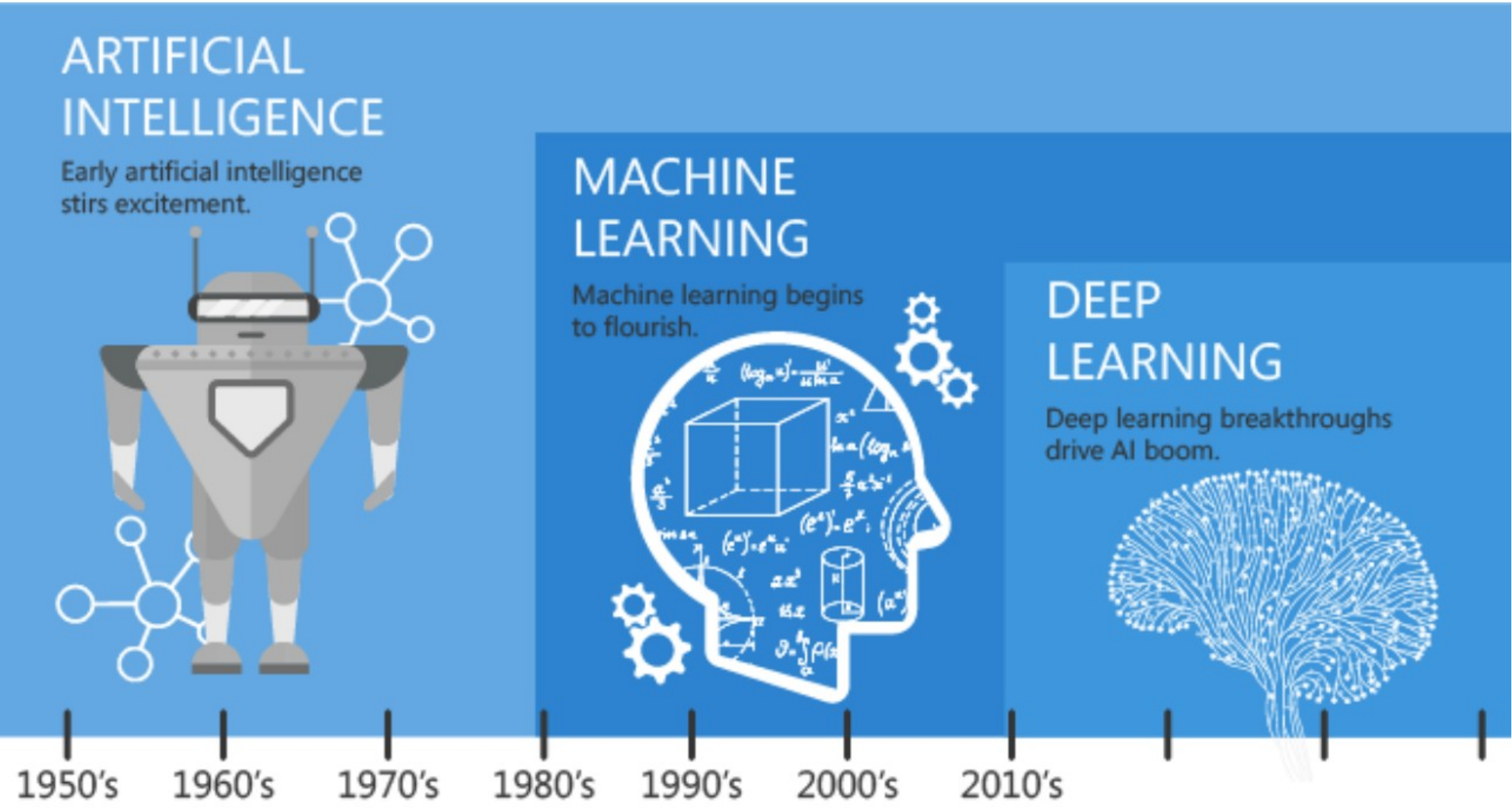
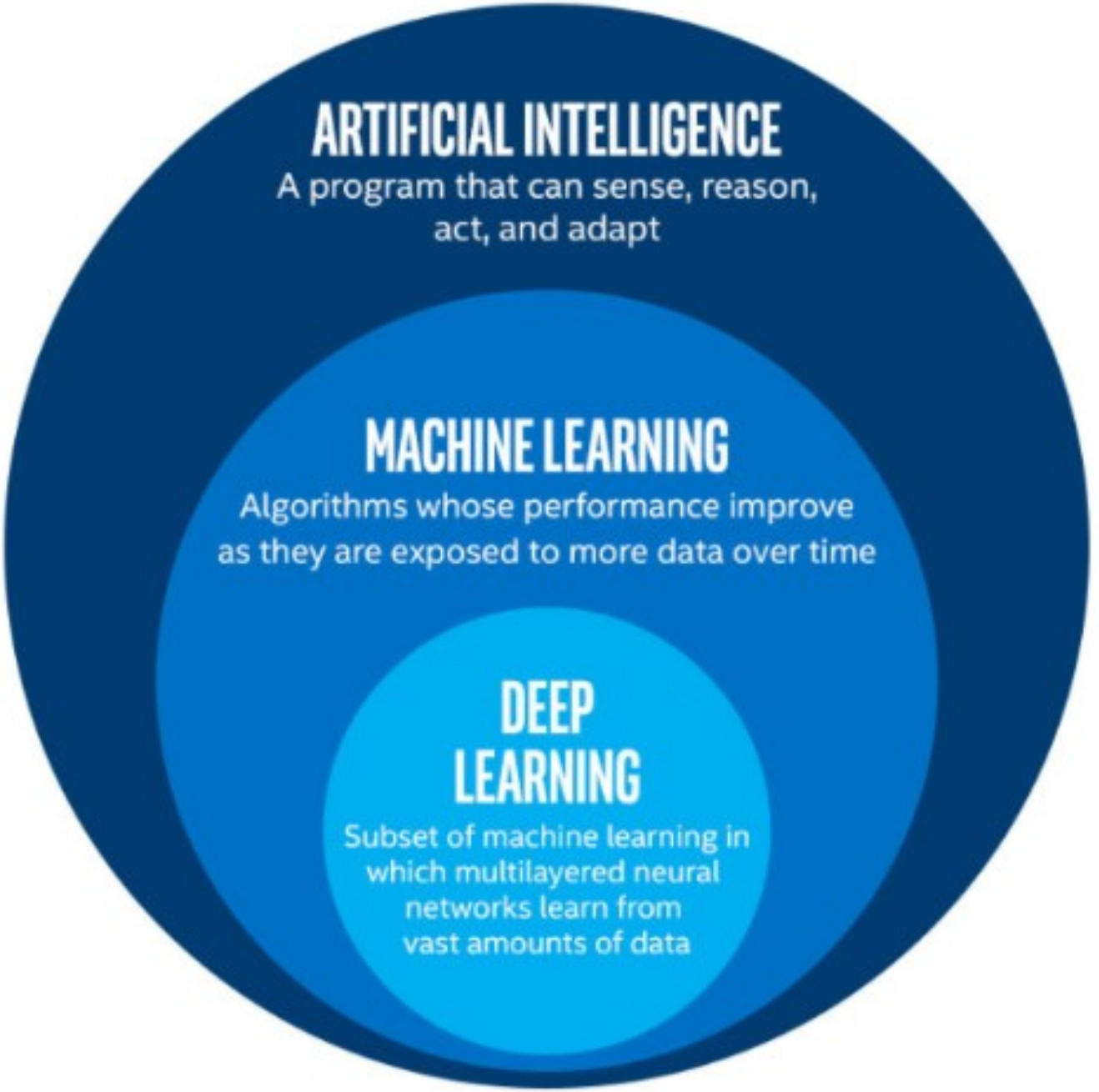
Credit: vas3k.com/blog/machine_learning/

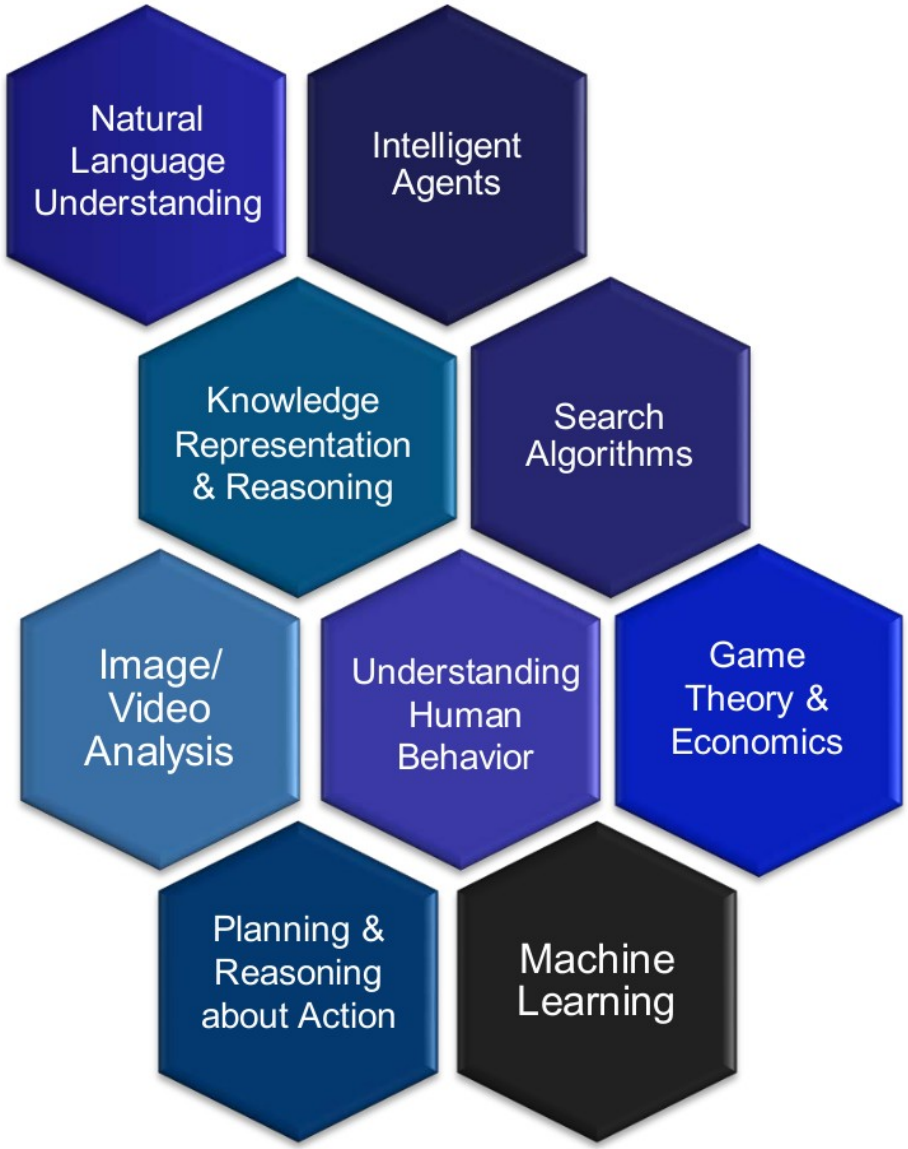
Evolution of AI

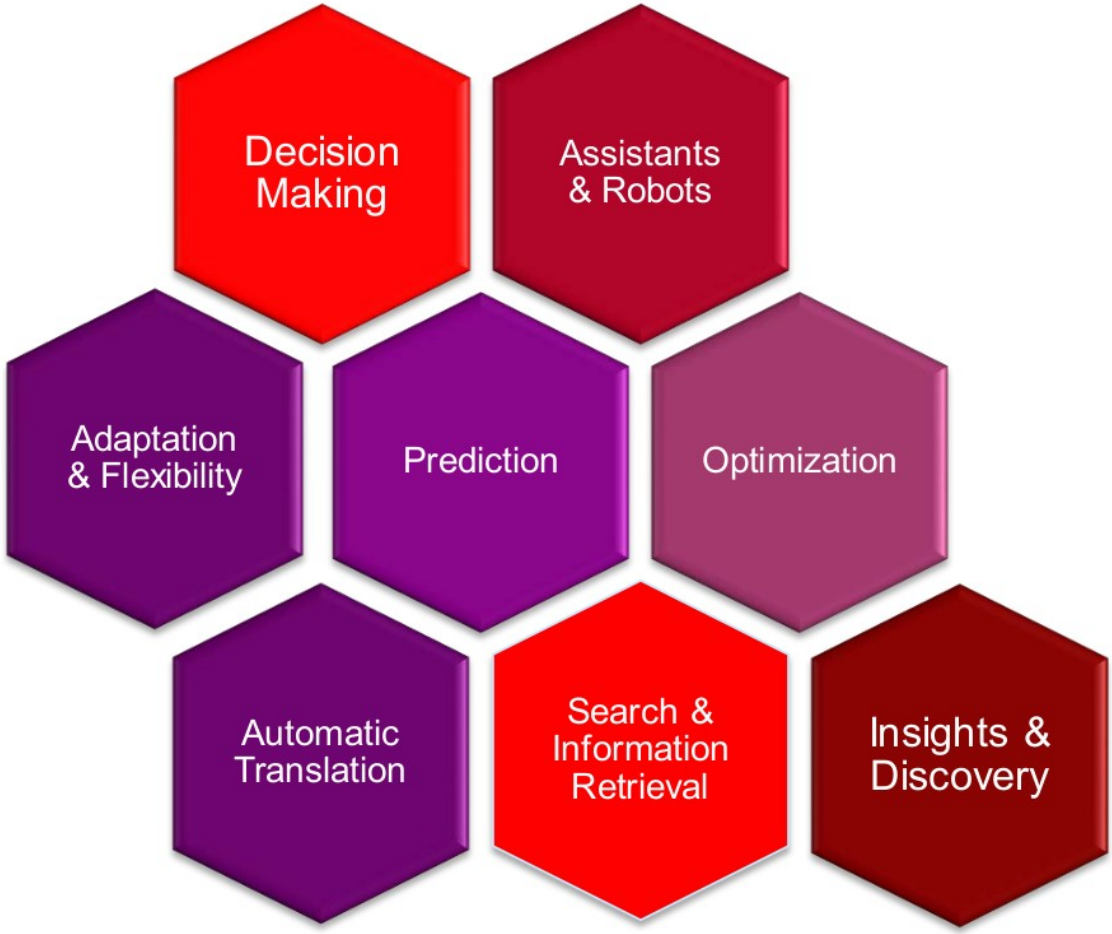


AI vs ML vs DL

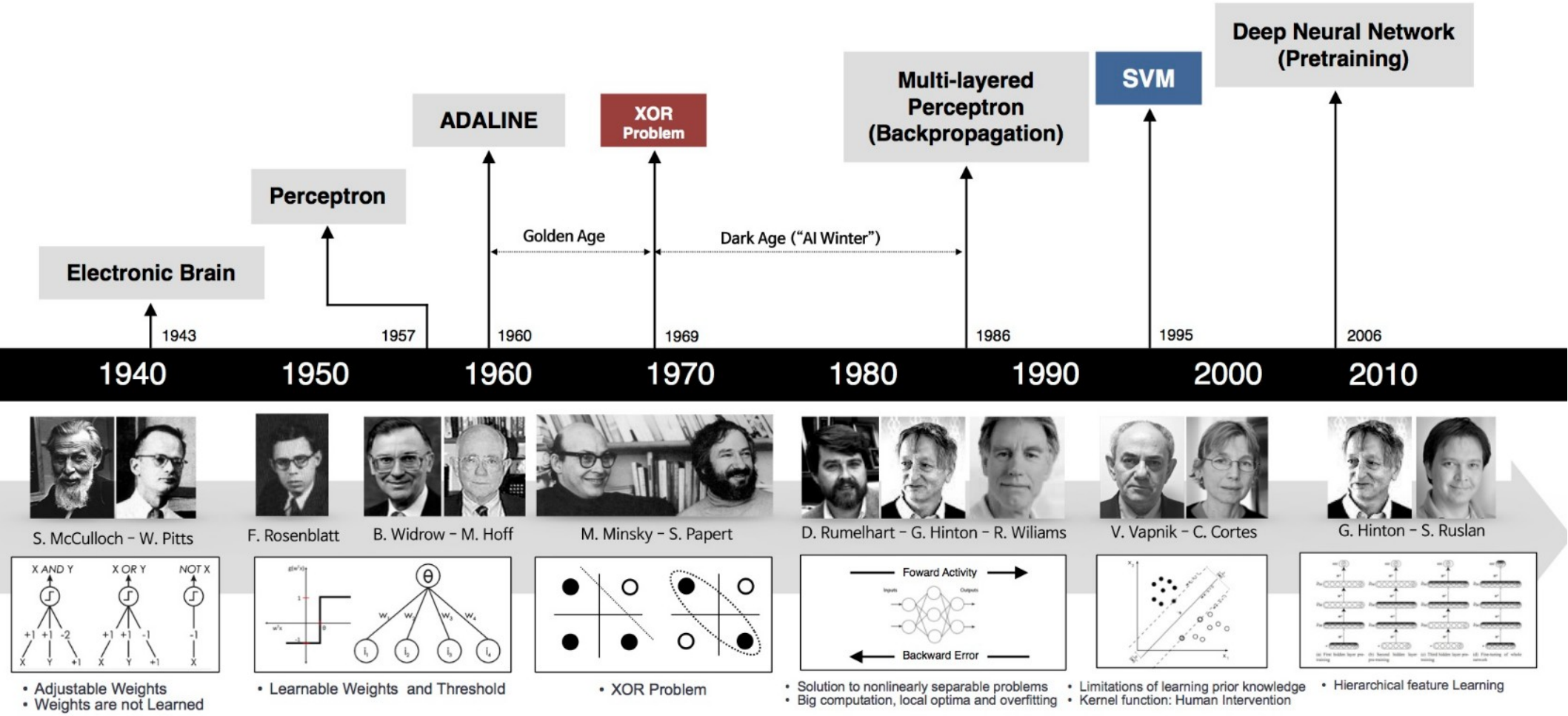

ARTIFICIAL INTELLIGENCE
A program that can sense, reason, act, and adapt
MACHINE LEARNING
Algorithms whose performance improve as they are exposed to more data over time
DEEP LEARNING
Subset of machine learning in which multilayered neural networks learn from vast amounts of data

Major AI Technologies & Application Areas





Progress over the Last Decade in ML



https://beamandrew.github.io/deeplearning/2017/02/23/deep_learning_101_part1.html

Progress in Search Algorithm & Game Playing

2008 - 2018

10^3	10^{13}	10^{47} 10^{20}	10^{170}		
Rules	Complete Search	Heuristic Search	Monte Carlo Search	Supervised Machine Learning	Reinforcement Machine Learning



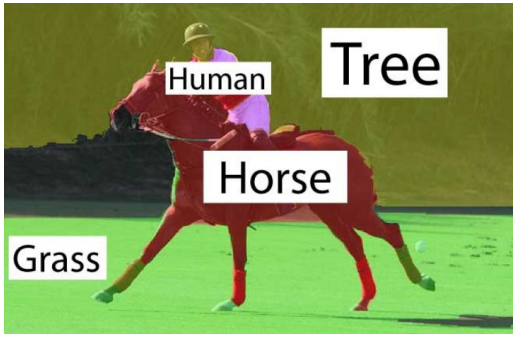



https://en.wikipedia.org/wiki/Game_complexity

Machine vs Human

- Machines have far superior computational abilities than humans
  - Square root of 964,324 ?
- Machines can sort through enormous amounts of data.
  - While a doctor makes a diagnosis in ~10 minutes, AI system makes a million.
- Humans, in general, are good at ?

Scene Understanding

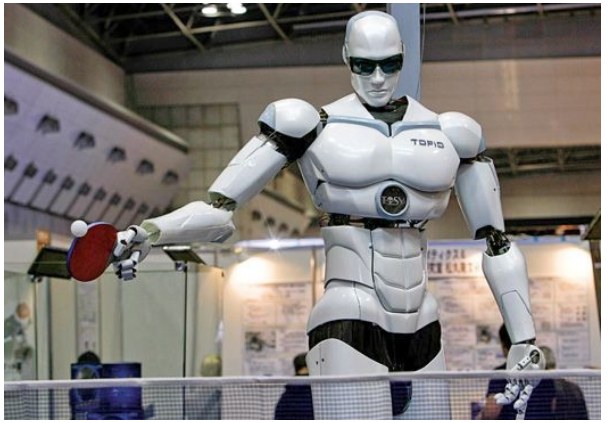


Taxi Driving

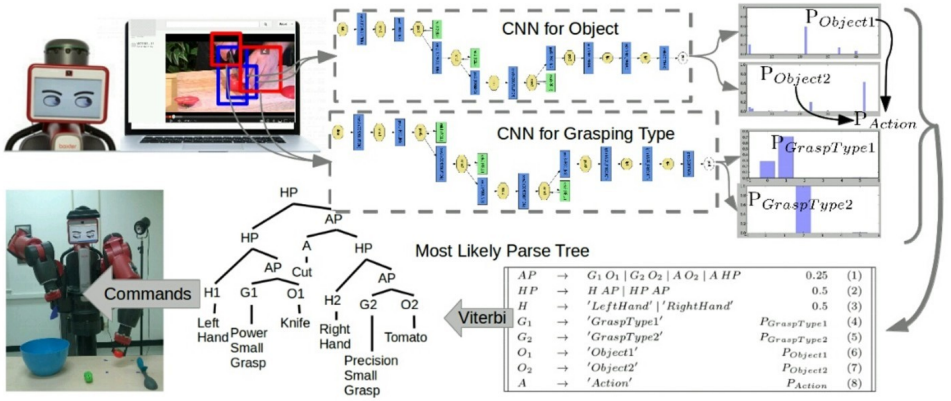
Dialogue Processing

Identify the digits

Ping-Pong playing robot



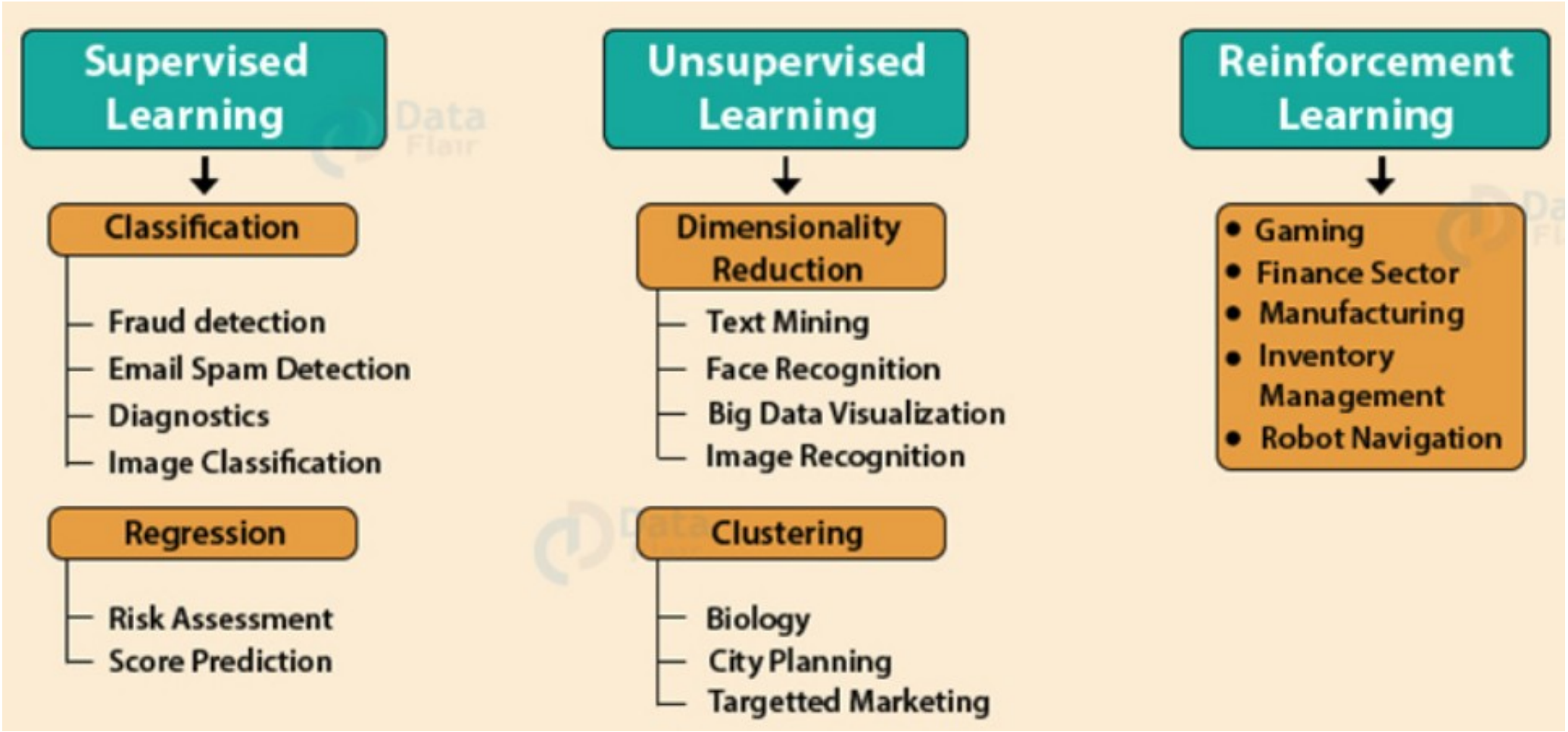
Learn Cook from youtube



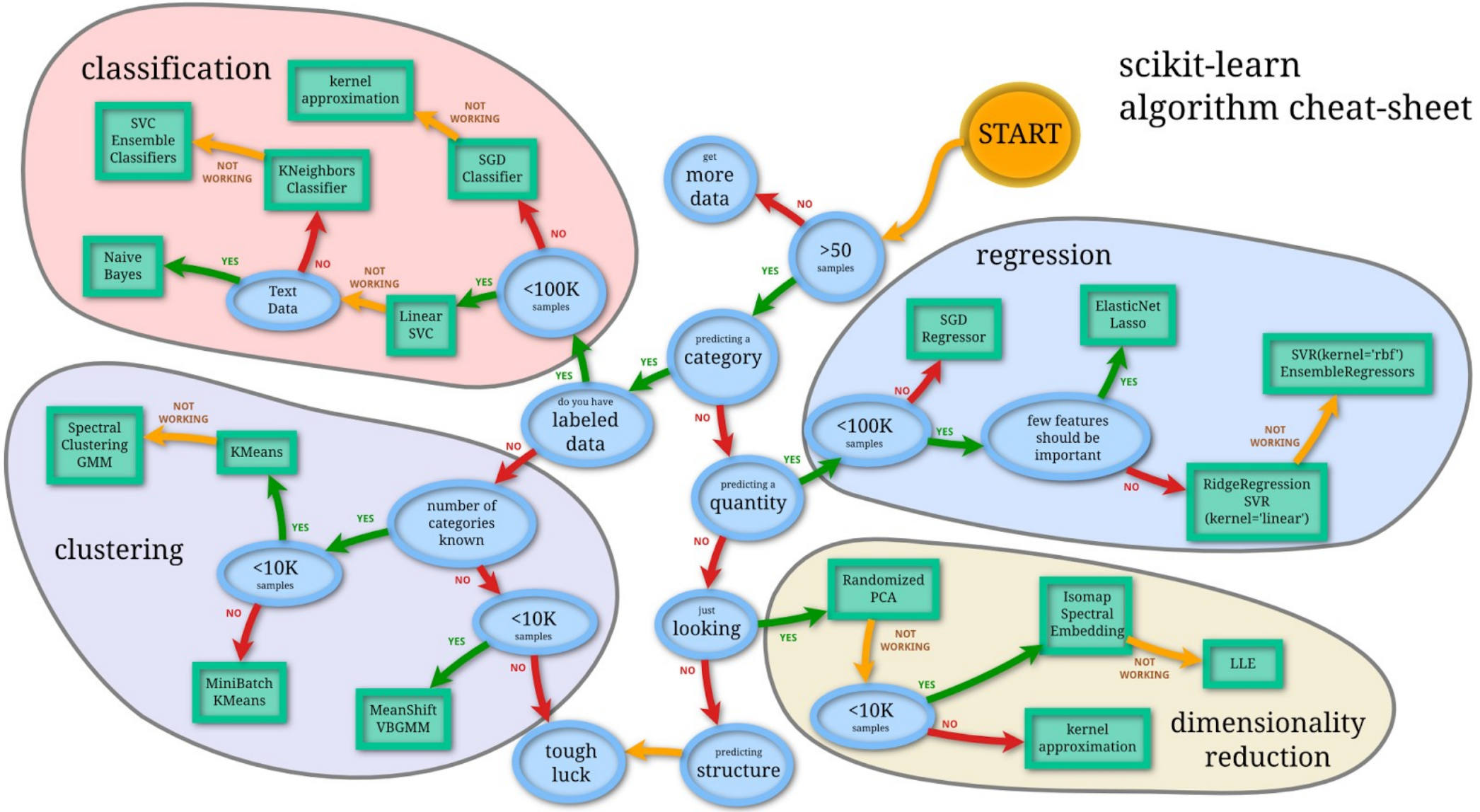
Perform clustering

Machine Learning: A Subset of AI

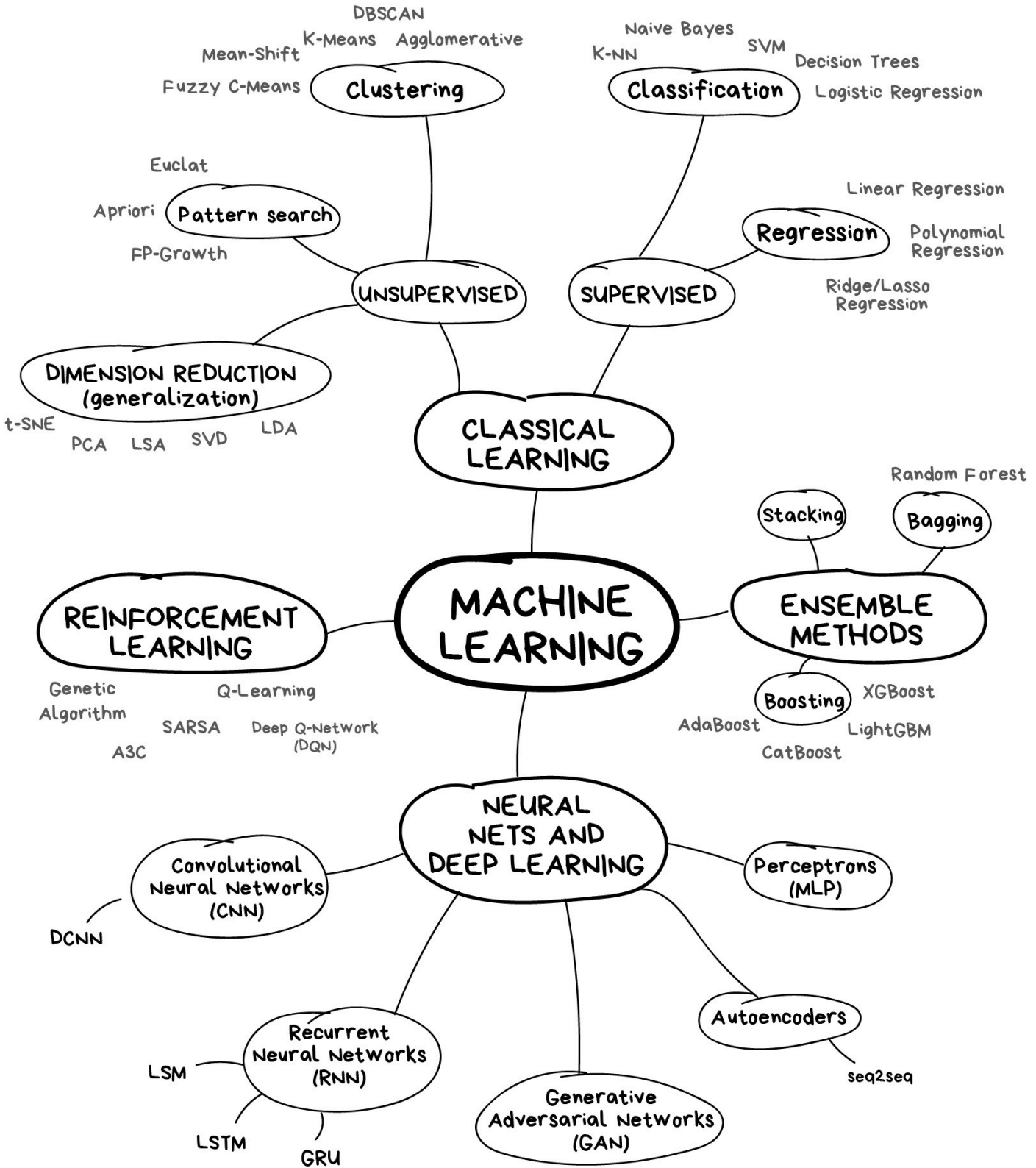
Why not allow machines to do the heavy thinking for us in order to make better decisions that, in general, people do better ?



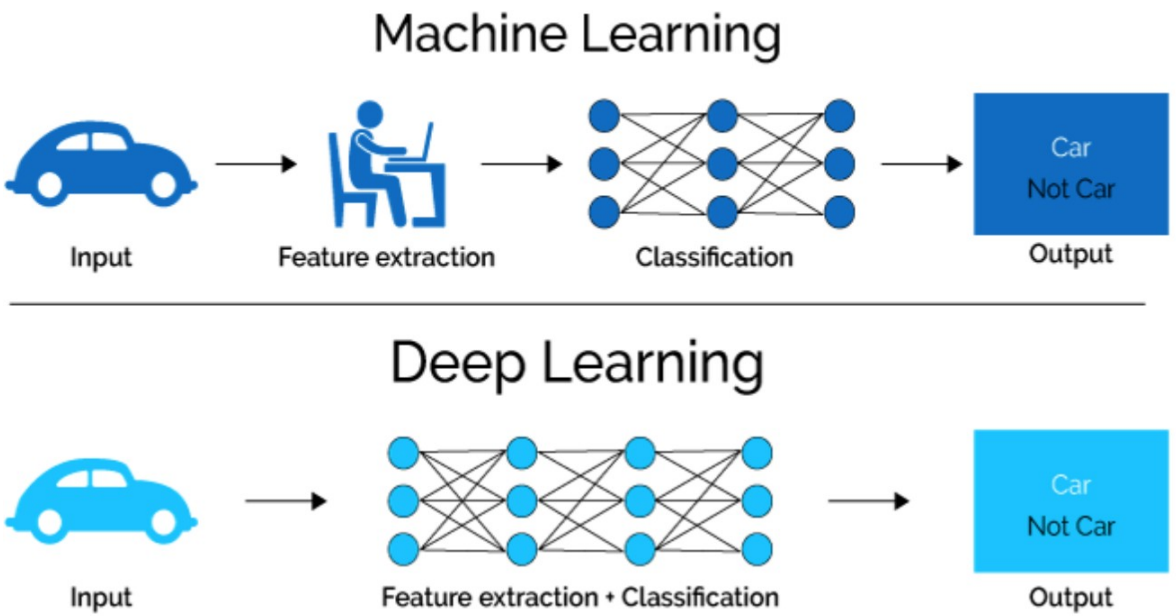
Machine Learning Algorithms



Machine Learning Algorithms



ML vs DL



Deep Learning	Machine Learning
Requires large data	Can train on lesser data
Provides high accuracy	Gives lesser accuracy
Takes longer to train	Takes less time to train
Requires GPU to train properly	Trains on CPU
Can be tuned in various different ways.	Limited tuning capabilities