Introduction Machine Learning and Data Mining

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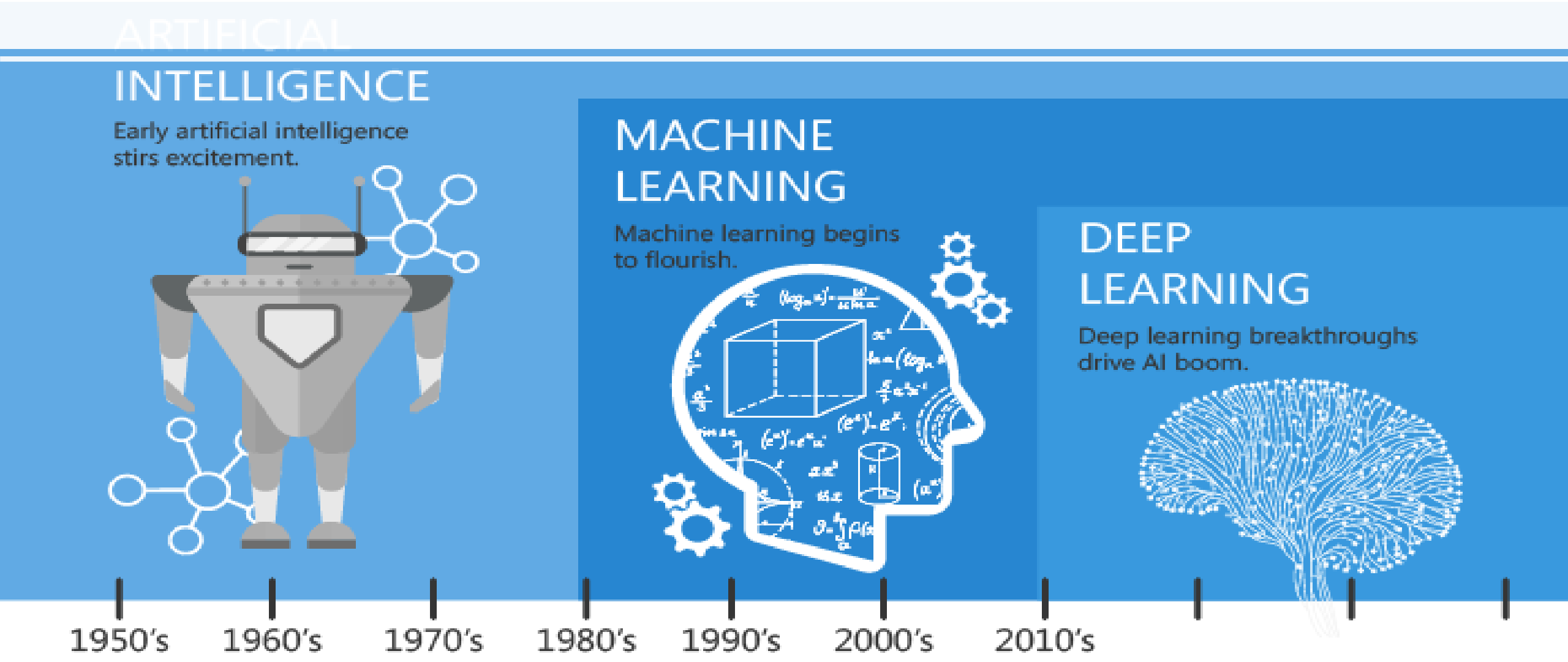
Outline

- What is Machine Learning
- Why Machine Learning
- Formal Definition : T,E,P for Machine Learning

Machine Learning: A subset of Artificial Intelligence

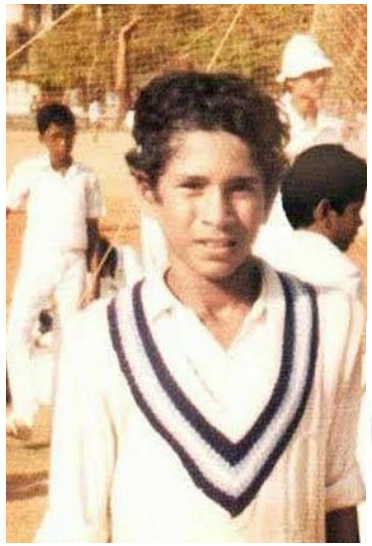


Since an early flush of optimism in the 1950's, smaller subsets of artificial intelligence – first machine learning, then deep learning, a subset of machine learning – have created ever larger disruptions.

Source : https://towardsdatascience.com/introduction-to-machine-learning-for-beginners-eed6024fdb08

Why Machine Learning : A motivational example

Look at the images and understand/remember the patterns.

Model and generalization

- Machine learning algorithms generate model.
- Model is a mathematical structure that learns and generalize the data
- Not coded…(If curly hair then sachin)

Why generate model ?

Guess : Is this Sachin ??

Model 1

Model 2

From binary world to Probability world

Likelihood of an image to be of Sachin.

REDUCE GENERALIZATION ERROR !!!

Machine Learning Definition

Definition 1 : Arthur Samuel(1959)

Field of study that gives computers the ability to learn without being explicitly programmed.

Definition 2 : Tom Mitchell (1998)

A computer program is said to learn from Experience E with respect to some Task T and some Performance measure P if performance on T, as measured by P, improves with experience E.

Task ,Experience,Performance

Ill posed problem : Recognize Sachin Tendulkar in the given Photographs

Well posed Problem

Task : Check if the face in an image is of Sachin or not
Experience : Various Images of Sachin
Performance : Out of 100 photographs, how many times was Sachin identified with more than 90% confidence

Takeaways

- Definition of Machine Learning
- Ill Posed Problem to Well posed problem
- 3 important parameters : Task, Experience, Performance

References

- https://towardsdatascience.com/introduction-to-machine-learning-for-beginners-eed6024fdb08
- https://www.houseofbots.com/news-detail/11973-1-clarifying-differences-between-data-analysis-data-mining-data-science-machine-learning,-and-big-data