AI in Ramadan

Session 1 :
Beginner’s guide

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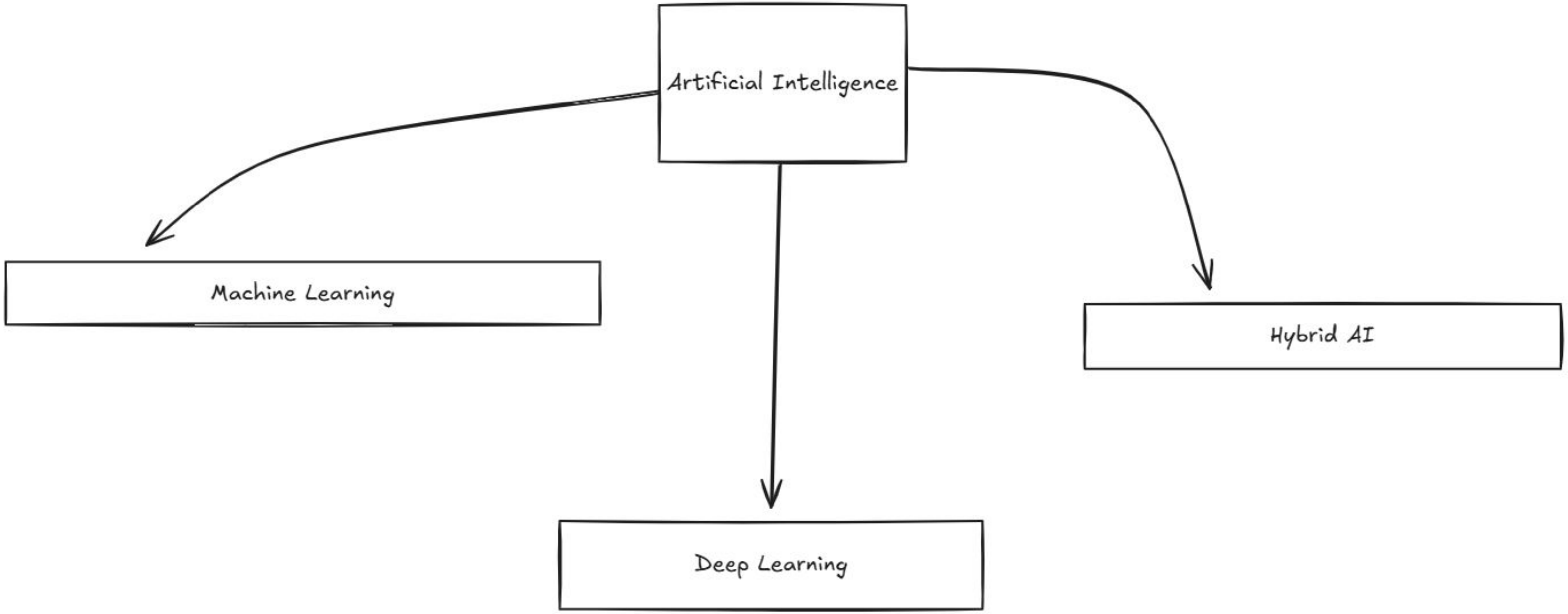
Introduction

A brief history

Introduction

Artificial Intelligence (AI) is the field of computer science focused on creating machines that can perform tasks requiring human-like intelligence, such as learning, reasoning, and problem-solving.

AI approaches



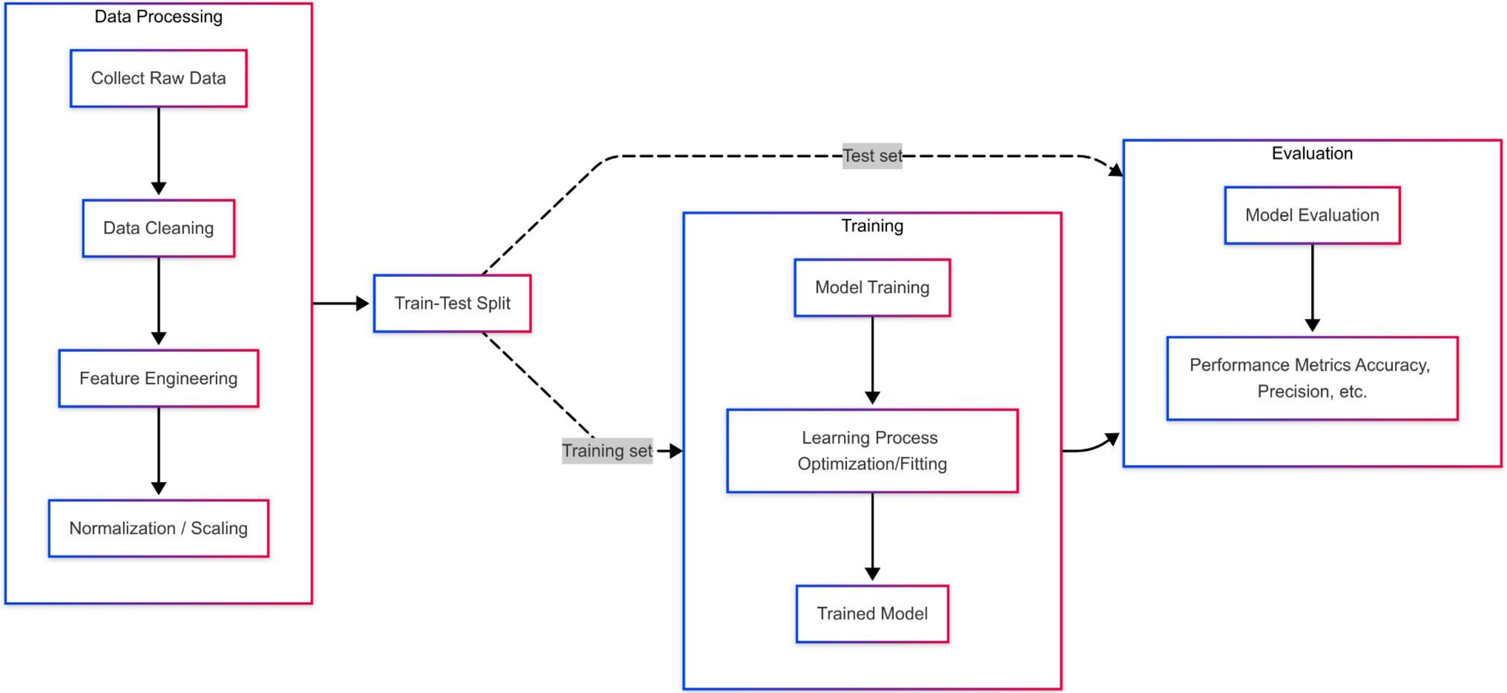
Brief History

- 1950-1960 : The birth of AI as a research field
- 1960-2000 : Formalization of machine learning algorithms, the boom of back-propagation and the introduction and the fall of neural networks
- 2000-2006: The focus shifts to Machine learning approaches and optimization algorithms
- 2006-present: Deep Learning rebirth, AlexNet boom and the emergence of the Transformer architecture

ML models

An overview

AI workflow



Data Processing

Collect Raw Data

Data Cleaning

Feature Engineering

Normalization / Scaling

Train-Test Split

Test set

Training set

Training

Model Training

Learning Process Optimization/Fitting

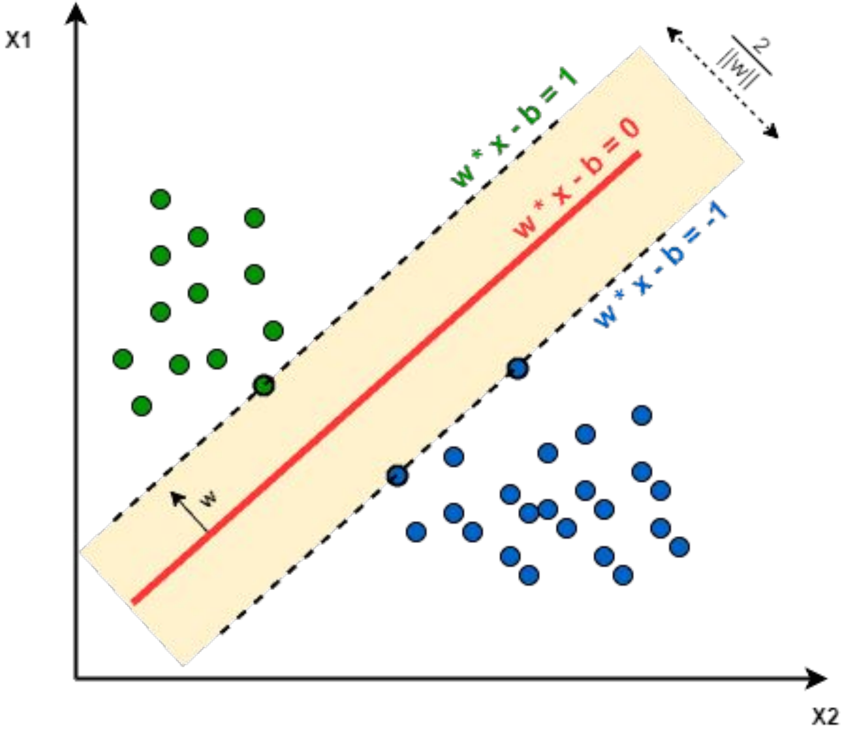
Trained Model

Evaluation

Model Evaluation

Performance Metrics Accuracy, Precision, etc.

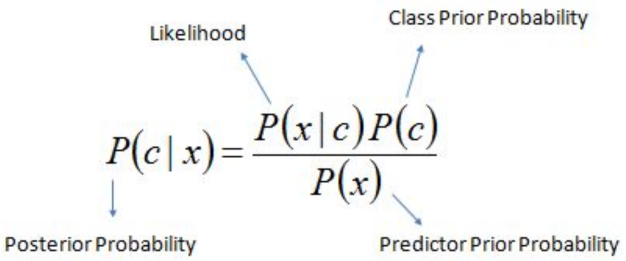
Support Vector Machine (SVM)



Support Vector Machine (SVM) is a supervised learning model that aims to find the best boundary—or hyperplane—that separates data into different classes. It does this by maximizing the margin between the closest points of each class

Naive Bayes

Naive Bayes is a simple yet effective classification technique based on probability theory and Bayes' theorem. It assumes that the features in a dataset are independent of each other, which simplifies the computation and makes the algorithm very fast.

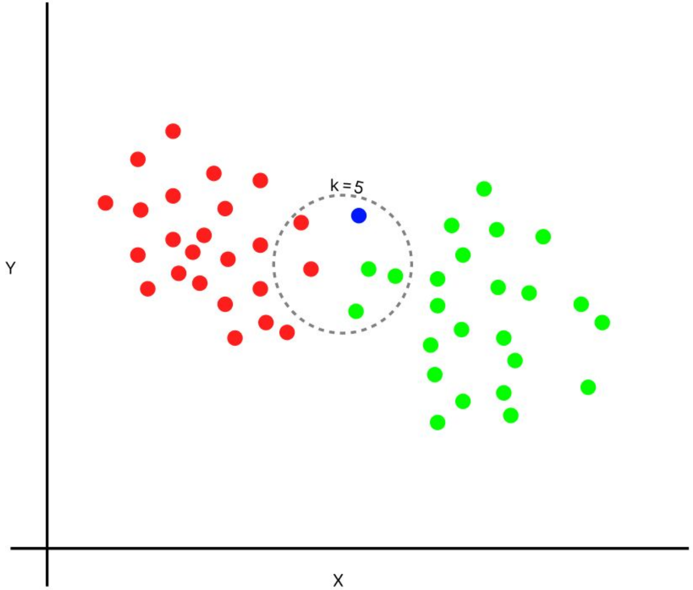


$$P(c \mid x) = \frac{P(x \mid c)P(c)}{P(x)}$$

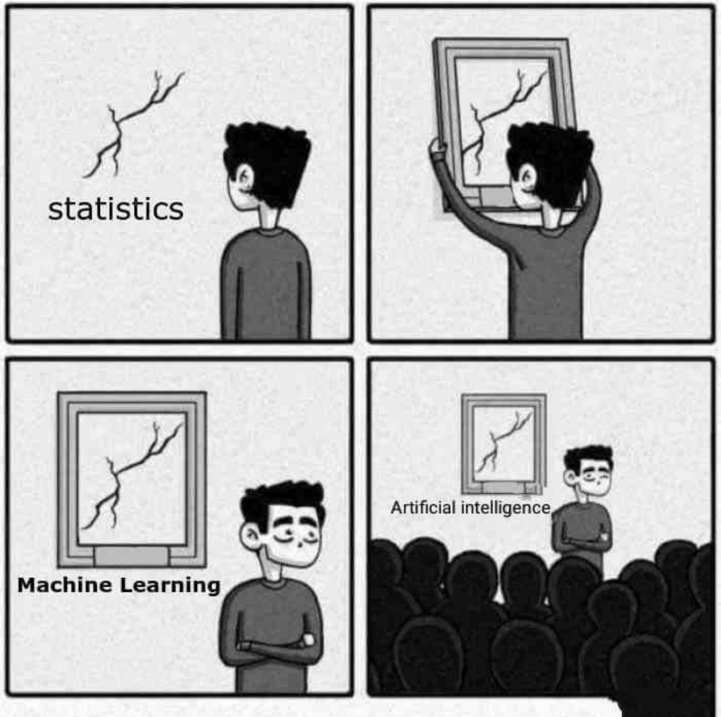
$$P(c \mid \mathrm{X}) = P(x_1 \mid c) \times P(x_2 \mid c) \times \cdots \times P(x_n \mid c) \times P(c)$$

K- Nearest Neighbour

K-Nearest Neighbors (KNN) is a straightforward and intuitive classification algorithm that classifies new data points based on the closest examples in the training data. It works by looking at the 'k' nearest neighbors of a new data point, and assigning the most common class among those neighbors.



Sooooo, basically



Metrics

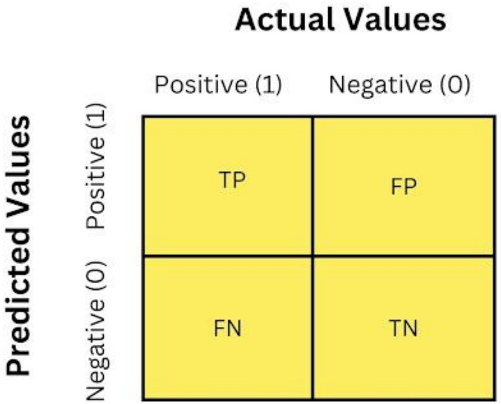
$$Accuracy = \frac{T_{pos} + T_{neg}}{T_{pos} + T_{neg} + F_{pos} + F_{neg}} \qquad (4)$$

$$Recall = \frac{T_{pos}}{T_{pos} + F_{neg}} \qquad (5)$$

$$Precision = \frac{T_{pos}}{T_{pos} + F_{pos}} \qquad (6)$$

$$F_1 - Score = 2 * \frac{Precision * Recall}{Precision + Recall} \qquad (7)$$

Where T_{pos} is the number of true positives, T_{neg} the number of true negatives, F_{pos} the number of false positive and F_{neg} the number of false negatives.



		Actual Values	
		Positive (1)	Negative (0)
Predicted Values	Positive (1)	TP	FP
	Negative (0)	FN	TN

Let’s collab

Questions?

See you

next time

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