Machine Learning

Learning:

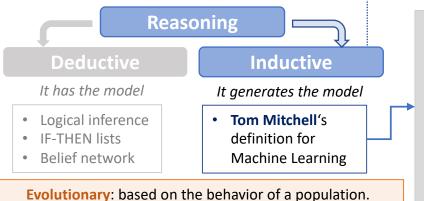
Approach for extracting information from data or experiences and transforming that information into knowledge.

Knowledge:

Ability to use the information obtained in solving problems, generating behaviors or appropriate solutions to these problems.

Paradigm:

Model or pattern to follow. A model derived from studies or experiences that have shown its efficiency in one or more situations.

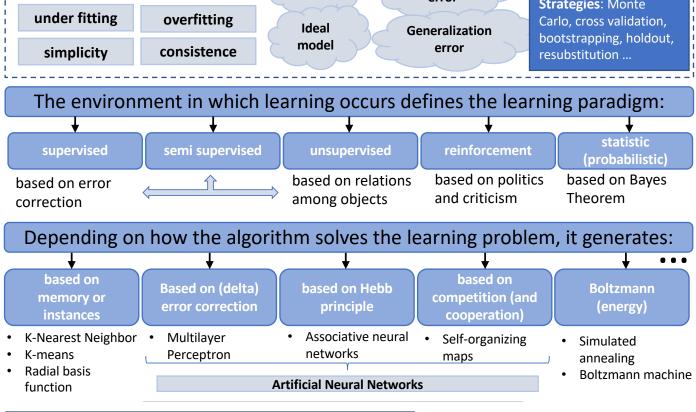


It uses a model to evolve or evolves a model.

A computer program is said to learn from experience E with respect to some class of tasks T and performance measure P, if its performance at tasks in T, as measured by P, improves with experience E.

Tom Mitchell. Machine Learning. 1st edition, 1990.

Computational learning theory: approximate learning / hypothesis of stationarity. Empirical risk minimization **Evaluation Obtained Approximation** model Metrics: accuracy, f-Error Hypothesis space scores, recall, precision, **Possible** intrinsic ... **Estimation** bias variance model error Strategies: Monte under fitting overfitting Carlo, cross validation, Ideal Generalization bootstrapping, holdout, model error simplicity consistence resubstitution ...



Group based learning (committee)

It expands the hypothesis space

Component generation

- bagging
- boosting
- Component selection
- vote
- stacking

Output combination

- ensemble (static)
- mixture (dynamic)

Continuous (online) learning

It is used in non-stationary problems/environments

Pseudo-stationary environments → time window without changes