



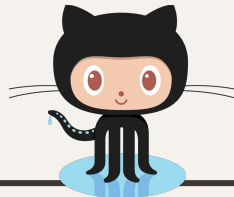
Machine Learning

Refresher

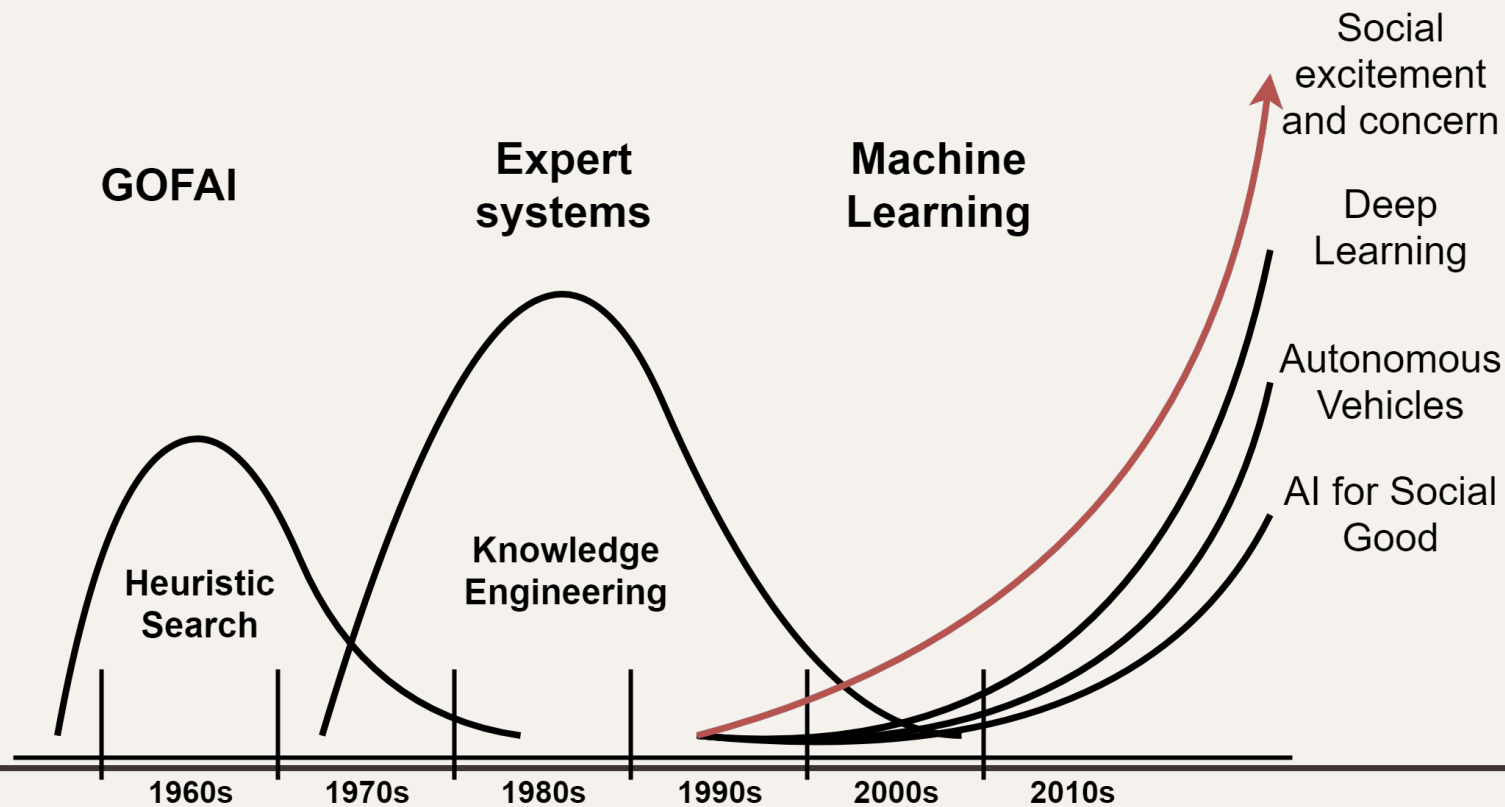


About Me

- Masters and PhD on Artificial Intelligence and Machine Learning
- Researcher at IT Aveiro
- Areas of interest: Artificial Intelligence, Machine Learning, text mining, stream mining, IoT, M2M



AI & ML



What is ML (Why should i Care)?

What does machine learning mean?

The term machine learning (abbreviated ML) refers to the capability of a machine to improve its own performance. It does so by using a statistical model to make decisions and incorporating the result of each new trial into that model. In essence, the machine is programmed to learn through **trial** and **error**.

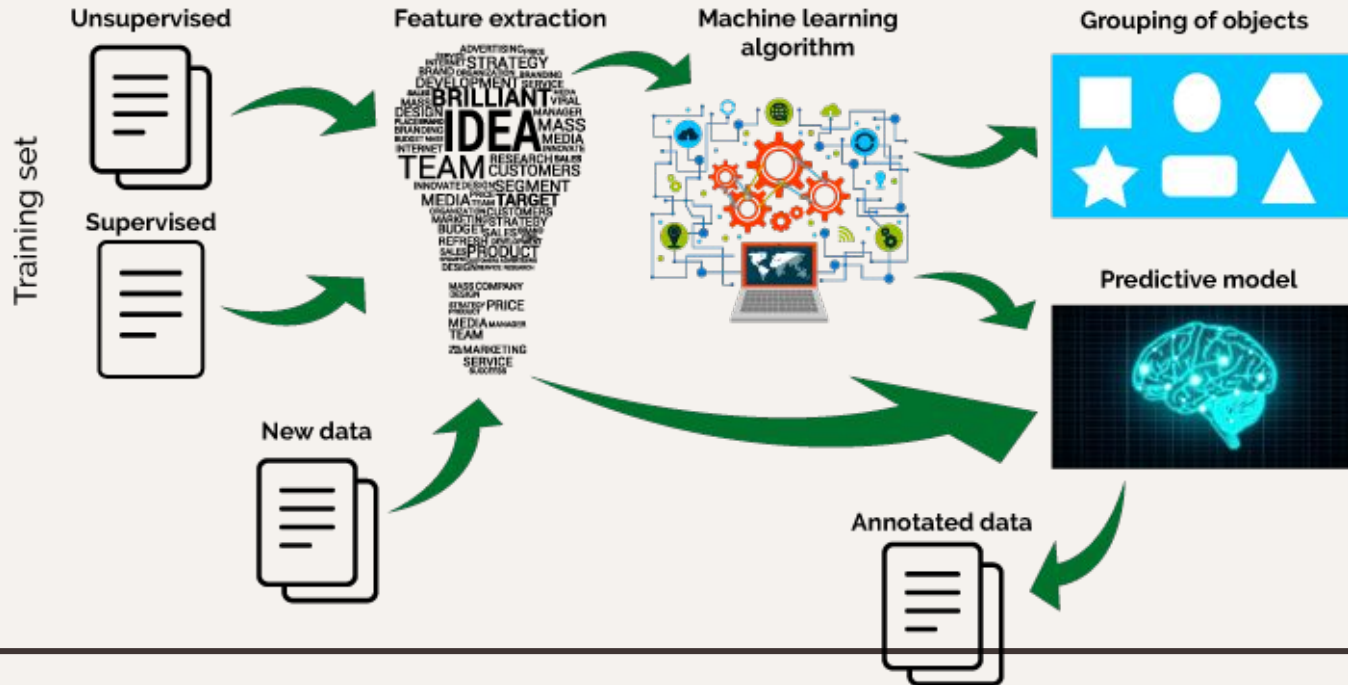
What is ML (Why should i Care)?

The Machine Learning Process

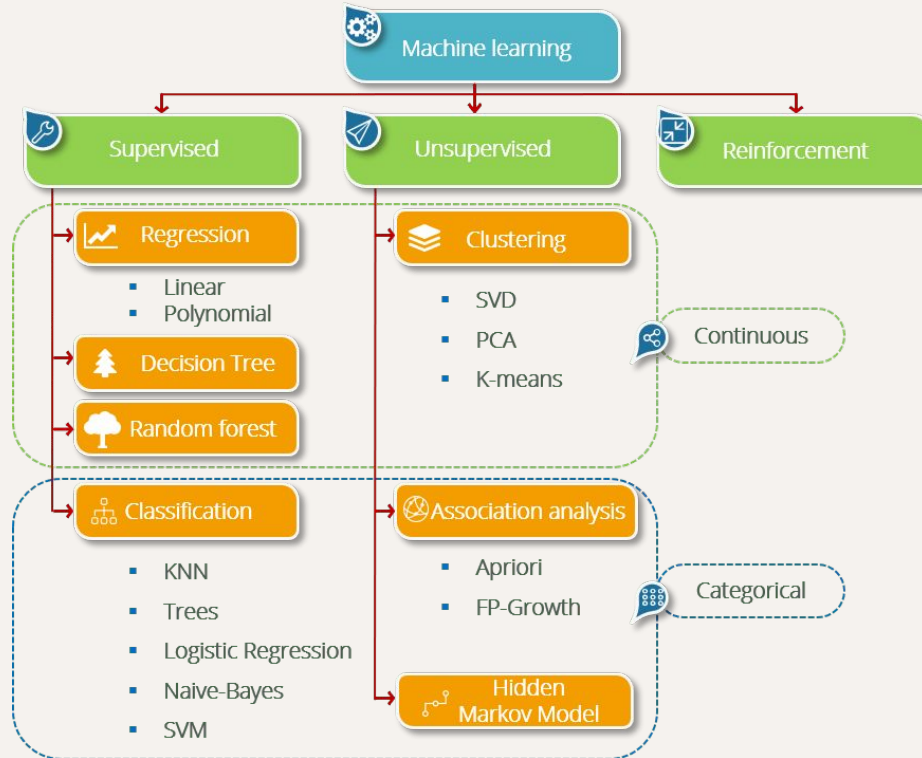


What is ML (Why should i Care)?

Machine Learning

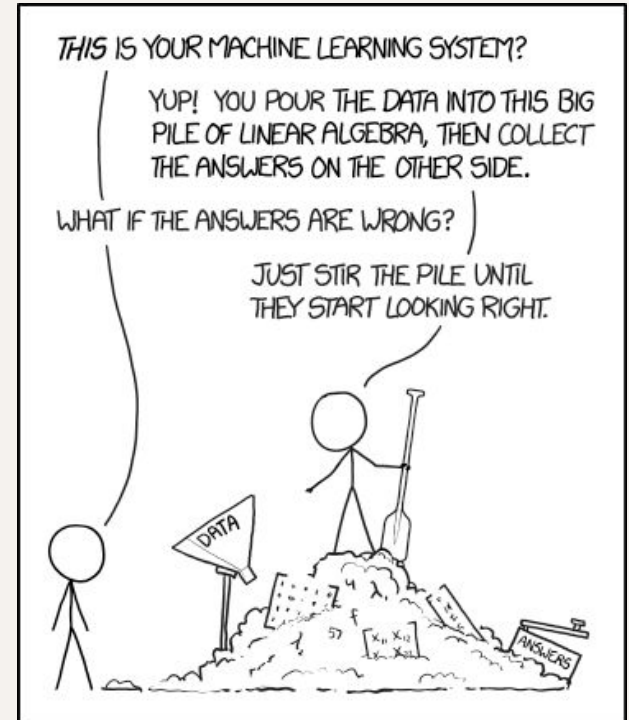


What is ML (Why should i Care)?

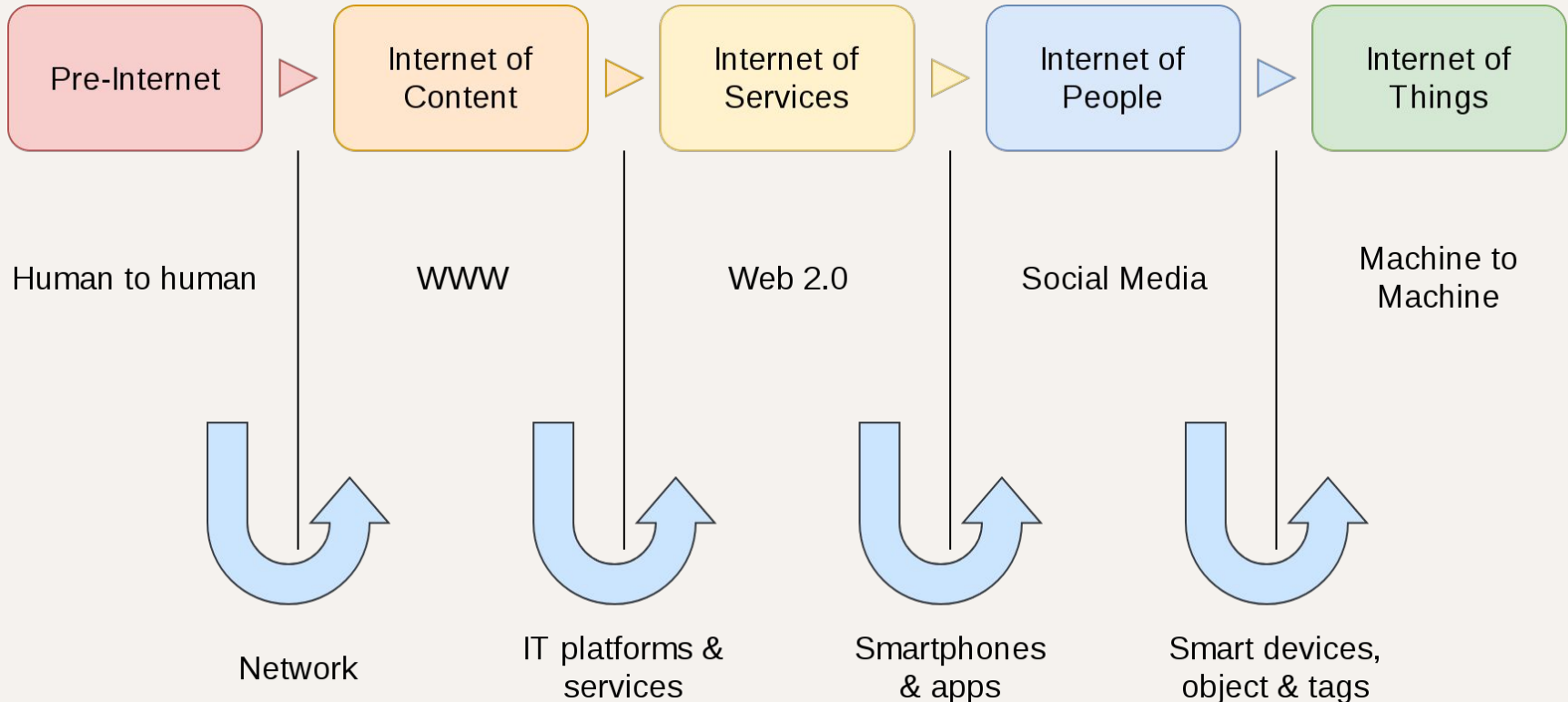


What is ML?

- A body of knowledge related with learning methods for machines (computers)
- Research area
- Opportunities for something useful



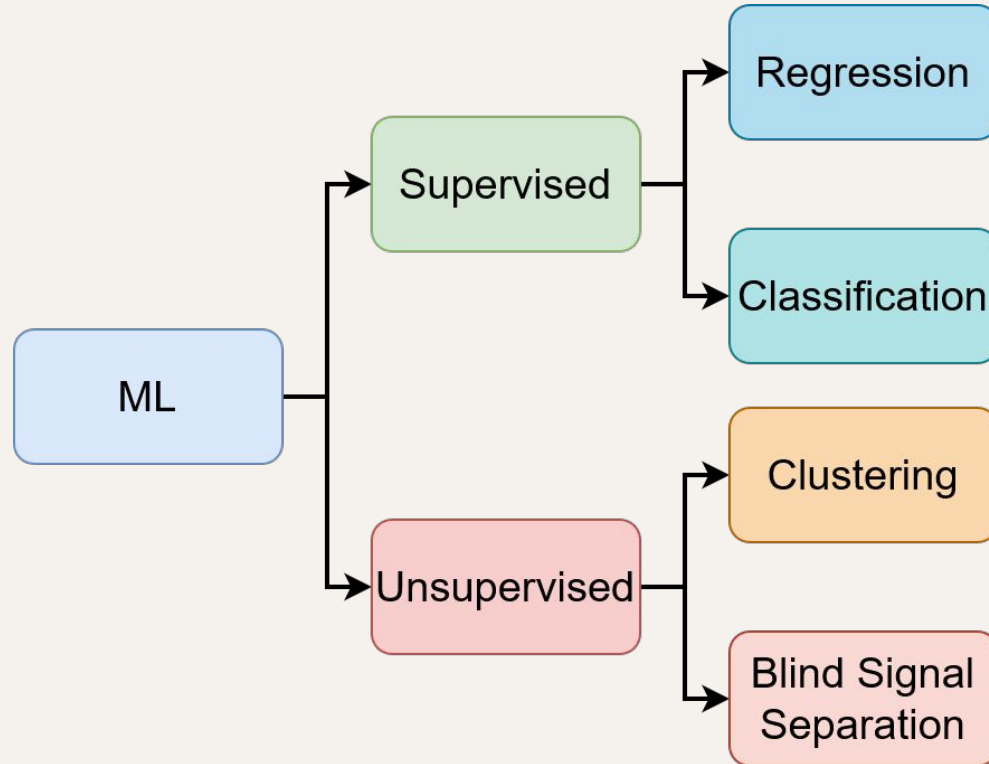
Why Should You Care?



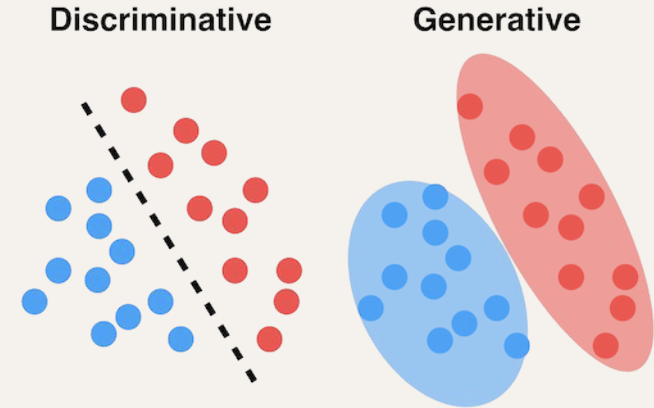
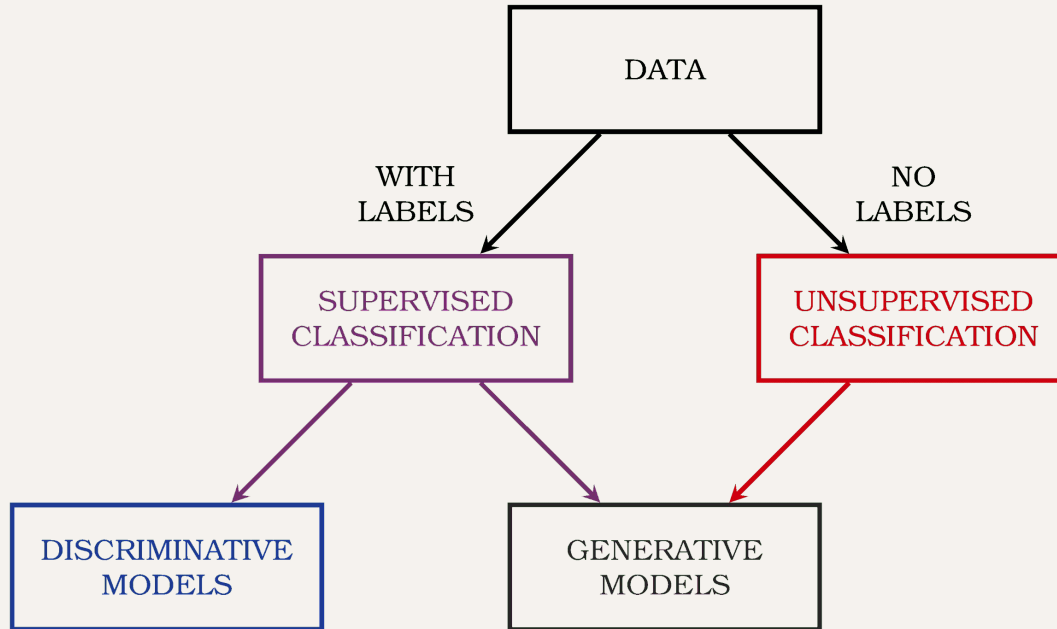
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Taxonomy

Taxonomies...



Taxonomies...



Taxonomies...

Induction symbolic reasoning

Neural Networks connections modelled on brain's neurons

Evolutionary algorithms learn from random generations (genetic algorithm)

Bayesian inference probabilistic models based on bayes' theorem

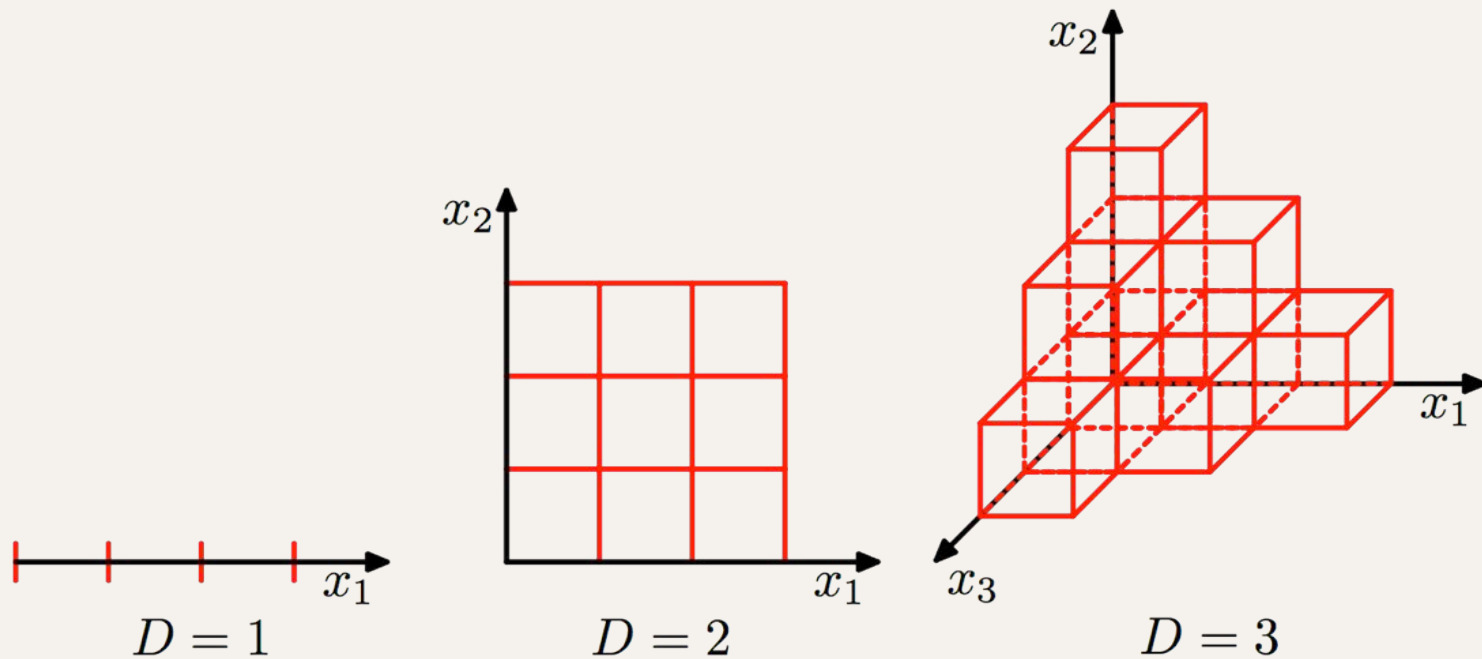
Analogy learns by finding similar examples



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Limitations

Limitations...



Limitations...

- Our model is a simplification of reality

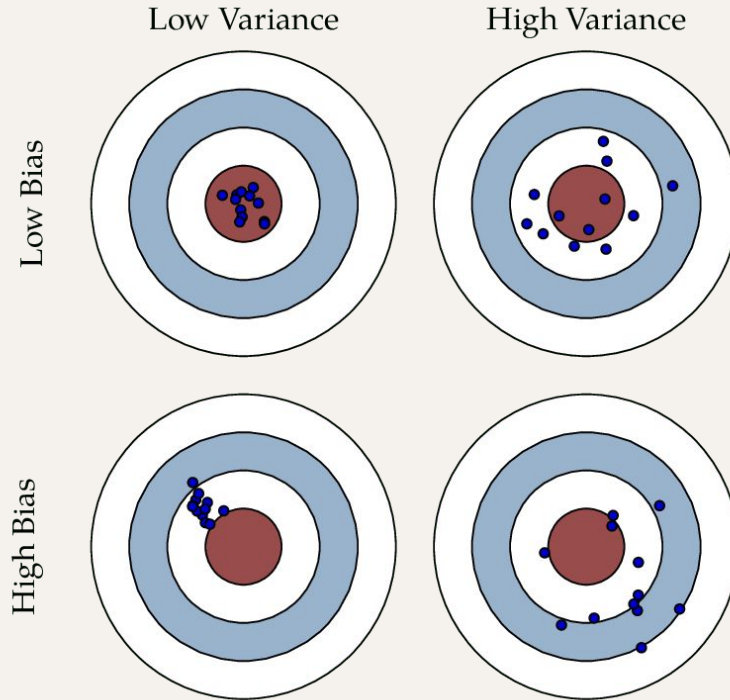


- Simplification is based on assumptions (model bias)



- Assumptions fail in certain situations

Bias and Variance



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Terminology

Terminology

Dataset: organized set of examples, typically composed of features and labels

Feature: single property of an example (input variable)

Label: classification category of an example (output variable)

Example: single instance of a dataset