MACHINE **LEARNING**

The A Team

Machine Learning

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Regression

Classifications

Deep Learning

Conclusio

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Contents in Brief

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Let's Get Started

Machine Learning — What?

Machine Learning

Introduction

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

Instead of writing code, you feed data to the generic algorithm and it builds its own logic based on the data.



Figure: Classification Algorithms

Case Studies — Supervised Learning

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Bedroom	Sq.Ft	Neighbourhood	Price
3	2000	Uptown	\$350,000
2	800	Downtown	\$200,000
2	850	City Centre	\$150,000
1	550	Suburbs	\$75,000
4	2000	Suburbs	\$200,000

Bedroom	Sq.Ft	Neighbourhood	Price
3	2000	Uptown	???

Supervised learning is the machine learning task of inferring a function from labeled training data.

Case Studies — Supervised Learning

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Math's Exam - Answer Keys

3)
$$221 = 3$$
 7) $534 = 11$

- The training data consist of a set of training examples.
- Training Data :
 - Input Object : Set of Features
 - Desired Output : Supervisory Signal
- A supervised learning algorithm produces an inferred function.
- An analogus task in human and animal phsycology: Concept Learning.

Case Studies — Unsupervised Learning





Figure: Google News grouping similar stories together.

Unsupervised learning is the machine learning task of inferring a function to describe hidden structure from unlabeled data.

Cocktail Party Problem — Unsupervised Learning

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Sound from:

- Microphone 1
- Microphone 2

Output from Learning Algorithm :

- Output 1
- Output 2



Figure: Overlapped Recordings

Case Studies — Unsupervised Learning

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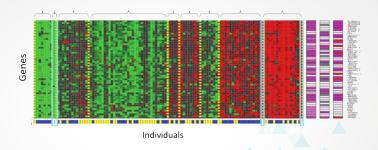


Figure: Gene Clustering

- Training Data given to the learner is unlabeled.
- No error or reward signal to evaluate a potential solution.
- Closely related to density estimation in statistics.

Machine Learning — Formal Definiton

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The field of machine learning is concerned with the question of how to construct computer programs that automatically improve with experience.

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.

Evolved from:

- Pattern Recognition
- Computational Learning Theory
- Artificial Intelligence

Benefits — Machine Learning

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The pain is almost over

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