

CHAPTER 2 :

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Related fields :

Machine learning can be said to be a subfield of AI, which itself is a subfield of computer science (such categories are often somewhat imprecise and some parts of machine learning could be equally well or better belong to statistics). Machine learning enables AI solutions that are adaptive.

Key Terminology(Machine learning)

Systems that improve their performance in a given task with more and more experience or data.

Deep learning:

Deep learning is a subfield of machine learning, which itself is a subfield of AI, which itself is a subfield of computer science. We will meet deep learning in some more detail in Chapter 5, but for now let us just note that the “depth” of deep learning refers to the complexity of a mathematical model, and that the increased computing power of modern computers has allowed researchers to increase this complexity to reach levels that appear not only quantitatively but also qualitatively different from before.

Data science:

Data science is a recent umbrella term (term that covers several subdisciplines) that includes machine learning and statistics, certain aspects of computer science including algorithms, data storage, and web application development. Data science is also a practical discipline that requires understanding of the domain in which it is applied in, for example, business or science: its purpose (what “added value” means), basic assumptions, and constraints.

Robotics:

Robotics means building and programming robots so that they can operate in complex, real-world scenarios. In a way, robotics is the ultimate challenge of AI since it

requires a combination of virtually all areas of AI. For example:

- Computer vision and speech recognition for sensing the environment
- Natural language processing, information retrieval, and reasoning under uncertainty for processing instructions and predicting consequences of potential actions.

What is a robot?

A robot is a machine comprising sensors (which sense the environment) and actuators (which act on the environment) that can be programmed to perform sequences of actions.