Artificial Intelligence

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Artificial Intelligence

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Definition

Intelligence is the ability to learn.

Artificial intelligence (AI) is a part of computer science that tries to create intelligent machines that work and react like humans.

It does this by simulating human intelligence processes via machines most commonly, computer systems.

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Definition

AI processes include learning (the acquisition of information and rules for using the information), reasoning (using rules to reach approximate or definite conclusions) and self-correction.

Definition

It has become an essential part of the technology industry.

Research associated with artificial intelligence is highly technical and specialized.

Definition

Some of the activities computers with artificial intelligence are designed for include:

- Speech recognition

- Learning

- Planning

- Problem solving

- Expert systems

- Machine vision

Definition

The core problems of artificial intelligence include programming computers for certain traits such as:

- Knowledge

- Reasoning

- Problem solving

- Perception

- Learning

- Planning

- Ability to manipulate and move objects

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Components of AI

Applications

- Image recognition
- Speech recognition
- Chatbots
- Natural language generation
- Sentiment analysis

Types of models
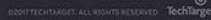
- Deep learning
- Machine learning
- Neural networks

Software/hardware for training and running models

- GPUs
- Parallel processing tools (like Spark)
- Cloud data storage and compute platforms

Programming languages for building models

- Python
- TensorFlow
- Java
- C

Knowledge

Knowledge engineering is a core part of AI research.

Machines can often act and react like humans only if they have abundant information relating to the world.

Knowledge

Artificial intelligence must have access to objects, categories, properties and relations between all of them to implement knowledge engineering.

Initiating common sense, reasoning and problem-solving power in machines is a difficult and tedious task.

Machine Learning

Machine learning is also a core part of AI.

Learning without any kind of supervision requires an ability to identify patterns in streams of inputs, whereas learning with adequate supervision involves classification and numerical regressions.

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Classification

Classification determines the category an object belongs to and regression deals with obtaining a set of numerical input or output examples, thereby discovering functions enabling the generation of suitable outputs from respective inputs.

Mathematical analysis of machine learning algorithms and their performance is a well-defined branch of theoretical computer science often referred to as computational learning theory.

Machine perception

Machine perception deals with the capability to use sensory inputs to deduce the different aspects of the world, while computer vision is the power to analyze visual inputs with a few sub-problems such as facial, object and gesture recognition.

Training

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