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## **Artificial Intelligence Problem**

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Artificial intelligence emerged as an independent scientific discipline in the second half of the 20th century. Its goal is to use the computing power of computers to solve problems that were considered exclusively subject to humans.

The main problem is that this kind of tasks can't be solved by methods used by artificial intelligence earlier. Rigid algorithms or fixed systems based on rigid rules do not work well with such things as image recognition or handwriting comprehension.

To solve such problems it was not enough to imitate human behavior, it was necessary to imitate the process of educating people. This is the essence of machine learning ideas, to give the algorithm a large amount of data and allow it to draw conclusions. In the process of improving these algorithms, many problems became solvable [1].

However, even this did not help to solve a whole layer of problems that is easily amenable to man. These include speech recognition, handwriting.

To solve problems of this kind, it was decided to go ahead and try to imitate the human brain. In practice, the implementation of this idea resulted in neural networks.

However, machine learning was still limited to simple tasks. Simple neural networks with hundreds or even thousands of neurons connected in a relatively simple way could not reproduce the capabilities of the human brain. This is not at all

surprising: there are about 86 billion neurons in the human brain and very complex interrelationships take place.

Deep learning is the use of neural networks with a large number of neurons and interconnections between them. Humanity is still far from imitating the human brain in all its complexity, but we are moving in this direction [1].

Deep learning is a specialized form of machine learning. A machine learning workflow starts with relevant features being manually extracted from images. The features are then used to create a model that categorizes the objects in the image. With a deep learning workflow, relevant features are automatically extracted from images. In addition, deep learning performs “end-to-end learning” – where a network is given raw data and a task to perform, such as classification, and it learns how to do this automatically [2].

There are many different artificial intelligence training methods, but one of the subsets of this larger list, machine learning, allows algorithms to learn from data sets. Finally, deep learning is a subset of machine learning that uses multilayered neural networks to solve the most complex tasks for computers.

#### References:

1. Artificial Intelligence: Foundations of Computational Agents / Poole O., David D. – Cambridge University Press. – 2017.
2. What is deep learning? [Electronic resource]. – Mode of access: <https://www.mathworks.com/discovery/deep-learning.html>. – Date of access: 22.03.2019.