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MACHINE LEARNING

Аннотация. В статье рассматриваются алгоритмы машинного обучения и описывается решение одной из самых популярных задач машинного обучения – классификации цифр. Десять тысяч изображений с цифрами необходимо разделить на десять групп, используя алгоритмы глубокого обучения. В данной статье читатель может найти информацию об одном из этих алгоритмов, нейронных сетях, определение этого метода и объяснение принципа его работы. Цель данной статьи познакомить читателя с машинным обучением. Она также включает в себя примеры использования искусственного интеллекта в повседневной жизни. Авторы данной статьи надеются, что читателям будет интересно узнать больше о машинном обучении.

Ключевые слова: машинное обучение, глубокое обучение, нейронные сети, классификация.

Abstract. The article deals with machine learning algorithms and describes the solution of one of the most popular machine learning tasks – digits classification. There are ten thousand images with digits, and the task is to separate them into ten groups using deep learning algorithms. In the article the reader can find information about one of these algorithms which is neural networks, the definition of this method and the explanation how it works. The aim of the article is to introduce machine learning to the reader. It also includes examples of using the artificial intelligence in everyday life. The authors of the article hope the readers would like to learn more about machine learning algorithms.

Key words: machine learning, deep learning, neural networks, classification.

Just imagine, you have ten thousand pictures with ten digits and your task is to separate one digit from the others, so you'll have ten groups of digits. You may do it by yourself, but it will take a lot of time. It is much easier to make someone do your job, for example, your computer.

Machine leaning is a group of algorithms, which get input data and examples of expected output. Using these, a machine learning system will be able to find out statistical rules for associating input and output.

One of the subfields of machine learning is deep learning. The deep stands for using several layers of data representation, which leads to usage of neural networks. In fact, the neural network will work with pixels of images transformed into a vector. Each pixel has its own color, a special number from RGB scale.

Layers of the neural network consist of neurons. Each neuron gets summed weights and constants and feeds them through some function. Next layers in the network get values from the previous layers. Doing the same, they will get to the last layer, which includes ten neurons, so the output is also a vector, which is unique for all ten groups of digits. Learning means finding a set of values for the weights of all layers in a network, such that the network will correctly associate input with expected output. Then the computer will be able to recognize digits and put them in correct groups. It's the most popular task for those, who want to study machine learning, but machine learning does not only classify images. For example, it can watch over your health, do some complicated calculations, so it may be useful for scientists. Or what about computer vision? Soon artificial intelligence will become your assistant, it will be able to drive your car, educate kids, transport things, help with scientific discoveries in different fields, from genomics to mathematics. It will transform our world in a fantastic way.

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