MACHINE LEARNING AS A TOOL OF MODERN PEDAGOGICAL TECHNOLOGIES

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Abstract. The use of machine learning in education is currently of great interest to researchers and scientists. Following the course of digitalization is impossible without the introduction of the most advanced technologies in the field of education. The article discusses the possibilities of practical application of machine learning technologies in the educational process

Keywords: machine learning, education, innovations in education, digitalization.

МАШИННОЕ ОБУЧЕНИЕ КАК ИНСТРУМЕНТ СОВРЕМЕННЫХ ПЕДАГОГИЧЕСКИХ ТЕХНОЛОГИЙ

Аннотация. Использование машинного обучения в области образования в настоящее время представляет большой интерес для исследователей и ученых. Следование курсу на цифровизацию невозможно без внедрения самых передовых технологий в сферу образования. В статье рассматриваются возможности практического применения технологий машинного обучения в образовательном процессе.

Ключевые слова: машинное обучение, образование, инновации в образовании, цифровизация.

INTRODOCTION

Machine learning, along with cognitive modeling and robotics, is one of the constituent parts of the artificial intelligence industry focused on simulating human behavior. Therefore, these concepts are closely related and often overlap. The term "machine learning" describes the totality of processes from providing a machine and a software model with access to data and the ability to learn on its own to obtain final results, as well as software products based on specific algorithms. In 1959, Arthur Samuel came up with the brilliant idea that we should not teach computers, but let them learn on their own. He coined the term "machine learning" to describe his theory, which is now considered the standard definition of the ability of computers to learn on their own.

MATERIALS AND METHODS

The goal-setting task of machine learning is programming computers to use data about previous knowledge and experience as a reference for solving a certain problem [1]. Graphic object recognition, computer vision, bioinformatics, natural language processing, commerce, finance, education, etc. are just some of the areas where machine learning can be applied in practice. This article focuses on the last area on this list, namely the application of machine learning in education. Every year the educational process changes at an accelerated pace. Information technology has long and firmly taken its place in the field of education and has proven its importance for student achievement. In educational institutions, you can no longer find ordinary students who sit in the audience and look at a notebook while the teacher is giving

a lecture. Education, both in general education schools and in vocational and higher educational institutions, is no longer just teaching from a tutorial, strict requirements for the student to behave diligently and memorize their own handwritten notes in a timely manner, in order to successfully pass tests and exams. The process of learning, both in the classroom and outside it, has become an activity with measurable and deterministic goals and results. Over time, new teaching methods have become a new dynamically changing characteristic of the educational process. In addition, these practices have evolved into a vital part that plays an essential role in expanding the opportunities for improving the components of the training system, improving the foundations of the curriculum and increasing its effectiveness and relevance.

At the moment, the development of artificial intelligence technologies provides machine learning with significant interest from the education sector. Combining many complex approaches and mathematical algorithms, machine learning is becoming in demand in many areas of human life.

The main idea of machine learning is to optimize the performance criterion based on data or previous experience [1]. Of course, machine learning is a complex field of knowledge that includes many different approaches. Classical machine learning algorithms are divided into two main groups: supervised learning algorithms ("supervised algorithms") and unsupervised learning algorithms ("unsupervised algorithms"). The principle of supervised learning algorithms is that the input receives information, as well as the required results. Thus, the machine can find out what the user expects to receive from it when a similar command is entered.

The best way to characterize the potential of machine learning is to look at how people and companies are currently using it. There are several examples:

Natural Language Processing: Google Translate is built on a set of machine learning algorithms that allow the service to update over time based on input from users, such as new words and syntax.

Content recommendation systems: In Netflix, ivi, Google or, for example, Yandex.Music, everything that is recommended to the user depends on his previous search activity. In this way, the services respond to user requests, matching products for buyers or digital content for viewers, thereby simplifying the search on the Internet.

RESULTS AND DISCUSSION

In addition to the commercial sphere, there are many business implementations of machine learning in the field of education and pedagogical technologies. Here are just a few of the concepts where machine learning can be applied in more detail in this article.:

- predicting student performance;
− optimization of the student assessment process;
− creation of an individual educational route;
− processing and adaptation of training materials;
− support for teachers and staff of educational institutions.

At present, education in general, and specific systems of education in particular, are still largely focused on supplying students with information and hoping that it will be assimilated. Accordingly, the student's intelligence is assessed by testing his ability to recall information previously obtained in the course of training. The problem is that this model ignores the need to control how well students understand information and how they apply it in real life situations.

This model has shown its low efficiency over the years. The introduction of machine learning technologies at the initial stages can be presented as a UEO - unique educational offer [2] – in the conditions of any scientific and educational center or laboratory. But with the growth of digitalization and the increase in the spread of modern information technologies, such software products have every chance of widespread use, since technological solutions based on machine learning are universal for students of all ages. In the long term, the application of machine learning is sure to provide the following benefits:

Personalized (or individualized) learning. Machine learning approaches are flexible and dialectical enough to meet the needs of all students, regardless of their learning speed. A system based on machine learning approaches will also allow teachers/tutors/mentors/moderators to follow each student individually and help in areas where he has poor results.

Analysis of educational materials. Big data analysis also refers to the machine learning system, in which teachers teach students using computers. These computers are used to analyze the information that teachers use to teach and determine if the quality of the content meets current educational standards.

Student assessment. Systems based on machine learning methods are used to reduce the time required to evaluate student work. In addition, machines are used to increase the efficiency and ease of reporting of the grading system.

Student achievement. Using computers and other hardware, teachers can monitor each student personally and evaluate their progress individually. Computers will help identify non-standard student learning models, which will allow teachers to determine the best ways of learning and assist in building a personal educational route.

CONCLUSIONS

As follows from the above information, the use of machine learning in the educational process provides many advantages. The learning process becomes easier, more efficient, and adaptation to the needs of each student is faster [3].

It can be assumed that in the future the learning environment will be highly individualized, providing the means and opportunities for students to realize their intellectual potential to the fullest extent. The sustainable adoption of machine learning will occur in a variety of areas of interest to educational technology. It is likely that in the initial stages its impact will not be obvious or significant to the end user. [4].

The progress made in bringing machine learning to the education sector will save a lot of time for teachers, educators and facilitators both in the classroom and in other non-classroom activities.

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