

HISTORY OF THE DEVELOPMENT OF ROBOTICS

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Abstract. *Robotics is the science of the process of developing automated technical systems based on electronics, mechanics and programming. Robots today have entered our lives in different areas. They fly into space, explore other planets; They help for military purposes - they defuse bombs and reconnoiter the situation from the air.*

Modern robotics is based on computer technology. Industrial robots make up more than 80% of all devices existing today. There are many types of construction sets, but the most popular and unique is Lego. I think everyone is familiar with this designer. It is unique because all its parts fit together and several sets can be connected. In robotics classes we work with the Lego Mindstorms EV3 construction set, this is the latest model of the LEGO educational construction set.

Keywords: *robotics, design, history, teaching methods, lego, science and life, primary education.*

Robots today have entered our lives in different areas. They fly into space, explore other planets; They help for military purposes - they defuse bombs and reconnoiter the situation from the air. In industry, many areas are already unthinkable without robots: they assemble cars and help find new medicines.

I study in the Robodelkin club. Robotics is a serious passion of mine, and I decided to devote my research project to this topic. My goal: to prove that robotics can be not just a game, but a serious activity that can later become a profession.

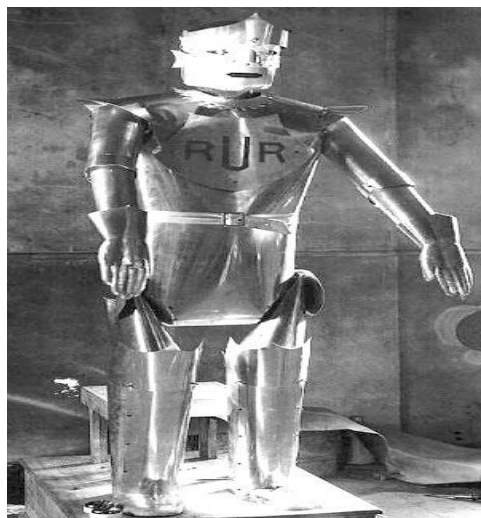
My tasks:

- Explore the history of robots
- Find out where robotics can come in handy.
- Conduct a survey to find out how popular robotics is among children my age.
- Build and program a moving robot from Lego Mindstorms.
- Formulation of conclusions.

Almost every human invention is reflected in art. With robots, the opposite happened: the works of many science fiction writers inspired scientists to work on robotics.

And the “era” of robots in art began in January 1921, when the premiere of a new play by playwright Karel Capek took place in Prague. Robots R.U.R. first they help people in everything, and then they seize control over humanity.

By the way, it was Capek who introduced the word “robot” into our speech - a slightly modified Czech “robota”, which translates as forced labor.



R.U.R. (short for "Rossum's Universal Robots").

Robots are mechanical human assistants capable of performing operations according to a program embedded in them and reacting to the environment.

The concept of "robotics" originated with Isaac Asimov and first appears in his 1941 short story "Liar." Robotics (from robot and technology; English robotics) is an applied science that deals with the development of automated technical systems.

Basic laws of robotics:

- A robot cannot harm a person.
- The robot must obey human commands.
- The robot must take care of its safety.

Robotics is the science of the process of developing automated technical systems based on electronics, mechanics and programming. The first drawing of a humanoid robot was made by Leonardo da Vinci around 1495. French mechanic and inventor Jacques de Vaucanson in 1738 created a mechanical duck covered with real feathers that could walk, move its wings, quack, drink water, and peck grain.



Swiss watchmaker Pierre-Jacques Droz created an automatic scribe in 1770. This is a girl sitting at a table who wrote out letters and words in neat handwriting and could even draw a dog. At the same time, she smoothly shook her head and lowered her eyelids in time with the movement of her hand.

Russian mechanics did not stand aside either. Ivan Petrovich Kulibin in 1769 built an egg figure - a universal clock - within three years. The clock gave a theatrical performance and played music.

Modern robotics is based on computer technology. Industrial robots make up more than 80% of all devices existing today. They are capable of almost completely replacing humans in many factories: mechanical "workers" do not make mistakes, do not get tired, and do not need to be paid wages.



In 1966, the Shakey robot appeared - the first universal mobile robot capable of reasoning over its actions.

Without the Dante II robot, a person would never have looked into the crater of an active volcano. Without the Sojourner robot, our knowledge of Mars would be much more limited. This unit landed on the surface of the planet in 1997 and transmitted a huge number of photographs to Earth.

Household robots are not adapted to extreme conditions. Their task is to help a person in everyday life and entertain him. There are a huge number of inexpensive home robots: robot vacuum cleaners, robot lawn mowers.

NEC's PaPeRo robot, in addition to purely everyday functions, can speak. This robot knows more than 300 phrases, and recognizes even more.

But the one that can do the most is Sony's dog Aibo (愛慕 aibo means "love"). She is able to recognize her owner, respond to commands and affection. Aibo has four stages of maturation: infancy, childhood, adolescence and adulthood. The dog can run, jump, stretch, play football and dance.

The body of most robots consists of separate moving and fixed parts. Here are the main ones:

Internal controller

Each robot is equipped with a controller - a computer operating system. The controller is the brain of any robot. It contains all the necessary information to complete tasks and instructions. Energy Source: Robots need an energy source. Some run on batteries. Others are equipped with photovoltaic cells that convert sunlight into energy. Mechanical robots are wound up using a spring mechanism.

Remote control. Robots that operate on other planets, such as the Mars rover, have internal controllers, but can also be controlled from Earth. From the photographs, the operator determines where the robot should move and what task it needs to perform.

Light and sound sensors. With their help, the robot can recognize light emanating from objects and detect sound waves. This function helps you either bypass various objects or go towards them. Also, a voice recognition device can be built into the robot body, with which a person gives verbal orders to the machine.

Pressure Sensors: Some robots are equipped with pressure sensors that simulate the sense of touch. These sensors generally have two purposes. They inform the robot that it has hit an object and must change direction, and also allow it to correctly grasp and lift the object.

Results of a survey of classmates I decided to conduct a survey in our class. The questionnaire contains one question: "What do you like to do in your free time?"

And five answer options:

----- going out with friends

-----read

-----watching TV

-----play LEGO

-----exercise

From this survey, I see that children like to play with construction sets and are familiar with Lego, and many would be interested in a school subject such as Robotics.

Practical part. There are many types of construction sets, but the most popular and unique is Lego. I think everyone is familiar with this designer. It is unique because all its parts fit together and several sets can be connected.

In robotics classes we work with the Lego Mindstorms EV3 construction set, this is the latest model of the LEGO educational construction set.

Conclusion: Nowadays, robotics is used in absolutely all areas and professions: in industry, in medicine, in war and even in space, robots help us around the house, and perhaps in the future they will replace many human professions in general.

During my research, I wanted to show that making a robot is a very interesting, exciting and educational process. Real scientists and engineers are working on the creation of robots, but every schoolchild can come up with a design for one of them. Already at school, children should have the opportunity to discover their abilities and prepare for life in a high-tech competitive world.

Thus, so that my hobby becomes my profession, but if I do not become a designer, I know that the skills acquired in robotics will be useful to me in the future both in my studies and in my work.

Informatics and ICT in the information environment of primary schools also make it possible to cover the entire field of primary education with interdisciplinary learning activities and, thereby, transfer children's education to a new qualitative level of active cognitive activity, but this requires the introduction in primary schools of such educational methods and training programs in computer science, which have flexible possibilities for adaptation to a specific pedagogical process and children's team in the inextricable unity of all subjects.

It is necessary to note the availability of these methods for primary education teachers, since due to the presence in primary education of one teacher working with children, it is important to involve him in information activities together with students as a conductor of elementary information literacy in accordance with the requirements of the primary school standard and an accomplice in information activities in all primary education subjects. Such methods primarily rely on interdisciplinary workshops based on ICT.

They require the formation in primary schools of conditions for their implementation - this is the creation of an information environment for primary schools, compliance of the personnel potential of primary education teachers with such methods, as well as the availability of appropriate educational and methodological materials that reflect the new educational standard of the primary stage of general education and organically include ICT. Forms of informatization are as diverse as information technologies themselves. If we consider the problem of teaching work techniques in primary school from the perspective of variability in the content of training, then we can classify the main developments and trends in the Russian school over the past 20 years as established and reflected in primary school.

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