

WOMEN IN COMPUTER SCIENCE

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Abstract:

The position of women in the field of computer sciences is considered. Examples of biographies of women who have made a great contribution to the development of information technologies are given.

Key words: women, computer science, information technology, programming, scientist, science.

Анотація

Розглянуто положення жінок в сфері комп'ютерних наук. Наводяться приклади біографій жінок які внесли великий вклад в розвиток інформаційних технологій.

Ключові слова: жінки, комп'ютерні науки, інформаційні технології, програмування, вчена, наука.

Introduction

Since ancient times, women have stored and multiplied our knowledge about the world. They sufficed the patience to teach, systematize observations and manually rewrite books that were once real pieces of relics. Often confronted by the chaos of endless wars and other manifestations of male aggression, they had to pay the price of their lives.

Despite the fact that in the 17-18 centuries women scientists have periodically appeared, their colleagues from among the learned men refused to seriously consider them as equal to themselves. Even the leading educators of the time, such as Jean-Jacques Rousseau, believed that women are meant were capable only of raising children and should not be engage in science. Only closer to the beginning of the 19th century, women began to enter the professorships of universities and publish in serious scientific publications.

At the turn of the nineteenth and twentieth centuries, the role of women in science, thanks to the development of suffragistic and feminist movements, is widening noticeably, and by the middle of the 20th century, women scientists have ceased to be a curiosity or irritation among conservative groups of the population. In favor of this is the fact that women in 1903 broke through the main scientific "glass ceiling" - the Nobel Prize.

In 1987, 42% of American software developers were women. And 34% of system analysts, too. Computer science began to attract women in the mid-60s, at the dawn of the computer age. At that time, men already dominated other technical specialities, but not in the computer environment. For almost two decades, the percentage of women with a degree in computer science has steadily increased and peaked at 37% in 1984. In reality, in the second half of the 1960s, the media was presented with programming as a female work [1].

Main part

Silicon Valley today excites the minds of the entire world. Previously, children wanted to become cosmonauts, now they dream of being programmers. Life without computers is impossible, this sphere is developing not that every year - every month, the need for cadres is huge. Representatives of the stronger sex say that computers - it's difficult, painstakingly, we need a special warehouse of mind and logic, which the woman can not comprehend. Few of these men know that they owe their profession to the girl. Moreover, the history of science knows many turning points related to computers in which the key role is played by a woman.

Men came to IT thanks to women, and not vice versa. The binary code was invented by mathematician Ada Augusta Lovelace. She also wrote the first program and introduced key concepts of programming – such as a cycle and a working cell. She was taught by an astronomer and mathematician Mary Somerville – author of the book "Interconnection of the physical sciences", in the review of which first appeared the word "scientist".

Ada Lovelace (Augusta Ada King, nee Byron, 1815-1842) is an English mathematician, the daughter of a great poet Lord Byron and his wife Anna Isabel, fond of mathematics [2]. Since childhood her mother, Anna Isabel, for fear of the child becoming like her father, taught her daughter only to exact sciences and kept her away from poetry. Ada Lovelace is known for creating a description of Babbage's computer, in which she proposed many innovations and terms. The concepts of "working cell" and "cycle" belong to it. Closer to the

end of life, Ada Lovelace published her works under the initials, but these works went far beyond her time, so Ada was forgotten and remembered more than a century later. In 1975, the US Department of Defense decided to start developing a new programming language (which was later used, for example, in missile systems), and the name was proposed in honor of Augusta Ada – Ada.

The first compiler was written by Grace Hopper, a mathematician and Navy officer, who completed her career as a Rear Admiral. She worked with the first electronic computers, was a senior mathematician in the group UNIVAC I and Mark I. Grace introduced standardization into testing practice and developed the idea of machine-independent languages. Under her leadership, the first high-level COBOL language was created [3].

In addition, it was Grace Hopper who discovered the world's first "bug" (software error) and became the author of the term debugging. And it happened in 1951, when a moth flew inside the computer Mark II incomprehensibly and closed the contacts of one of the relays there. Later, Grace said: "When an officer came to us to find out what we are doing, we answered that we were cleaning the computer from insects (debugging)." Since then, the term debugging has become common practice for all programmers in the world, and the term "bug" has meant a malfunction of any kind. The moth, which was extracted from the computer, was carefully pasted into the system log in the report on the first case of "debugging".

Perseverance, independence and own style helped Grace Hopper become the first in everything she did. This amazing woman never used the generally accepted rules and did not follow the established system.

The ENIAC is immortalised in history as the world's first electronic general purpose computer. It was initially developed to do the same jobs as our human computers at the Moore School, by calculating bullet trajectories. While the ENIAC was designed and built by a team of male scientists from the University of Pennsylvania, all the programmers – who at the time were called 'operators' – were women.

In 1946 six brilliant young women programmed the first all-electronic, programmable computer, the ENIAC, a project run by the U.S. Army in Philadelphia as part of a secret World War II project. They learned to program without programming languages or tools (for none existed) – only logical diagrams. By the time they were finished, ENIAC ran a ballistics trajectory – a differential calculus equation – in seconds! Yet when the ENIAC was unveiled to the press and the public in 1946, the women were never introduced; they remained invisible [4].

Kay McNulty was one of the first women to be chosen to join the ENIAC team, along with Holberton, Meltzer, Teitelbaum, and another woman called Helen Greenman, who declined to go to Aberdeen for training and was hence replaced with Bartik. McNulty's friend Fran Spence would join the project later.

On 21 February 2007, the Association for Computing Machinery announced the name of the 2006 laureate of the most prestigious scientific award in the field of high technologies, the Turing Award. This unofficial "Nobel Prize in Computing Technologies" and the sum of 100 thousand dollars was first given to a woman - 75-year-old Frances Allen (Frances Allen), a former employee of IBM, who worked at the corporation from 1957 to 2002. Ms. Allen was engaged in scientific research in the field high-performance computing, worked on parallel computing technologies that are used in many modern computing systems.

In 1989, Allen was the first woman to fall into the so-called IBM Fellow – this is the most prestigious technical title in the corporation, which has been awarded since 1962 to the most distinguished employees. Many famous inventions in the field of computer technology – from the language of Fortran and relational DBMS to the first hard disk, virtual memory and DRAM technology – were created by those who received this title.

But Francis Allen is by no means the only woman who has achieved such impressive successes and left her mark on computational technologies.

Karen Spark Jones – British scientist in the field of computer science. She developed technologies that allowed users to work with a computer using ordinary words, rather than through equations and code. This breakthrough was of great importance for the further development of search engines.

Karen was born on August 26, 1935 in Huddersfield, Yorkshire (England). Father, Owen Jones, was a chemistry teacher. Mother, Norwegian Ida Spark, moved to the UK after World War II.

Spark Jones attended Huddersfield High School and then went to Girton College in Cambridge. From 1953 to 1956, she studied history and philosophy. Having graduated from the university, Jones worked as a teacher at school for a while, after which she got into the field of computer science.

Erna Schneider Hoover – American mathematician, the inventor of the computer method of switching calls.

Hoover was a professor at Swarthmore College from 1951 to 1954, she taught philosophy and logic. During the work she married Charles Wilson Hoover, who later very much supported the career aspirations of his wife.

In 1954, Hoover was invited to work in the laboratory of Bell Labs. The internal training program was the equivalent of a master's degree in computer science. Switching systems moved from electronic to computer-based. But when in a short period of time the number of calls reached a peak and the call centers turned out to be literally "piled up" with calls, the entire system was hanging.

Hoover applied her knowledge of symbolic logic and feedback theory to programming call center control devices to use the data on incoming calls to restore order throughout the system. She used a computer-based electronic method to monitor the frequency of incoming calls at different times. With its help, it was possible to set priorities: according to the method, preference was given to processes that concerned the input and output of the switch. Processes, such as accounting and billing, were carried out in the second turn. As a result, the computer automatically regulates the speed of receiving call center calls, significantly reducing the likelihood of overload.

For her invention, called "Feedback Control Monitor for Stored Program Data Processing System", Hoover issued a patent number 3,623,007 in November 1971. It was one of the first ever issued, software patents.

Thanks to the invention, Hoover became the first female head of the technical department at Bell Labs.

Radia Joy Perlman is a software developer, network engineer. She invented the spanning tree protocol (STP), which became fundamental for the operation of network bridges.

Radia was born on January 1, 1951 in Portsmouth (Virginia, USA). Parents worked for the American government: his father worked as a radar engineer, and her mother as a programmer.

As a student at the Massachusetts Institute of Technology, Perlman participated in the Undergraduate Research Opportunities Program, as part of the LOGO Lab in the MIT Artificial Intelligence Laboratory. She developed a children's version of the training robotic language LOGO, called TORTIS. In a study conducted in 1974-1976, young children (the youngest age was 3.5 years), programmed a training robot, called Turtle. Radia was considered a pioneer in the field of teaching young children computer programming.

Most of all Perlman is known for his invention of the STP channel protocol. Its main task is to eliminate loops in the topology of an arbitrary Ethernet network, which includes one or more network bridges. STP automatically blocks connections that are currently redundant for complete connectivity of switches.

Sophie Wilson is a British inventor, the developer of some of the very first commercially successful personal computers, the creator of the ARM-processor.

Wilson was born in 1957 in the city of Leeds (Yorkshire, England). She studied computer science at the University of Cambridge. Encouraged by the early MK14, it developed a microcomputer with a 6502 processor (an 8-bit processor with a 16-bit address bus, allowing an address of up to 64 kilobytes of RAM).

In the early 80's, Wilson expanded the BASIC programming language of the Acorn Atom home computer into an improved version for Acorn Proton. This microcomputer contributed to the conclusion of a contract between Acorn and the British Broadcasting Corporation (BBC). In less than a week, Wilson developed a system, including a board and components and software. Proton became BBC Micro and its BASIC turned into BBC BASIC. Sophie wrote the manual and technical specifications, realizing that communication was an important part of success.

The world of information technology is filled with many amazing developers, inventors, researchers and eminent personalities. And most of them are men. But among women there were many talented scientists who made their invaluable contribution to the IT industry. On an equal footing with others, these women influenced the history of the development of information technology.

Conclusion

Today, there are more women in the IT field, which indicates the improvement of the psychological climate in the society. In addition to the ABI Institute and the Google program, it is supported by the Women in Computer Science Association [5].

All these initiatives help the fair sex to find their place in IT, but everything is fine in moderation. The brightest people have always been formed during difficult times. Now the main thing is not to overdo it and not to fall into fanatical feminism, demanding for women instead of equal some exclusive rights.

Brilliant ideas are born in the heads and are embodied by hands. These organs are almost identical in both sexes. Therefore, the chances of using them for their intended purpose should also be equal.

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