

of observations. This is crucial for the formal analysis of strategy correctness, environmental robustness, and principled selection of meta-strategies.

Modern AI approaches increasingly utilize hybrid models that combine heuristic, symbolic, and probabilistic components. Model theory serves as a foundation for:

- formalizing explainable decisions (explainable AI, XAI);
- constructing models with explicit semantics;
- logical inference over learned representations (e.g., Hoare logic applied to neural architectures);
- building trustworthy user interfaces where model behavior is formally interpretable.

Such systems, grounded in semantically meaningful representations, offer not only accuracy but also interpretability and verifiability, which is critical in socially significant domains.

Integrating model theory into machine learning enables the development of logically sound approaches to modeling and analysis. This deepens our understanding of generalization, reliability, logical expressiveness, and interpretability in artificial intelligence systems.

Thus, the synthesis of these disciplines opens promising avenues—from formalizing learning environments to constructing trusted hybrid systems that merge logical reasoning with the heuristic strength of statistical models.

References

- [1] Кейслер Г., Чэн Ч.Ч. Теория моделей. М.: Мир, 1977. 615 с
- [2] Yeshkeyev A.R., Issayeva A.K., Porova N.V. PAC-learning and J-o-minimality. Традиционная международная апрельская математическая конференция в честь Дня работников науки Республики Казахстан . – Алматы, 2025. –С. 289.
- [3] Mitchell T. Machine Learning. – McGraw-Hill Science/Engineering/Math, 1997. ISBN 0-07-042807-7.

USING ARTIFICIAL INTELLIGENCE IN COMPUTER SCIENCE LESSONS

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Modern society is experiencing a stage of rapid technological progress. Artificial intelligence is becoming a part of everyday life, and education cannot stay away from these processes. Computer science as a subject has been teaching students the basics of digital literacy for several decades, and now it faces a new challenge — integrating AI into the educational process. This article discusses the possibilities and prospects of using AI in computer science lessons [1].

AI offers a wide range of opportunities to transform the learning process. Thanks to machine learning algorithms, it is possible to analyze students' academic performance, identify knowledge gaps, and form individual learning trajectories. For example, based on data analysis, AI can recommend certain tasks or topics to repeat.

In addition, AI is able to perform routine tasks such as checking homework, automatic test analysis, which significantly saves teachers time and allows them to focus on developing students' creative and analytical abilities.

The use of AI tools in computer science lessons is possible in several forms. First, it is the use of virtual assistants and chatbots that are able to answer students' questions, explain the material and guide them in the process of completing assignments. Secondly, these are learning platforms with AI elements, such as Khan Academy, Coursera, which adapt to the student's level of training.

In addition, code analysis tools such as repl.it or Scratch with the automatic project evaluation function, which allows students to instantly receive feedback and improve their programming skills.

In practice, AI can be used to create adaptive exercises. For example, the CodeCombat platform offers students programming tasks that gradually become more complicated depending on the student's success. Another example is the use of voice assistants in the classroom, which can conduct mini-surveys, remind students of assignments, or comment on student responses.

It is also possible to mention projects in which students train their own AI models using Python and machine learning libraries, which develops research skills and immerses them in the real challenges of the digital age.

Despite the broad prospects, the introduction of AI into school education is accompanied by a number of difficulties. Among them are insufficient training of teachers to work with AI tools, limited technical equipment of schools, as well as important issues of ethics, data privacy and digital security. It is important to prevent the misuse of technology and maintain a balance between live communication and automation.

Computer science teachers are encouraged to start small, using AI to test knowledge, create visual materials, and analyze learning outcomes. It is important to train teachers, share experiences, and integrate AI into school projects. It is also advisable to discuss the opportunities and threats of technology with students, forming a responsible attitude towards AI [2].

Artificial intelligence can significantly enrich the teaching of computer science, make learning more effective, interesting and individualized. With a competent approach, AI becomes not a substitute for the teacher, but his assistant and ally in developing the intellectual potential of schoolchildren.

References

- [1] Semakin I.G., Henner E.K. Computer Science: a textbook for grades 10-11. Moscow: BINOM, 2023.
- [2] Yudin S.V. Artificial intelligence in education. Moscow: Prosveshchenie, 2022.

THE USE OF ARTIFICIAL INTELLIGENCE IN ADAPTIVE LEARNING: ANALYSIS OF PERCEPTION AND READINESS OF UNIVERSITY TEACHERS AND STUDENTS IN KAZAKHSTAN

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