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THE USE OF ARTIFICIAL INTELLIGENCE IN NEW ARCHITECTURE

The theses under consideration highlight the application of artificial intelligence (AI) in architecture and offer useful resources for further study.

AI plays a key role in modern architecture, transforming and modifying the way constructions are designed, built and managed. The use of artificial intelligence in modern architecture ensures a faster and more efficient design process. The essence of AI in architecture is to learn from data. Advanced algorithms carefully study extensive architectural data, including building plans, structures, materials and historical architectural aspects. Subsequently, AI uses this knowledge to create innovative architectural projects, offering a variety of options and improvements. AI in architecture also processes a large amount of data, including climatic, geographical and structural characteristics. AI performs the routine tasks of analyzing data and creating variations of projects, which free up time for architects to focus on the more creative and conceptual aspects of design. Machine learning algorithms allow to analyze vast amounts of data, which help architects understand the needs and requests of clients as well as optimize the design of buildings. The procedure for creating architectural projects using AI involves the use of various methods and algorithms to formulate distinctive and creative solutions.

Some of these methods are:

- deep neural networks;
- genetic algorithms;
- recurrent neural networks;
- graphical algorithms.

Neural networks are used to predict and optimize energy and material consumption during construction. In addition, artificial intelligence helps to ensure the sustainable efficiency of buildings by controlling lighting, heating and ventilation systems, that helps to reduce energy consumption and improve user comfort. Technologies both in virtual and augmented realities are used to visualize projects and contribute to clients´ understanding of space and functionality of future buildings. In general, the use of AI in modern architecture offers wide opportunities for innovation and improvements in construction, which contributes to the creation of efficient, energy-efficient and user-friendly buildings.

However, the further, the more actively architects and designers use new technologies in their work, and with development and improvement, these tools will become even more entrenched in their activities. Artificial intelligence is one of the three technologies that will have the biggest impact on the real estate sector in the coming years. [1]

Large design tasks require a creative approach to decision-making, which is considered a skill in which humans are superior to machines. In a new study, scientists examine the problems of complex structures, focusing on multi-level engineering tasks. The study emphasizes the importance of visualization for training AI to observe human actions in modifying bridge designs based on visual information, not just rules that help to create new designs without additional prompts. [2]

‘Artificial intelligence is not just an imitation or repetition of existing solutions’, said Jonathan Kagan, the professor at Carnegie Mellon University and a co-author of the study - It is the study of how

people solve specific problems and create new design solutions. How good can artificial intelligence be for this? In our case, AI did very well'. [2]

'We tried to make artificial intelligence create projects the way humans do, understanding this process: how people approach design, how they plan a sequence of actions, and then, step by step, create a new design', said Ayush Raina, co-author of the study. [2]

Examples of software using AI in architecture:

- Autodesk Dynamo;
- Spacemaker AI;
- Archistar;
- Cityzenith.

Having analyzed this information, it is possible to understand that in a few years AI will not just be an assistant, but also a full-fledged part of the architecture, because human imagination, sense of style and aesthetic perception are combined with the analytical skills of artificial intelligence, creating a symbiosis that promotes to innovative design, providing new opportunities, process optimization and innovative design approaches.

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FOREIGN EXPERIENCE IN DESIGNING REHABILITATION CENTRES FOR CHILDREN

The relevance of the chosen topic is due to the urgent need to improve the architectural and planning solutions of rehabilitation centres in Ukraine. Most rehabilitation centres in our country were built in Soviet times and are now morally and physically outdated. These buildings do not meet the modern medical needs of children. Given the psychological trauma and the need for medical rehabilitation due to the military conflict, it is important to study and use international experience.

The goal is to analyse foreign experience in designing rehabilitation centres for children.

Statement of basic material In the modern world, the issue of rehabilitation of children with various physical and mental disabilities is becoming increasingly important. Increased attention to this area is not only a matter of humanitarian aid, but also a strategically important component of society's development. In this context, foreign experience in the design of rehabilitation centres for children becomes particularly interesting and important to study and implement. The design of rehabilitation centres in other countries includes analysing the needs of the target audience, developing individual programmes and using advanced techniques and technologies. Particular attention is focused on creating a comfortable environment that promotes not only physical but also emotional and social development of each child [1].

In this study, we will look at key aspects of the design of rehabilitation centres for children abroad, in particular in Europe, Asia, North America and Africa, to highlight the prospects and opportunities for improving current practice in Ukraine (Fig. 1).