Conclusions. Modern problems require modern solutions. BIM technologies in building design solve many similar, straightforward problems. This allows architects and engineers to devote more time to more complex tasks. The fast automated operation of the BIM programms allows to check quickly several options and to choose more economical, technological and up-to-date solution. Such tools help to create more economical, more accurate projects and as well as to build perfect structures.

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V. Klerfon (PSACEA, Dnipro)
Scientific supervisor: V. Uzhelovskyi, Cand. Sc.(Tech), Assoc. Prof.
Language consultant: L. Druzhinina, Assoc. Prof.

OPTIMIZATION OF ORIENTATION IN THE SPACE OF SOLAR PANEL

More than 2 billion people on the planet still rely on coal, wood, oil, and gas for both cooking and heating their homes. Today, the implementation of alternative energy sources, autonomous and decentralized, is more advantageous in many countries, both economically and environmentally. Fossil fuels are becoming yesterday's energy source. Today, other forms of future energy are appearing and one of them is solar energy. Solar power is considered to be one of the most promising directions for obtaining clean electrical energy for consumer power supply, Solar power is. It's development is driven by both purely economic factors, such as constantly rising prices for traditional sources like coal, oil, peat, and gas, and environmental concerns. Eastern Europe is a sunny region, that is why the application of solar photovoltaic panels is particularly relevant here.

A solar photovoltaic system is a solar power station that utilizes the direct conversion of solar radiation energy into electricity. The installation consists of a set of solar modules (panels) placed on a supporting structure or on the roof of a residential building, battery storage, charge-discharge controller, and an inverter for converting DC to AC voltage when necessary. Despite all the advantages of using solar panels, such technologies have certain drawbacks, particularly caused by their dependence on the level of illumination. Solar energy systems are often stationary and therefore operate differently at different times of the day.

The sun does not remain stationary relative to the horizon. Every day it rises and sets, and it occupies different positions in the sky throughout the day. Its position also varies depending on the season. In winter, the sun rises lower, and in summer it rises higher. This fact significantly affects the generation of solar electricity. [1,2] For the most optimal positioning not only during the season but also throughout the day, solar trackers, a movable structure that automatically determines the best position for solar panels and sets it independently, are used. The advantage of solar trackers is the automatic positioning, which allows to achive maximum electricity generation output.

In industrial applications the ground-mounted solar power stations (SPS) with dual-axis trackers and actuators the movable devices for controlling in two axes - changing the tilt angle and azimuth, are used to adjust the optimal tilt angle of the panel with achievements of the highest efficiency of the SPS at the moment. [1,2]

The factors mentioned above lead to the conclusion that, for achieving maximum electricity generation, it is necessary to maintain the optimal arrange angle of the SPS panel towards the sun and also to position the SPS panels towards the sun throughout the day (from sunrise to sunset). Maintaining the optimal position of the solar panel can be achieved by using an automatic system for optimal positioning of solar panels in space. The solution of the above mentioned problem is given in various literary sources such as textbooks, manuals, articles, patents, copyright certificates. [1,2] The application of solar trackers, especially dual-axis ones equipped with automatic adjustment systems for optimal positioning of solar panels in space, is quite costly, as it involves complex technical means requiring qualified maintenance.

One way to reduce costs and to simplify the tracker and control system design is to use a single-axis tracker and to utilize the concept of the "unique angle," which remains fixed throughout the year. This angle is determined separately for each region and it depends on the angle at which solar energy generation will be maximum. If the angle remains fixed regardless of the sun's position, only a small portion of the generated electricity will be lost. To avoid losing this generation, the angle is adjusted depending on the season: panels are lowered during warm seasons and they are raised during cold seasons.

When using a single-axis tracker, it is advisable to perform adjustment using fuzzy logic control. The software and technical capabilities of the Matlab application package are allowed to create the optimal control system for positioning solar panels in space. Since the control system involves the use of a microcontroller, it is advisable to use fuzzy control model for positioning the solar panel in the FCL (Fuzzy Control Language) notation as outlined in the IEC 1131-7 Standard. The FCL language is developed for representing fuzzy control models of programmable logic controllers (PLCs) in the form of structured text that can be interpreted as a high-level language program. The algorithm for the operation of the solar battery using the Matlab software package is provided below.

When developing a program, the Mamdani algorithm is adopted as the fuzzy inference algorithm. Additionally, it is assumed that the model will receive a digital signal from the zenith angle sensor of the solar panel proportional to the zenith angle in degrees. Furthermore, as it is provided in publications, utilizing the optimal values of the zenith angle, which is in the interval from 35° to 45°, the following values are accepted: optimal is 40°, minimum is 35°, maximum is 45°. The output of the system will be the actual value of the zenith angle of the solar panel rotation. To form the rule base of the fuzzy inference system, the input and output linguistic variables are defined in advance: β1 is a "current zenith angle of rotation"; β2 is a "desired zenith angle of rotation."

The fuzzy control model was constructed according to the following rules:

RULE 1. If the "zenith angle is greater than 45°", then "the executive motor of the tracker device should be activated in the direction of a large decrease in the angle";

RULE 2. If the "zenith angle is greater than 43°", then "the executive motor of the tracker device should be activated in the direction of a small decrease in the angle";

RULE 3. If the "zenith angle is 40°", then "there is no need to activate the executive motor of the tracker device";

RULE 4. If the "zenith angle is greater than 37°", then "the executive motor of the tracker device should be activated in the direction of a small increase in the angle";

RULE 5. If the "zenith angle is greater than 45°", then "the executive motor of the tracker device should be activated in the direction of a large increase in the angle";

By accumulating the rule conclusions using the MAX method and employing the Center of Gravity (COG) method as the defuzzification method, a fuzzy control model for positioning the solar panel can be expressed in FCL notation.

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I. Malyi (PSACEA, Dnipro)
Language consultant: K. Shabanova, English lecturer

THE IMPACT OF MODERN TECHNOLOGY AND ARTIFICIAL INTELLIGENCE ON STYLE IN ARCHITECTURE IN RECENT HISTORY

Changes in architectural thought under the influence of time and newly invented technologies.

At the moment, artificial intelligence (AI) is being introduced into more and more fields. This has also affected construction and architecture. AI is now already helping to design buildings, interiors, making drawings of these buildings, making calculations, etc.

AI is being used to streamline workflows, add efficiency, and assist in decision-making processes within the architectural profession. It has the potential to revolutionize the industry by providing decision support systems for building regulations compliance and enhancing the overall architectural process.

The use of technology in architecture has expanded over the years, with mainstream tools such as Computer Aided Design (CAD), Building Information Modeling (BIM), virtual reality, augmented reality, 3D printing, and machine learning playing vital roles in the design and construction of infrastructure.

AI is seen as an indispensable tool that enriches the field of architecture with innovative designs, blending classical aesthetics with futuristic design. It is expected to shift, rather than replace, human roles in the field, leading to major changes in architecture.

We can't be completely sure how AI will influence architectural thought, where architectural art will turn. Perhaps post-modernism will get a new breath, an influx of thoughts, or maybe abstractionism or hi-tech will have a leading role. In theory, we can expect the return or revival of styles that are no longer used, unpopular styles or compilations of once super-popular styles such as neoclassicism, baroque and gothic.

But it's still worth arguing that the benefits of artificial intelligence are inestimable and obvious. AI optimises many processes, thus speeding up work and at the same time removing a sufficient number of problems that arose earlier. Now human hands can be freed up and by putting the simplest tasks on the shoulders of artificial intelligence, they can do things that humans have never been able to do before. Although it all comes down to the same creation of new things for the sake of progress and so on until humanity stops itself.

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