Using Bionic Architecture In Uzbekistan's Climate

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ABSTRACT

This article explains the importance and application of bionic architecture in the climatic conditions of Uzbekistan. The arid and continental climate of Uzbekistan reveals the urgency of saving energy resources, ecological sustainability, and efficient use of natural resources. Recommendations are given that the use of bionic architecture is another direction that is suitable for the environment of Uzbekistan. It is noted that bionic architecture has been widely used in world practice and has achieved good results. The advantages of applying bionics to the architecture of Uzbekistan in the near future are highlighted.

Keywords: bionics, continental, energy, innovation, technology, engineering, engineering, aircraft designer, improvement, efficiency.

Introduction

As a science, bionics began to emerge in the 1950s and 1960s. It emerged at the junction of biology and engineering, solving technical problems. The name "bionics" is derived from the Greek word, and the term "bionics" is derived from the combination of the words "bios" - life and electronics. "Bionics" is a branch of science that studies biological systems and processes, and is the creative use of the reality of living nature in technology. The term "bionics" was introduced by the American scientist Jack Still and was adopted at the 1st conference-symposium on the field of bionics in 1960 in the city of Dayton (USA). Pay attention to the words of academic architect A. Shusev: “The great masters of the high classics paid great attention to the manifestations of nature. Just as an aircraft designer studies a flying creature, an architect creating a perfect work of art should study and know living nature in the same way.[3.4]

Bionic architecture is a modern approach to improving human activity, inspired by natural systems and processes. It allows you to create designs that are not only aesthetically attractive, but also environmentally sustainable and energy-efficient. The fact that the exterior and interior design are taken from natural forms has an aesthetic aspect.

The main part

The unique climatic conditions of Uzbekistan create great opportunities for the development of bionic architecture. The presence of arid and semi-arid climatic conditions in the country, high temperatures and low humidity, require the search for innovative solutions. Among the new approaches in modern architecture, bionic architecture occupies a special place. This direction is aimed at improving architecture and design processes through the study of natural systems and biological models. The purpose of the article is to study the principles of bionic architecture in the conditions of Uzbekistan, to propose appropriate solutions to existing problems, and to study the practical application of this approach. [Section 5.4]

Bionic architecture: world experience and its scientific advances in the field of construction. Bionic architecture involves studying the functional properties of natural organisms and systems and using them in technological and architectural solutions. These principles are based on such properties of natural systems as energy conservation, air management, water conservation, heat transfer, and durability. Bionic architecture is also aimed at ensuring environmental and social sustainability in design and engineering. Bionic architects are numerous in the world, including: Antoni Gaudi, Zaha Hadid, Norman Foster, Santiago Calatrava. For example, we can cite a few of Zaha Hadid's projects as examples. (Figure 1 Figure 2) Bionic architecture uses curves and animal shapes inspired by them. According to Antoni Gaudí, "A straight line is a human line, a curved line is a divine line."[1.4] The development of architecture has used bionic shapes in buildings to an extent that human imagination cannot comprehend.

Figure 1 Hong Kong Polytechnic University

Photo 2: "Golden Metro" in Qatar.

The basic principles of bionic architecture are derived from the analysis of the natural environment and biological systems. The interconnectedness, efficiency, and flexibility of nature are the basis of bionic design. For example, through natural devices, self-cooling, and energy-saving mechanisms, bionic architecture helps to improve the quality of design and construction processes.[2.3] (Figure 3)

Figure 3 Energy-saving technologies

The climatic conditions of Uzbekistan create an interesting area for the application of bionic architecture. The country has a predominantly arid and semi-arid climate, with high temperatures in summer and low temperatures in winter. These conditions require innovative architectural solutions to reduce energy consumption and use resources efficiently. For example, the use of heat-retaining and moisture-controlling materials in the selection of building materials allows for the creation of energy-efficient and environmentally friendly designs.

Projects based on bionic architecture are increasing throughout Uzbekistan. For example, in Tashkent, new buildings created using environmentally friendly construction

technologies and bionic designs can significantly reduce energy consumption. Examples of successful applications of bionic architecture include natural ventilation, the use of solar energy, and projects integrated with natural materials.[Section 1.3]

The development of bionic architecture in Uzbekistan not only helps to renew the fields of modern architecture and design, but also helps to solve environmental problems. It is important to develop bionic solutions suitable for the country's climatic conditions, to increase the well-being of the population and reduce the impact on the environment. In urban areas, green plants can be used as decoration on roofs and facades. This will allow more natural light and air flow,

helping to make cities healthier. Although building bionic buildings is difficult, new technologies will lead to an increase in passive energy-saving environmentally friendly buildings. When building bionic architecture, it is necessary to study the environment together with representatives of various industries and place buildings that are suitable for it**.**

Conclusion

Bionic architecture allows you to create modern solutions that are suitable for the climatic conditions of Uzbekistan. By drawing inspiration from natural systems and processes, projects aimed at increasing energy efficiency and ensuring environmental sustainability play an important role in the future of architecture in the country. The use of bionic architecture helps to create a sustainable and innovative environment in Uzbekistan.

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