

FUTURISTIC ARCHITECTURE AND GEOMETRY

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ABSTRACT: The article discusses how modern architecture is changing from the usual rectangular buildings familiar to the eye into a variety of intricate ones, futuristic architecture appears where geometric shapes take place.

KEYWORDS: Futurism, industrialism, urbanism, body combinations, prisms, golden section, rhombicuboctahedron shape, parallelepiped, semiregular polyhedra.

INTRODUCTION

Mathematics and architecture are very ancient sciences that have existed for over a thousand years. In our time, both architecture and mathematics are very important. Mathematics is directly involved in ensuring the strength and usefulness of architectural structures. It also underlies the laws of beauty, manifested in architecture. Architecture is all around us. This is the environment that belongs to everyone; the environment in which we live, study and play. Architecture changes with time and always strives forward. Also, futurism, which received its development, and at the beginning of the twentieth century, finds its embodiment at the present time. The main features of futurism are considered to be striving for the future, moving forward, rejecting the past, breaking with the present, speed, and a vivid expression of the new. Futurism is called the prototype of the art of the future - it involves the destruction of cultural stereotypes and instead offers ideas of the future as an era of technology, industrialism, urbanism, high speeds and pace of life.

THE MAIN FINDINGS AND RESULTS

If earlier architectural structures were monotonous structures, now geometric shapes have made it possible to diversify the architectural appearance of cities. Architectural works live in space, are part of it, fitting into certain geometric shapes. In addition, they consist of separate parts, each of which is also built on the basis of a specific geometric body. Often geometric shapes are combinations of various geometric bodies.

If an architect plans to create a prism-shaped structure, then it will certainly become a real masterpiece. An outstanding example of this is the "Palace of Peace and Accord" in Astana, the capital of the Republic of Kazakhstan. An architectural creation made of aluminum, glass and steel

was created according to the principles of the Fibonacci Golden Ratio. It reaches a height of 61.8 meters and has the same base width. The pyramid is known for its elevators, which do not move vertically, but diagonally to the top of the structure.

To create non-standard objects, Archimedean solids (or, in other words, semi-regular polyhedra) are used. In the architecture of various cities, such buildings become real magnets for tourists. Pay attention to the National Library of Belarus. It has rightfully earned the status of one of the most original buildings in the world because of its rhombicuboctahedron shape. This Archimedean solid consists of 18 squares and 8 triangles. Because of this shape, the library is often compared to a diamond. The building becomes especially similar to these gems when it lights up at night.

The Interlace Apartments, Singapore. The complex looks like 31 bricks unevenly stacked on top of each other in hexagons around eight courtyards. Interlace consists of six-story blocks that are stacked four high at the center to provide a maximum of 24 floors. Mathematical calculations in the design of such a building force one to resort to computational problems about a parallelepiped.

Showing the close connection between mathematics and architecture, the design of the Gherkin building in London has a height of 180 meters. There are three main features that make it stand out from most other skyscrapers: it's round instead of square, it bulges in the middle and tapers to a thin end towards the top, and it's based on spiral structures.

By combining two separate buildings serving as the office and broadcast divisions of the Hong Kong media company under one roof, BIAD UFO architects have managed to create an immersive diagonal shell based on the Mobius strip principle. The structural system not only embodies engineering genius, but is also environmentally sustainable.

Zaha Hadid considered Heydar Aliyev Center one of her main projects. This building was awarded one of the most prestigious architectural awards - in 2014 the London Design Museum recognized it as "Project of the Year". One of the most important and, at the same time, complex elements of the project was the architectural development of the building's cladding. Its forms are reminiscent of waves crashing against each other.

The roof, whose area is 4 hectares, consists of 2027 panels in the form of various geometric shapes - triangles, rectangles, trapezoids.

CONCLUSION

As you can see, architecture has always been used to achieve goals that use not only function, but also aesthetics, philosophy and meaning. And in many cases this was achieved through mathematics..

In modern architecture, based on computer simulations of both building appearance and physical phenomena such as aerodynamics and building acoustics, an understanding of geometry allows

increasingly unusual designs to be created using modern materials. Who are these developers to a greater extent - experts in the field of mathematical sciences or architects? Almost every aspect of a building can be modeled with a computer, from physics to appearance. Computer models can simulate wind blowing around a building, or sound waves reflecting around or inside a building. Graphics programs can explore various mathematical surfaces and fill them with panels of various textures. However, mathematical laws are the basis of all architectural projects of our time!

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