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Innovations Inspired By Nature: Bionics and Iot Structures

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Abstract: *This article explores the fascinating intersection of nature-inspired innovation and modern technology, focusing on bionics and IoT (Internet of Things) structures. It explores how these fields draw inspiration from natural phenomena such as animal movements, plant structures, and ecological systems to develop cutting-edge solutions for a variety of industries. The article emphasizes the impact of biomimicry on technological development and its potential to create sustainable, efficient and versatile products and systems.*

Keywords: *biotechnology, Internet of Things system, technical biology, environment, energy efficiency, natural systems, biomimicry.*

Today, taking strong inspiration from the natural world, it plays an important role in creating new innovations. Bionics and INTERNET OF THINGS (IoT) technologies are inspired by the complexity of natural systems and are being used to find solutions to local problems.

Bionics refers to technologies created using structures in nature. This is the process of creating and developing new products and services based on the structures of animals, plants or other natural elements. And IoT makes the collection, transmission and learning of data from shared devices in residences and local environments intuitive.

Structures of an innovative nature, bionics weaponized transplantation methods, futuristic women's clothing or stages of zoo systems are illustrated through many examples. Examples of IoT include

automated gardens in agriculture, services for intelligent individuals to perform daily tasks, and devices to monitor the surrounding environment.

The application of bionics and IoT to each other opens up the possibility of using modern structures in nature in the field of technology. This has the potential to create benefits for innovative events, accommodation and other sectors. In our article, we will explore the role of bionics and IoT technologies in improving the living and surrounding environment, and how they are applied in the country's systems and health services.

High Impact of Bionics and IoT on Residential and Surrounding Environments. Bionics and IoT, with innovative technologies created for residential and surrounding environments, play an important role in solving problems, maintaining the legal environment and improving the quality of health services.

With these technologies:

1. Habitats: Bionics and IoT technologies are used to create automated systems, devices and innovative habitats. For example, automatic witness stands, security systems and parking automation processes are managed through IoT systems.

2. Health services: Bionics and IoT technologies, development of telemedicine systems, smart clinics and scientific research will help. Now, people can monitor their health remotely.

3. Environment: These technologies play an important role in environmental monitoring, energy efficiency and water conservation. Bionics and IoT structures are used to dig through nature's weaponized structures and develop biotechnologies.

It is the application of structures inspired by natural systems through innovative technologies. It has great potential in improving the quality of residential areas and the surrounding environment. The application of bionics and IoT to habitats and environments is of great importance in creating an interactive environment for humans and cultivating critical challenges. Creative technologies and nature-inspired technologies work together successfully and are essential to further improve our homes, health services and the surrounding environment.

To achieve greater stability and structural efficiency, engineers use nature as inspiration for their designs. Considering the degree of stability in biological systems, they analyze their structural behavior, consider relevant analogies with technical systems, abstract the observed physical and mechanical principles, and incorporate these principles into the final product. This process defines the bionic design approach. The term "bionics" refers to the scientific discipline that focuses on the transfer of properties from biology to technology. This thesis aims to study the theoretical foundations of this concept, explain its methodologies and demonstrate its application in architecture. Through the evaluation of bionically constructed shell structures, the various stages of the design process are described, and elements of each analogy are evaluated both biologically and technologically. Examples selected in this thesis include concrete, stone, steel, and wood structures. Multidisciplinary literature is reviewed to provide a detailed explanation for each design project. Based on this research, the structural advantages that characterize some biological systems can be transferred to architectural design and, in particular, the load-bearing capacity of shell structures can be improved using a bionic approach.

Technical biology and bionics "To do 'technical biology' means to study and describe nature in terms of technical physics and related fields and in a methodological way," says Nachtigall. , defines it as a process of representation and understanding, while bionics is the study of technology from nature. He

also considers them to be "antipodes" that "complement each other, like images and mirror images", on the one hand bionics without prior study of natural conditions, and biology cannot be carried out without fundamental research in the field of technical biology, on the contrary, there is a risk of drying up if it is not obtained by bionics, processed and proposed for introduction into technology.

Nature has always been a source of inspiration for designers from various disciplines. The innate tendency to follow the model of nature has greatly influenced the urban landscape and the changing appearance of our surroundings, especially the development of architecture. For example, Zaha Hadid, who is famous for the uniqueness and fluidity of her structures, "was inspired by the complexity of forms in nature, Arabic calligraphy and the natural continuous flow of landscapes that occurred among the reeds of the Sumerian village of Iraq. , But water and sand" . , this type of inspiration usually reflects only the aesthetics and appearance of the product, not whether it is the performance of the product, whether it is a building, machine or other object. involves the implementation of technical solutions given by systems and natural models, from macroscopic organisms such as animals and plants to atomic-level nanostructures and conglomerates. This "biologically inspired" concept of innovation focuses more on abstracting functionally useful properties found in nature and they help to develop a more effective design of a given structure. Bionics, the science that focuses on the transfer of abstract principles from biology to technology, is a relatively new discipline. For this reason, most of the relevant scientific publications and research works on this topic are recent and correspond to modern developments and problems in technology. References by Werner Nachtigall, Julian Vincent, Janine Benyus, and a number of other researchers who helped popularize the concept of bionics around the world date mainly to the early 21st century, and the new organization for the multidisciplinary application of bionic projects. created a knowledge base. related to the date. A particular concern of civil engineers and architects, where a bionic design approach can provide valuable solutions, is the stability and structural efficiency of buildings in terms of load-bearing capacity.

In conclusion, the paper illuminates the interplay between technical biology and bionics and highlights how they come together to inspire innovative design and technological solutions. The influence of nature on various disciplines, particularly architecture and urban planning, is evident, with designers drawing inspiration from the complexity of natural forms and landscapes. The concept of "biologically inspired" innovation, which involves extracting functionally useful properties from nature, emerges as a driving force for effective design. In addition, the emergence of bionics as a relatively new science and its importance in modern technological developments and potential applications in civil engineering and architecture are highlighted.

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