

The use of parametric principles in the elements of park architecture

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I. INTRODUCTION

The beginning of XXI century is marked by the emergence of research, experimentation and implementation in the direction of “parametric”. Parametric principles have been applied in the design of architectural elements of the park.

II. MAIN PART

1. General Information

Parametricism is a sub-genre of avant-garde style in architecture and design that uses conceptual modeling of computer programs, algorithms and parametric equations. Parametricism involves an abstract approach to the surrounding space. All its processes are organized according to certain parameters. In the aesthetic sense, parametrization is achieved by embodying a new kind of space – fluid, seamless, constantly adapting and changing.

2. The history of parametricism and its heuristics

The official emergence of parametricism as a style can be considered 2008, when architect and theorist Patrick Schumacher published his "Manifesto of Parametricism", in which he proclaimed a new global style in architecture. Smooth flowing surfaces, interdependent elements and variations of self-similar shapes are actively used in the new architecture. Functionally, parametrization involves the abandonment of rigid separation into functional zones in favor of more permeable and multipurpose spaces. In his articles, Patrick Schumacher uses the term "heuristics." The term "heuristics" refers to the set of techniques and methods that facilitate and simplify the decision of cognitive, constructive and practical problems.

Characteristics of parametricism heuristics *

Formation in parametricism	
<i>Negative heuristics</i>	<i>Positive heuristics</i>
<ul style="list-style-type: none"> • avoid regular primary shapes – squares, rectangles, triangles and circles (lack of compliance); • avoid simple repetition (lack of variety); • avoid collages of isolated, unrelated elements (lack of order). 	<ul style="list-style-type: none"> • all shapes should be reasonably flexible (deformation = information); • all systems must be differentiated (gradients = diversity); • all systems must be interdependent (correlation).
Functional heuristics	
<ul style="list-style-type: none"> • avoid solid functional stereotypes; • avoid isolating functional zoning. 	<ul style="list-style-type: none"> • all functions are parametric scenarios with an element of chance; • all actions are correlated and interdependent.

Table 1. * the materials of the parameterists' manifesto were worked out [2]

Some rules dictate which paths to avoid (negative heretics) and other rules dictate which paths to follow (positive heretics). Negative heuristics prevents repetition of techniques and methods that are incompatible with the central core of the style and cause the repetition of existing patterns and styles of formation, and the positive heuristics offers basic principles and desirable methods that quickly accelerate work in a new advanced direction (table 1).

3. Use of parametricism in park architecture

The aesthetics of parametricism deeply penetrated the park architecture. Parametricism can be embodied in small architectural forms, park structures, lighting elements, playgrounds and other recreation areas.

Parametric principles are used in the multi-level park project in Aberdeen by Diller Scofidio+Renfro. The concept of the project is not to disturb the natural space in the most harmonious way to fit into the environment. Therefore, bionic, natural forms are used in the formation of architectural elements.

We propose project proposals for the implementation of the principles of parametricism in the reconstruction of the Cadet Grove Park in Solomenskiy district of Kyiv.

In the development of the master plan, the features of the relief and the auxiliary environmental factors were taken into account. In this way, the park architecture was maximally integrated into this environment and had plastic, natural forms. Instead of the usual classical forms, the arbor architecture uses new architectural elements that transform the space and add dynamism to the volume. A non-linear approach applied to the design of the park bench enhanced its ergonomic properties. Bionic, natural forms are used in the formation of the 50-seat cafe. The building is designed on the basis of environmentally friendly technologies. Lighting elements also contain elements of parametricism.

III. CONCLUSION

Based on the research, we can conclude that in the design of parks the direction of parametricism is a really new avant-garde style.

It largely relies on the structural, constructive and formative principles of nature, thereby continuing to develop the organic approach to a new level. The main feature of parametricism is the appeal to nonlinear forms, which brings it closer to bionic architecture. Thus, this new style is a natural step in the development of modern park architecture and integrates its achievement in the formation, relying on new design technologies and newest construction technologies.

References:

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2. Schumacher P. LECTURES & INTERVIEWS – theorizing architecture [Электронный ресурс] / Patrik Schumacher – Режим доступа: <http://www.patrikschumacher.com/index.htm>