

Development of Generative Designed

I.Yu. Mamedova, O.A. Zyabneva, I.A. Oranskaya



Abstract: *The article discusses the importance of design generation methods in synthesis with additive technologies for creating innovative interior products of new visual forms from biodegradable plastic using an example of an interior panel.*

Keywords: *generative design; ecology; bioplastic.*

I. INTRODUCTION

Modern methods of shaping in interior design contribute to a comprehensive solution of both aesthetic, functional, economic problems, and existing social problems in the field of environmental protection.

The use of generative design products in the interior involves the search for new artistic-figurative means, and also makes it possible to use biodegradable materials in the production of art products.

Designers using generative modeling techniques can contribute to the development of environmentally friendly products through careful selection of materials, in particular PLA plastic, which has gained popularity in 3D printing, can be applied.

PLA plastic is created from agricultural products - corn, potatoes, sugar beets, sugar cane, that is, its basis is lactic acid, which decomposes over time and thereby does not harm the environment.

In addition, due to its composition in the manufacture of this plastic, the emission of carbon dioxide into the atmosphere is much less compared to petroleum-based polymers.

The finished PLA itself has a transparent color and is easy to paint, so this plastic has a rather diverse color palette.

Due to its properties, this material can be actively used in modern interior creativity using generative design, in which artificial intelligence is a co-author of the design.

Generative design solves the following problems: synthesis of forms; surface and structure optimization; the formation of trabecular structures; topology optimization, removing excess [1].

An important advantage of generative technologies is development speed, "one-click solution" [2] (Fig 1,2).

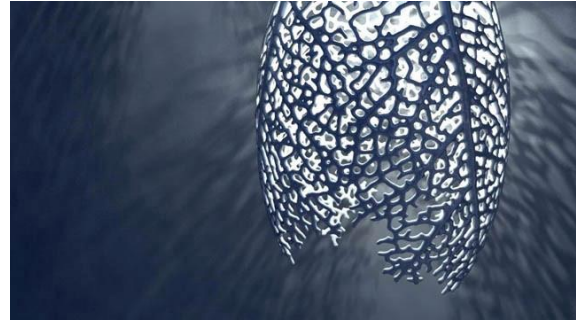


Fig. 1.Lamp hyphae lamp [3].



Fig. 2.Metal sculpture Monro [4].

Associated with generative design in visual perception, bionic and parametric design are inspired by nature and math.

The synthesis of additive technologies and generative design allows you to create a variety of plastic forms, optimal lattice and cellular structures that cannot be implemented using traditional tools [5], [6], [7].

The play of light and shadow in the product shape segments is applicable in light design (Fig. 3).



Fig. 3.Decorative partition. Generative Form Lighting Design [8].

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The plasticity and softness of the structures are related by design based on additive technologies with sculpture.

Products are distinguished by the absence of straight lines, symmetry and, in general, of any classical architectural forms.

An example of generative design in the interior is the wall panel (Fig. 4).

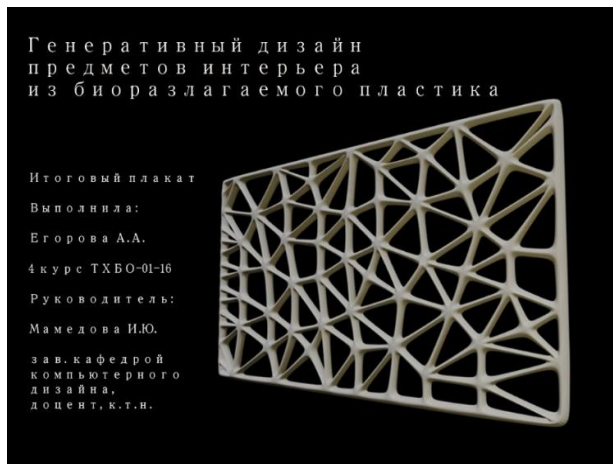


Fig. 4. Project biodegradable plastic wall panel [8].

II. METHODOLOGY

To create a decorative panel, the Blender program was used.

The modifier was applied to the created panel solidify, then a modifier was applied to the resulting rectangle decimate with option planar (angle limit =20 degrees), with active flag on all boundaries, after the modifier is applied wireframe, value thickness discretionary.

Next, the cast modifier was used, all values are applied at the discretion of the user, in conclusion, the surface modifier is used.

The way the model is rendered changes to your liking.

III. RESULTS

As a result, due to using the generative design method, models of interior products are designed for implementation from bioplastics which meet the principles of environmental safety. The model configuration and the size of the plastic wall panel can be easily changed by the designer and customer decision.

IV. CONCLUSION

A new era requires new criteria and guidelines in the field of culture and design design [6]. Thus, the methods of generative programming allow you to create new innovative products in interior design of high aesthetic value, versatility and environmental friendliness, making a great contribution to the formation of a new socially responsible design culture.

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