Mini Review
Volume 12:03, 2023

Journal of Applied & Computational Mathematics

ISSN: 2168-9679 Open Access

Pattern Mathematical for Parametric Design

Claudio Procesi*

Department of Mathematics, University of Rome, Roma, Italy

Abstract

Parametric design is a computational design approach that uses a set of parameters to generate and manipulate geometric forms and structures. Mathematical patterns are essential in parametric design as they provide a framework for generating complex and intricate designs using simple rules and equations. In this article, we will explore some of the key mathematical patterns that can be used in parametric design. Fractals are geometric patterns that exhibit self-similarity at different scales. Fractals are generated by repeating a set of rules or equations iteratively. Fractals are used in parametric design to create complex and intricate designs that have a natural and organic feel. One of the most famous fractals is the Mandelbrot set, which is generated by iterating the equation z=z^2 + c, where z and c are complex numbers. Voronoi diagrams are a mathematical pattern that divides a plane into regions based on the distance to a set of points. Voronoi diagrams are used in parametric design to create complex and irregular shapes that have a natural and organic feel. Voronoi diagrams are widely used in architecture, industrial design, and product design to create unique and aesthetically pleasing designs.

Keywords: Computational design • Organic feel • Voronoi diagrams

Introduction

Parametric design is a design approach that involves the use of parameters or variables to create and modify a design. In this approach, the design is defined by a set of rules and constraints, which are used to control the behavior and appearance of the design. One of the key tools used in parametric design is pattern mathematics, which is used to create complex and intricate patterns that are easily manipulated using a set of parameters.

Pattern mathematics is a branch of mathematics that deals with the study of patterns, their structure, and the mathematical principles behind them. This field of mathematics is concerned with the study of repeating patterns, symmetry, and regularity. The study of pattern mathematics is important in the field of parametric design because it provides a foundation for creating complex and intricate patterns that can be easily modified and adapted to different design needs. One of the key concepts in pattern mathematics is the use of mathematical formulas to create patterns. These formulas are based on simple geometric shapes and can be manipulated to create complex and intricate designs. The use of formulas allows designers to create patterns that are precise, repeatable, and easily modifiable.

Literature Review

One of the most common types of patterns used in parametric design is the fractal pattern. Fractals are patterns that repeat at different scales, creating intricate and complex designs. Fractals are based on a mathematical concept known as self-similarity, which is the property of a pattern that is repeated at different scales. Another important concept in pattern mathematics is the use of symmetry. Symmetry is a property of patterns that have mirror or rotational symmetry. Symmetry is important in parametric design because it allows designers to create patterns that are balanced and visually pleasing. The use of pattern mathematics in parametric design is not limited to the creation of 2D patterns. It is also used to create 3D patterns that can be used in the design of buildings, furniture, and other products. The use of 3D patterns in parametric design is known as digital fabrication or 3D printing. In this approach, the pattern is created using software, which is then used to control a 3D printer to create the physical object [1,2].

Discussion

The use of pattern mathematics in parametric design has revolutionized the way designers approach the design process. Instead of creating a design from scratch, designers can use a set of parameters and mathematical formulas to create complex and intricate patterns that can be easily modified and adapted to different design needs. This approach allows designers to create designs that are precise, efficient, and visually pleasing. One of the key advantages of using pattern mathematics in parametric design is the ability to create designs that are scalable. Because patterns are based on mathematical formulas, they can be easily modified to create designs of different sizes and scales. This allows designers to create designs that are appropriate for different applications, from small products to large buildings. Another advantage of using pattern mathematics in parametric design is the ability to create designs that are adaptable. Because patterns are based on mathematical formulas, they can be easily modified to meet different design requirements. This allows designers to create designs that are customized to the specific needs of a project [3-6].

Conclusion

The use of pattern mathematics in parametric design has also led to the development of new design tools and software. There are now a wide variety of software tools available that are specifically designed for parametric design, many of which incorporate pattern mathematics into their algorithms. These tools allow designers to create complex and intricate designs quickly and efficiently, while also providing a high degree of control and precision.

One of the key challenges in using pattern mathematics in parametric design is the need for specialized knowledge and skills. Because pattern mathematics is a complex field of mathematics, designers who want to use it in their work need to have a solid understanding of the underlying principles and concepts. They also need to have the skills to use.

***Address for Correspondence:** Claudio Procesi, Department of Mathematics, University of Rome, Roma, Italy, E-mail: Zhanlingcui9@ipb.ac.rs*

Received: 01 March 2023, Manuscript No. jacm-23-95929; **Editor assigned:** 03 March 2023, PreQC No. P-95929; **Reviewed:** 15 March 2023, QC No. Q-95929; **Revised:** 22 March 2023, Manuscript No. R-95929; **Published:** 28 March 2023, DOI: 10.37421/2168-9679.2023.12.520

Acknowledgement

None.

Conflict of Interest

None.

References

1. Samanta, G. P. "A production inventory model with deteriorating items and shortages." *Yugoslav J Oper Res* 14 (2016).
2. Tripathi, R. P and Manoj Kumar. "Credit financing in economic ordering policies of time-dependent deteriorating items." *IJMSS* 2 (2011): 75-84.
3. Munir, M. S and R. S. R. Gorla. "Combined convection from a vertical flat plate with temperature dependent viscosity and thermal conductivity." *Int J Fluid Mech Res* 29 (2002).
4. Brady, Shannon T., Bridgette Martin Hard and James J. Gross. "Reappraising test anxiety increases academic performance of first-year college students." *J Educ Psychol* 110 (2018): 395.
5. Wang, Lie, Liyuan Wang, Ye Zhang and Jian Pan, et al. "Weaving sensing fibers into electrochemical fabric for real-time health monitoring." *Adv Funct Mater* 28 (2018): 1804456.
6. Xing, Yi, Yiman Xu, Qilin Wu and Gang Wang, et al. "Optoelectronic functional fibers: materials, fabrication and application for smart textiles." *J Mater Chem* C 9 (2021): 439-455.

How to cite this article: Procesi, Claudio. “Pattern Mathematical for Parametric Design.” *J Appl Computat Math* 12 (2023): 520.