

The Fractal Implementations in Fashion Design

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Abstract:

Fashion is one of the most important elements for human beings because of its diverse features that enable it to meet human needs and interact with them in an appropriate and comfortable way. Through the intellectual development of the modern era, the resulting integration of science and advanced technology, and the discovery of many modern sciences that explain numerous cosmic phenomena; fashion designers employed all these elements to create many modern innovative ideas. Fractal science is a modern science that has distinctive constructive basis, which made it an experimental approach and a creative feature in the field of visual and applied arts, through which the fashion designer can create innovative designs that include unconventional interactions between form and color.

The problem of this research is that the applications of fractal science in fashion design are not highlighted by fashion designers, despite their multiple use of it in many forms since old time, and that fashion designers did not link these techniques with fractal science. This research aims to shed light on the applications of fractal science in fashion design, The paper addresses the concept of fractal geometry, its types and characteristics, its association with nature, golden proportions, contemporary fashion design , fractal science and discussing sixteen ways of application of fractal science in fashion design from ancient times until now, according to the researcher's vision. One of the most important outcomes is the use of computer programs to expand the use of Fractal science in the design of fashion on a more advanced scale. Since the link between science, technology and fashion design through 3D printing and laser cutting, realizes the principle of self-similarity in many designs is a realization of the fractal science in fashion design.

Keywords:

fractal ,Self-similarity ,Fashion Design

The definition of fractal :

Fractal is one of the sciences of contemporary engineering which is directly related with organizing the world around us, the fractal is geometric shapes we can liken in the process of breaking down an object into smaller portions to produce irregular shapes, and these parts are self-similar with each other and with the original body. (2)

types of fractals:

Fractal is classified to fractal in nature and fractal in geometric, knowing that fractures found in nature differ from each other, while there are similarities between parts and their origins which is just approximate similarity (7)



Fig "1" Models from unsystematic formations that are in nature and subjected to fractional geometry (4)

properties of fractals

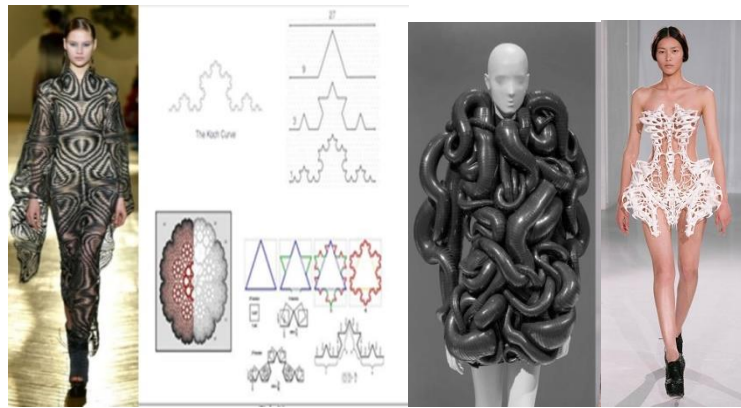
Fractal has many properties to achieve fashion forming aesthetics, one of the most important of these properties is self-similarity, it has three types which are identical similarity, apparent similarity and statistical similarity (4) shape "2" represents some designs which is expressed on three types of self-similarity, the second property of fractal is the ability of branching like blood vessels, nervous cells, trees with simple and unlimited repetitions. (7) The third property is fractional dimension which Koch curve is one of its examples which clarifies the fractional dimension (4), like shape "4" design for Iris Van Herpen from silk 2018. The fourth property is replacement which is described as geometric fractal is related to repetition so the refined shape is the same as the original shape, and the fifth property is complicity (9) like shape "4" which presents a design for Iris van Herpen fall / winter 2011 / 2012.

:Fashion design by using geometric fractal

The result of the discovery of fractal science is that many fashion designers create designs by using fractal science like shape "4" for Iris Van Herpen designer inspired by skeleton, 2011. (10)



Fig "2" The types of self-similarity of fractal on fashion design



complicity of fractal on fashion design Fig "3" fractional dimension (5) Fig "4"

The implementation of fractal science on fashion design according to the researcher's view:

The study of practical implementations of fractal contributes to reach new designs in fashion field, and from here began the use of fractal on fashion design in many ways, we'll take it according to the suggested classification by the researcher which reviews sixteen practical implementations for fractal science in fashion design, some of them typical implementations and others is atypical implementations. where merging between fashion and scientific technological development with focus on a self-similar property of fractal science and its implementation on fashion design field. these implementations are: 3d printing, laser cutting, breakers, folds, origami, layers, draping, cuts, lace and Joubert, strips, embroidery, leather, printing, bihat, nervier, ruffles.

Fig "5" presents seven designs which design are "a" & "b" for the designer Valentino for spring 2009 (19), design "a" is an implementation for fractal science in fashion design on breakers techniques, but design "b" is for fractal science in fashion design on draping, design "c" is for the designer Mohammed Ashi for spring / summer 2015, (25) for fractal science in fashion design on folds techniques, design "d" is for the designer Benny Bickham which is fractal science in fashion design on layers, design "s" for Lucia Benitez 2020 (24) which is fractal science in fashion design on origami, design "L" is for the designer Iris Van Herpen, spring / summer 2015 which is fractal science in fashion design on 3d printing, design "h" is for the designer Alba part which is fractal science in fashion design on laser cutting. (17)



Fig "5" part 1 from implementations of fractal science on fashion design

Fig "6" presents eight designs which are design "a" is for the designer Alexandre Vauthier for spring 2019, the design which is fractal science in fashion design on strips, design "b" is for the designer Sandra Mansour for fall 2019 which is fractal science in fashion design on Lace fabric, design "c" is for the designer Gareth Pugh for fall 2011 which is fractal science in fashion design on leather fabric, design "d" is for the designer Alexander McQueen 2013 which is fractal science in fashion design on embroidery, design "h" is for Iris Van Herpen 2018 which

is fractal science in fashion design on bieah, design "L" for the designer Thierry Mugler Fall 2015 (25) which is fractal science in fashion design on cuts techniques.



Fig "6" part 2 from implementations of fractal science on fashion design

Results:

The research presents the properties of fractal science and the researcher presents some implementations of fractal science on fashion design with focusing on the principle of self similarity , and the results are as follows :

- There are many fields of implementations of fractal science on fashion design for a long time ago .
- drapping , cuts , nirveir , folds and biahat are being used in different atechniques to implemenet the fractal science on fashion design .
- Leather , lace and printing are being used in many techniques to implement the principle of self similatry on fractal science on fashion design .
- The origami is an important impement of fractal science on fashion design because it depends on self similtry principle of fractal science .
- Using computer programs led to expansion in using fractal science on fashion design by 3d printing and laser cutting which achieves the self similitry principle in many designs .

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