

"Printed Contemporary Upholstery Design in View of Fractal Geometry "

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Abstract:

Design depends on creativity and innovation as a value to offering possible solutions to design problems to reach the best functional and aesthetic design ideas, and design has always relied on nature and its elements as a creative catalyst for the designer's creative energies, as nature is a source of inspiration for the artist and designer because it includes an infinite number of design elements that are characterized by permanent and continuous change in their formal appearance. Nature has had a great share as a major focus of interest for explorers and researchers. As soon as they studied the design of nature, they established new science bases and scientific theories whose basic idea crystallized around the combination of the universe and the creatures that live in it, whether it is science or engineering with its theories. Through the development of knowledge in the modern era and the resulting integration and integration of science and advanced technology, and the discovery of many sciences and theories that explained many cosmic phenomena, fractal engineering is one of those modern sciences, as it is characterized by special structural foundations, which made it an experimental entrance and a creative feature in the field of visual and applied arts, through which the designer can create innovative designs that include non-traditional plastic and color relationships. As a result of the amazing scientific, cognitive and cultural development in the age of information and technology, it has become necessary to mix between scientific and cognitive development and artistic creativity and looking forward to everything new in the field of art. Therefore, the current research will deal with the study of fractal geometry and its properties and how to benefit from them in enriching the plastic aspects of contemporary furniture printing design because of the mathematical formulas and equations that achieve repetition, zoom in, transparency, contrasting and compatible lines and colors, and this is consistent with textile printing design in general and furniture printing design in particular. Fractal geometry is a science that contributes to the development of the creative side of designers through the freedom to think, move outside the traditional framework and add new dimensions to the design by understanding and realizing the properties of fractal. Therefore, this research tends to take advantage of fractal geometry in a contemporary way to develop printing designs for upholstery fabrics in modern printing ways that give them diversity in color groups and the multiplicity of different sensory and visual effects, through exposure to the mechanism of dealing with some graphic programs supporting this science.

The research problem is based on the following two questions: How to apply fractal geometry in contemporary furnishings printing design? What is the possibility of applying the technical capabilities of some computer programs for fractal engineering to obtain innovative and unconventional design solutions to develop printing designs for contemporary upholstery fabrics?

Objectives The current research aims at shed light on fractal geometry, its characteristics and features, and to benefit from them to enrich the design of contemporary furniture printing, emphasizing the adaptation of modern theories and sciences and their use in the field of furniture printing design. Also, enriching the field of furniture printing design by revealing new entrances that enrich creative visions, and employing the technical capabilities of some computer programs for fractal engineering to obtain innovative and unconventional design solutions to develop printing designs for upholstery fabrics characterized by novelty and modernity. Furthermore, the applied study through the implementation of a set of printing designs for upholstery fabrics using digital printing technology, and contribute to solving the Egyptian economic crisis through the development of the local product to face the competition of foreign product.

Significance: The importance of the current research summarized in revealing modern theories and sciences to benefit from them in the development of visual, sensory and mental perception, linking fractal geometry to design and benefiting from its outputs in enriching design entrances to keep pace with the developments of the times., The time limits of the study are limited to the study of fractal geometry at the present time. and spatial boundaries and include benefiting from the aesthetics of fractal geometry in enriching the design of contemporary furniture printing in the Arab Republic of Egypt.

Delimitations: As well as objective limits, including the study of fractal geometry, its characteristics and features, and benefiting from them to enrich the design of contemporary furniture printing, the use of some computer programs for fractal engineering to create printing designs for contemporary furnishing fabrics, and printing some applied models by digital printing means.

Methodology : The research is based on the descriptive analytical approach based on collecting information and data from relevant references to build the theoretical framework of the research, and the applied approach by taking advantage of fractal geometry in producing designs with a new plastic vision for printing contemporary furnishings fabrics characterized by novelty and modernity, as well as application and

implementation with digital printing technology.

Major Results The research found that the study of fractal engineering helped to produce a set of printing designs that are suitable for contemporary furnishings fabrics and carry with them new values and plastic dimensions, the use of some computer programs for fractal engineering gain artwork a lot of aesthetic structural relationships and enrich the field of design printing contemporary furnishing fabrics. Also, Linking science, scientific theories and the field of art contributes to deepening the innovative vision of the designer and artist. The study was able to innovate (8) design ideas that are suitable for printing contemporary furniture of all kinds inspired by fractal geometry, and invented (32) employment proposals to employ design ideas so that they are suitable as furniture upholstery fabrics and printed bed linen, and some design models, which amounted to (5) samples, were printed as applied models for research by digital printing.

Recommendations The research recommends the need for continuous disclosure of modern sciences and theories related to design to benefit from them in enriching the creative process of the designer, and paying attention to computer programs that serve modern theories and work to provide them to benefit from them in the field of design and to reach the desired results, as well as expanding the use of specialized programs in fractal engineering in design research and studies in general and textile printing design in particular.

Keywords :

Fractal Geometry , Printed Upholstery Design , Self – similarity , Fractal Dimension , Replacement Rule .

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