

Origami as a Philosophical Thought and Innovative Design Technique to Enhance the Formal Aesthetics of Architectural Facades

Ghada Mohamed Elsayed Mohamed Shatta

Lecturer at the Department of Sculpture, Architectural Formation and Restoration - Faculty of Applied Arts - Damietta University - Egypt
Dr.ghadashatta@gmail.com

Abstract:

Origami is one of the traditional Japanese arts that rely on folding paper to create complex geometric shapes, and this art has been adopted in modern architecture to develop architectural facade designs that combine beauty and functionality, and the concept of origami is one of the biggest design trends in the world in the past few years, as origami as a philosophical thought relies on the principles of simplicity and complexity, as a flat sheet of paper can be transformed into a complex three-dimensional shape using only folding, this transformation from a simple surface to a complex shape reflects the concept of architecture that starts with a simple idea and develops into a complex and integrated design. This transformation from a simple surface to a complex shape reflects the concept of architecture that starts with a simple idea that evolves into a complex and integrated design. By applying these principles to the design of architectural facades, innovative forms can be achieved that add a unique aesthetic dimension to buildings, and enhance the value of urban spaces, so the origami technique in design is considered a powerful tool for achieving aesthetic aesthetics. It allows designers to exploit the geometric properties of folds to create repetitive and complex geometric patterns, these patterns not only add visual beauty, but also contribute to improving the functional performance of facades by providing natural shading, improving ventilation, and reducing energy consumption.

Statement of the Problem: Can origami improve architectural façade designs in terms of aesthetics, efficiency, and sustainability? How can origami designs in architectural facades balance sculptural aesthetics with practical functionality?

Research objectives: The research aims to: To shed light on origami as a modern design trend to enhance the aesthetic value of architectural facades. Trying to uncover innovative and sustainable solutions using origami techniques by integrating complex sculptural geometric shapes and modern materials to obtain architectural facades that combine art and architecture. Analyze the benefits and challenges associated with using sculptural origami patterns to shape architectural facades.

Importance of the research: Emphasizing that the use of origami in the design of architectural facades opens new horizons for creativity in modern architecture. Benefit from the development of new techniques in origami to create architectural facades that achieve a balance between beauty and functionality, and support sustainability.

Research hypotheses: The research hypothesizes that: Origami offers tremendous potential for designing innovative sculptural architectural structures that combine beauty and function. Origami-inspired architectural facades can be designed to adapt, and change based on environmental conditions such as sun, wind, etc.

Research methodology: The researcher relied on the descriptive-analytical approach, which consists of describing and analyzing some contemporary architectural models inspired by origami. The researcher uses the empirical approach by presenting some designs of sculptural architectural works and configurations inspired by origami that combine contemporary techniques with traditional arts.

- **Results:** The use of origami in the design of modern architectural facades shows how traditional arts can be combined with modern technologies to create innovative and sustainable designs. Origami as a modern design trend in architectural facades offers tremendous potential for designing innovative sculptural architectural structures that combine beauty and functionality. By exploiting traditional origami principles and applying them to modern materials and complex architectural structures, origami design can provide integrated aesthetic and functional solutions that meet the needs of modern times. By addressing engineering challenges and applying innovative solutions, origami can become a powerful tool in the design of modern architecture.

- **Recommendations:** The researcher recommends promoting the application of origami techniques in shaping architectural facades due to its great potential in improving visual aesthetics, energy efficiency, environmental sustainability, design innovation, and interaction with users. The researcher recommends conducting more detailed studies of architectural façade projects using origami sculptural patterns to analyze performance, benefits, and challenges. The need to raise awareness of the importance of collaboration between architects, artists, and designers to develop innovative architectural façade designs that combine art and function.

Keywords :

Origami Art, Origami Design, Kirigami Art

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