

# Comparing between Geometric Patterns in Persian – Islamic Architecture and Carpet Design

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**Abstract:** The geometry of Persian -Islamic architecture and carpet design is used to express the idea of unity in multiplicity. On other hands, geometry is a visual language that stems from the worldview of the artist or architect. At various times in history, the idea of diversification and transformation, have been seen in Persian-Islamic architecture and carpet design. Aim of study is to investigate regular geometric forms in Persian-Islamic architecture and carpet design and the compares between these two art forms.

**Keywords:** Persian –Islamic; architecture; carpet; Regular geometry; unity in multiplicity.

## 1. Introduction

Different forms of traditional Persian-Islamic art contain different figures of semantic representation. They all share concepts that reveal a combination of Persian and Islamic beliefs [1, 2]. The languages of these arts are symbolic and each artist uses allegorical tools in his work that are appropriate for the art form. Carpet and architecture design are two art forms in Persian art that embody symbols [3, 4].

Susan K. Langer believes that art is creating symbolic figures to express human emotion. Art often uses concepts that are directly related to the symbols for emotion expression giving the art work an intellect dimension [4, 5]. Kasyrr believes that symbols can be used to create a direct and immediate relationship between man and art. According to his ideas, the architecture uses the highest and most direct symbolic forms to create a relationship with us [6]. Thus, the architecture is capable of transferring concepts between the individual and the art of a building through the medium of space. This spatial experience is an important tool of expression used in Persian architecture and it has spiritual and historical contexts [7, 8].

Symbolism is important to mankind. One significant manifestation of its importance can be seen in art. According to the Islamic perspective, each symbol has a visual, worldly, and spiritual aspect [9]. On other words, all worldly things are represented as tokens of another world [10]. Religious artist, turn to allegorical language to express and substantiate their concepts. There are several forms of Persian art that use these symbols, including architecture [11, 12] and carpet design [9].

The relationship between symbolism and art contains may complex issues. Art benefits from symbolism as it adds levels of expression. An example of this can be seen in traditional Persian art where different forms of artistic

expression have the same meaning, which is derived from Persian and Islamic beliefs. These forms of traditional Persian art also communicate the idea of unity through multiplicity, which is an important value expressed in Persian art. In addition to creating beautiful images, Persian artist further understanding through symbolism [3].

As mentioned, Persian-Islamic architecture and carpets use symbolic language. To understand how concepts are expressed, an analysis of the Persian -Islamic architectural and carpet design was undertaken and will be discussed in this paper. This analysis considered art forms and their geometry and did not consider other visual elements such as the colors and material. As will be seen, traditional artists express concepts using the symbolic language of geometry.

The goal of this study was to compare Persian -Islamic architecture and carpet geometry. After identifying important geometric symbols, this paper explained the similarities between the symbols used in Persian-Islamic architecture and carpet.

## 2. Method

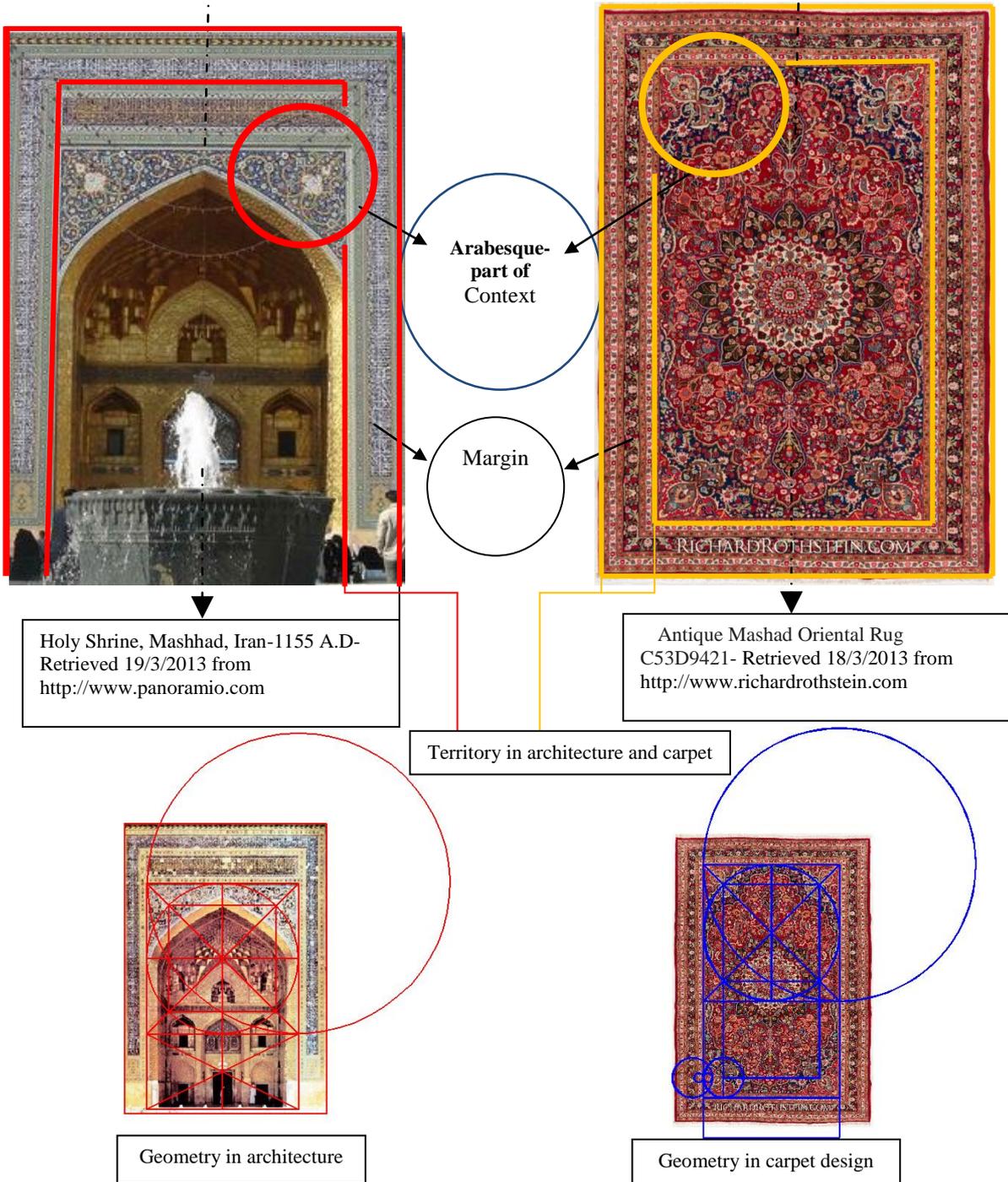
This study focused on archaeological remains in Iran relevant to Iranian history. When developing this study, it was possible to establish a geometric method. The first step in this analysis was accomplished by using the library to collect data. After the data was collected by reviewing historical records and other documents, the geometric symbols of both art forms were analyzed and discussed. The method used to draw similarities between geometric symbols in terms of their shape was considered. To accomplish this task, the images obtained from documents were analyzed using AutoCAD software to draw guide lines. After describing and comparing the symbols, their historical and visual relevance was studied. This process required an

examination of the evidence and previous theories related to symbolic expression of Persian-Islamic art.

### 3. Results and Discussions

Decorative elements used in traditional Islamic art, holds

a special place. These elements reflect the ideas of artists and the unique traditions of each region [13]. An artist's worldview and their faithful interpretation of paradise as described in religious texts influence the similarity of motifs found in architectural and carpets design [1].



**Figure 1:** Analysis of form based on the main structure of architecture and carpet's design

In this section, the general design and details used in architecture and carpet design are compared and analyzed. The schematic structure of carpet design includes seven components as listed below:

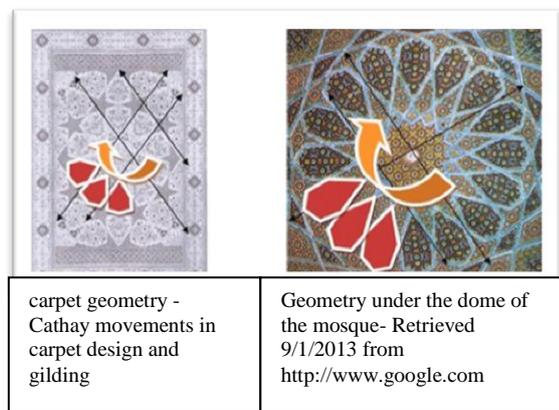
1. Arabesques are used to symbolize reason. They are symbolic of the Garden of Paradise and some artists

use arabesques as an interpretation of the heavens. (Figures 1)

2. The regular geometry found in both architecture and carpet designs are characterized by analytic geometry. (Figure 1)

3. Both art forms can be quadrilateral or rectangular, allowing them to be defined according to Euclidean geometry. (Figures 1)
4. Architecture and carpet design are both symmetrical and balanced .(Figures 1)
5. Architecture and carpet design contain a “context” or central motif and “margins” or borders that surround the ground section. (Figure 1)
6. Perspective is avoided in carpet design but the essence of architecture is spatial and this characteristic makes it distinct from carpet design. However, architecture and carpet design do not show differences in symbolic expression. In this instance, the difference lies in how we perceive their symbolic expressions (Figure 1).
7. The amount of detail in the design of both art forms allows the viewer an escape from the vacuum of thinking. (Figures 1).

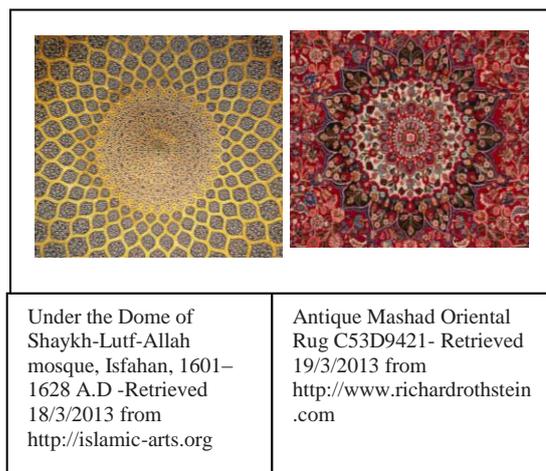
Study shows that, the three principles that govern motif design were discussed. These three principals were repetition, rotation and transfer and they are illustrated in Figure2 [14].



**Figure 2** Similar geometry principles

Unity in multiplicity is an expression of the monotheistic system in Persian-Islamic architecture and carpet design and it is communicated symbolically in these art forms [14]. As noted in this study, the concepts that influence the creation of a piece of architectural or the design of a carpet, are seen as spiritual messages and their representation should reflect their heavenly origins. One very common concept is that of multiplicity in unity and

unity in multiplicity as seen in the figures shown bottom (Figure 3).



**Figure 3** Concepts expressed in Persian-Islamic architecture and carpet design

Results show that the design details used in both architectural and carpets are similar, or at least adopt the same principles and procedures. A wide range of similar icons and symbols are used in both art forms to express various concepts. Furthermore, the use of geometric symbols in Persian-Islamic architect and carpet design is greatly influence by a monotheistic worldview. In both art forms, geometric symbols are used to indicate logic and order, which highlight a monotheistic perspective.

Artistic principles such as symmetry, balance and proportion create visual beauty in any work of art. The design components evident in Persian -Islamic architect and carpet design make use of the geometry to not only express concepts such as monotheism but to also harness the potential of the artistic principles listed above.

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