



## Article

# The Art of Peshtaq in Timurid Architecture: Historical Genesis, Geometric Proportions, and Semantic System

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**Abstract:** This article provides a comprehensive analysis of the historical genesis, compositional structure, geometric proportioning principles and symbolic-semantic meaning of the pishtaq in Timurid architecture. The study focuses on major Timurid monuments in Samarkand, including the Gur-e Amir Mausoleum, the Bibi-Khanym Mosque and the madrasas of the Registan ensemble. The research combines historical-comparative, morphological, graphic-reconstructive, modular-proportional and semantic methods. The findings demonstrate that, during the Timurid period, the pishtaq evolved beyond a mere entrance element and became a monumental architectural sign expressing urban dominance, compositional hierarchy, ideological meaning and mathematical harmony. The square module, central axis, arch geometry, epigraphic bands, girih ornaments and muqarnas layers function as a unified artistic and tectonic system. The proposed interpretation may serve as a theoretical and methodological basis for restoration, graphic reconstruction and the integration of national compositional codes into contemporary architectural design.

**Keywords:** Timurid architecture, pishtaq, monumental portal, geometric proportion, modular system, composition, symbolic meaning, Samarkand, architectural heritage.

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## Introduction

The fourteenth and fifteenth centuries occupy a distinctive place in the history of Central Asian architecture not only because of the scale of construction and the richness of decorative arts but also due to the theoretical maturity of architectural thought. With the transformation of Samarkand into the capital of the Timurid Empire, architecture became an important instrument for expressing state power, political legitimacy, religious and educational ideals, as well as scientific and artistic thought. Within this context, the peshtaq evolved from a simple entrance feature into an architectural element that defined the central compositional axis, established the spatial boundary between the building and the surrounding square, and served as a dominant landmark within the urban skyline[1].

The scientific significance of the peshtaq lies in its multilayered nature. Simultaneously, it functions as a structural frame, the core element of façade composition, an urban orientation marker, a medium for decorative expression, and a carrier of symbolic and spiritual meanings. The monumentalization of this element in Timurid monuments was not a random phenomenon; rather, it was determined by a precise geometric module, central symmetry, proportional discipline, and the hierarchical arrangement of decorative layers[2].

The purpose of this article is to provide a scholarly analysis of the historical

development, compositional and geometric principles, and semantic meanings of the art of the peshtaq in Timurid architecture. The object of the research is the Timurid architectural heritage of Samarkand, while the subject of the study is the principles governing the formation, harmonization, and meaning-making processes of peshtaq compositions within these monuments[3].

The scientific novelty of the study lies in interpreting the peshtaq not merely as a decorative or structural element, but as an integrated system that combines historical, geometric, compositional, and symbolic dimensions. Such an approach makes it possible to identify the intrinsic relationships between drawing, modular design, and semantics in the study of historical architectural monuments.

### Literature Review

The issue of geometric harmony in Central Asian architecture has been extensively examined from both theoretical and historical perspectives by scholars such as M. S. Bulatov, P. Sh. Zohidov, A. S. O'rolov, and K. S. Kryukov. Their studies primarily focus on the proportional systems of architectural forms, compositional structures based on square and circular geometries, and the integration of ornamentation with tectonic principles[4].

International scholarship on Timurid architecture places particular emphasis on the monumental ensembles that emerged in the cultural environments of Samarkand and Herat, the relationship between domes and peshtaqs, urban squares, and the political and aesthetic significance of religious and educational buildings. In the works of Golombek and Wilber, Timurid architecture is interpreted as a sophisticated artistic tradition that developed across the regions of Iran and Turan. Likewise, Blair and Bloom characterize the Timurid period as a stage in the history of Islamic architecture distinguished by remarkable achievements in color composition, tile decoration, monumental portals, and spatial organization[5].

In recent years, increasing scholarly attention has been devoted to the study of applied geometry in Timurid architecture, particularly the use of intersecting squares, modular grids, and proportional systems in the architectural monuments of Samarkand. Research conducted by M. Sakkal demonstrates that the geometric construction of several Timurid monuments in Samarkand was based on highly sophisticated yet rigorously organized design principles [6]. From this perspective, the peshtaq should be understood not merely as a decorative architectural surface but also as a mathematical model that governs and organizes the overall architectural composition.

An analysis of the existing literature indicates that although numerous studies have addressed various aspects of peshtaq architecture, there remains a need for an integrated interpretation that simultaneously examines its historical evolution, geometric proportionality, and symbolic-semantic system within a unified conceptual framework. The present article seeks to fill this scholarly gap by providing a comprehensive analysis of the peshtaq as a multidimensional architectural phenomenon[7].

### Materials and Methods

The research materials consist of the most significant examples of Timurid architectural heritage in the city of Samarkand, namely the Gur-e Amir Mausoleum, the Bibi-Khanyim Mosque, and the peshtaqs of the madrasas within the Registan ensemble. Although these monuments belong to different functional categories, they are united by a common characteristic: the peshtaq serves as the principal compositional focal point that organizes the façade, defines the surrounding square, and contributes to the formation of the urban skyline[8].



Gur-Emir maqbarasi;



Bibi-Khanyim masjidi;



Registon maydoni.

**Figure 1.** Timurid architectural monuments selected as the objects of the study: the Gur-e Amir Mausoleum, the Bibi-Khanyam Mosque, and Registan Square.

Methodologically, the research was conducted in five stages. In the first stage, the genesis of the peshtaq was investigated on the basis of historical and documentary sources. In the second stage, the morphological structure of the façades of the selected monuments was analyzed. In the third stage, the proportions of the peshtaqs, including their height, width, arch dimensions, and frame ratios, were compared using a modular-proportional approach. In the fourth stage, the geometric grid underlying the façade composition was identified and clarified through graphic-reconstructive methods. In the fifth stage, the religious-philosophical, ideological, and urbanistic meanings of the peshtaq were examined through semantic analysis[9].

**Table 1.** Content and Scientific Objectives of the Research Methods Applied in the Study.

| Method                                 | Purpose of Analysis                                                                            | Expected Scientific Outcome                                                              |
|----------------------------------------|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| <b>Historical-Comparative Analysis</b> | To identify the evolution of the peshtaq before and during the Timurid period                  | Historical continuity and morphological transformations were determined                  |
| <b>Morphological Analysis</b>          | To distinguish the façade, arch, frame, minaret, dome, and decorative layers                   | A structural and compositional model of the peshtaq was developed                        |
| <b>Modular-Proportional Analysis</b>   | To examine the relationships between height and width, the central axis, and the square module | The principles of mathematical proportion and harmony were identified                    |
| <b>Graphic-Reconstructive Analysis</b> | To redraw the façade based on a geometric grid system                                          | The compositional structure of the peshtaq was interpreted through architectural drawing |
| <b>Semantic Analysis</b>               | To interpret the symbolic meanings of the square, arch, epigraphy, and girih patterns          | The relationship between architectural form and ideological meaning was revealed         |

### Results and Discussion

The earliest forms of portal architecture in Central Asia can be observed in simple arched entrance systems, chahar-taq structures, and buildings incorporating ayvan-type spatial arrangements. Over time, these architectural forms gradually evolved into monumental portals that became prominent features of the façades of mosques, madrasas, mausoleums, and khanqahs[10]. During the Timurid period, however, the peshtaq reached the highest stage of its artistic and compositional development. It evolved from a functional element marking the entrance passage into the aesthetic, urbanistic, and ideological focal point of the entire architectural structure.

Peshtaq tipologiyasining evolyutsion sxemasi

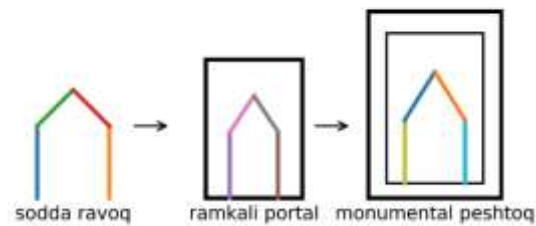


**Figure 2.** Evolutionary scheme of the peshtaq typology from a simple arch to a monumental portal.

A pronounced emphasis on verticality, increased depth of the central arch, clear framing of the façade surface, and strong visual connections with flanking minarets and domes can be observed in Timurid peshtaqs. As a result, the peshtaq became not merely a component of the building façade but also a dominant architectural element influencing the spatial perception of urban squares and street panoramas. This phenomenon is particularly evident in the compositions of Registan Square and the Bibi-Khanym Mosque[11].

### Geometric Proportions and the Modular System

Geometric order served as a fundamental compositional principle in Timurid peshtaq architecture. The external frame of the peshtaq was typically based on the proportions of square and rectangular modules, while the inner arch was positioned along the central vertical axis, organizing and subordinating all decorative layers of the façade. The height-to-width ratio, often approaching or corresponding to 1:2, enhanced the monumentality of the structure and created a strong visual impression of vertical ascension for the observer[12].

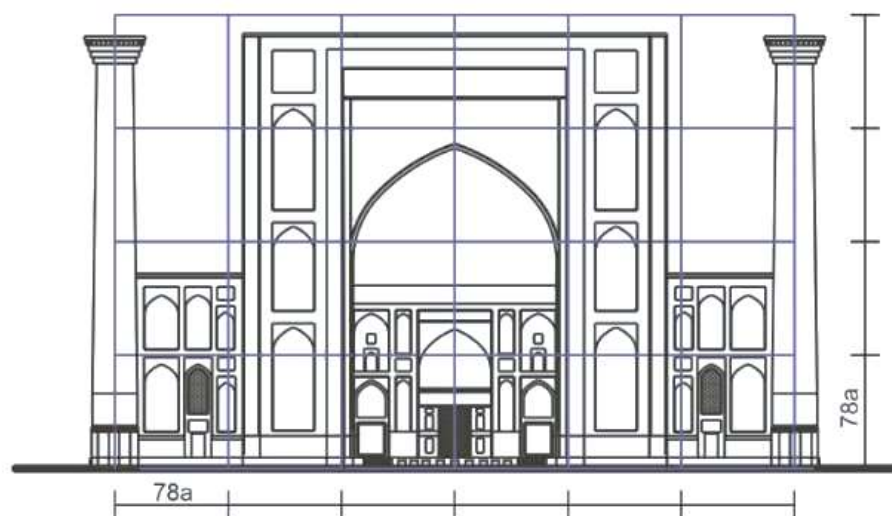


**Figure 3.** Harmonization method of the façade of the Ulugh Beg Madrasah based on a modular grid:  $1M = 78a$ ,  $78a = 936$  cm (based on the drawing by F. U. Djumaqulov).

The modular system operates on three levels within the composition of the peshtaq. The first level is the structural order, where the main frame, lateral supports, and central arch are balanced in relation to one another. The second level is the compositional order, in which the central axis, side sections, epigraphic bands, and decorative fields are arranged according to a hierarchical system. The third level is the semantic order, where geometric forms such as the square, arch, circle, and girih patterns become elements of a symbolic system that generates architectural meaning[13].

**Table 2.** Principal Components of Timurid Peshtaq Composition and Their Scholarly Interpretation

| Element                   | Architectural Function                                                                       | Scholarly Interpretation                                    |
|---------------------------|----------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| <b>Central Axis</b>       | Defines the vertical symmetry of the peshtaq and determines the principal entrance direction | Spatial order and monumental elevation                      |
| <b>Square Module</b>      | Regulates the façade frame, decorative fields, and proportional relationships                | Mathematical harmony and structural stability               |
| <b>Arch Geometry</b>      | Forms the entrance opening and the transitional boundary to the interior space               | Sacredness and the symbolism of the architectural threshold |
| <b>Epigraphic Bands</b>   | Incorporate inscriptions and ornamentation into the compositional system of the façade       | Spiritual meaning and rhythmic unity                        |
| <b>Girih and Muqarnas</b> | Create geometric ornamentation and spatial depth                                             | Harmony of form, light and shadow, and symbolic expression  |

#### Compositional Principles: Center, Frame, and Hierarchy

The compositional structure of Timurid peshtaqs is based on three fundamental principles: the central axis, framed composition, and hierarchical organization. The central axis constitutes both the geometric and spiritual core of the peshtaq. It is integrally connected with the entrance passage, inner courtyard, prayer hall, or mausoleum chamber, thereby establishing a clear spatial relationship between the external façade and the internal architectural space.

The framed composition distinguishes the peshtaq from other façade elements and presents it as an independent monumental architectural feature. Within this frame, the arch, tile decoration, inscriptions, muqarnas, and girih patterns do not compete with one another; instead, they form an ordered hierarchy centered around the main arch. The principle of hierarchy is particularly evident in the façades of the Ulugh Beg Madrasah and the Sher-Dor and Tilla-Kari Madrasahs, where the central portal concentrates the compositional force, while the lateral wings serve to balance and reinforce this dominant center[14].

**Table 3.** Compositional Functions of the Peshtaq in Timurid and Timurid-Tradition Monuments of Samarkand

| Monument                    | Functional Type            | Compositional Role of the Peshtaq                                                                                                                                 |
|-----------------------------|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Gur-e Amir Mausoleum</b> | Mausoleum-Memorial Complex | The peshtaq is vertically integrated with the mausoleum dome, while the entrance composition enhances the symbolic sense of grandeur and ceremonial significance. |
| <b>Bibi-Khanym Mosque</b>   | Congregational Mosque      | The main peshtaq expresses state power and the idea of collective worship through its monumental                                                                  |

|                           |                         |                                                                                                                        |
|---------------------------|-------------------------|------------------------------------------------------------------------------------------------------------------------|
|                           |                         | scale and deeply recessed arch.                                                                                        |
| <b>Ulugh Beg Madrasah</b> | Educational Institution | The peshtaq serves as the compositional axis of the educational center and governs the geometric order of the façade.  |
| <b>Registan Ensemble</b>  | Urban Square Ensemble   | The peshtaqs create architectural rhythm, symmetry, and an urban stage-like setting along the perimeter of the square. |

The symbolic meaning of the peshtaq is closely associated with its geometric foundations. In Islamic architectural thought, the square is often interpreted as a symbol of the earth, order, and stability, whereas the arch and the circle represent the heavens, ascension, and spiritual elevation. The peshtaq is formed precisely at the intersection of these two geometric principles—the square and the arch. Consequently, it symbolizes the boundary between earth and sky, the external public realm and the sacred interior space, as well as between worldly movement and spiritual orientation [15].

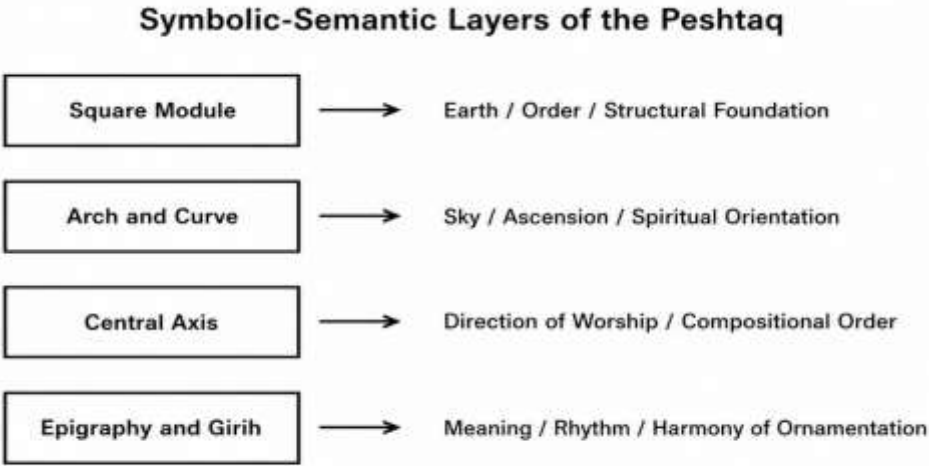


**Figure 5.** Symbolic-semantic layers of the peshtaq: the harmony of geometric form, compositional axis, and meaning.

Epigraphic inscriptions and girih ornaments also play a significant role within this semantic system. Inscriptions impart spiritual and intellectual meaning to the surface of the peshtaq, while girih patterns express the concepts of infinity, order, and divine harmony through geometric forms. The layers of muqarnas, in turn, artistically represent the transition from surface to space and from planar geometry to volumetric form. As a result, the peshtaq becomes a multilayered architectural text that can be viewed, read, and interpreted.

The principles of peshtaq design developed during the Timurid period continued to influence the architecture of Central Asia, Iran, Afghanistan, and India in various forms throughout subsequent centuries. In particular, the monumental portal, the central \*iwan\*, the relationship between the dome and the peshtaq, the symmetrical arrangement of ornamentation, and façade compositions integrated with urban squares served as important prototypes for later architectural schools. This demonstrates that Timurid architecture should be understood not merely as a local historical phenomenon but as part of a broader regional cultural process.

Today, the study of the art of the peshtaq should not be limited solely to the description of historical heritage. Its modular system, spatial hierarchy, and symbolic

compositional code provide valuable opportunities for contemporary architectural practice. These principles can be applied in the design of public buildings, cultural centers, museums, educational institutions, and urban squares, allowing national identity to be expressed not as superficial decoration but as a profound compositional model.

### Conclusion

Based on the historical, morphological, graphic, proportional, and semantic analyses conducted in this study, the following scientific conclusions can be drawn:

1. During the Timurid period, the peshtaq evolved beyond the function of a simple entrance element and became a monumental architectural system that defined the compositional, urbanistic, and ideological center of a building.
2. The composition of the peshtaq is structured around a unified spatial hierarchy formed by the central axis, framed composition, inner arch, lateral sections, and visual relationships with domes and minarets.
3. The geometric foundation of Timurid peshtaqs is based on the square module, height-to-width proportions, symmetry, and a strict emphasis on verticality. This demonstrates that architectural form was created according to a mathematically ordered system.
4. The symbolic-semantic meaning of the peshtaq is expressed through the square, arch, epigraphy, girih patterns, and muqarnas, reinforcing the concept of the architectural threshold between the external world and the sacred interior space.
5. The peshtaqs of Timurid monuments in Samarkand played an important urbanistic role in shaping the city skyline, organizing the composition of public squares, and directing collective spatial perception.
6. For the application of peshtaq principles in contemporary architecture, it should be interpreted not as a decorative imitation but as a system of modules, proportions, axes, frames, spatial hierarchy, and semantic signs.

In conclusion, the art of the peshtaq in Timurid architecture represents an outstanding synthesis of mathematical proportion, artistic composition, and spiritual symbolism. Its comprehensive study is of great importance both for the preservation of historical monuments and for the scientifically grounded development of national compositional thinking in contemporary architecture.

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