



PACE-2021

International Congress on the Phenomenological Aspects of Civil Engineering

Research Article

20-23 June 2021

Geometric Patterns of Islamic Architecture: Regeneration of Patterns In Digital Environment

Makbule Özdemir*,¹, Semra Arslan Selçuk²

¹ Gazi University

² Gazi University

Corresponding Author E-

mail:makbuleozdemir@gazi.edu.tr.com

Corresponding Author ORCID: 0000-0002-7276-8831

Keywords

*Islamic geometrical patterns,
Categorization,
Modularity in geometric
ornament.*

Abstract

Throughout history different geometric patterns for ornamentation have been used and developed in the Islamic art and architecture. By utilizing the mathematical methods of the era they belong to, a rich variety of patterns were created. Based on repetition and symmetry, Islamic geometric patterns shaped with different combinations of circular, triangular and hexagonal patterns. Geometric-based relationships gained new characters thanks to the computable rules. This study examines the question of how mathematical descriptions and regeneration of Islamic geometric patterns are possible. The paper focuses on the formal features of Islamic geometric patterns, and evaluates the calculations of these patterns and formation of shapes by using the digital tools and environments of today. For this purpose, a research has been planned through the examples in Ankara where different periods of Islamic architecture can be found in. Within the light of the selected examples, the acquisition of form in the formation process of geometric compositions in Islamic architecture and the adaptation of the changing process from past to the present are discussed from a mathematical point of view. Results indicate that "a set of rules" obtained through the design and regeneration of geometric patterns in Islamic architecture playing a mediating role in understanding the compositions of the forms.