Pattern Construction Based on the Analysis of Cathedral Floor Plans

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Geometric space division methods along with the proportions they create have been adopted by various design disciplines, including textile surface pattern design. For example, tartan is a type of cloth which displays a checked feature. Similar types of square-related space division can be found in Cathedral floor plans.

This paper suggests a range of simple geometric methods to create repeating pattern alternatives suited to fashion textile and similar end uses, based on the analysis of floor plans of twenty well known British Cathedrals selected from the list 'The Cathedrals of Britain' given by the BBC history archive website.

Polygons, including triangles, squares, pentagons and circles, as well as their geometric derivatives (e.g. 3-4-5 triangles; golden-section triangles; equilateral triangles; golden-section rectangles, root rectangles, Brunes stars and the sacred cut measurements etc.) and combinations, such as a triangle placed on a rotated triangle; a square placed on a rotated square, a pentagon placed on a rotated pentagon; overlapping circles, square grids as well as square divisions by their diagonal lines. These applications have been found in previous literature following past determinants of Cathedral floor plans.

This paper found that although the appearances are different, and complicated geometrical and numerical proportions are found in each Cathedral plan, the analysis suggested that almost all of the Cathedral floor plans can be constructed from a single square without any further significant measurements by just applying a number of simple geometric constructions.

Results: The combinations of square-based and golden-section-based constructions, root-two rectangles and modular constructions of various kinds were found in the majority (90%) of samples used in the study. In terms of space division of Cathedral floor plans, square-related designs were thus predominant. Further to this, frameworks built on these findings can be used to create square-based guidelines,which can be coulored, duplicated and combined in different

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