INTRODUCING ISO-TILER 3D:
A 3D TILING VISUALIZER

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Abstract

This paper introduces a Java applet called Iso-Tiler 3D that models whole tiling in 3D by using a single unit tile, and stores the model obtained in a 3D file.

Keywords: Tiling, Isohedral tiling, Tiling visualizer, JavaView, Periodic tiling.

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1. Introduction

The history of tiles goes back to the prehistoric period. Coloured tiles can be seen in every civilization and culture as the most ancient decorative art. For example, Figure 1 represents an example of tiling in the church of Saint Nicholas, Myra (Turkey) [12]. Mathematically, a tiling is a geometric pattern made up of one or more shapes which fit together to completely cover an infinite plane region or surface without any gaps or overlapping.

Tiles are important tools for tiling the floors and walls in Computer Graphics. Several authors have explored the possibility of creating tilings in various forms by computer. C. Kaplan and D. H. Salesin [8] introduce and present a solution for the “Escherization” problem. They describe a representation for isohedral tilings that allows for highly interactive viewing and rendering. Later on, C. Kaplan and D. H. Salesin [10] showed how the original Escherization algorithm can be adapted to the dihedral case, producing tilings with two distinct shapes. In Kaplan [7] one procedure is described for constructing Islamic star patterns based on placing radially-symmetric motifs in a formation dictated by a tiling of the plane.