

Representing 3-D Objects Through Flat Tessellations

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Abstract

Origami tessellations are usually abstract geometric patterns of shapes, flowers and stars, but they can also be used to represent more detailed figures. During the last few years, I've been developing a technique for representing perspective illusions of three-dimensional objects and impossible figures through flat tessellations. This technique combines so-called *flagstone* tiles with a classic twist-fold tessellation, and was first documented in [Beber \(2017\)](#).

It allows the design and construction of any flat representation composed of rhombi and triangles, giving as result the illusion of a 3-D object made of small cubes. Crease patterns of such objects are obtained by combining a very limited number of tiles, but allowing a great versatility.

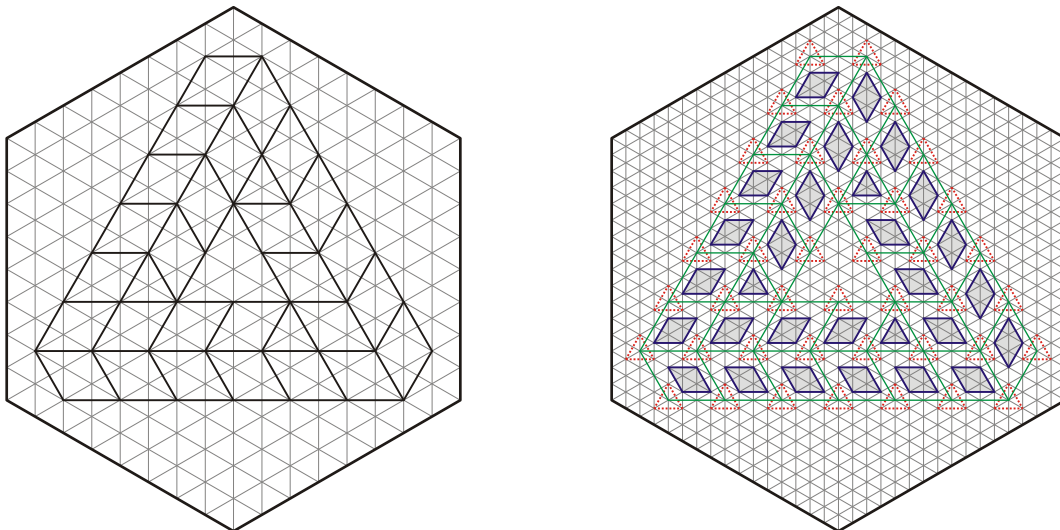


Figure 1: The desired figure (left), and the construction tiles (right).

As an example, see [1](#). The desired figure on the left is composed of rhombi and triangles only, and these shapes are then filled in with the corresponding tiles, obtaining the partial CP on the right. In this case, only two different tiles are needed, but different ones may be necessary in other figures.

The talk will focus on the possibilities and constraints of this technique, through practical

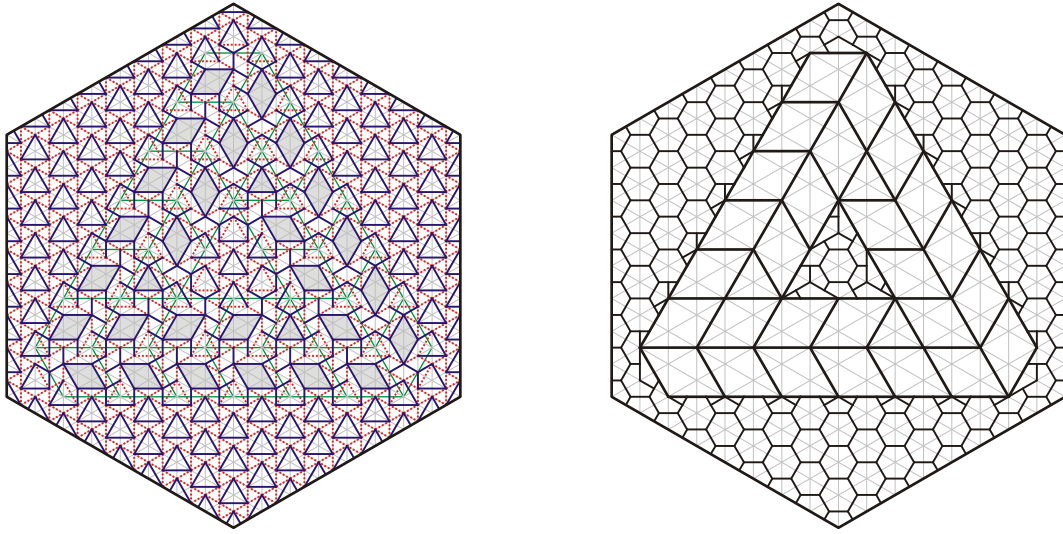


Figure 2: The full crease pattern (left), and the folded figure (right).

examples of its applications. As a real example, see [2](#): on the left is the completed crease pattern of the former desired figure, and on the right is the completed scaled-up folded shape.

References

Alessandro Beber, *Origami New Worlds*. Self-published, 2017.