Geometric Folding Algoritihms: Linkages, Origami, Polyhedra

Updates to Chapter 22, Section 22.1: Edge Unfolding of Polyhedra: Introduction

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Abstract

Updates to Chapter 22 of [DO07].

1 Updates

The question addressed in this chapter, Open Problem 21.1—whether every convex polyhedron has an edge-unfolding to a net—has become to be known as "Dürer's Problem" [O'R13]. It remains open as of this writing.

This chapter introduced the terminology ***general unfoldings*** to contrast with ***edge unfoldings***. The survey [O'R19] suggested new and more memorable terminology for the same concept: In an ***anycut-unfolding***, the cuts may be any curves on the surface that form a spanning tree of the vertices.

This survey explores twenty generalizations and specializations of Dürer's Problem, and highlights six that were open as of 2019, and remain open as of the date of this update.

References

[DO07] Erik D. Demaine and Joseph O'Rourke. *Geometric Folding Algorithms: Linkages, Origami, Polyhedra*. Cambridge University Press, 2007.

[O'R13] Joseph O'Rourke. Dürer's problem. In Marjorie Senechal, editor, *Shaping Space: Exploring Polyhedra in Nature, Art, and the Geometrical Imagination*, pages 77–86. Springer, 2013.

[O'R19] Joseph O'Rourke. Unfolding polyhedra. In *Proc. 31st Canad. Conf. Comput. Geom.*, pages 85–86, August 2019. http://arxiv.org/abs/1908.07152.