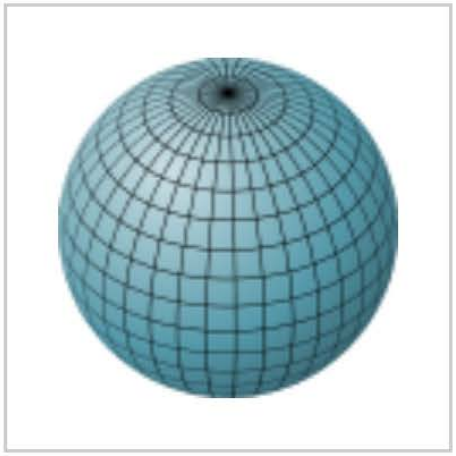
Can you formally define what a handle is?

Gudenrath Glassblowing: Handle — casting off
http://youtu.be/nACHHJwcFWM

http://en.wikipedia.org/wiki/Genus_(mathematics)

Genus of orientable surfaces



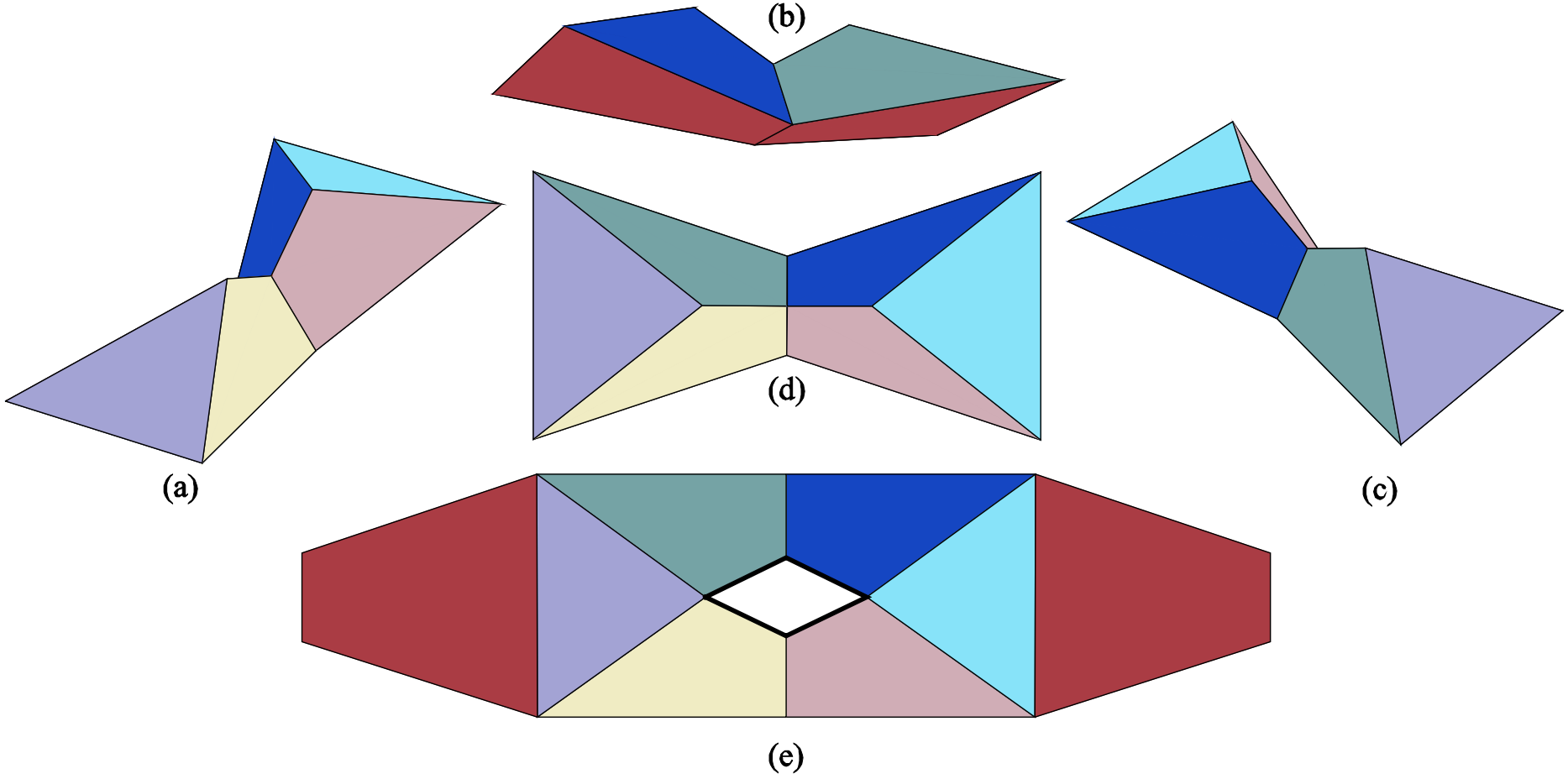
genus 0

genus 1

genus 2

genus 3

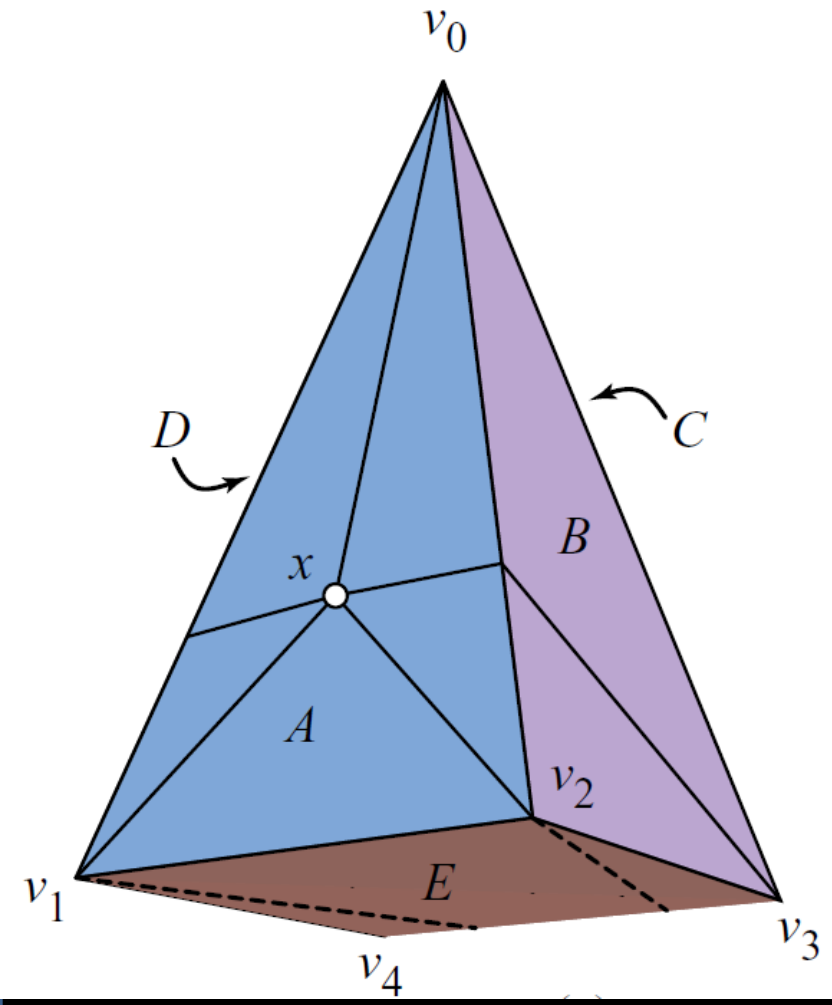
Why do convex polyhedral unfoldings necessarily have no holes?

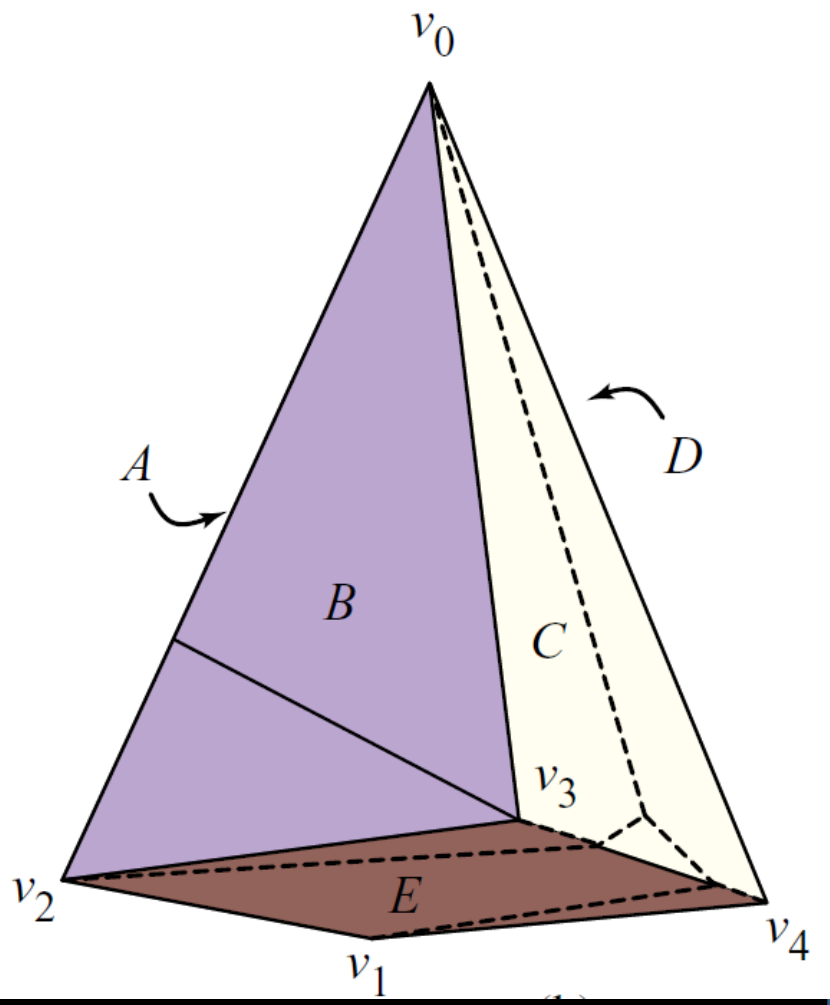


[Bern, Demaine, Eppstein, Kuo, Mantler, Snoeyink 2003]

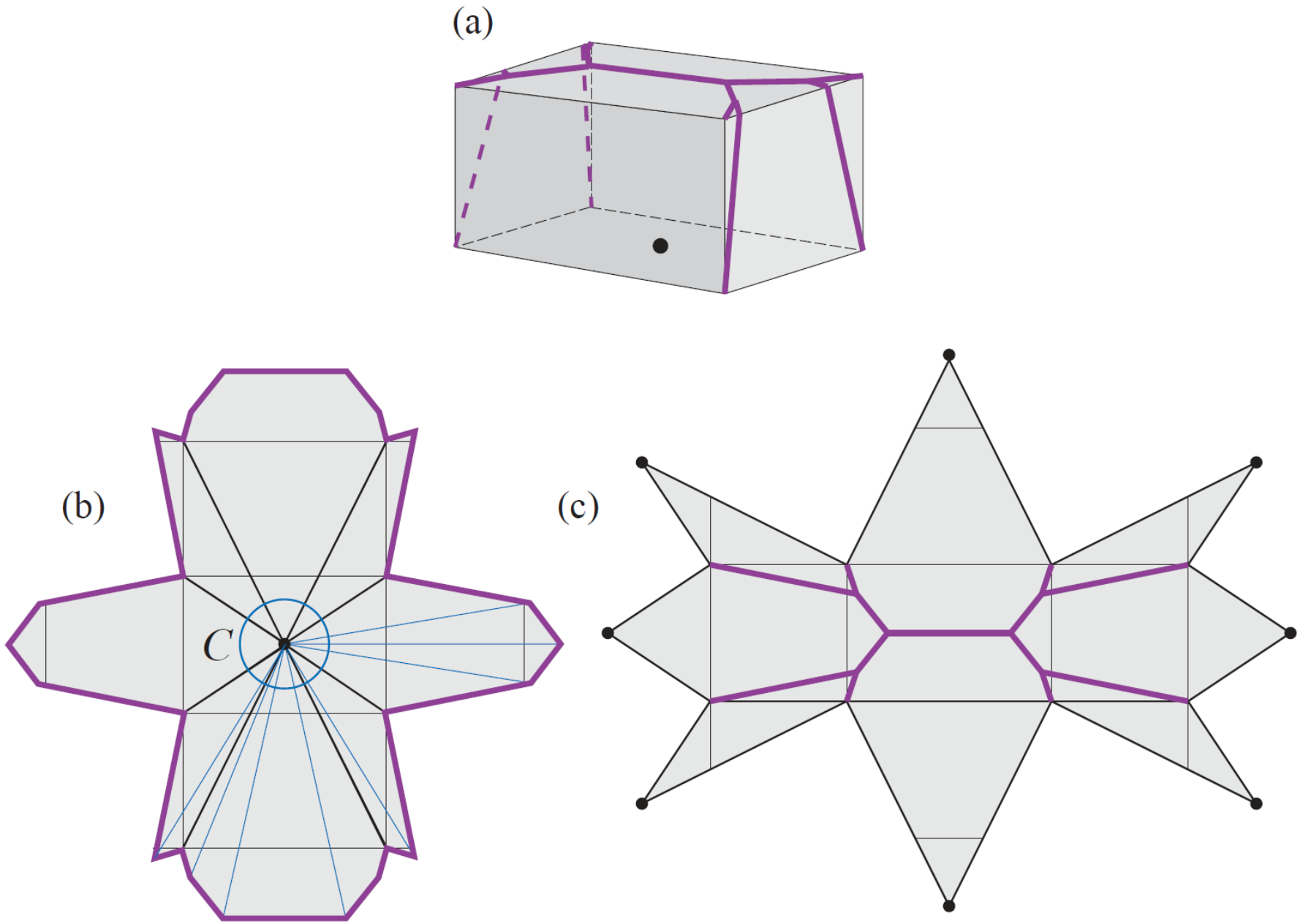
Can you explain the comment "leaves = the polyhedron vertices" on page 4? It looks like vertices usually have unique shortest paths to x."

Cut locus / ridge tree with respect to point x
= points with nonunique shortest paths from x
= Voronoi diagram of x
- spanning tree of polyhedron
- leaves = the polyhedron vertices

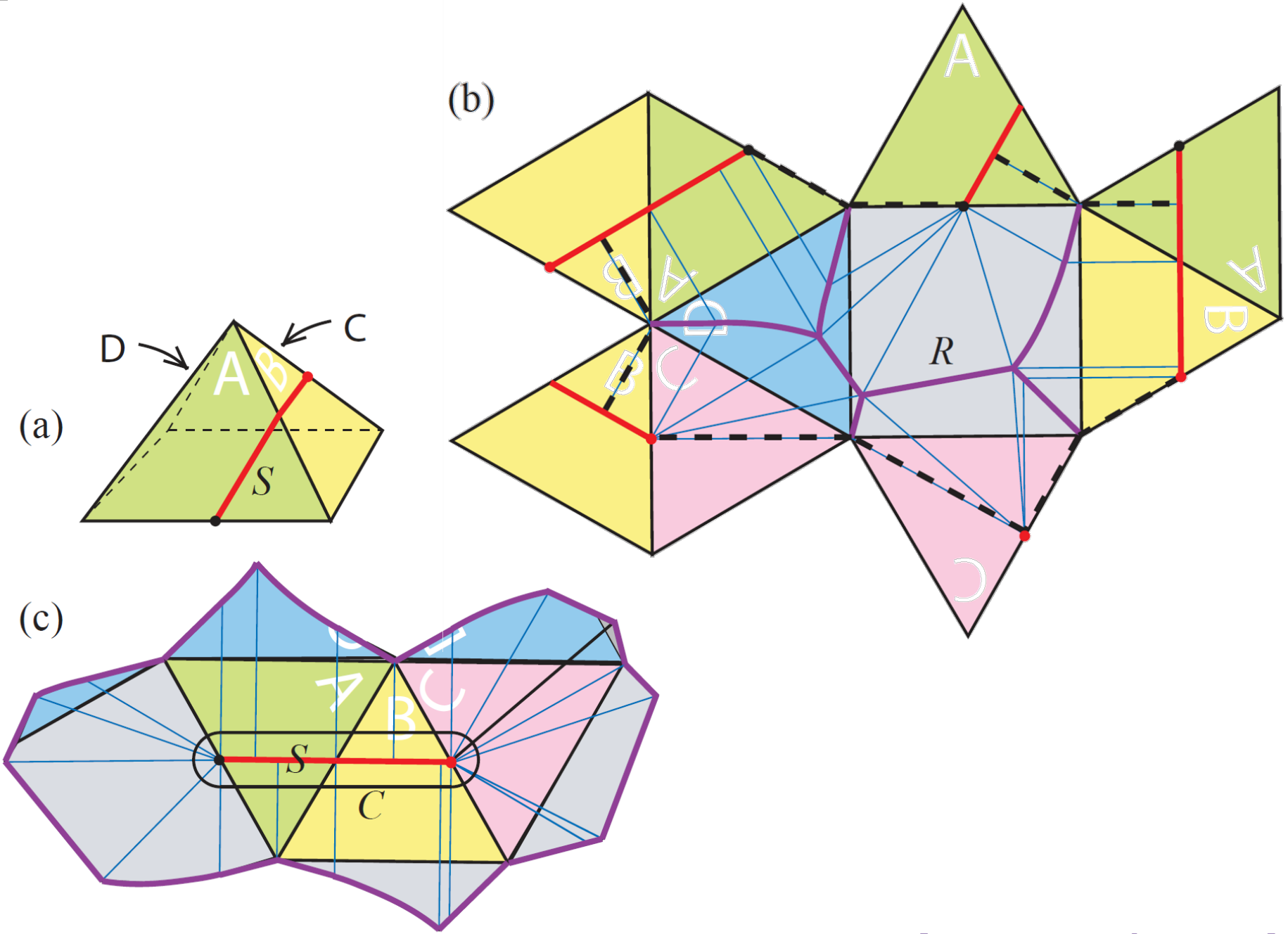

v_0
D
C
B
x
A
v_2
v_1
E
v_3
v_4


v_0
A
D
B
C
v_3
v_2
E
v_4
v_1

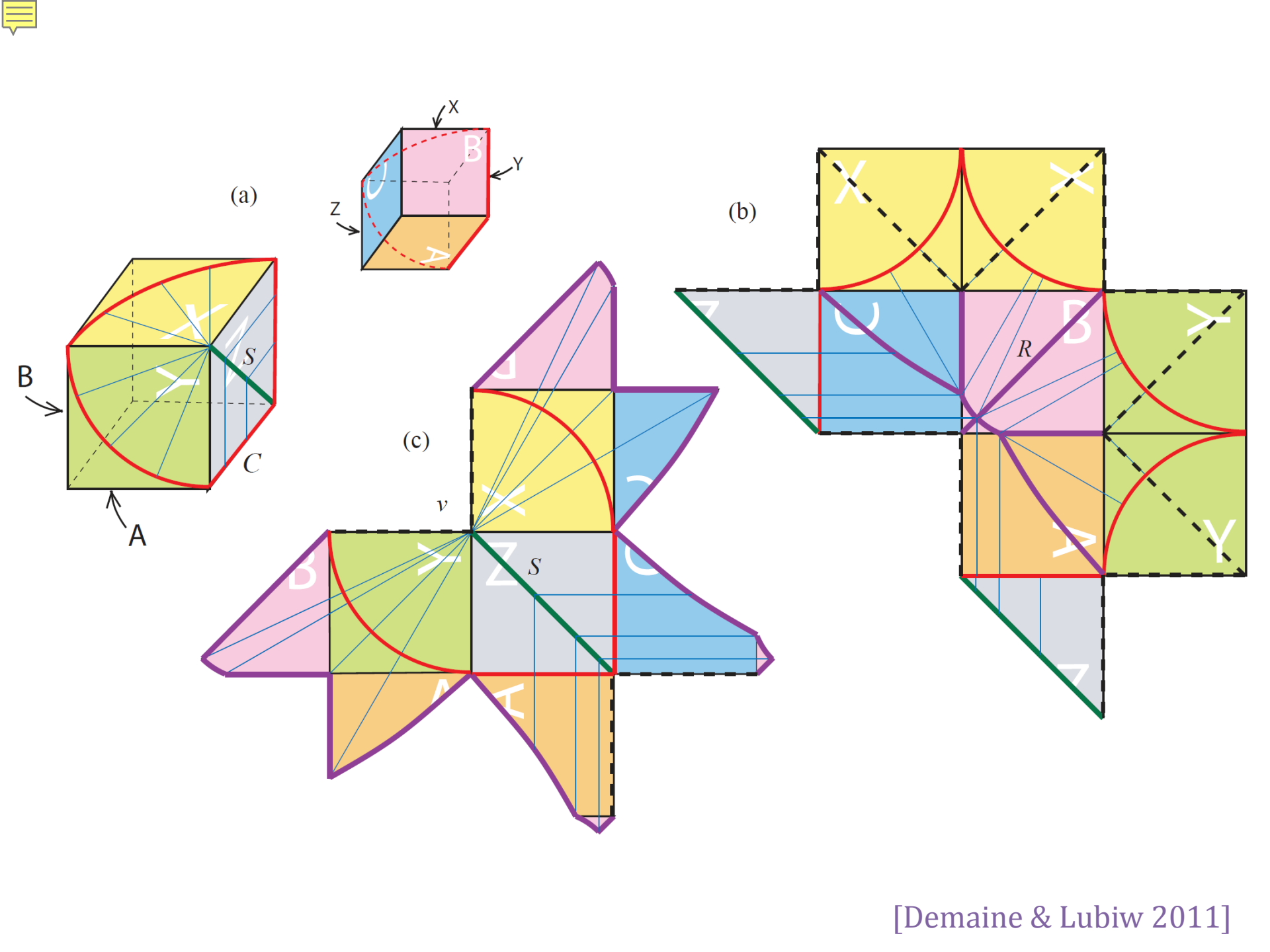
Any luck finding generalizations of star and source unfoldings?



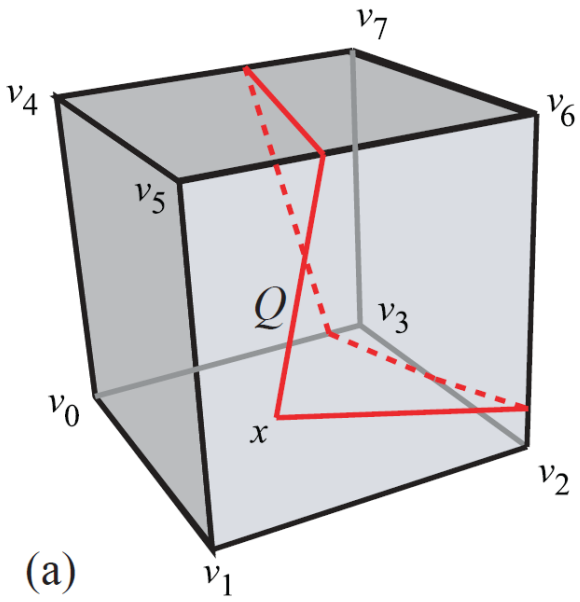
[Demaine & Lubiw 2011]



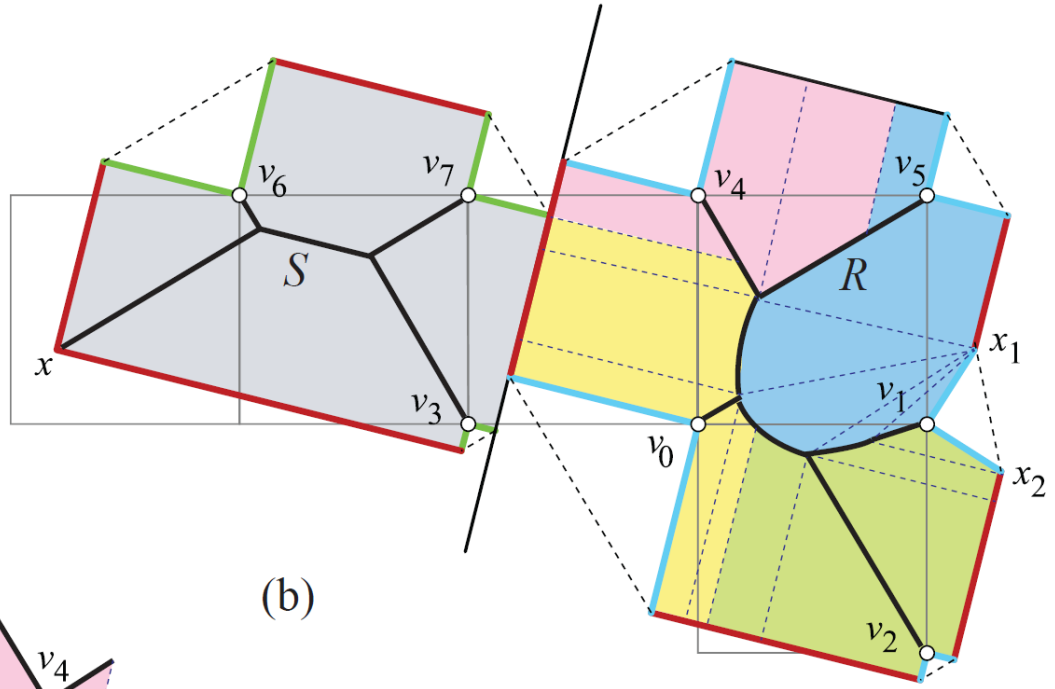
[Demaine & Lubiw 2011]



[Demaine & Lubiw 2011]

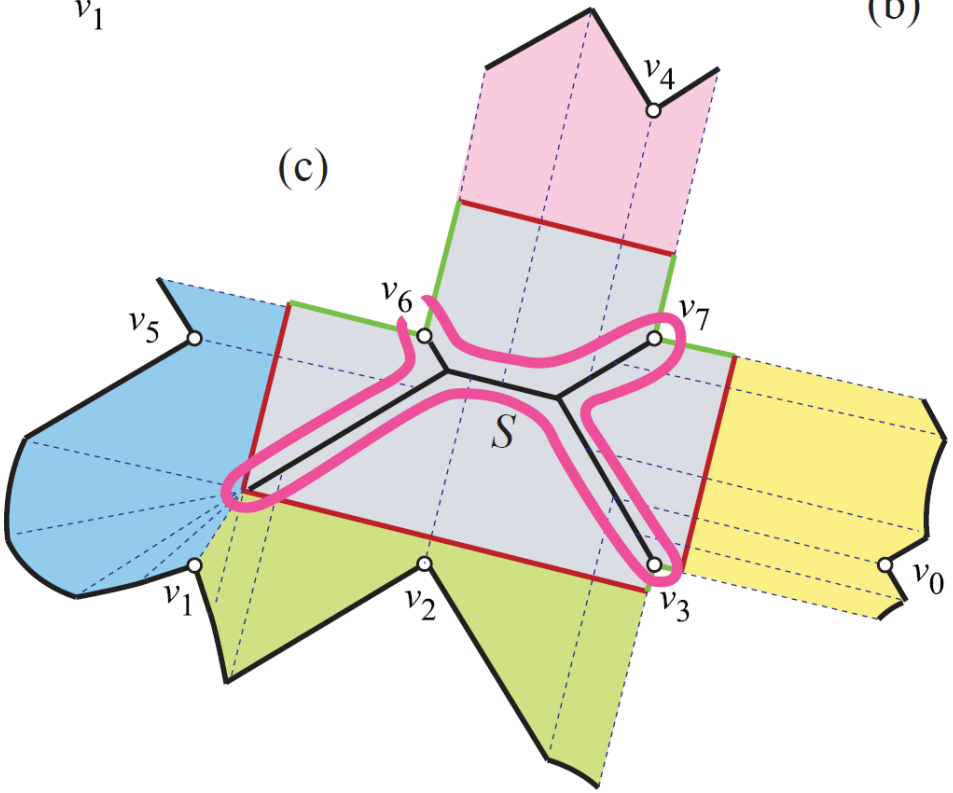


(a)

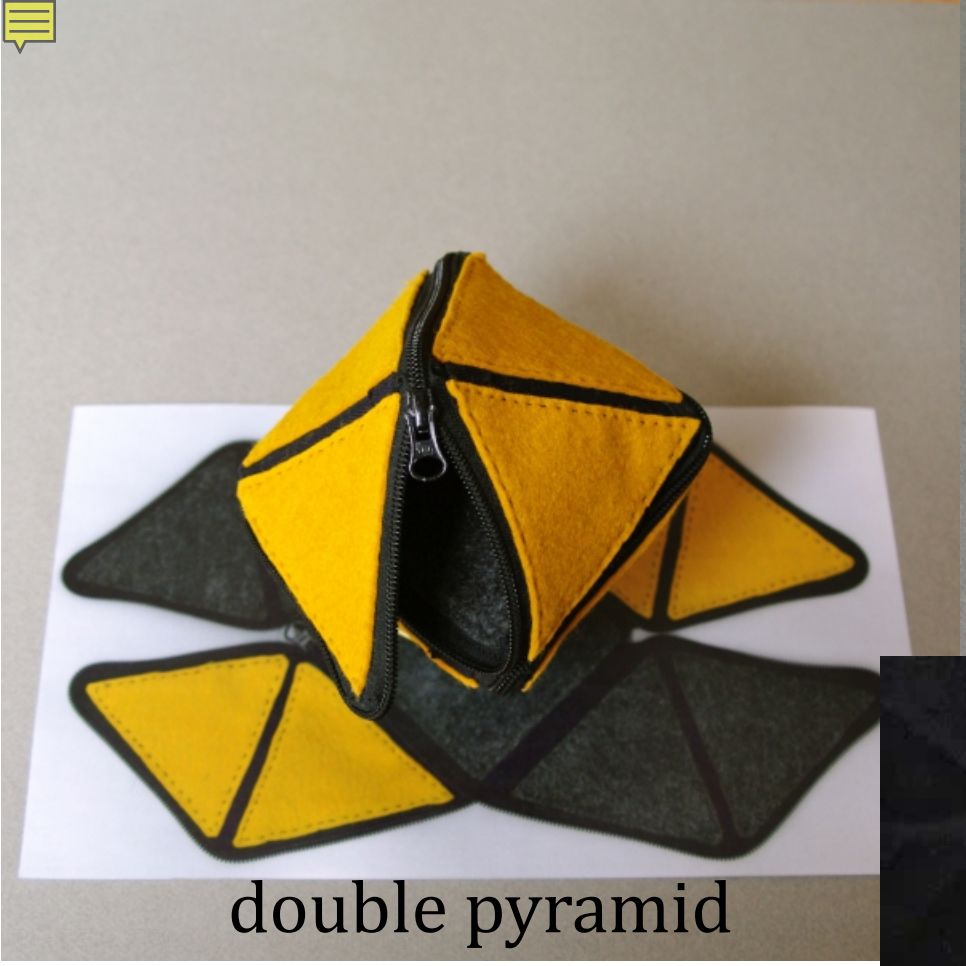


(b)

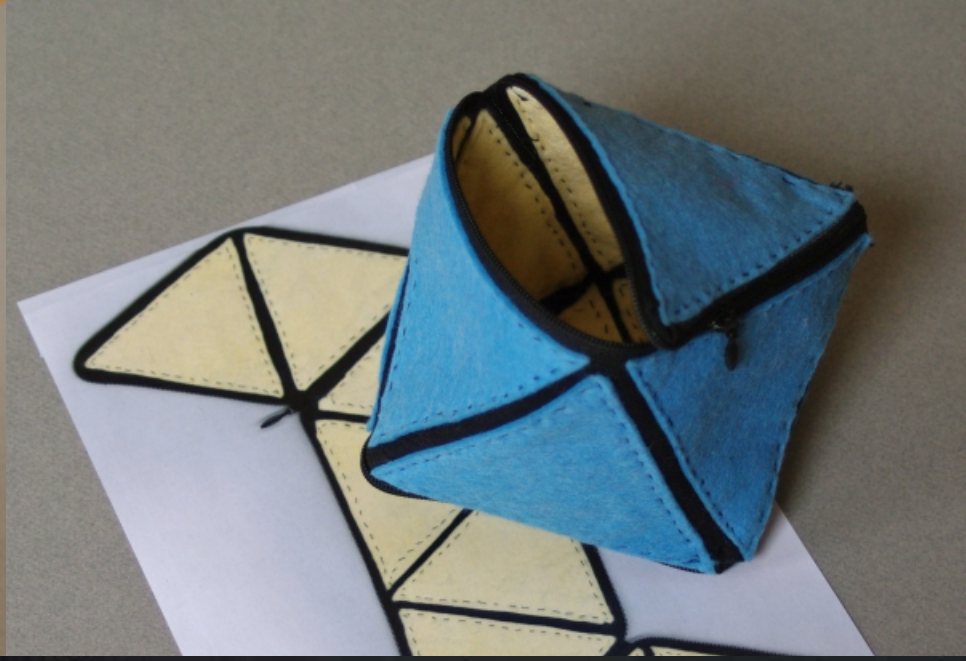
(c)

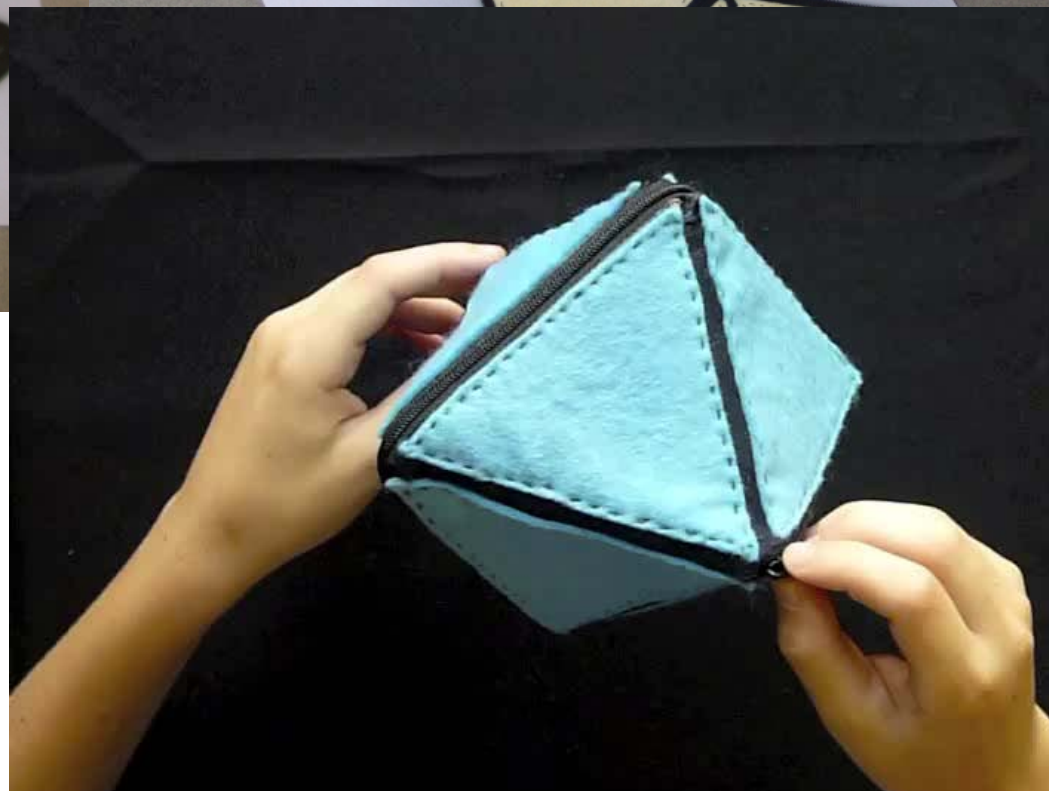


[Demaine & Lubiw 2011]



double pyramid

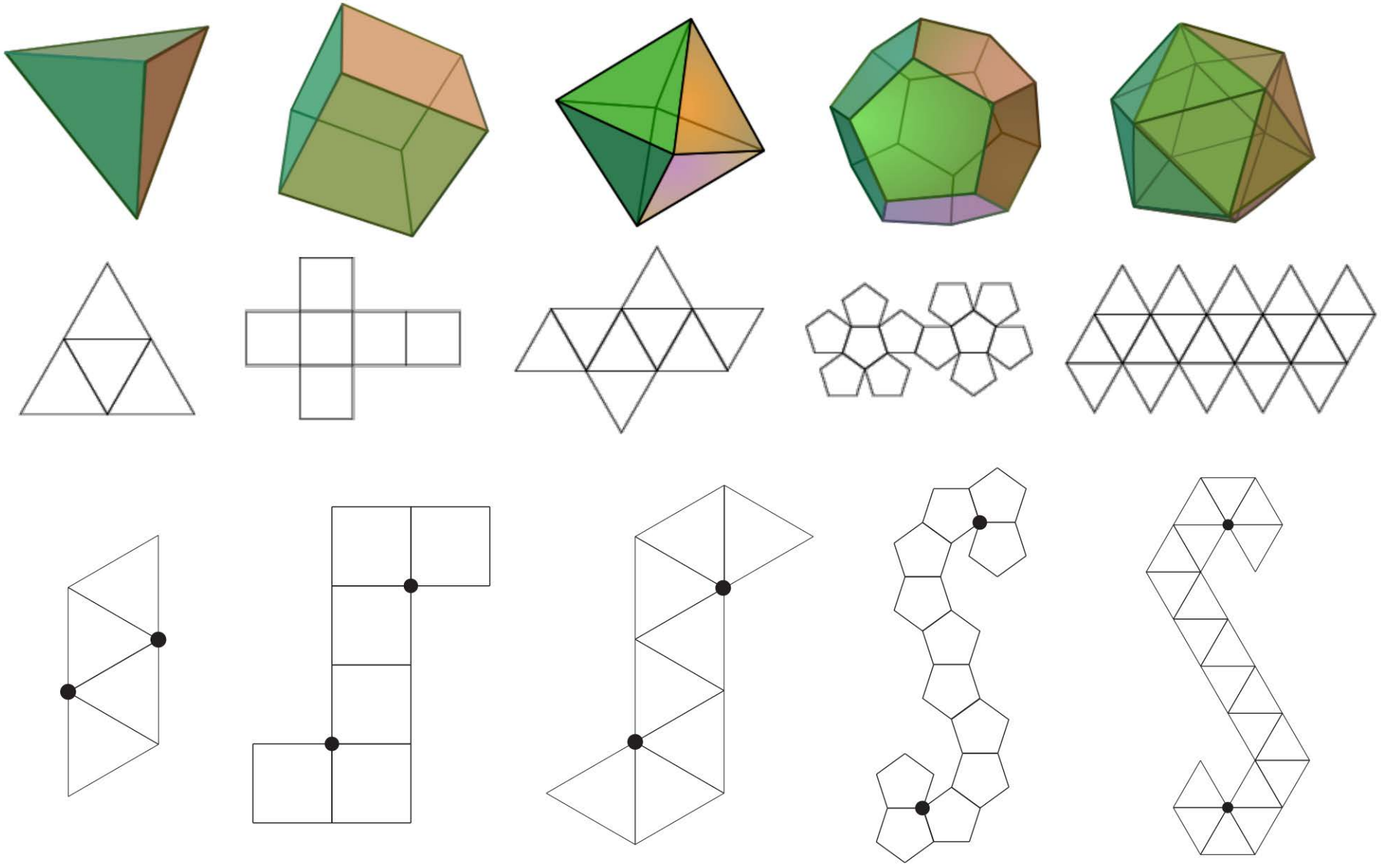




Bridges Exhibition of Mathematical Art
Portugal, July 2011

[Demaine, Demaine, Lubiw, Shallit, Shallit 2010–2011]

Platonic Solids

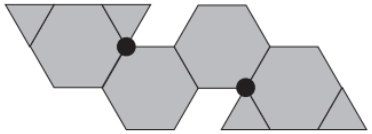


[Demaine, Demaine, Lubiw, Shallit, Shallit 2010]

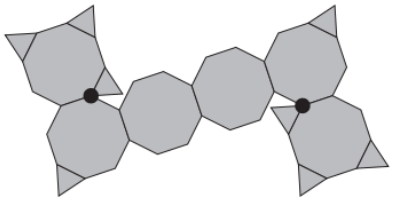
Archimedean Solids

[Demaine, Demaine, Lubiw, Shallit, Shallit 2010]

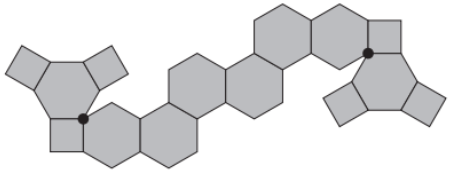
truncated tetrahedron



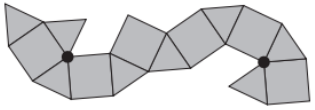
truncated cube



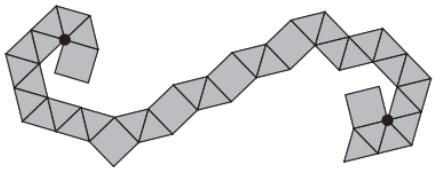
truncated octahedron



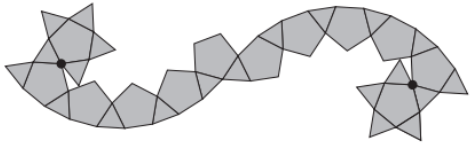
cubocta-hedron



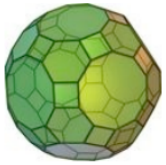
snub cube



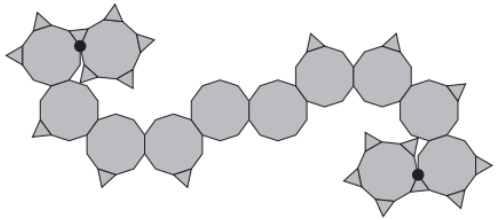
icosidodeca-hedron



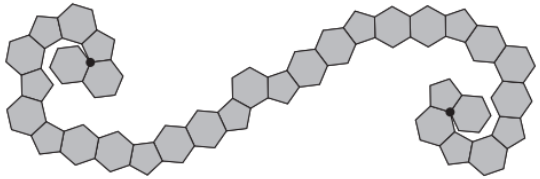
great rhombicosi-dodecahedron



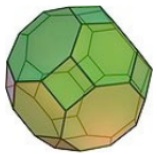
truncated dodeca-hedron

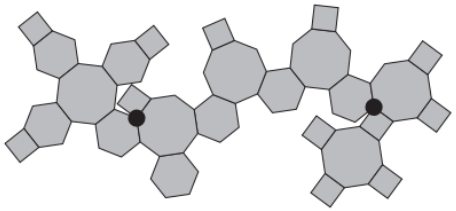


truncated icosa-hedron

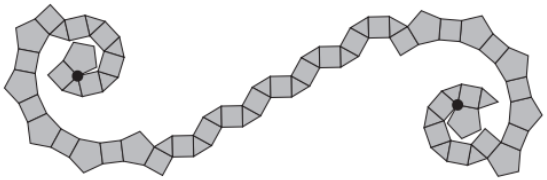


great rhombicub-octahedron

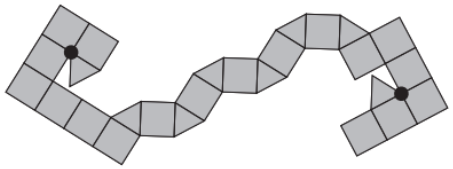




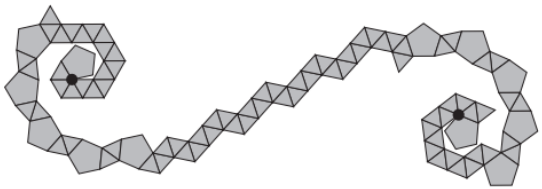
small rhombicosi-dodecahedron



small rhombicub-octahedron



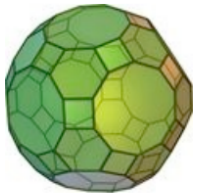
snub dodeca-hedron

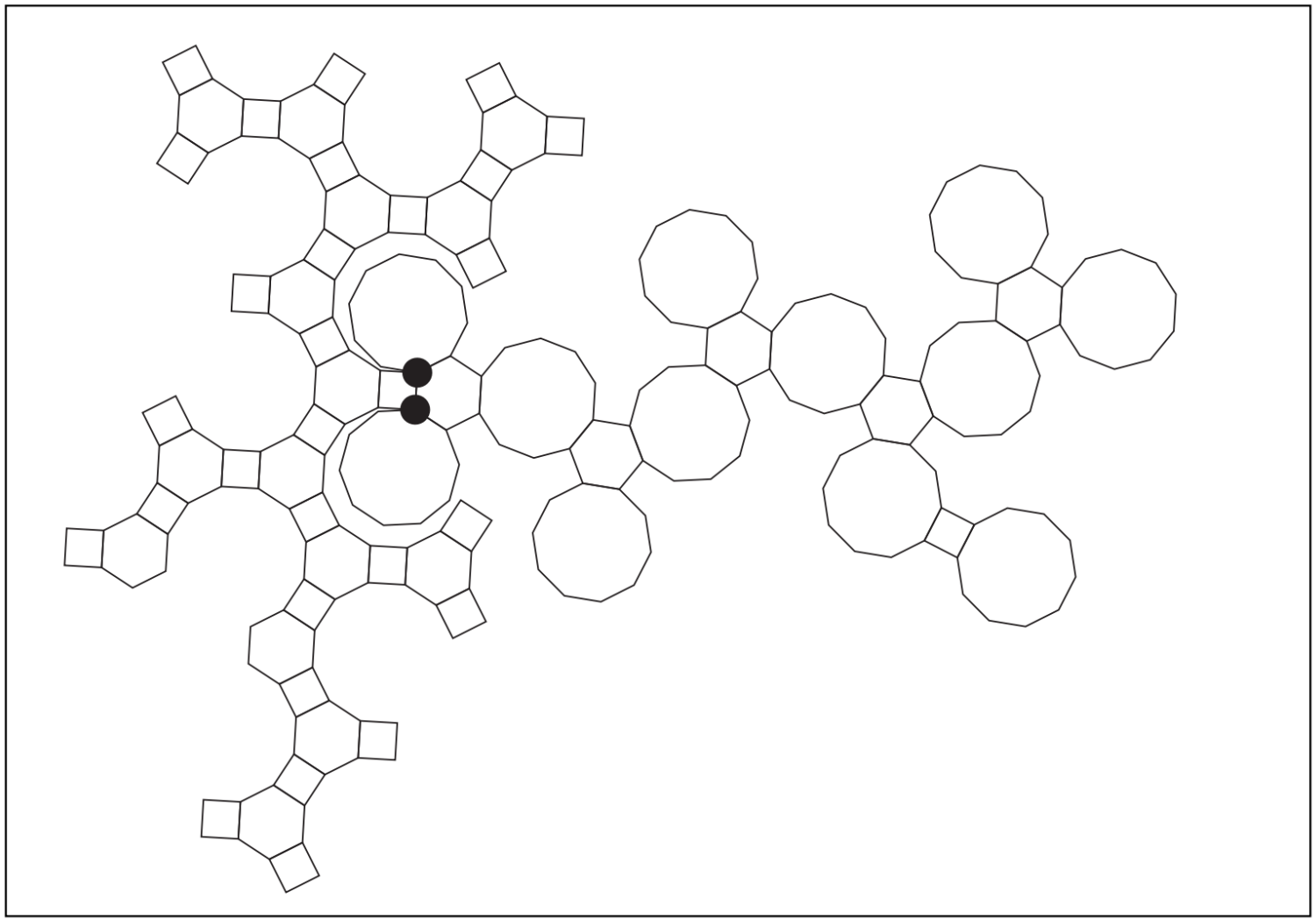


Archimedean Solids

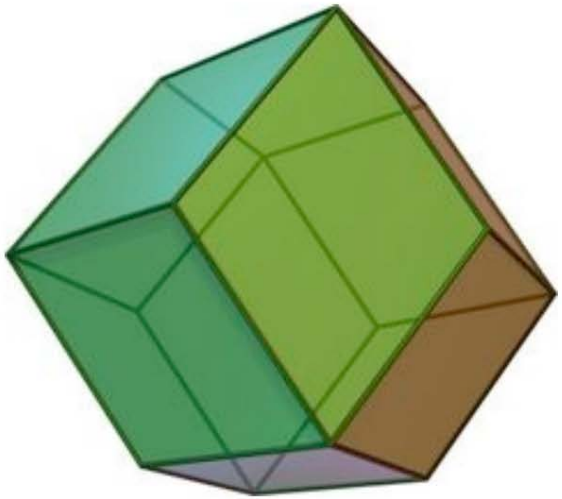
[Demaine, Demaine, Lubiw, Shallit, Shallit 2010]

great
rhombicosi-
dodecahedron

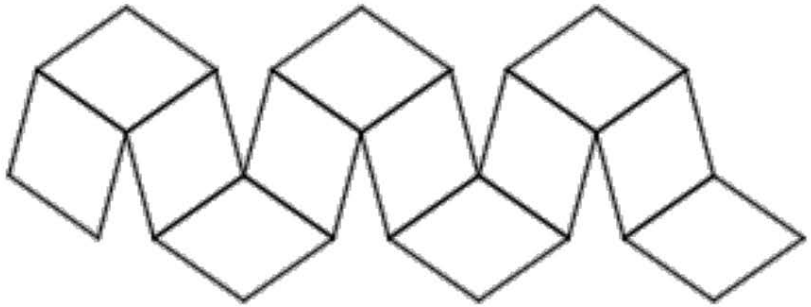




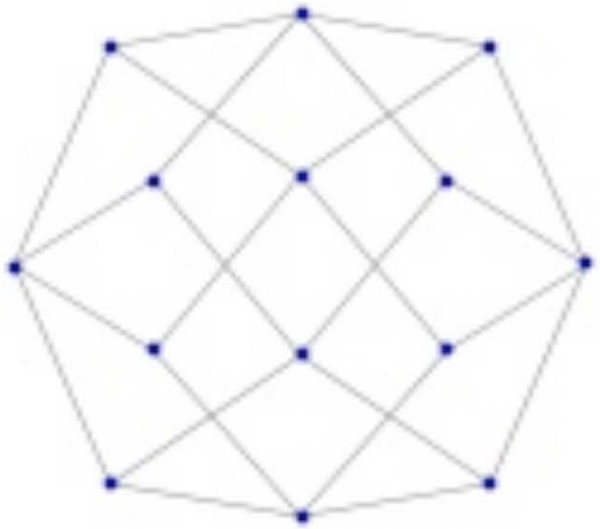
rhombic dodecahedron



net



its graph has no
Hamiltonian path



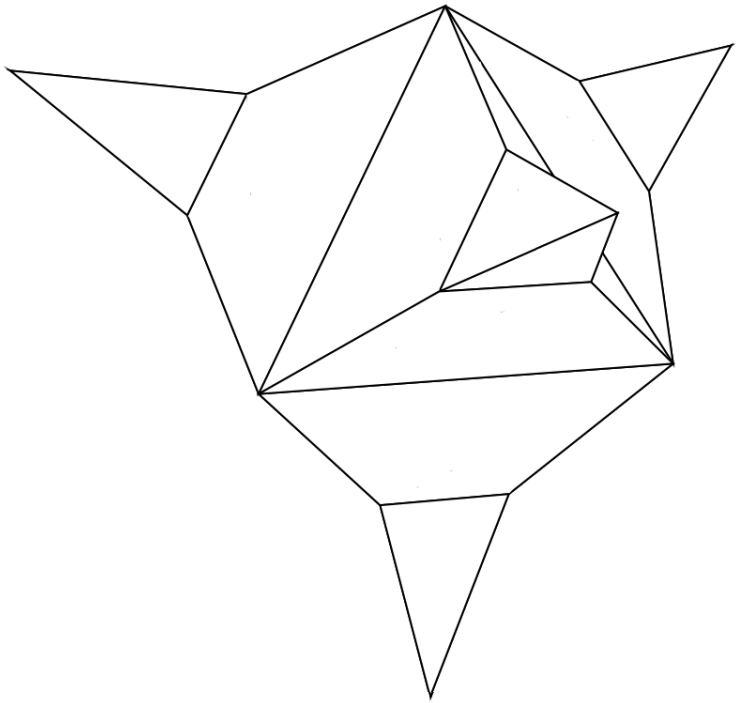
[Demaine, Demaine, Lubiw, Shallit, Shallit 2010]

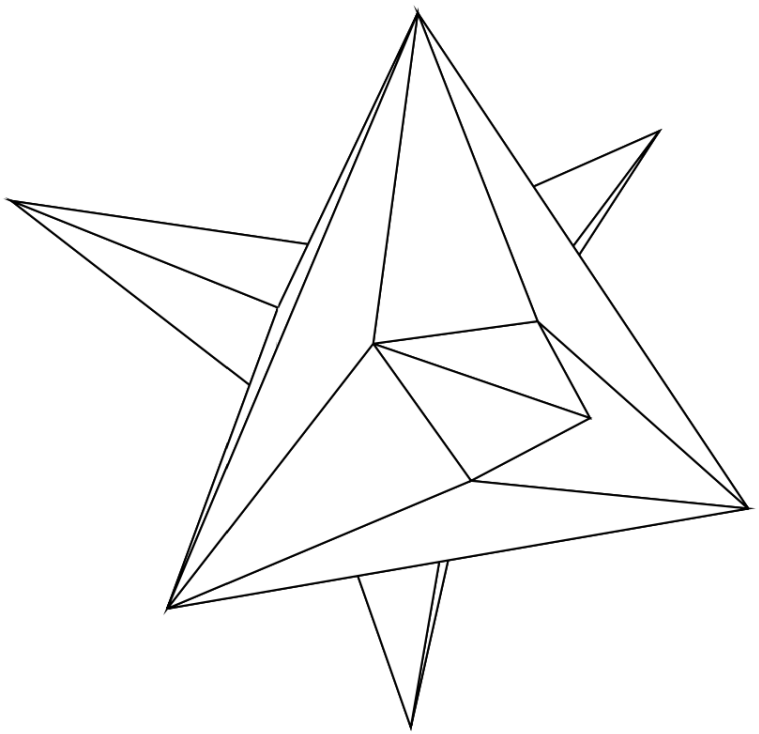
[Demaine, Demaine, Lubiw, Shallit, Shallit 2010]

Edge unfoldings seem super cool. […] before, they seemed pretty obviously doable but you have convinced me otherwise.

Ununfoldable Polyhedra with Convex Faces

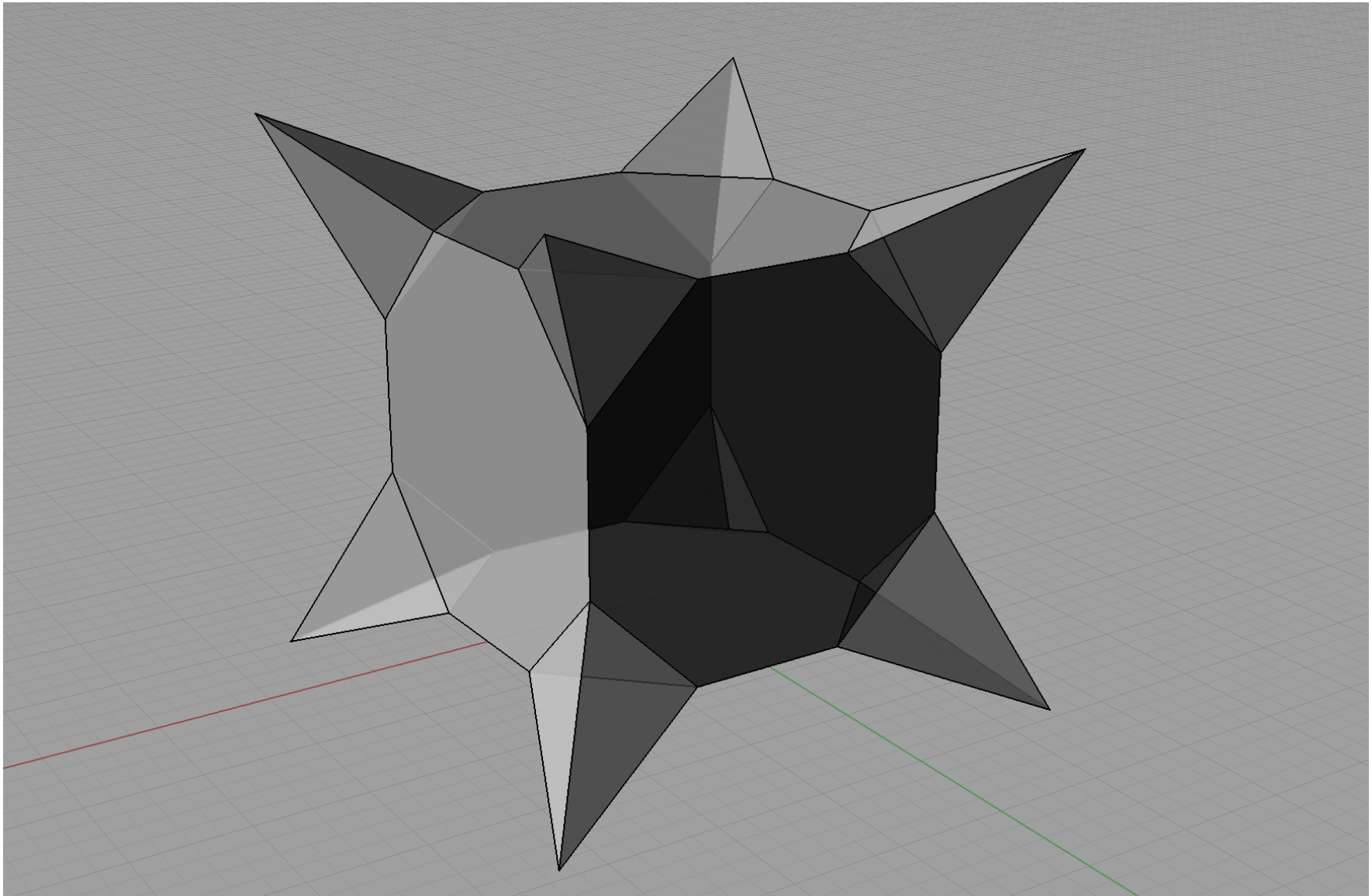
Marshall Bern* Erik D. Demaine† David Eppstein‡
Eric Kuo§ Andrea Mantler¶ Jack Snoeyink¶ ‖





Polyhedra with no natural unfoldings

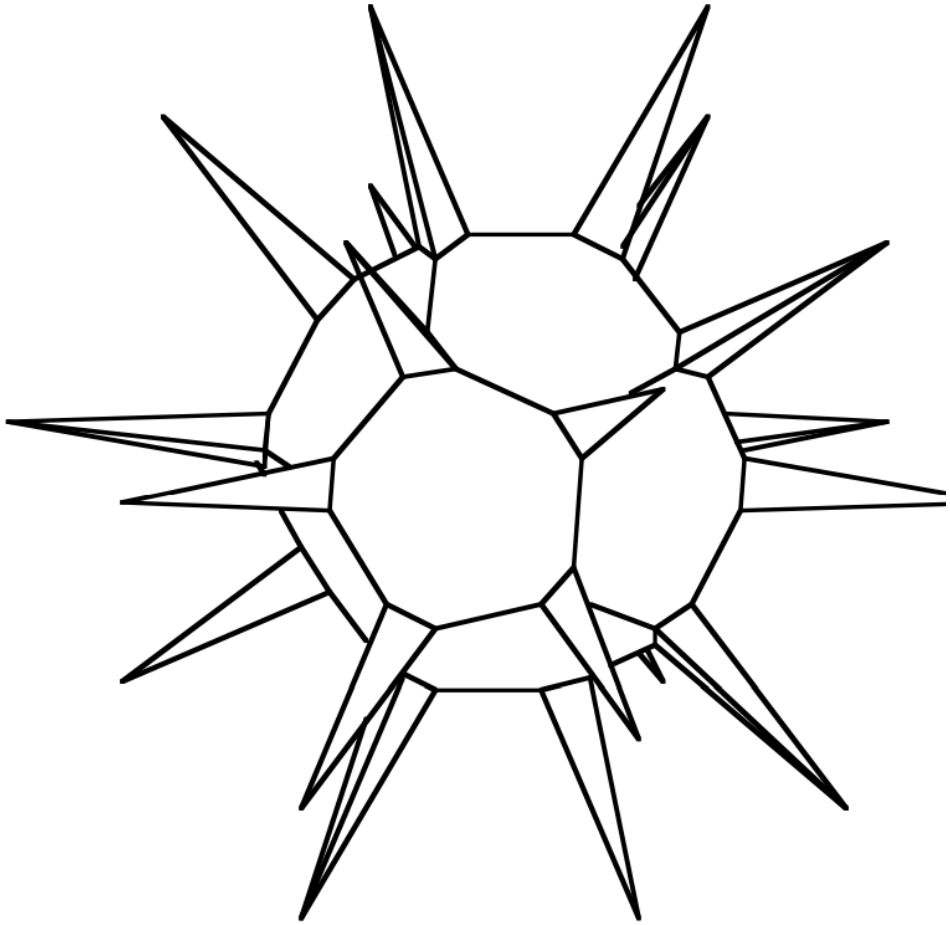
A. S. Tarasov



Geombinatorics 11(2001), 43 – 48.

A starshaped polyhedron with no net

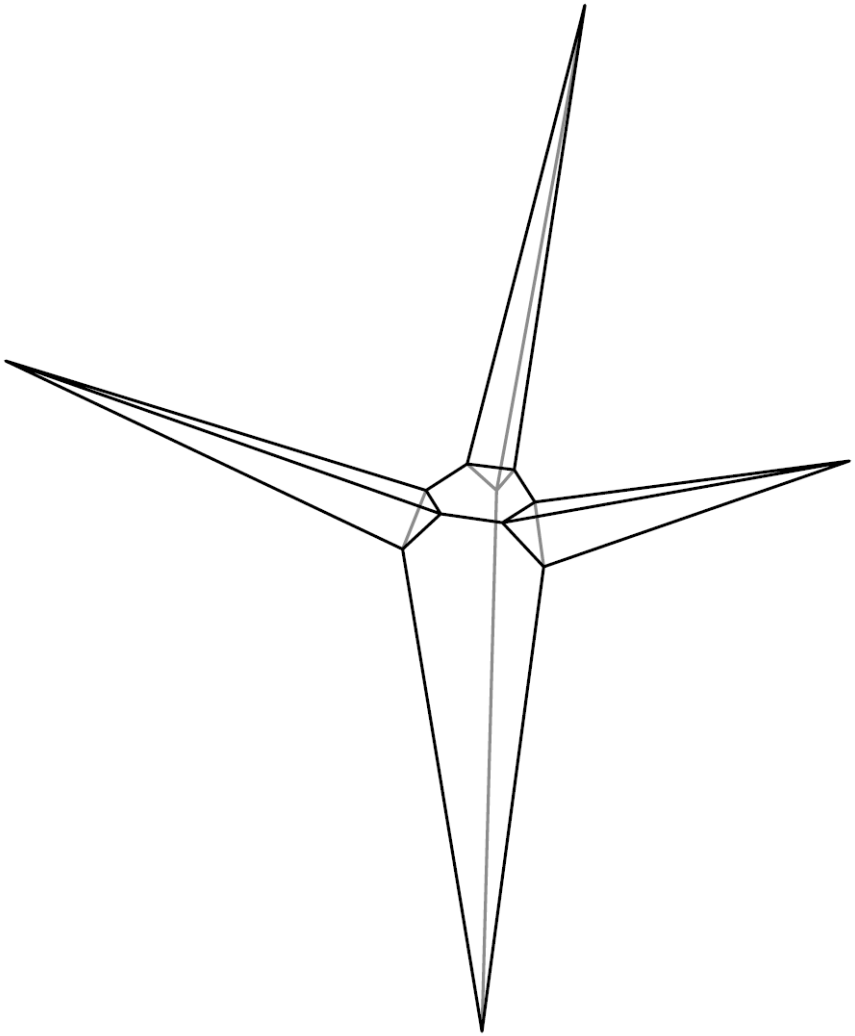
Branko Grünbaum
Department of Mathematics, Box 354350
University of Washington
Seattle, WA 98195-4350
e-mail: grunbaum@math.washington.edu



Geombinatorics 11(2002), 111 – 114

NO-NET POLYHEDRA

Branko Grünbaum
Department of Mathematics, Box 354350
University of Washington, Seattle, WA 98195-4350
e-mail: grunbaum@math.washington.edu



Packing Squares into a Square*

JOSEPH Y-T. LEUNG, TOMMY W. TAM, AND C. S. WONG

Computer Science Program, University of Texas at Dallas, Richardson, Texas 75083

GILBERT H. YOUNG

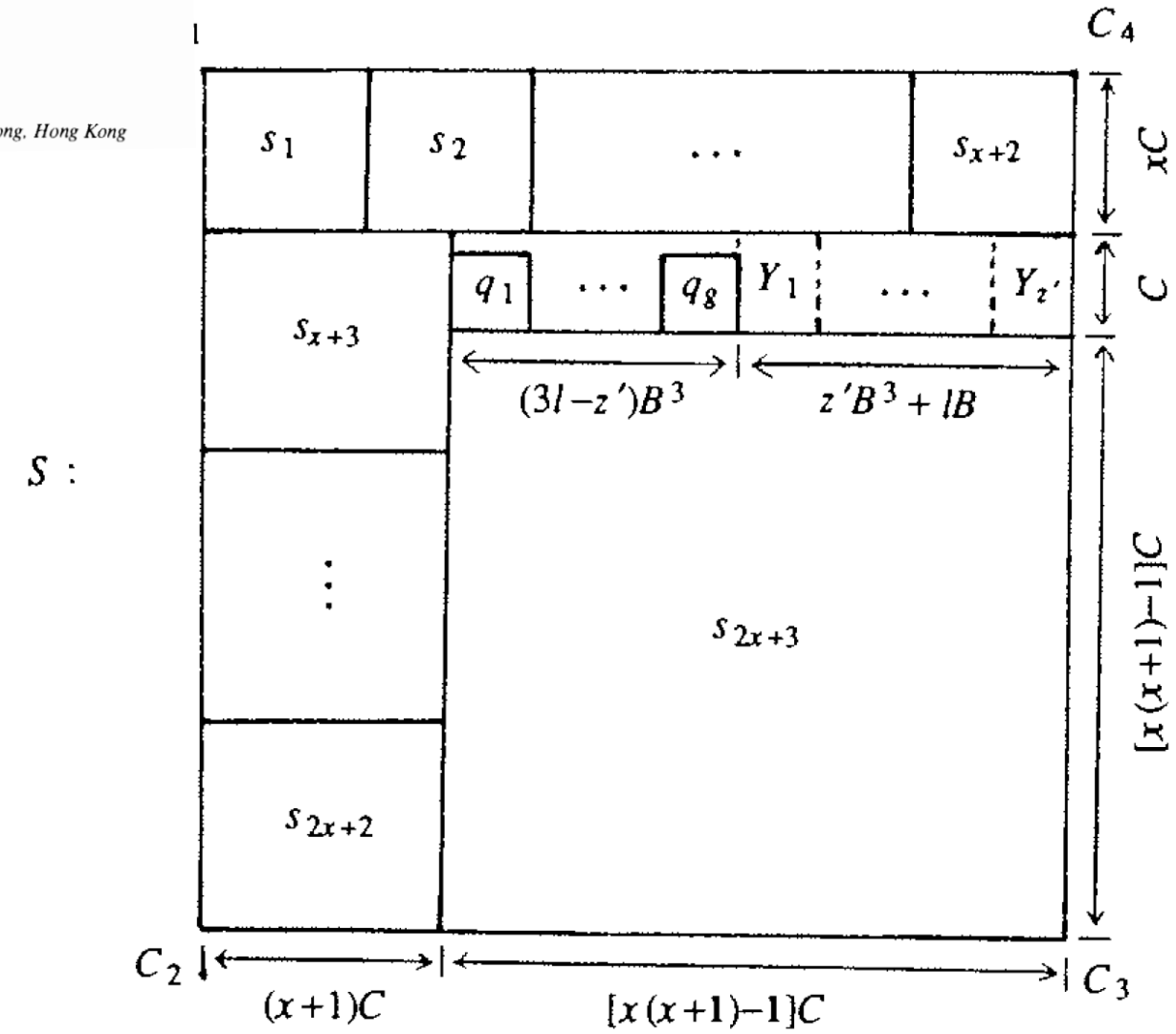
Department of Computer Science, Tulane University, New Orleans, Louisiana 70118

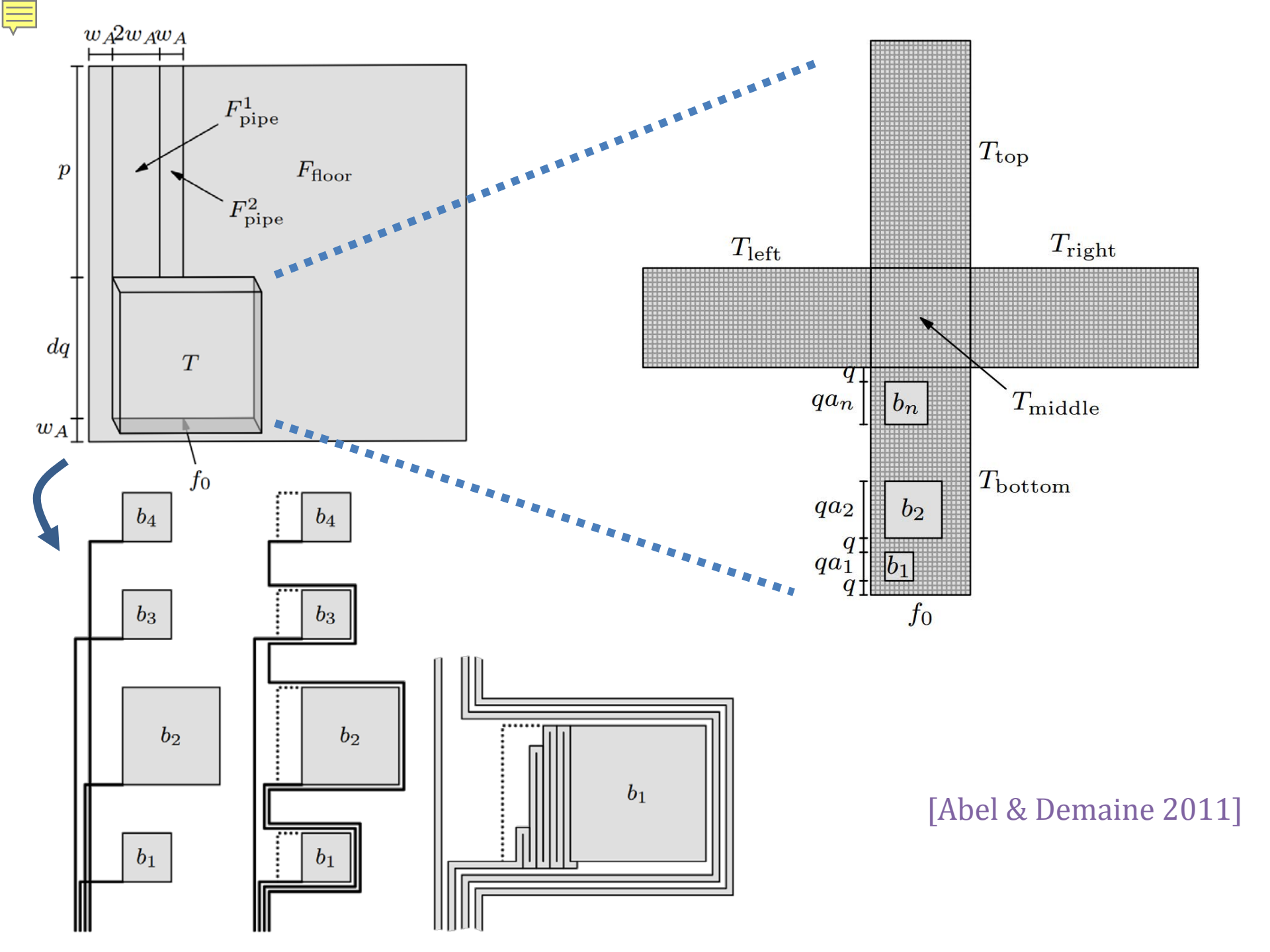
AND

FRANCIS Y. L. CHIN

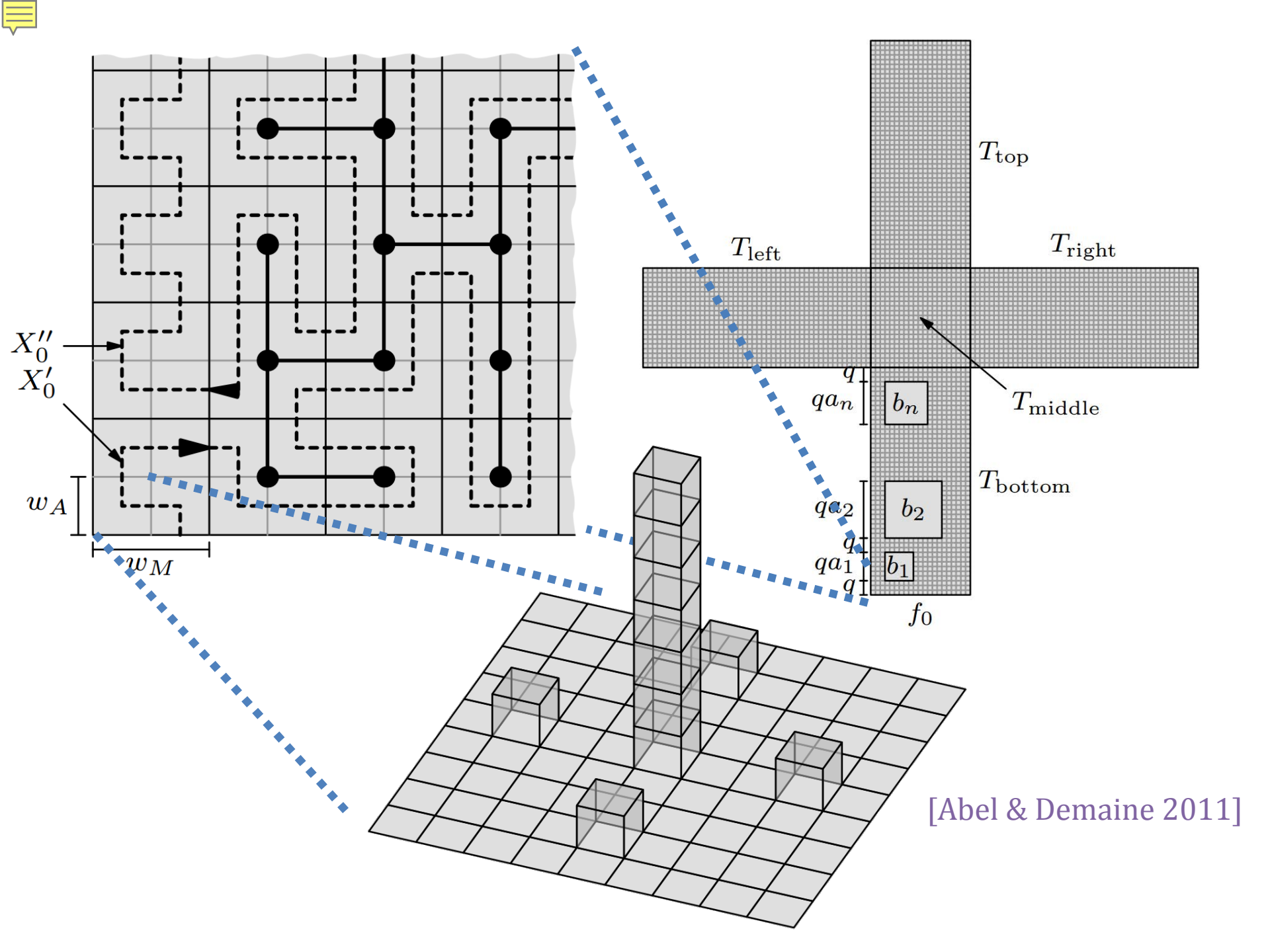
Department of Computer Science, University of Hong Kong, Hong Kong

$C = 3B^3 + B$

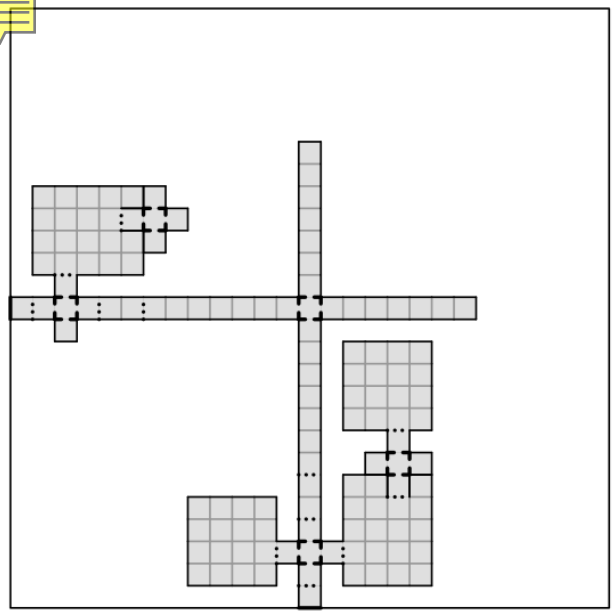




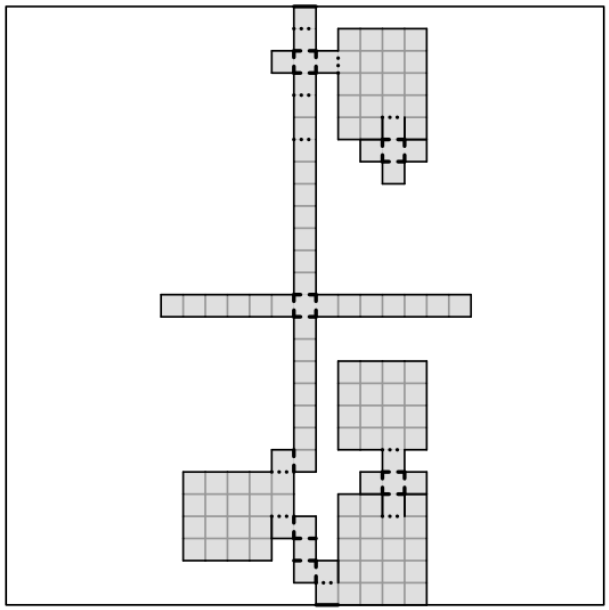
[Abel & Demaine 2011]



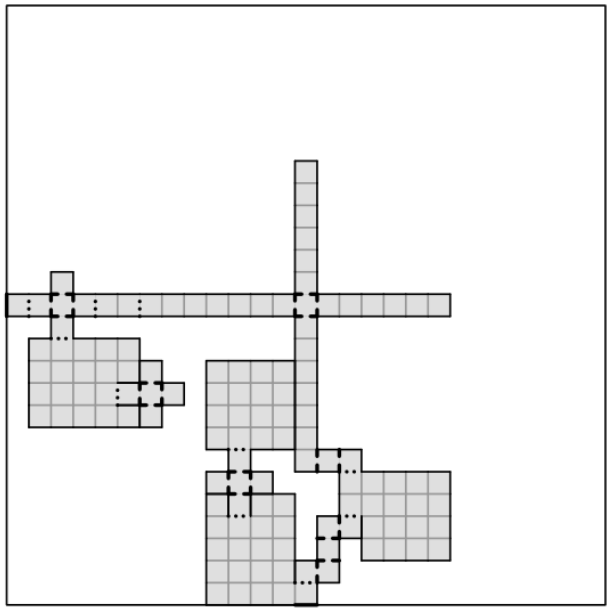
[Abel & Demaine 2011]



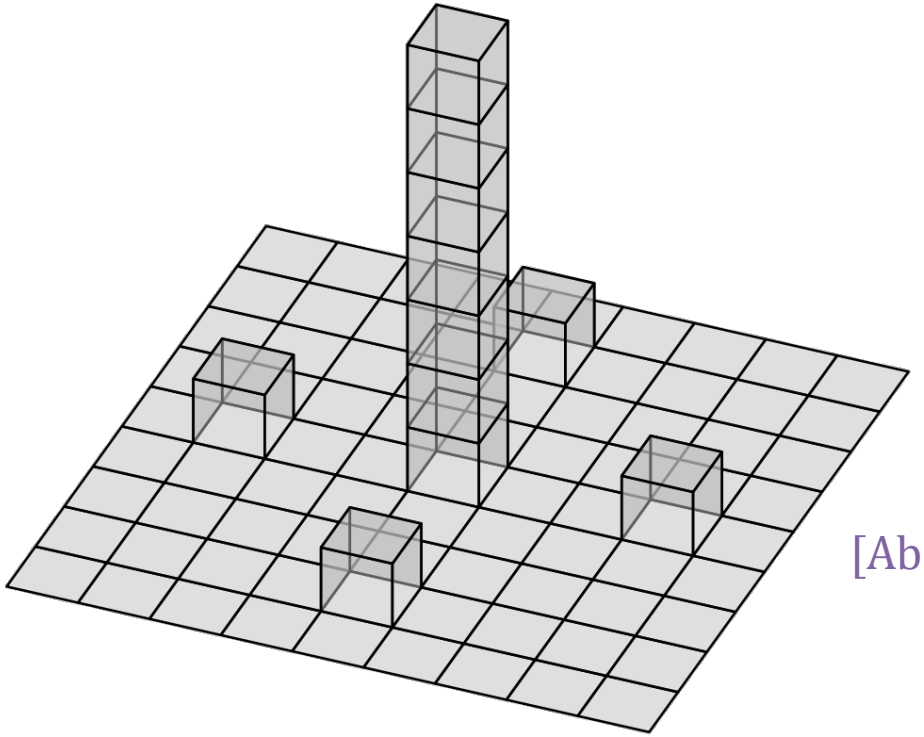
(a) [L, L, 13, 13].



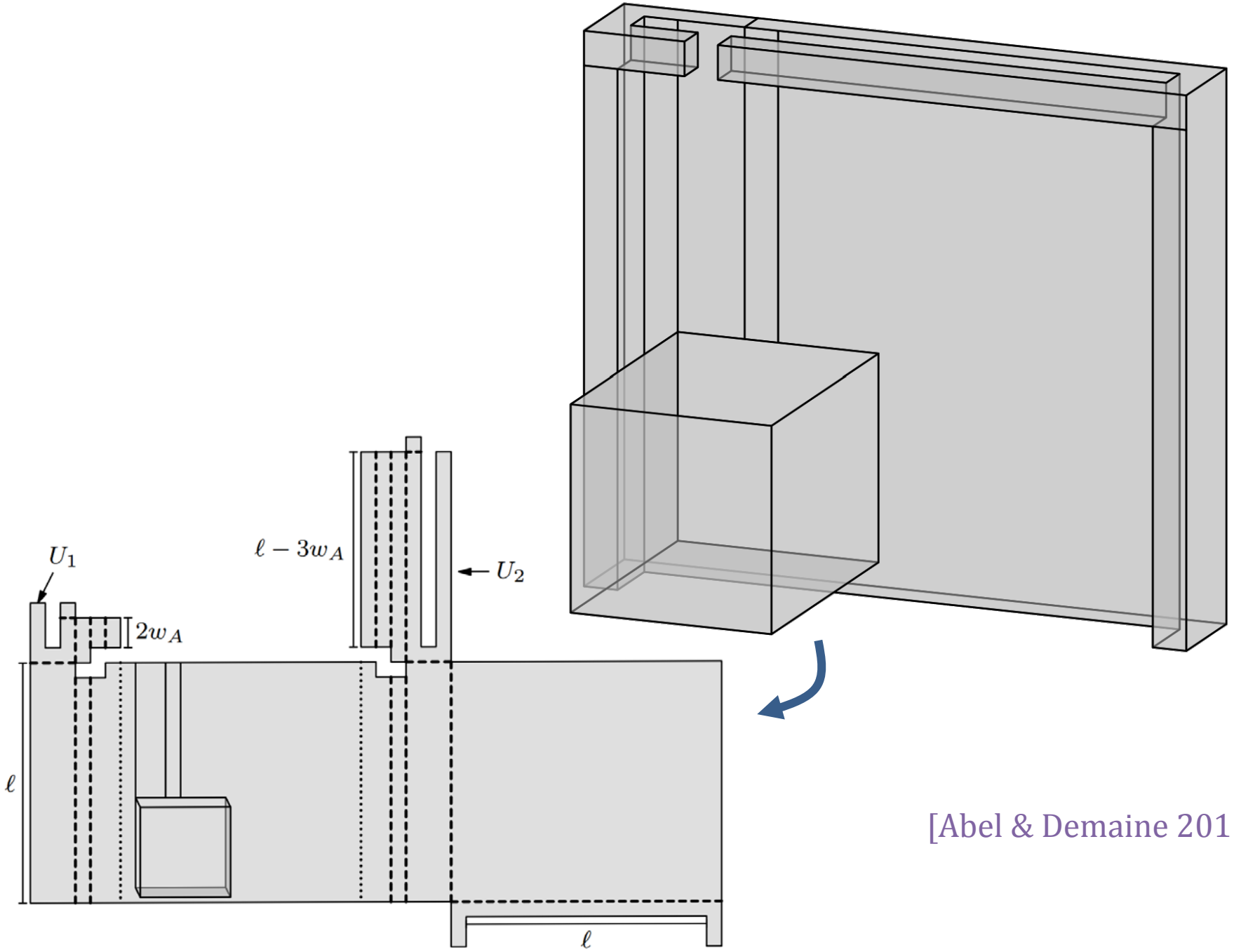
(b) [L, S, 14, 13].



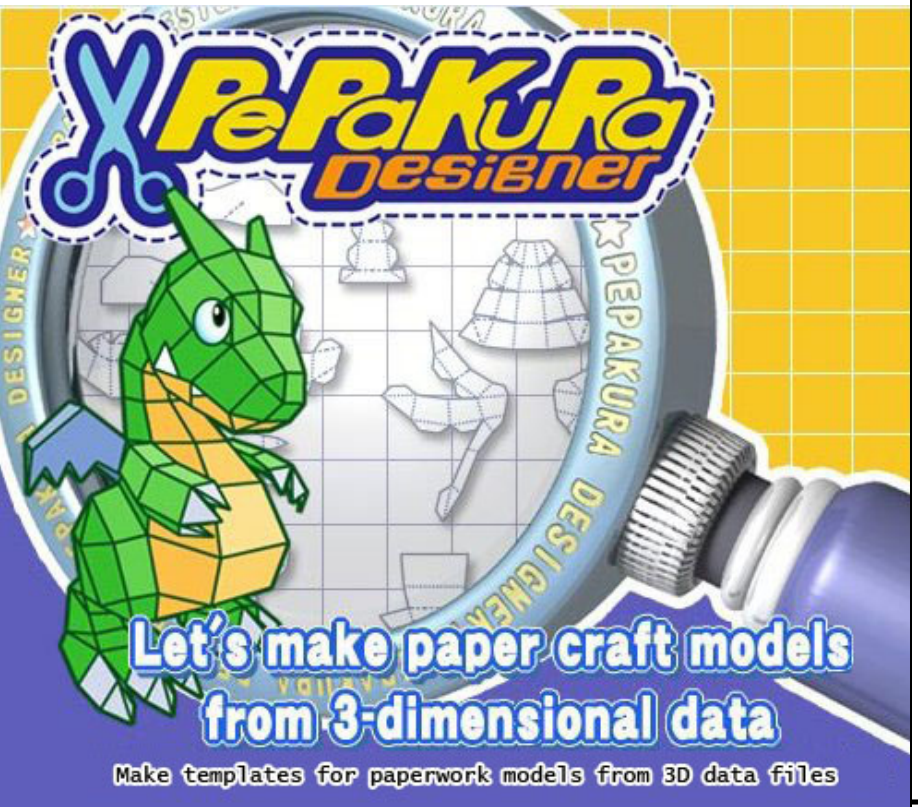
(c) [R, L, 13, 13].



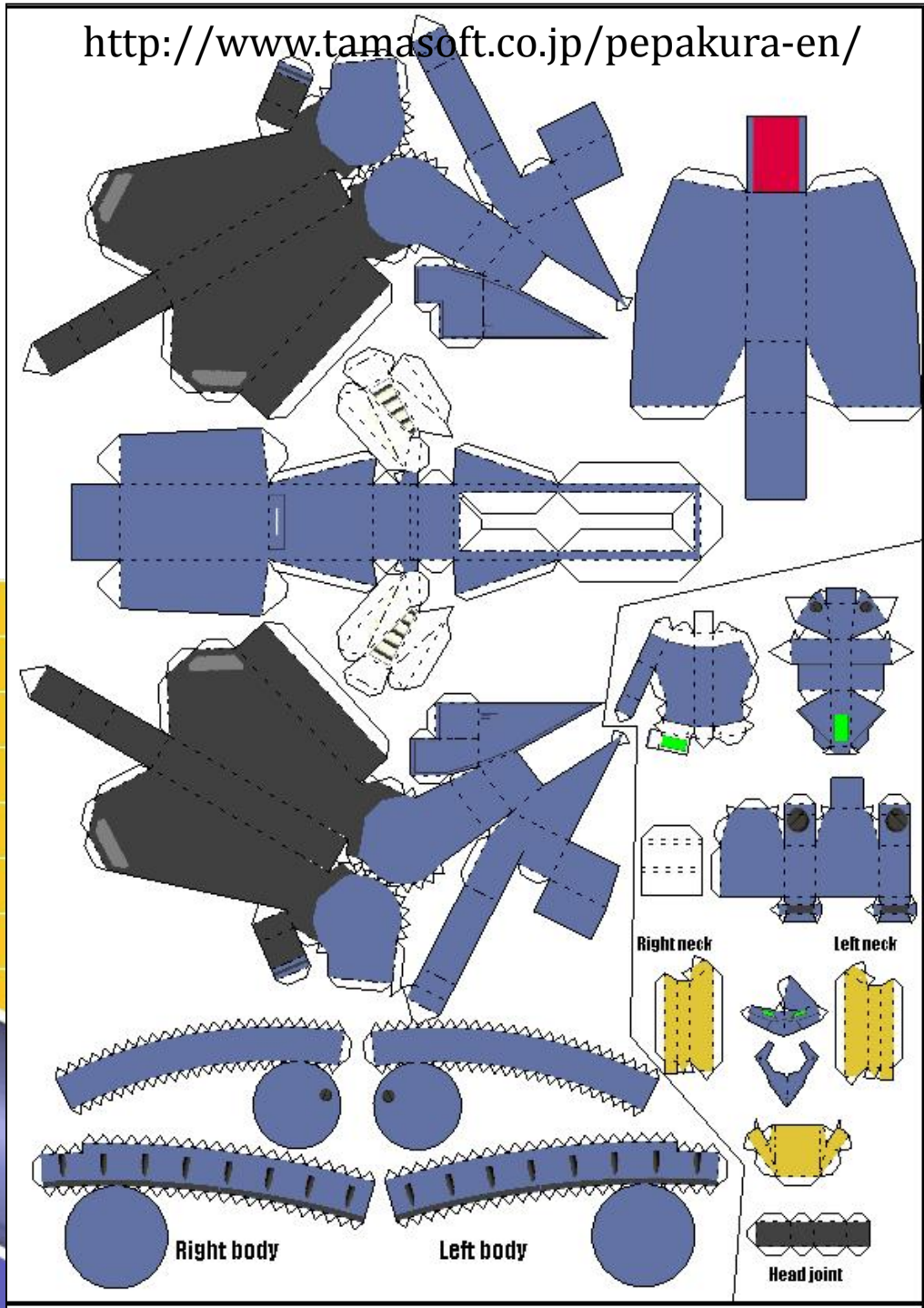
[Abel & Demaine 2011]



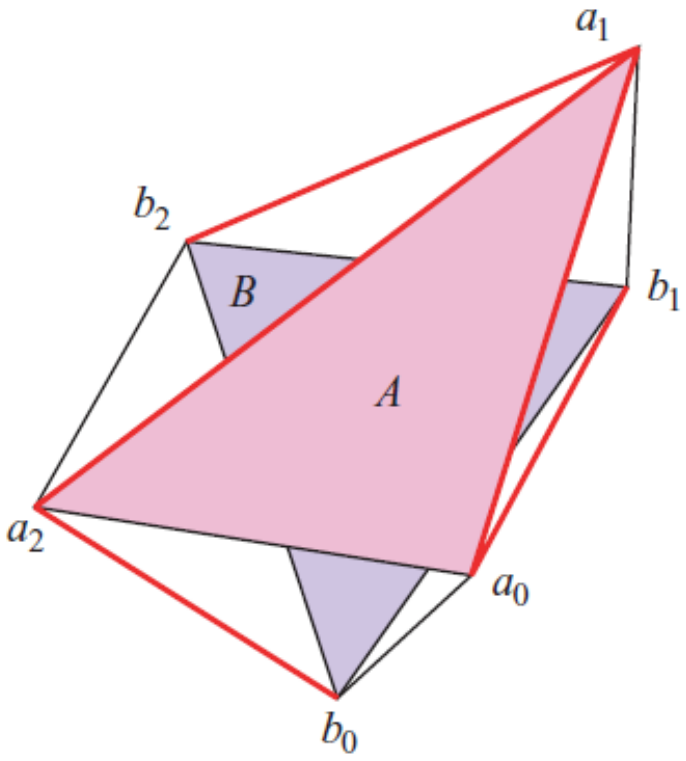
[Abel & Demaine 2011]



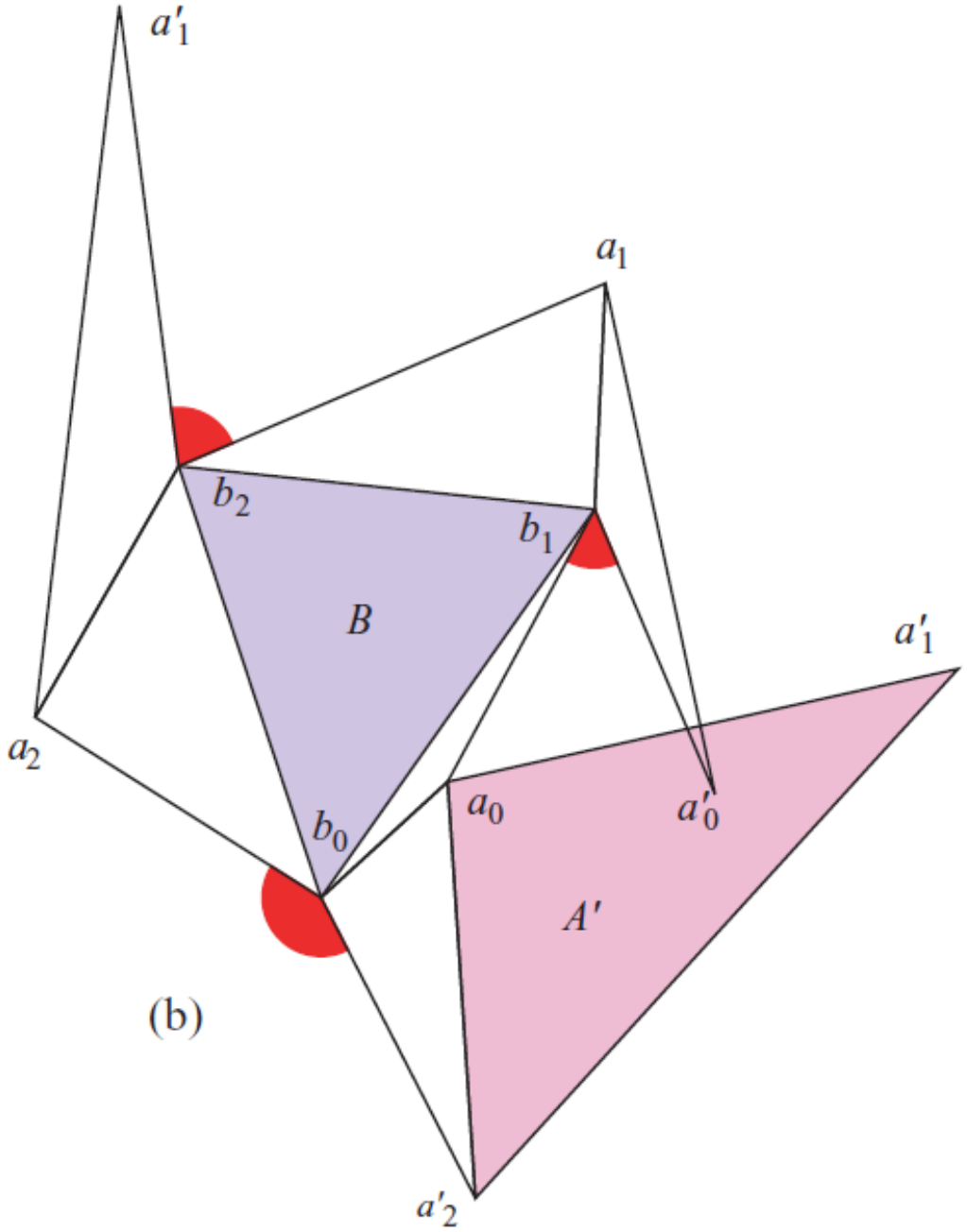
http://www.tamasoft.co.jp/pepakura-en/



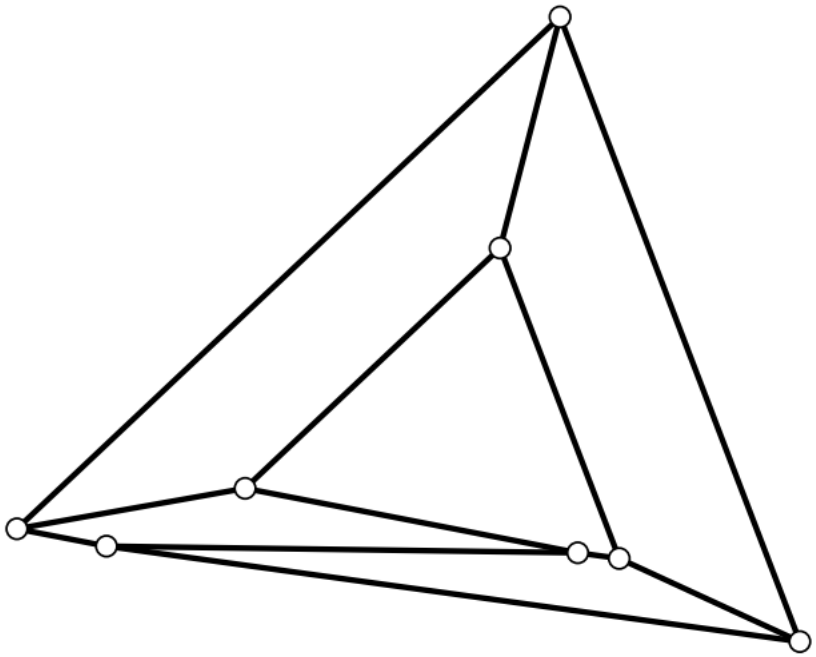
Does a band unfolding work on a prismoid?

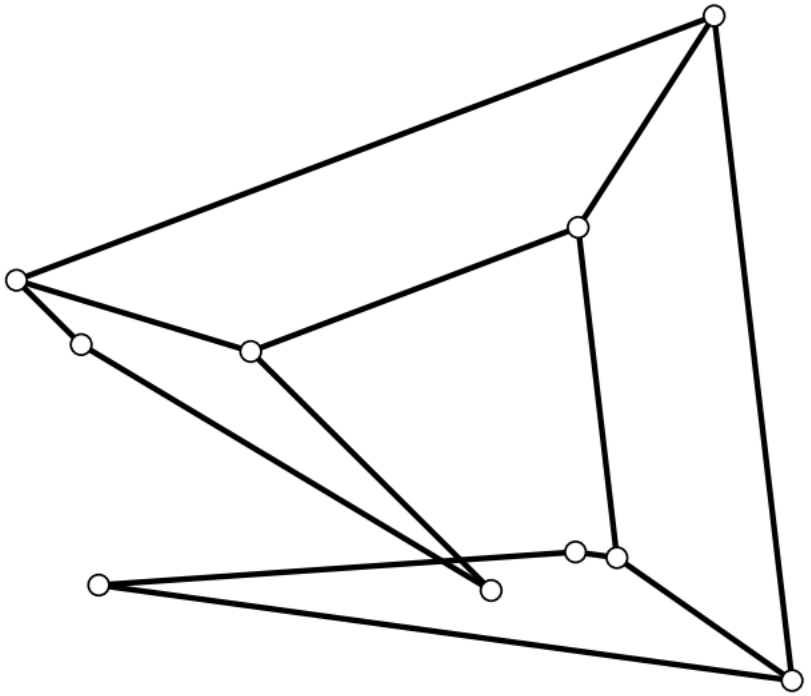


(a)

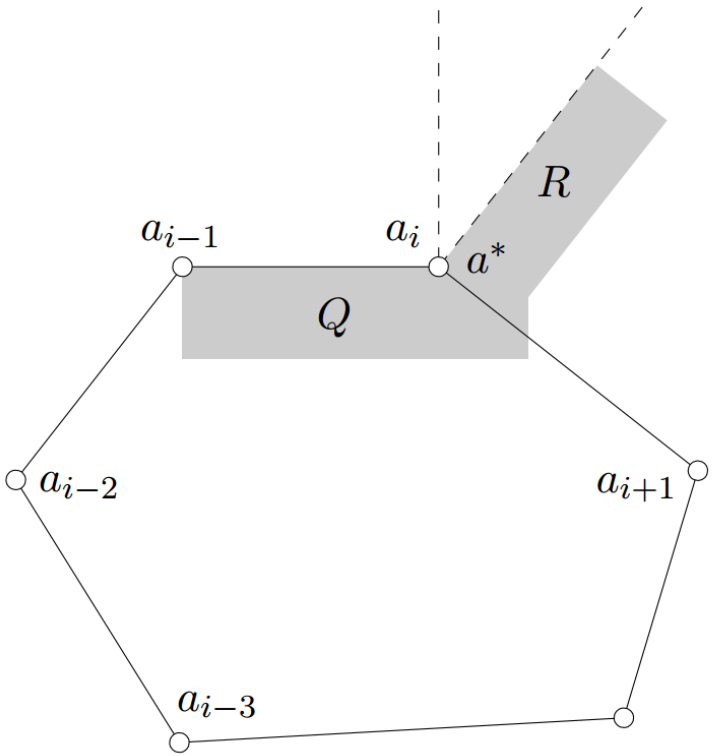


(b)

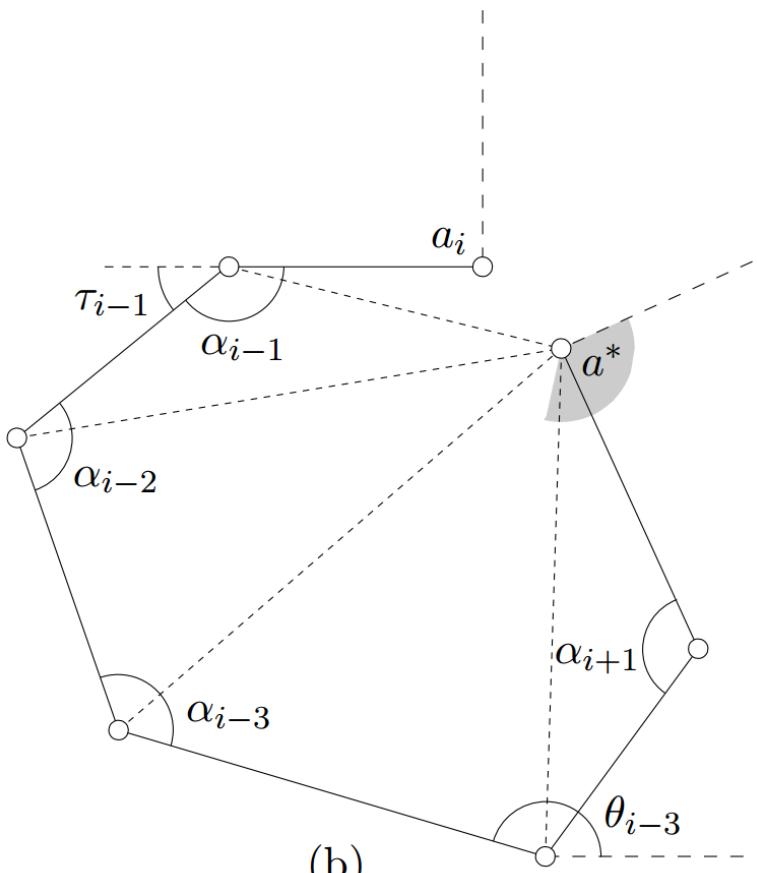




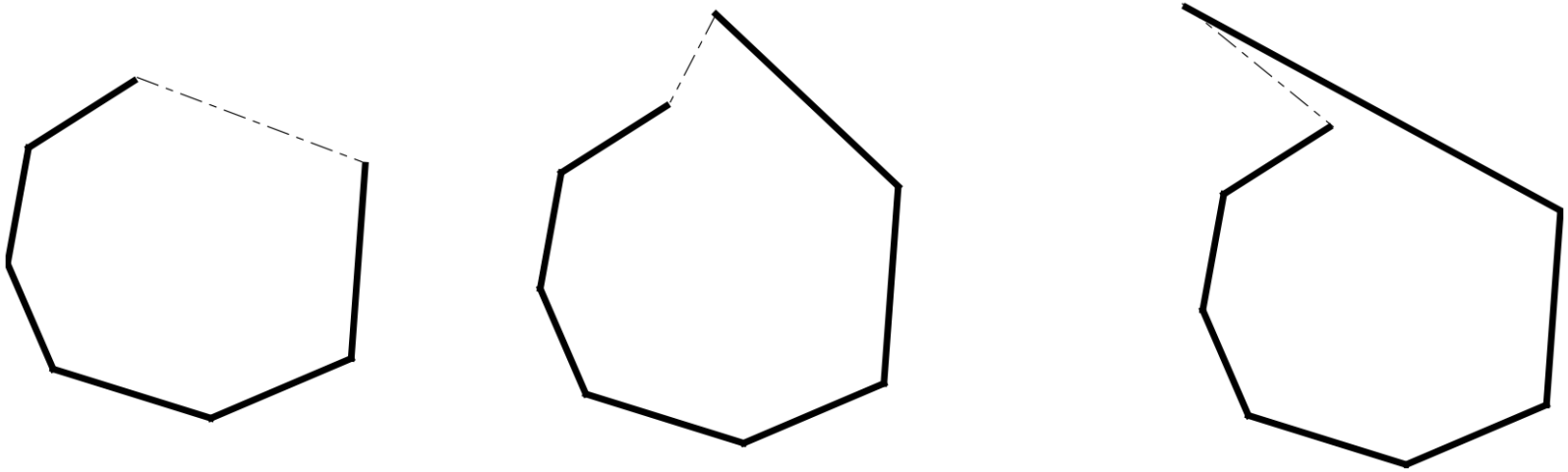
[Demaine, Demaine, Lubiw 1999]

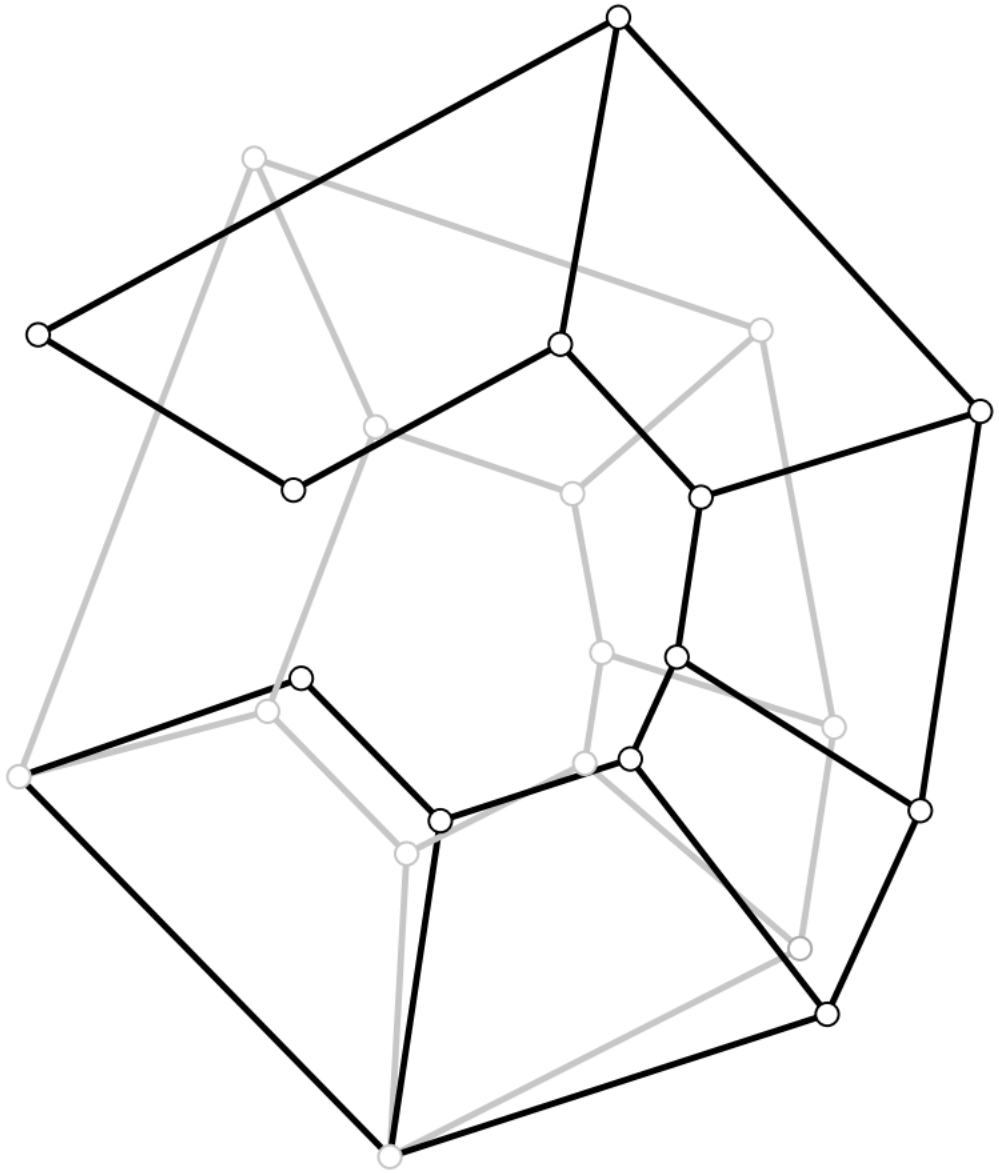

a_{i-1}
a_i
a^*
R
Q
a_{i-2}
a_{i+1}
a_{i-3}

(a)


a_i
τ_{i-1}
α_{i-1}
a^*
α_{i-2}
α_{i+1}
α_{i-3}
θ_{i-3}

(b)





Can you describe in more detail what “continuous blooming” is?

Tell us more about continuous blooming.

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PROCEEDINGS PAPER

Continuous Blooming of Convex Polyhedra

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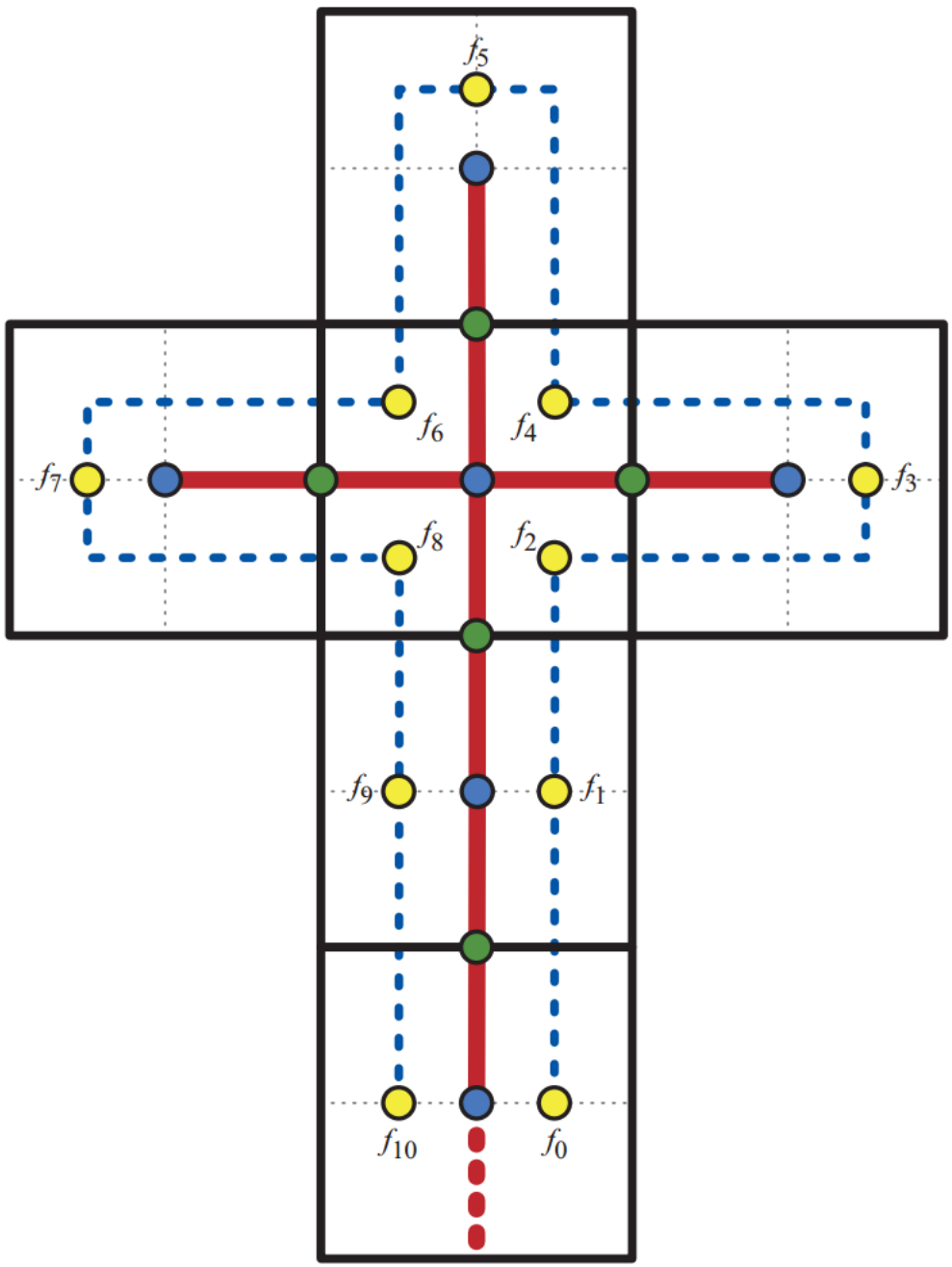
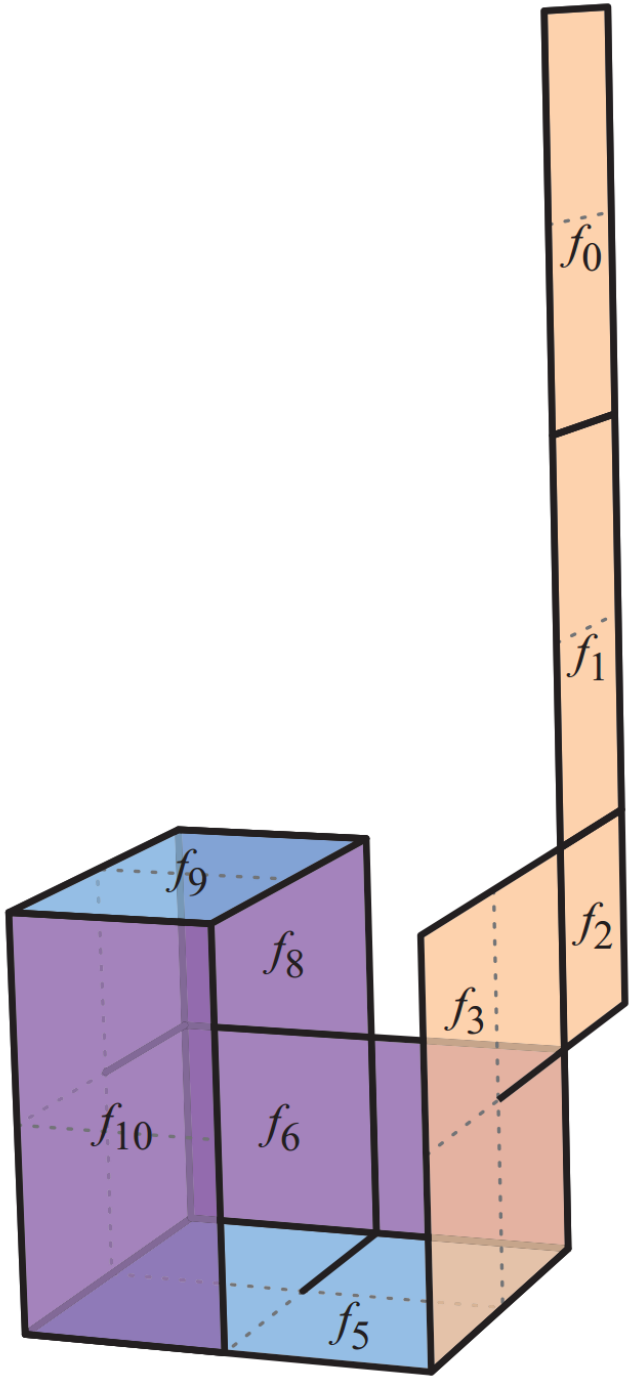
Abstract We construct the first two continuous bloomings of all convex polyhedra. First, the source unfolding can be continuously bloomed. Second, any unfolding of a convex polyhedron can be refined (further cut, by a linear number of cuts) to have a continuous blooming.


f_5
f_6
f_4
f_7
f_3
f_8
f_2
f_9
f_1
f_{10}
f_0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