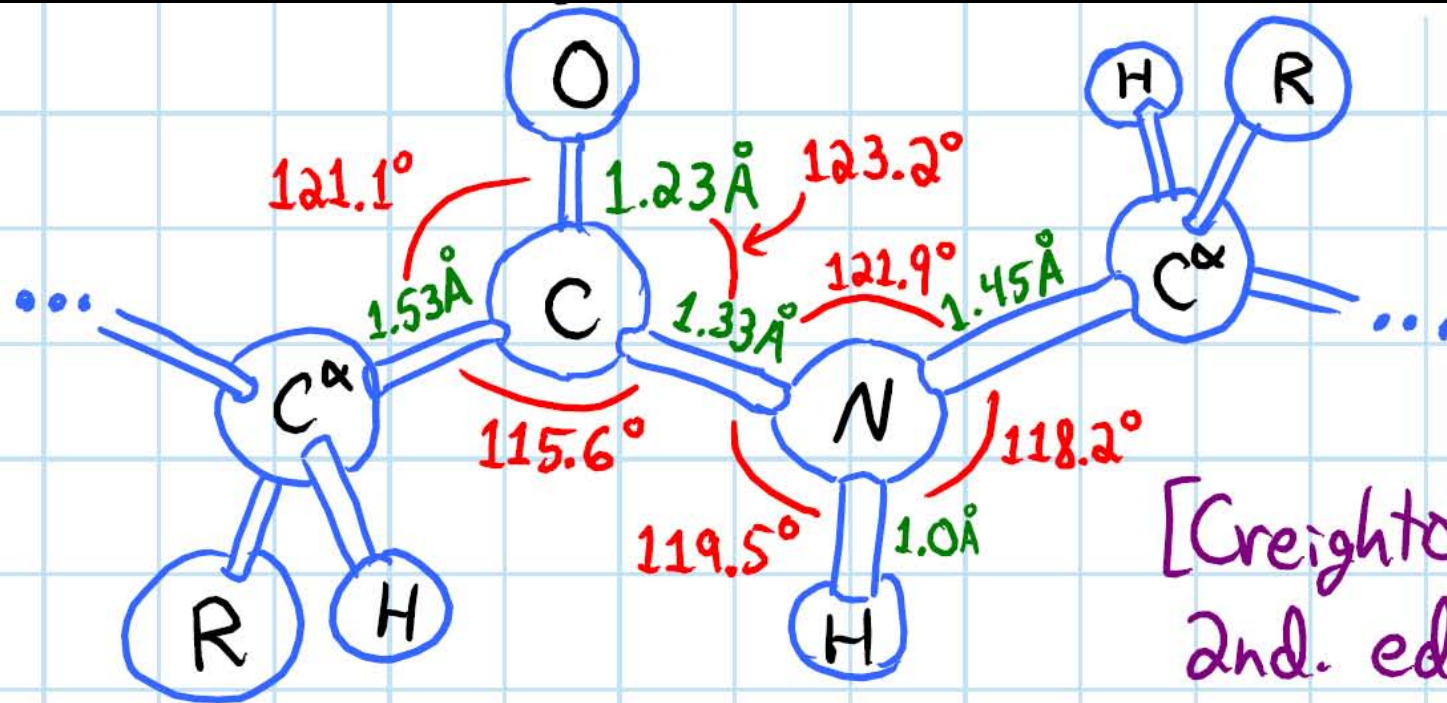


This image is in the public domain.

hexokinase (PDB 1QHA)
drawn by Tim Vickers



[Creighton: PROTEINS,
2nd. ed., p. 5]

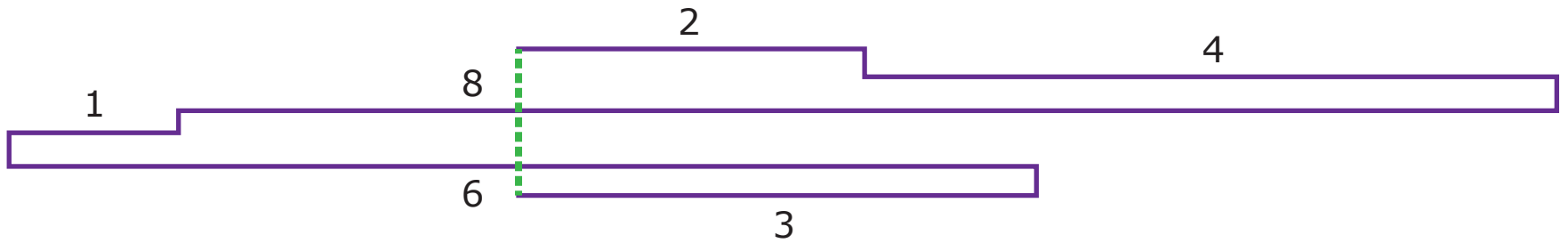


Image by MIT OpenCourseWare.

minimum flat span is NP-complete



Image by MIT OpenCourseWare.

maximum flat span is NP-complete

[Soss 2001]

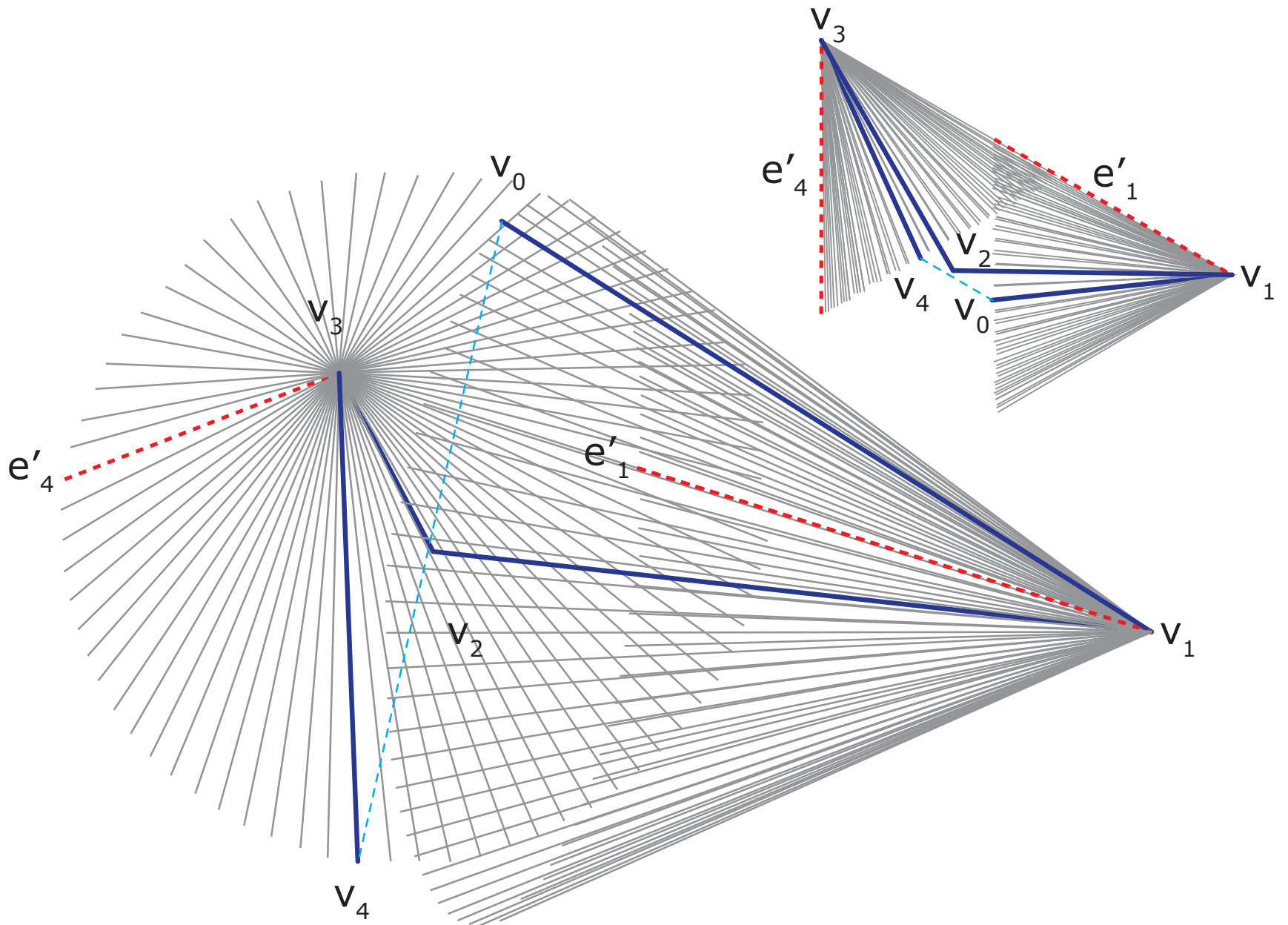


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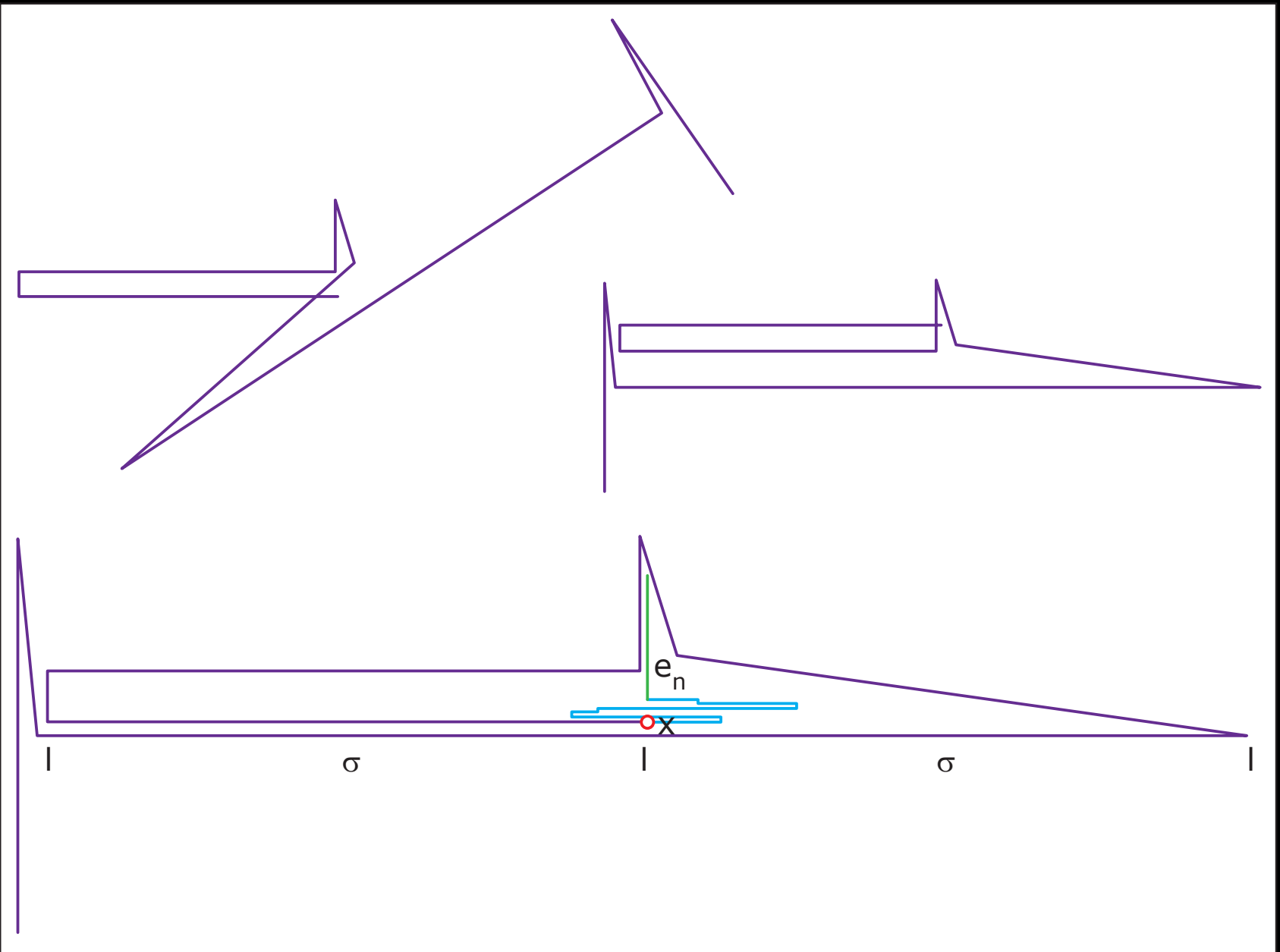


Image by MIT OpenCourseWare.

[Soss & Toussaint 2000]

CONSTRAINTS ON FIXED-ANGLE LINKAGE

Connectivity	Chain Geometry	Flat-state connectivity
Open chain	Has monotone state	Connected
	α orthogonal or obtuse	Connected
	α equal acute	Connected
	Unit; $\alpha \in (60^\circ, 150^\circ)$	Connected
Multiple pinned open chains	Orthogonal	Connected
Closed chain	Unit; orthogonal	Connected
Tree	Orthogonal; partially rigid	Disconnected
Graph	Orthogonal	Disconnected

“Unit” means with unit link lengths; a “monotone state” is a planner, strictly monotone configuration; α represents the joint angles.

Image by MIT OpenCourseWare.

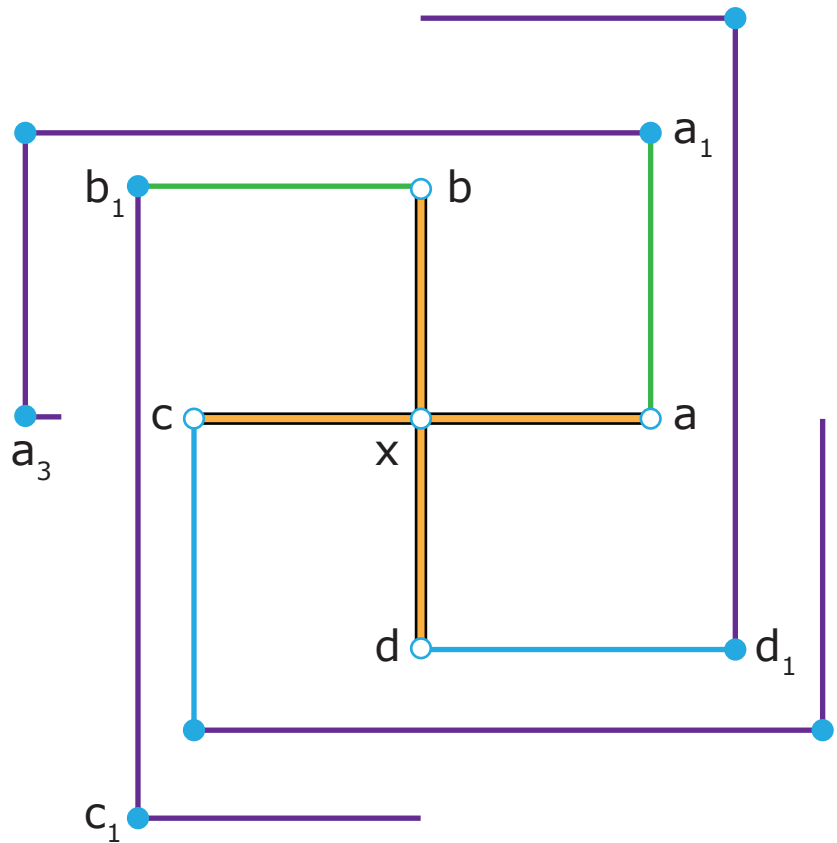
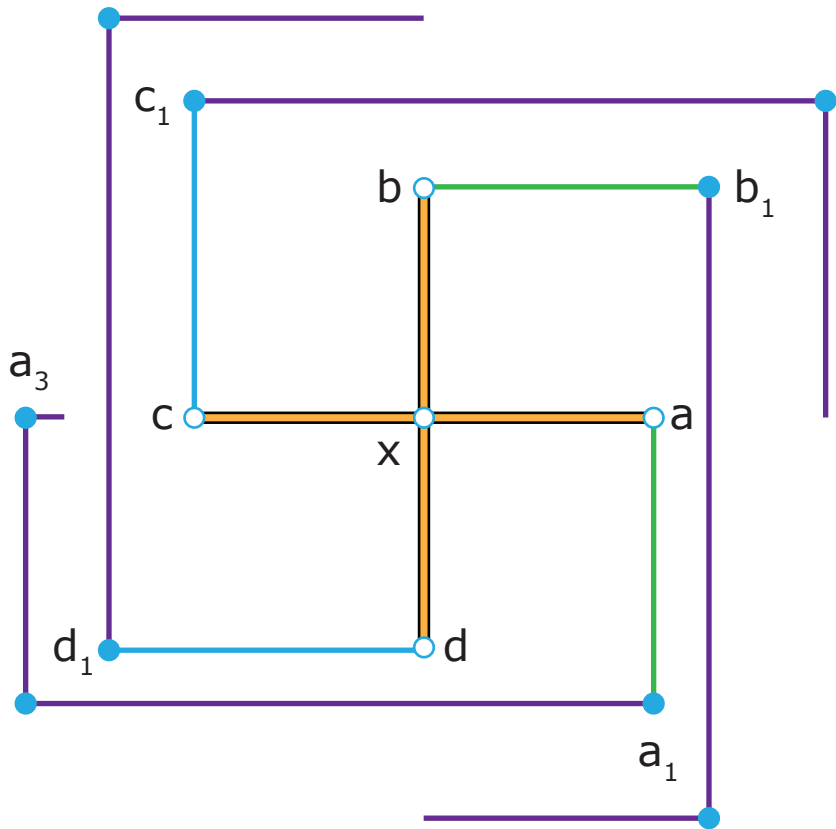
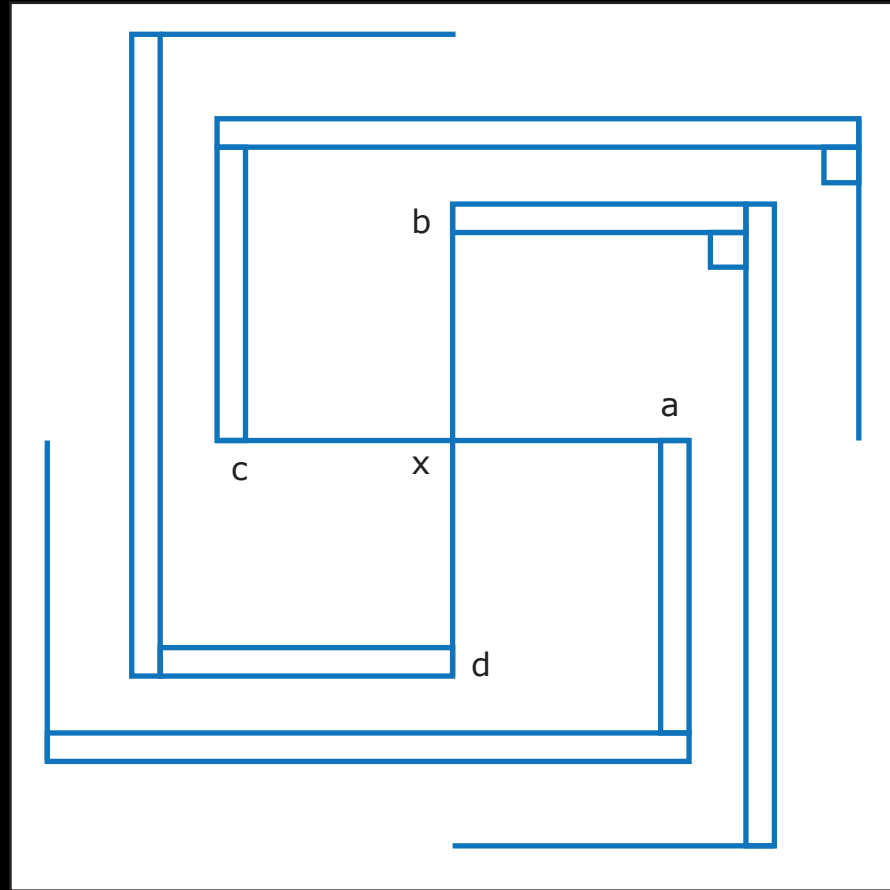
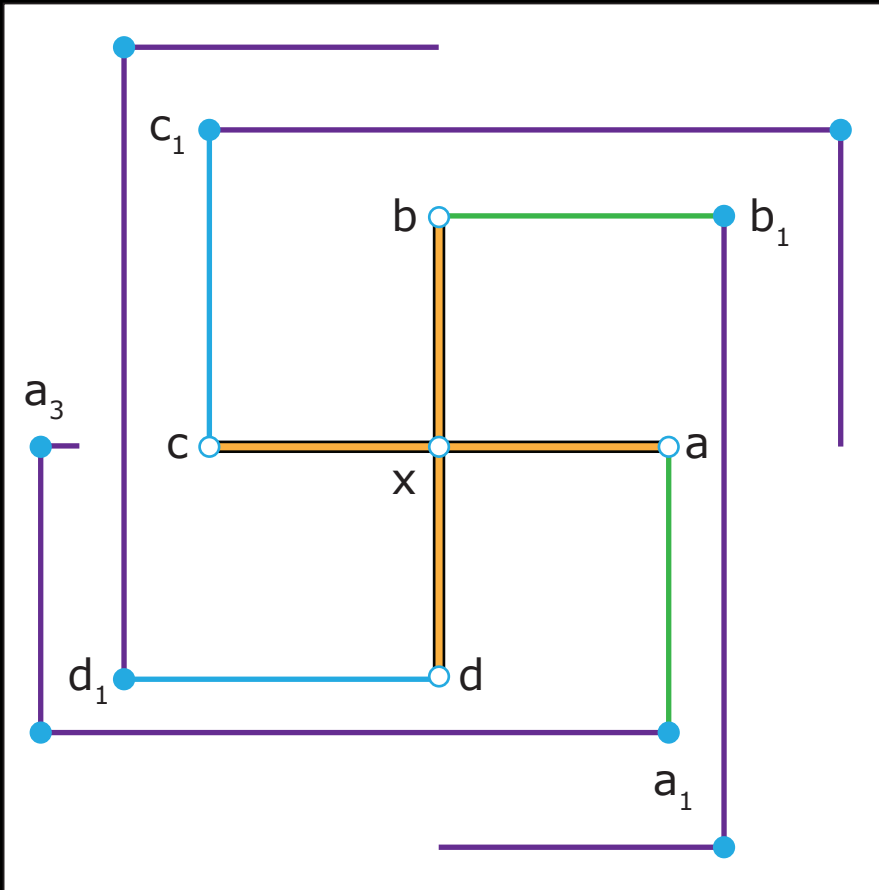


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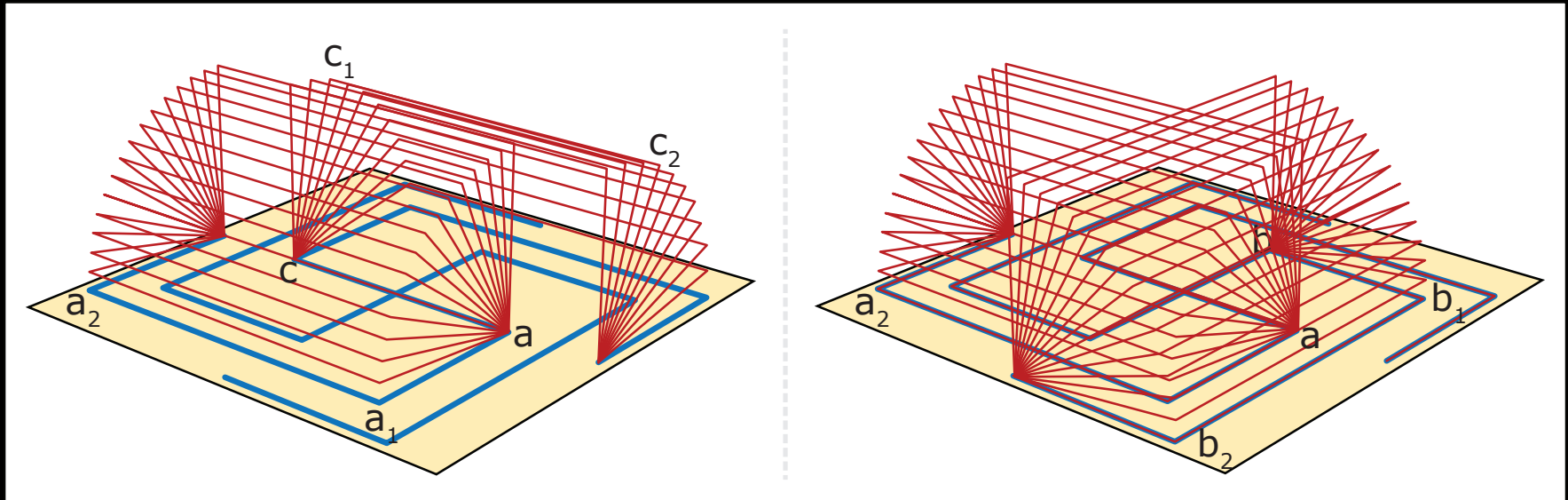
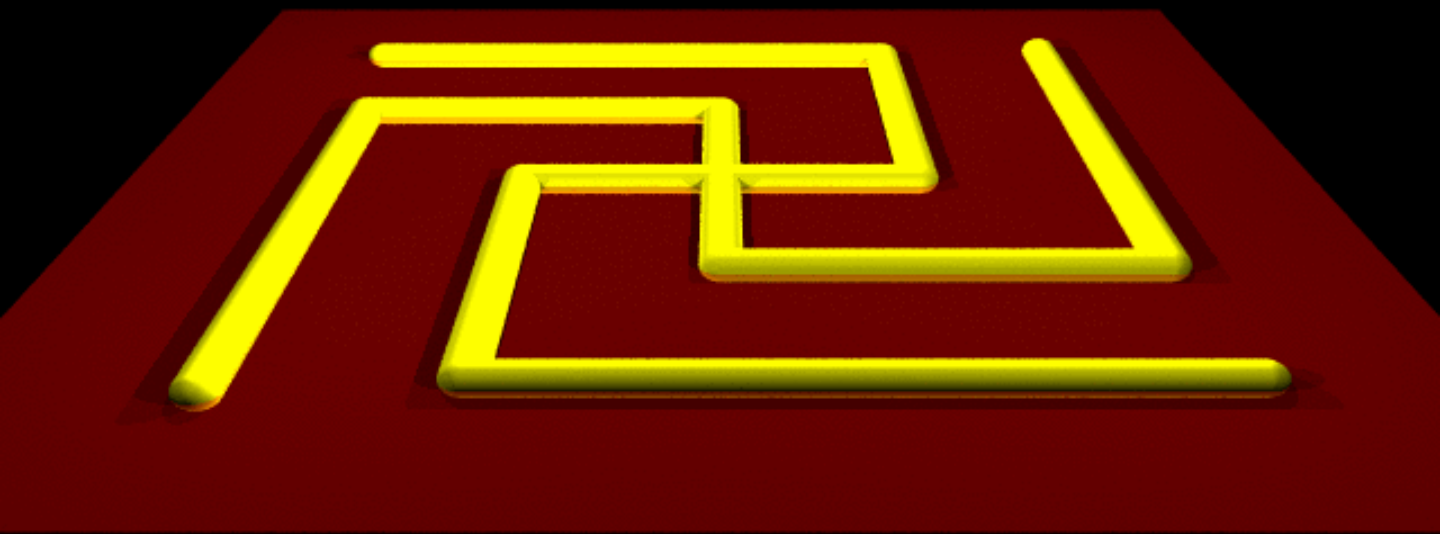
[Aloupis, Demaine, Dujmović, Erickson, Langerman, Meijer, O'Rourke, Overmars, Soss, Streinu, Toussaint 2002]



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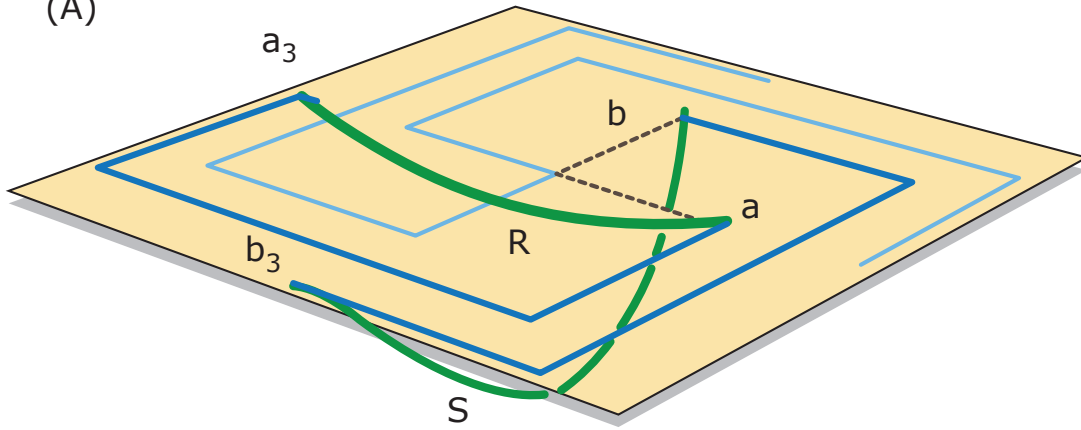
[Aloupis, Demaine, Dujmović, Erickson, Langerman, Meijer, O'Rourke, Overmars, Soss, Streinu, Toussaint 2002]

[Aloupis,
 Demaine,
 Dujmović,
 Erickson,
 Langerman,
 Meijer,
 O'Rourke,
 Overmars,
 Soss,
 Streinu,
 Toussaint
 2002]



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(A)



(B)

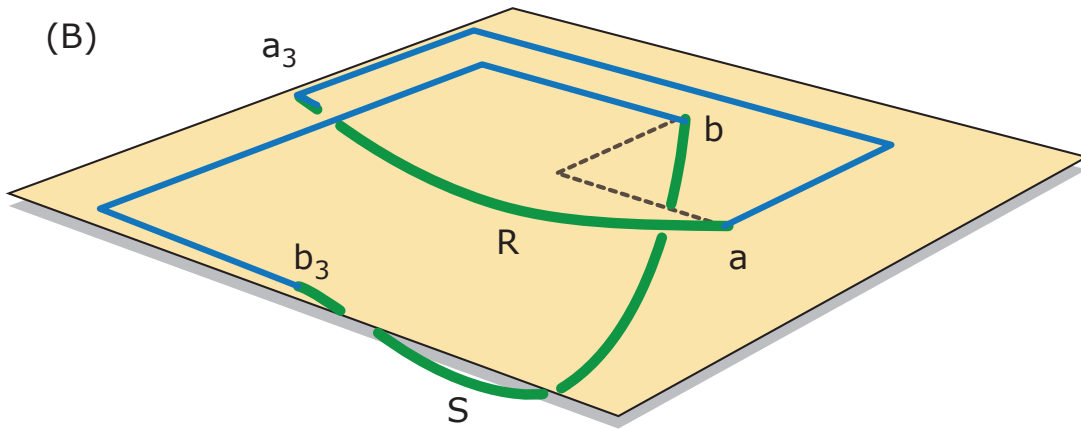
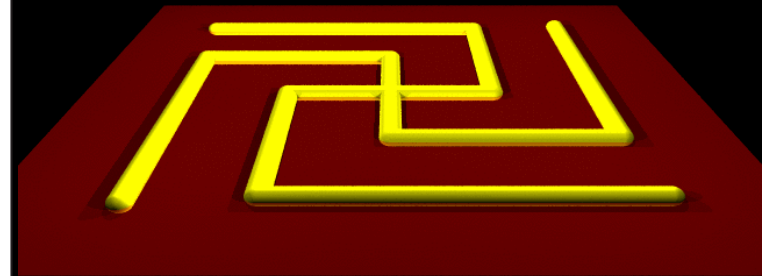


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[Aloupis, Demaine, Dujmović,
Erickson, Langerman, Meijer,
O'Rourke, Overmars, Soss,
Streinu, Toussaint 2002]

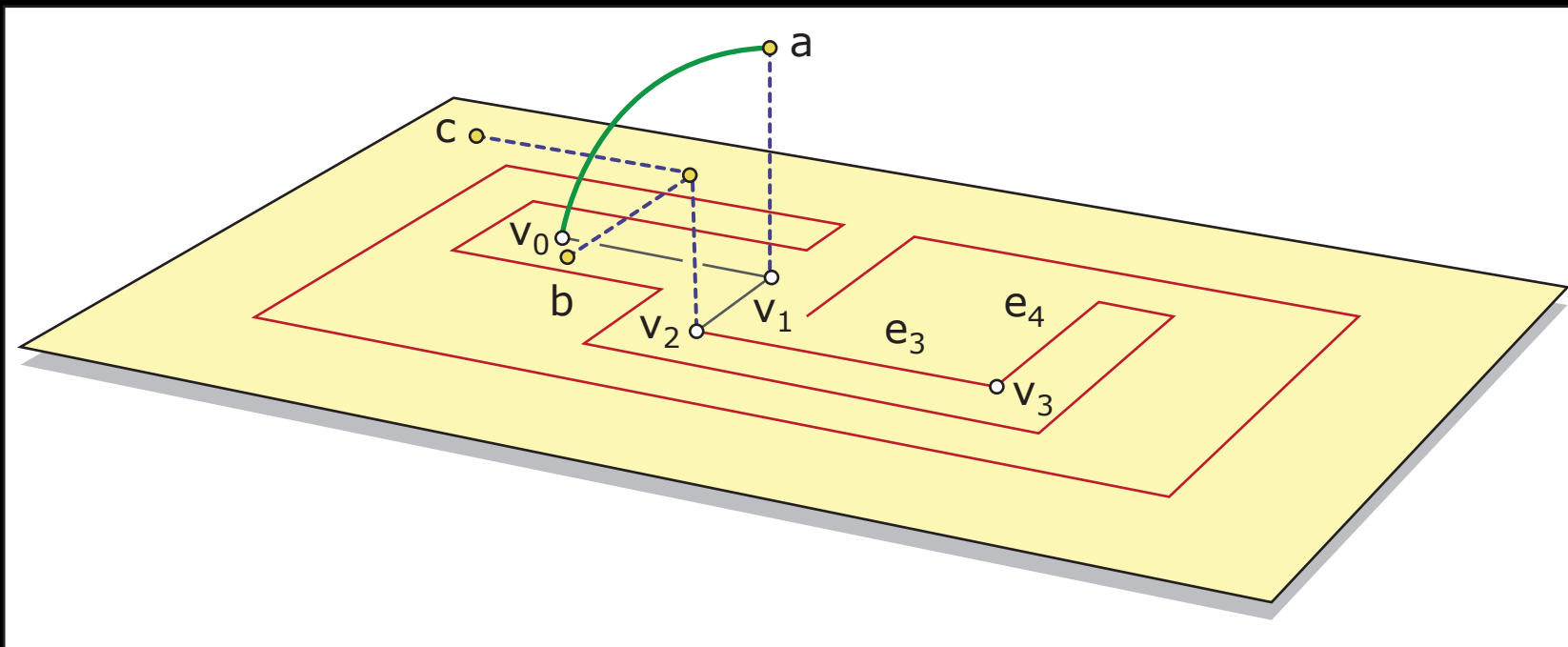


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[Aloupis, Demaine, Dujmović, Erickson,
Langerman, Meijer, O'Rourke, Overmars,
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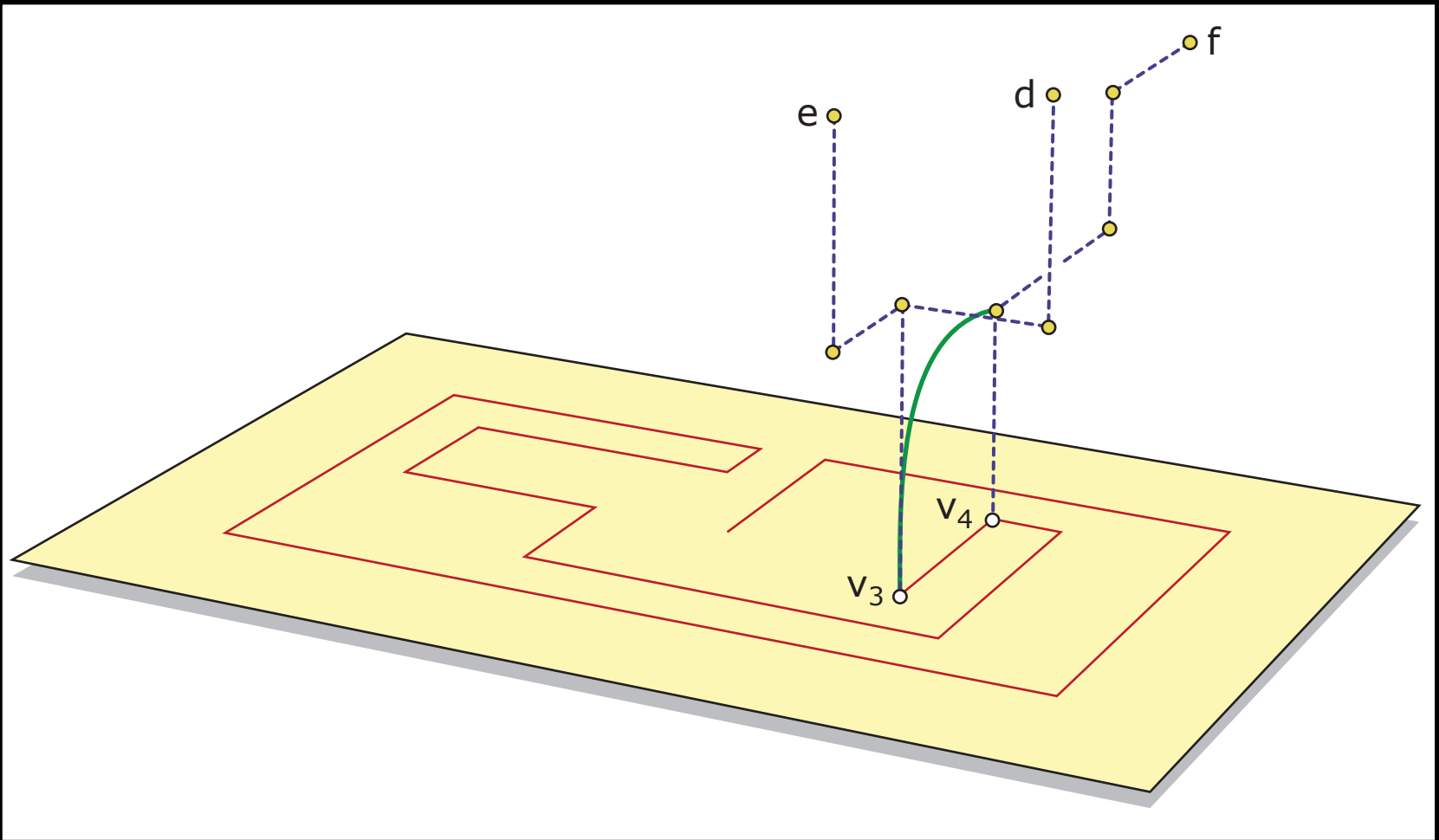


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[Aloupis, Demaine, Dujmović, Erickson,
Langerman, Meijer, O'Rourke, Overmars,
Soss, Streinu, Toussaint 2002]

Email from Stefan Langerman (2002) removed due to copyright restrictions.



[Langerman 2002]

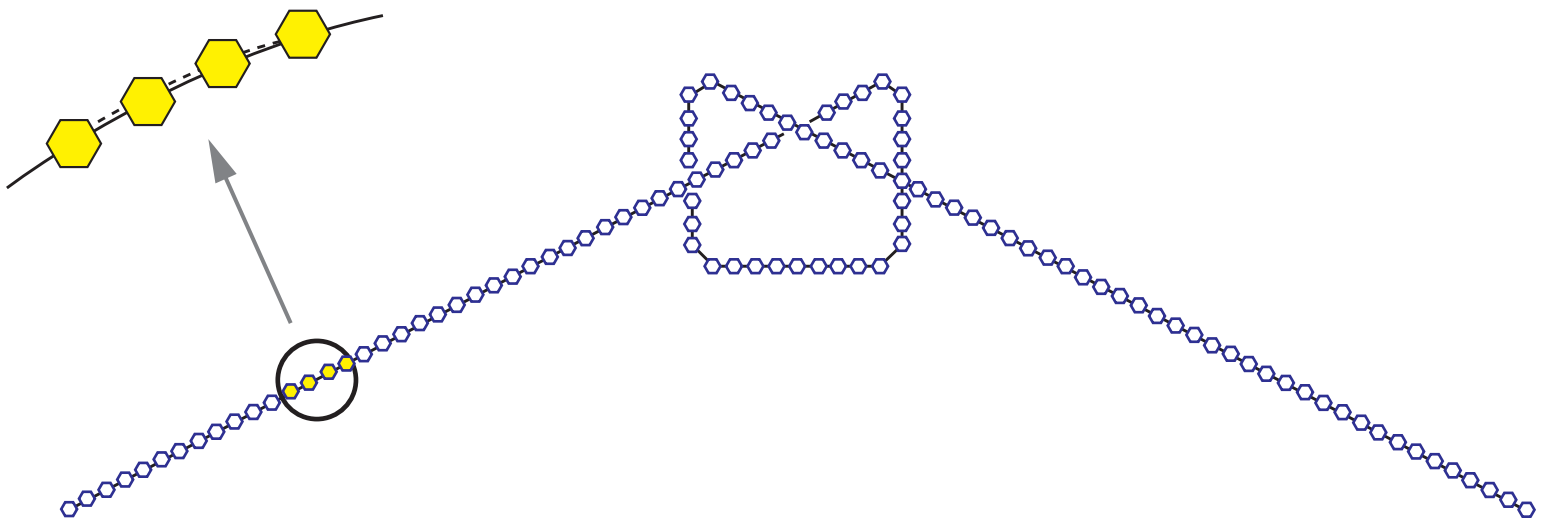
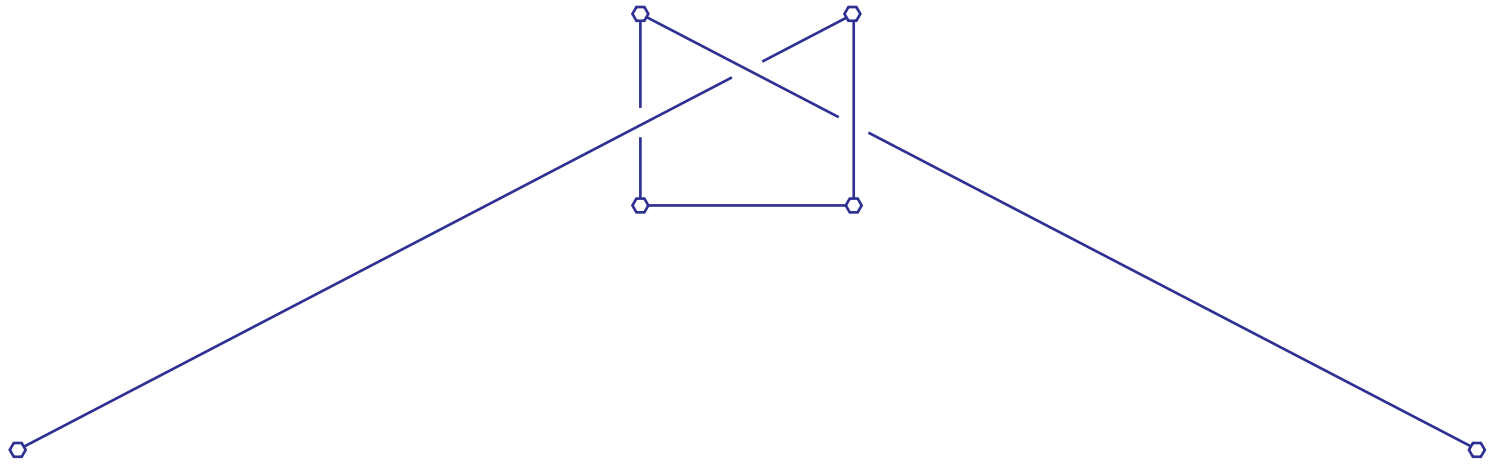


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Fig. 1 removed due to copyright restrictions.

Refer to: Demaine, E. D., S. Langerman, et al. "Geometric Restrictions on Producible Polygonal Protein Chains." *SIAM Journal on Computing* 44, no. 2 (2006): 167–81.

[Demaine, Langerman,
O'Rourke 2006]

Fig. 2 removed due to copyright restrictions.

Refer to: Demaine, E. D., S. Langerman, et al. "Geometric Restrictions on Producible Polygonal Protein Chains." *SIAM Journal on Computing* 44, no. 2 (2006): 167–81.

[Demaine, Langerman,
O'Rourke 2006]

Fig. 3 removed due to copyright restrictions.

Refer to: Demaine, E. D., S. Langerman, et al. "Geometric Restrictions on Producible Polygonal Protein Chains." *SIAM Journal on Computing* 44, no. 2 (2006): 167–81.

[Demaine, Langerman,
O'Rourke 2006]

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[Demaine, Langerman,
O'Rourke 2006]

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Photograph of **climber plant** removed due to copyright restrictions.

[Demaine,
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[Demaine, Langerman,
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