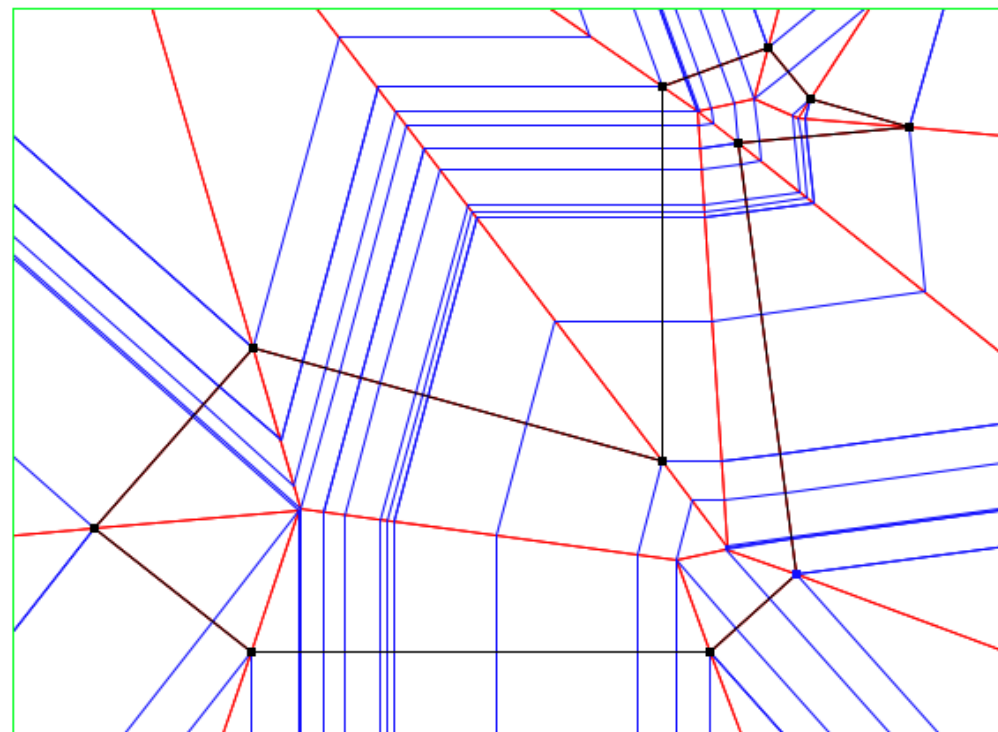
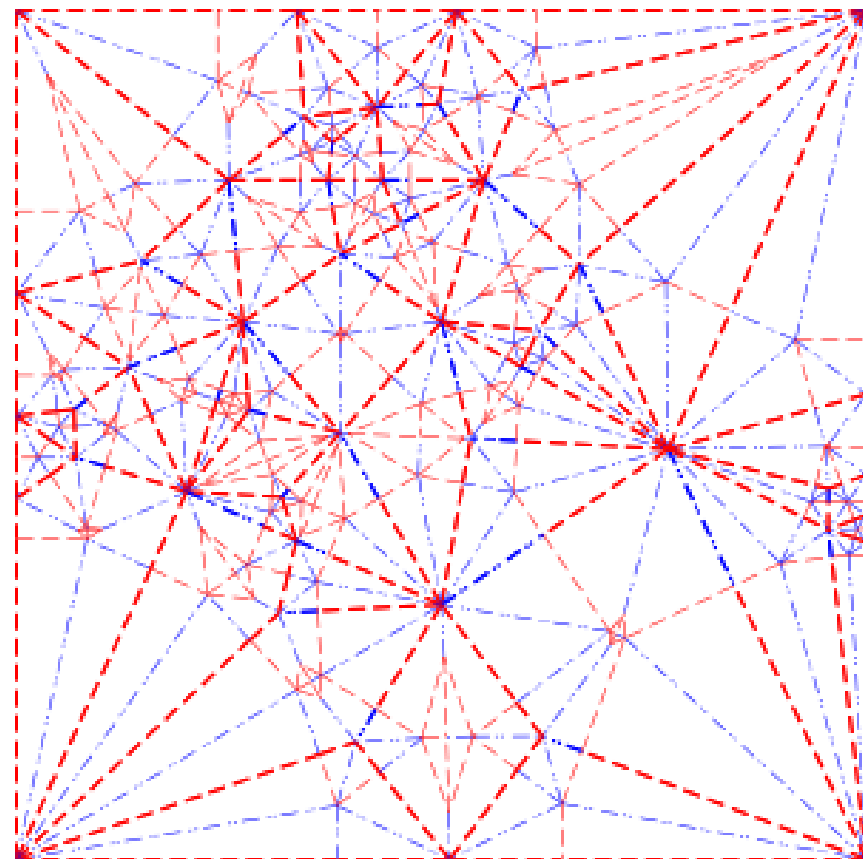


**Is there still no software for  
the fold-and-cut problem?  
I was totally expecting you to  
pull out some cool app for it.**



David Benjamin & Anthony Lee  
2010

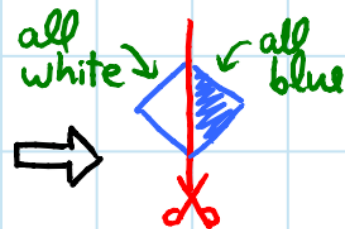
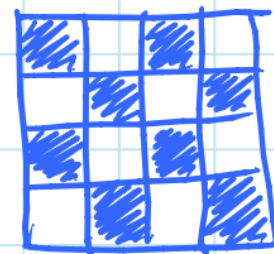


JOrigami  
Paulo Silveira, Rafael Cosentino,  
José Coelho, Deise Aoki

**For the universality condition, don't you need some condition like that every vertex not on the edge of the paper has even degree? Or can the cut be a line segment instead of a whole line?**

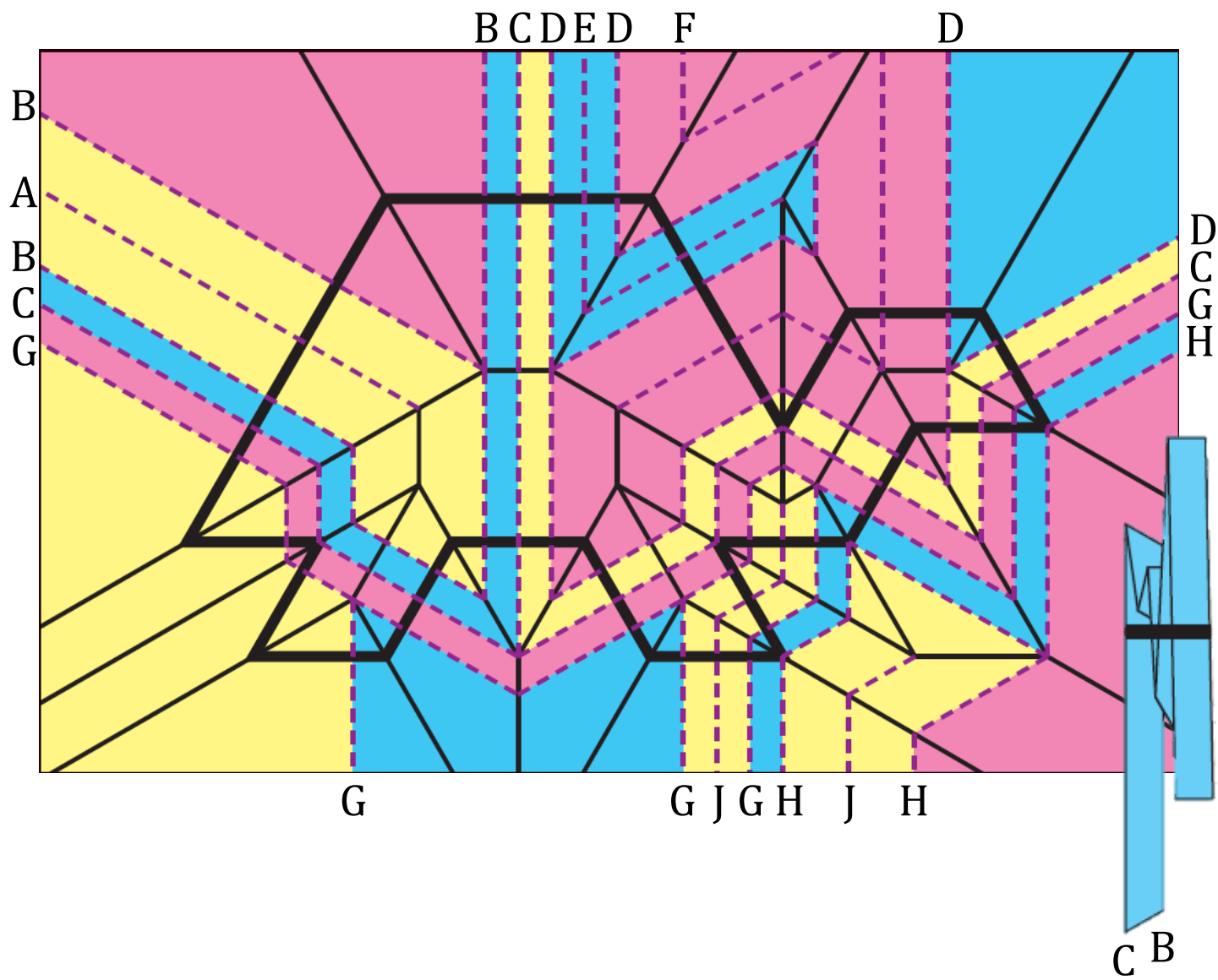
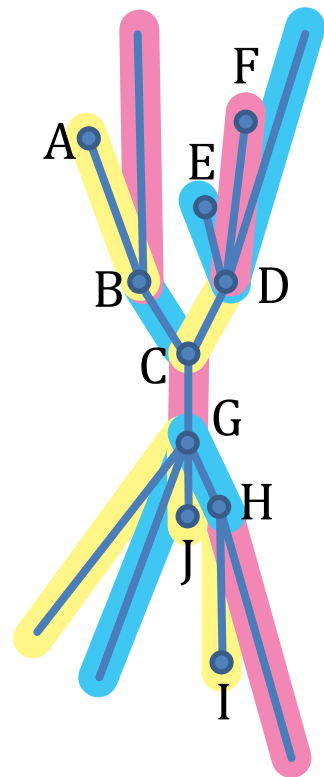
- Side assignment: specify which cut regions are above or below the cut line
- skeleton edges as above in above regions;  
reversed in below regions
  - cut edge valley between two above regions  
mountain between two below regions  
unchanged between one above & one below
  - e.g. 2-regular (nested/disjoint polygons)  
⇒ natural 2-coloring  
⇒ all cuts unchanged
  - e.g. 4-regular checkerboard

("scissor cuts")

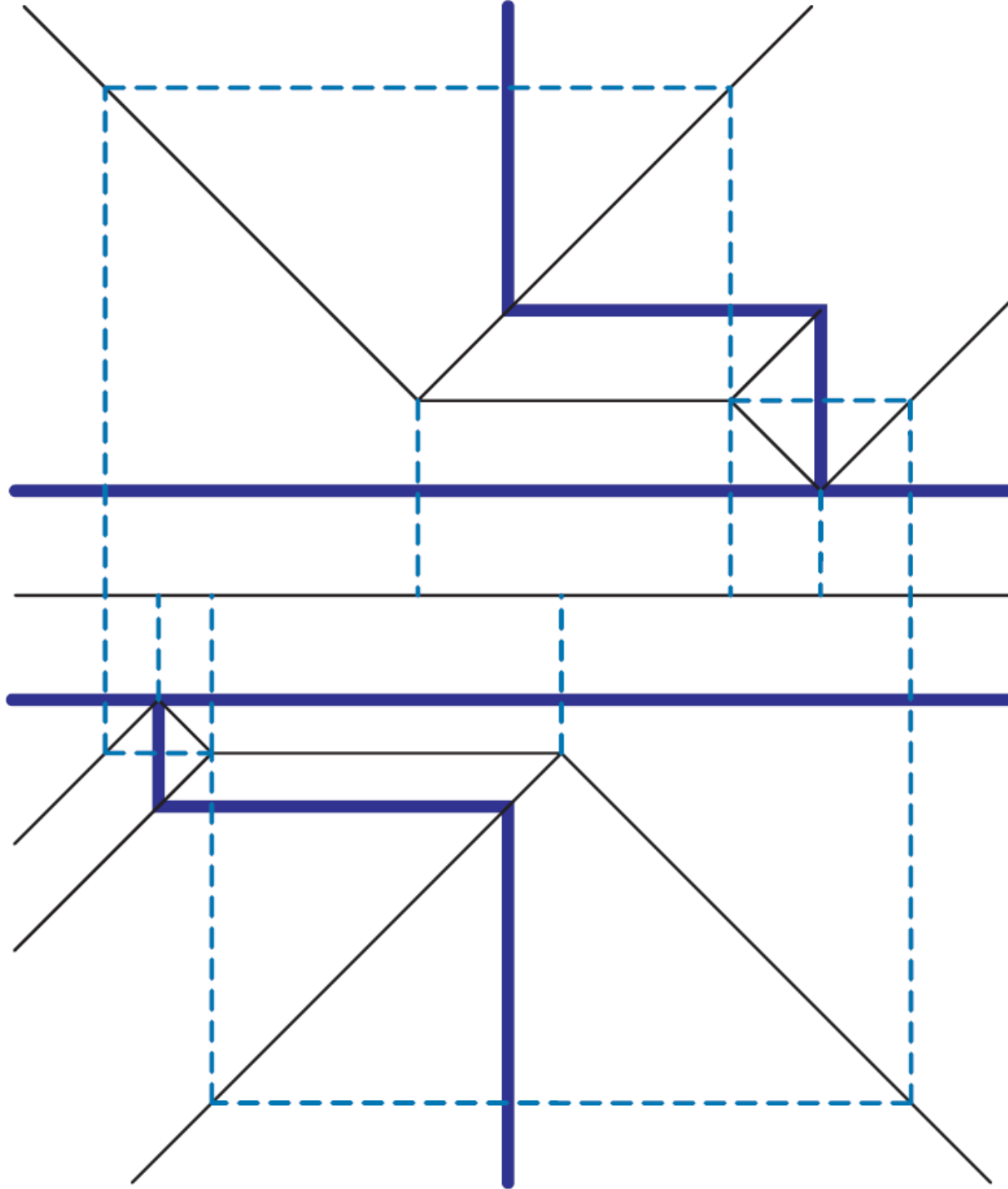


**Could you quickly show the process of turning linear corridors into a tree?**

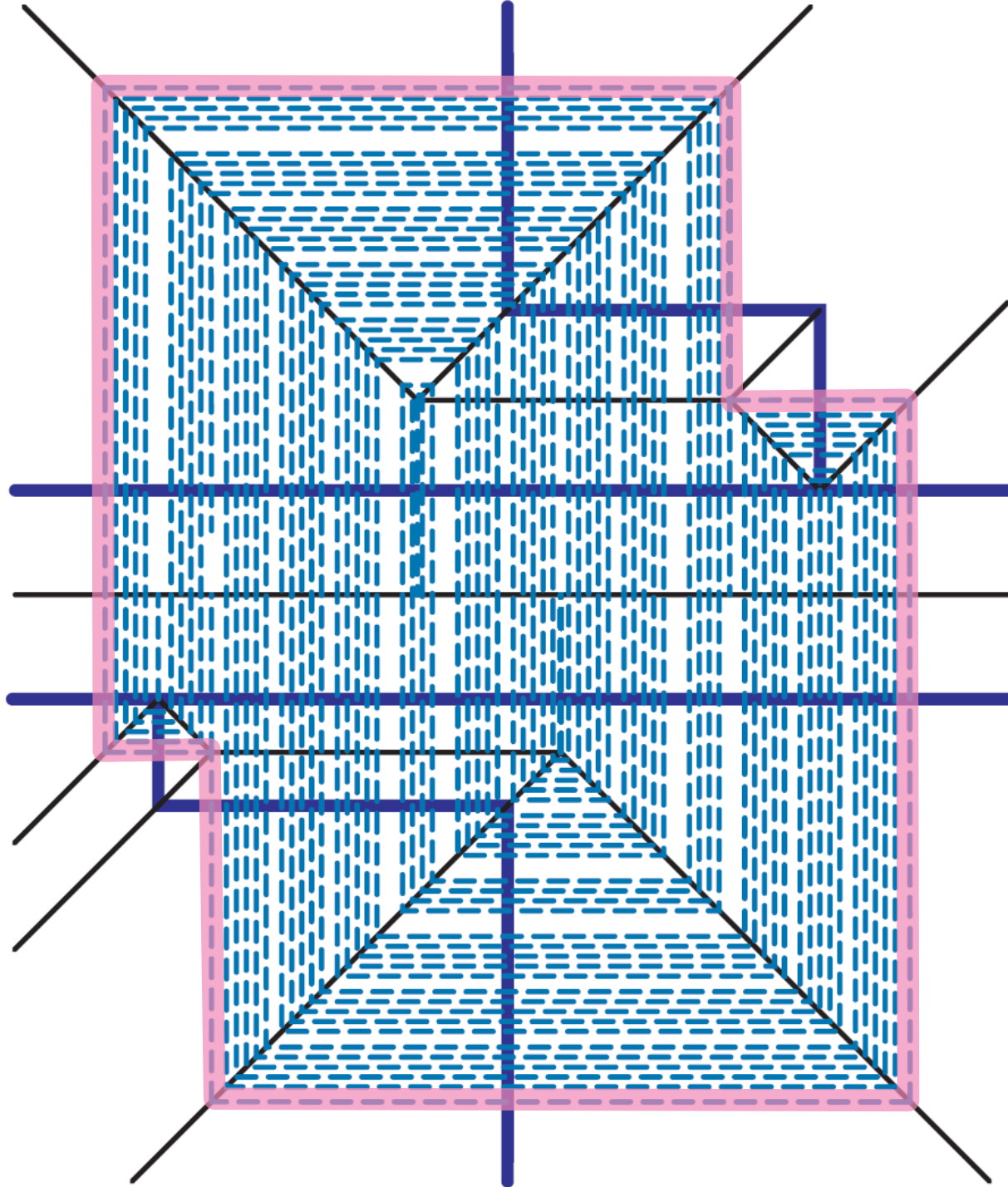
**I am confused about the correspondence between trees and corridors and their relation to being flat foldable.**

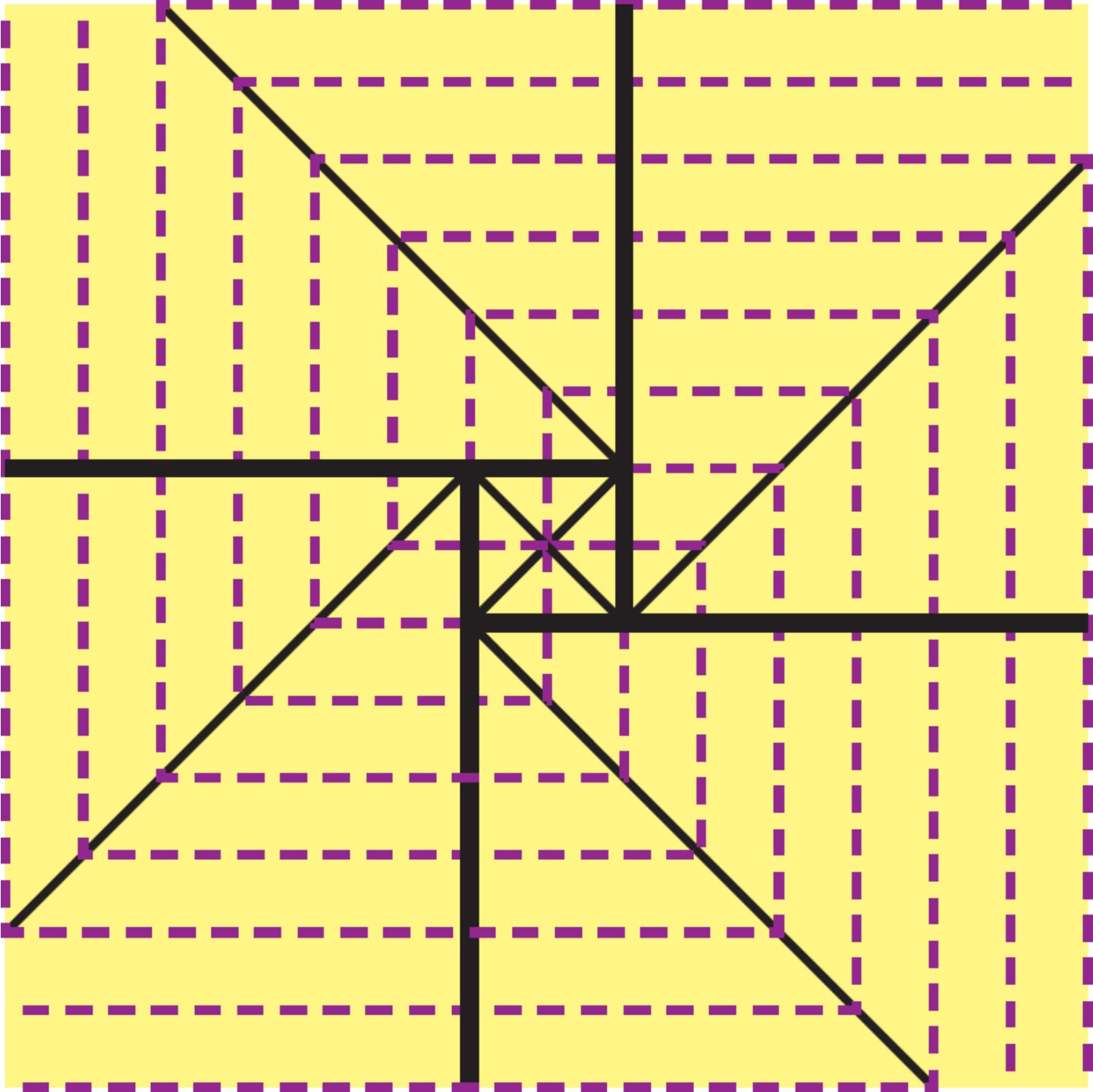


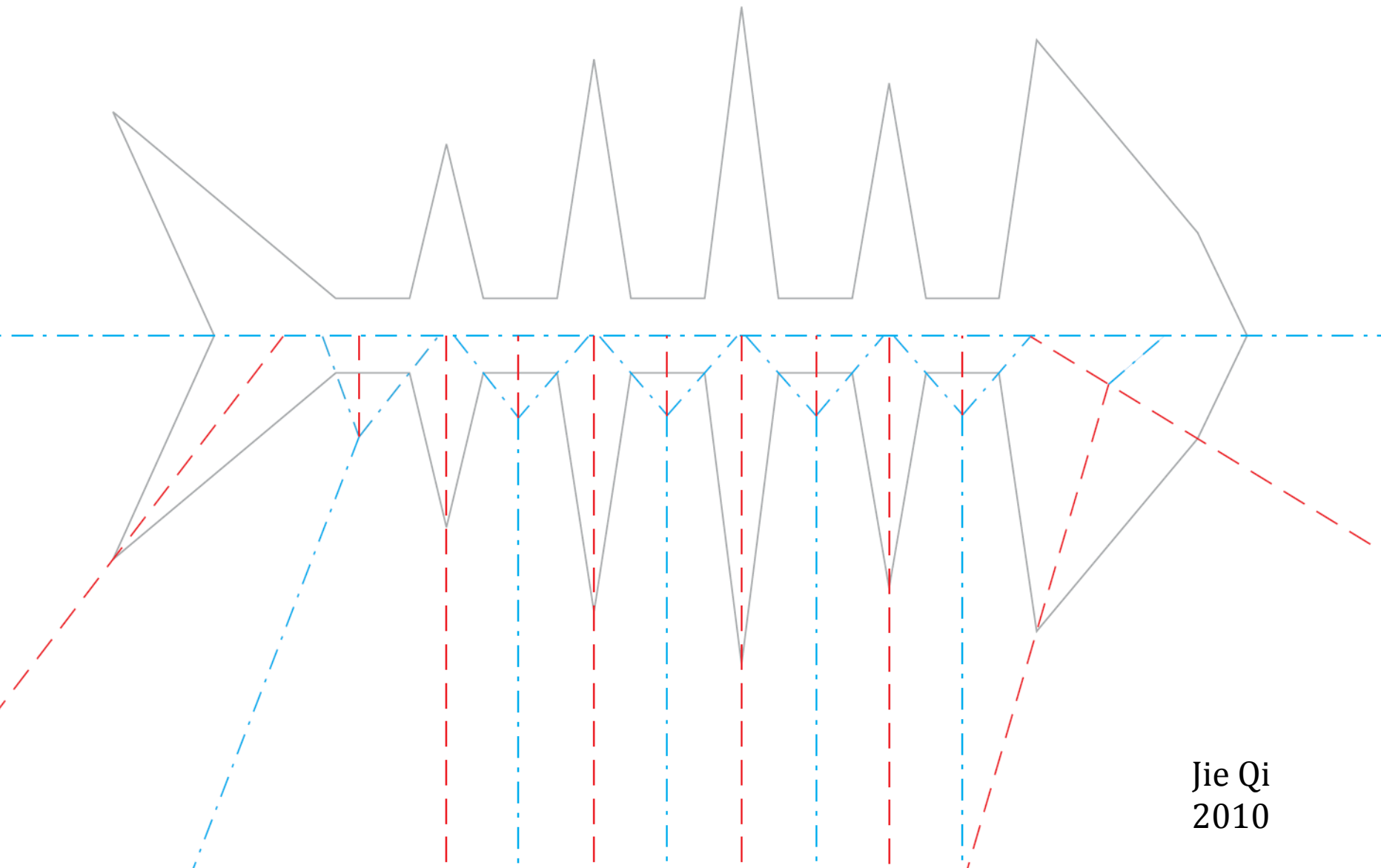
**On the probability of bad straight skeletons, I was wondering if should be the other way around — [...] most randomly generated fold-cut problems will exhibit this chaotic straight skeleton, since the number of irrational numbers in any interval is more than the number of rational numbers?**



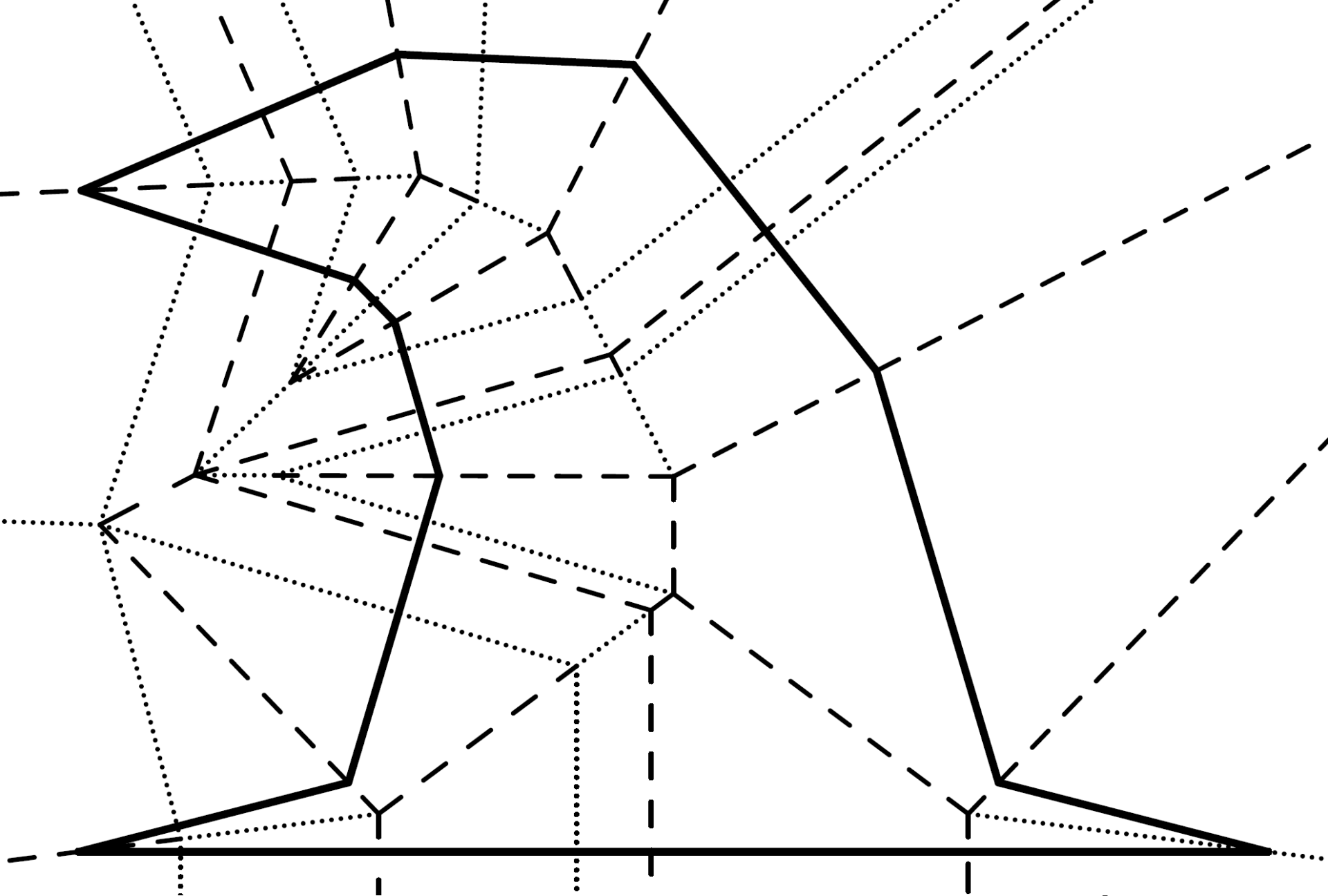




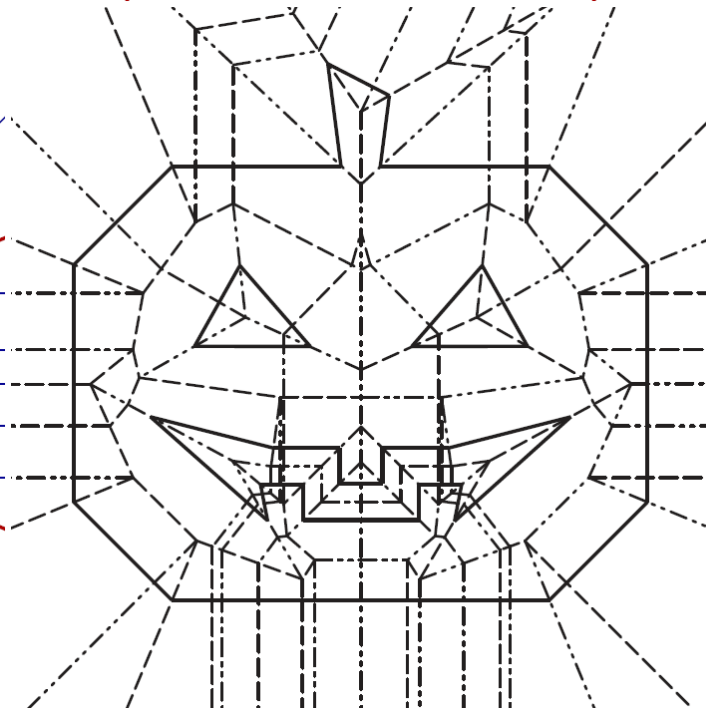
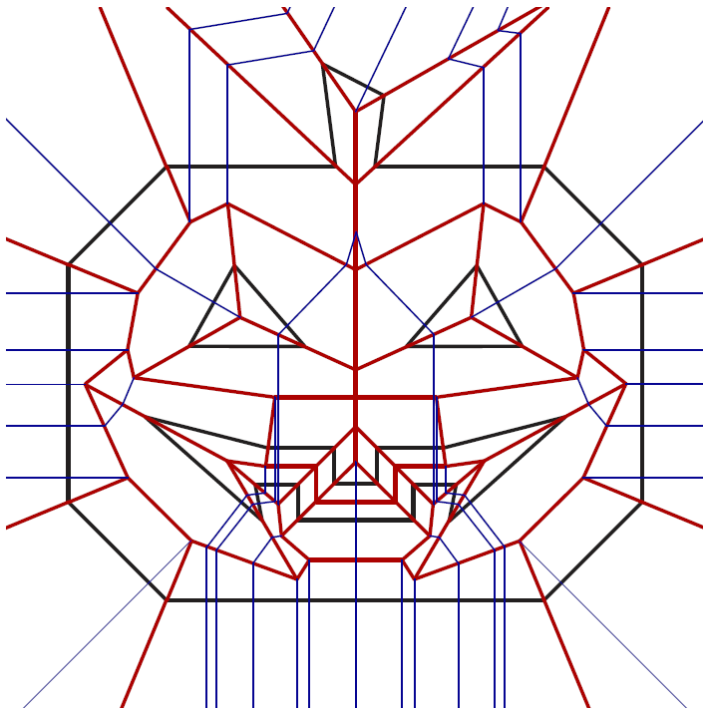
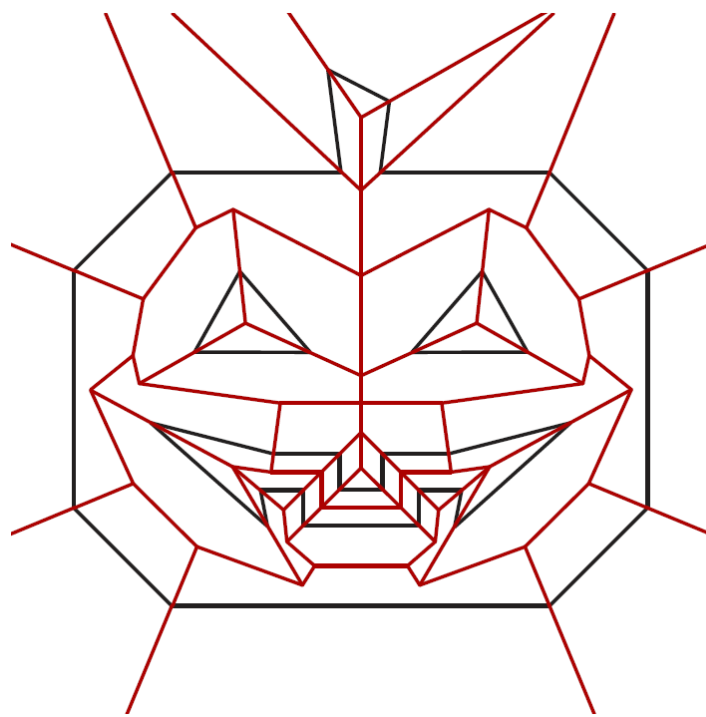
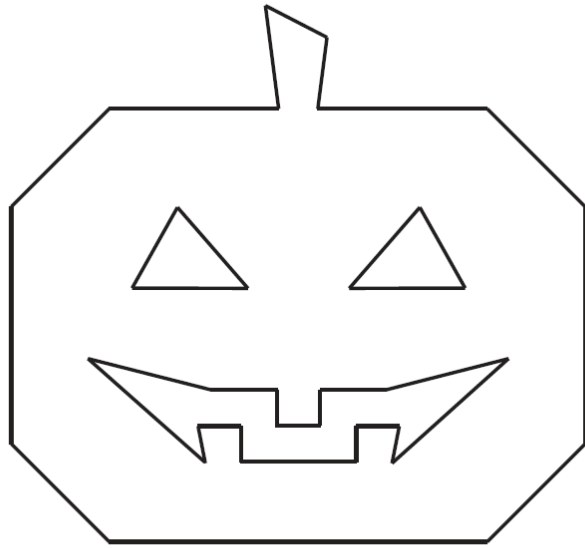




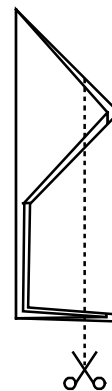
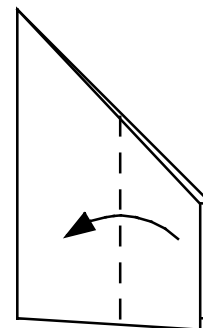
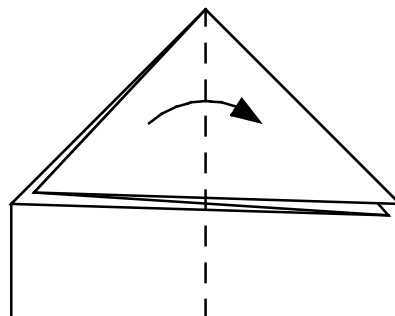
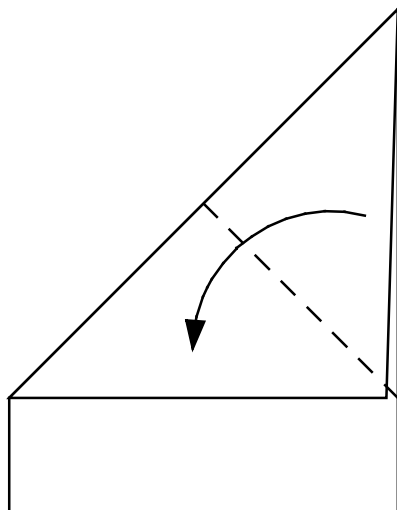
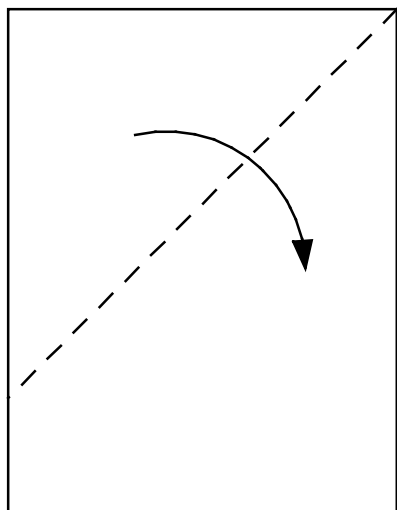
Jie Qi  
2010

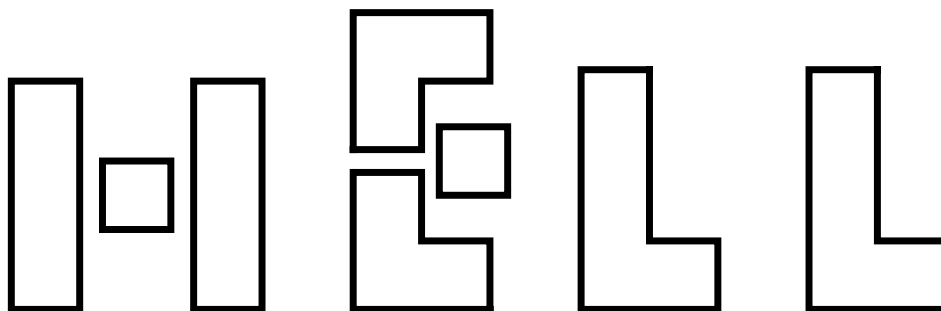
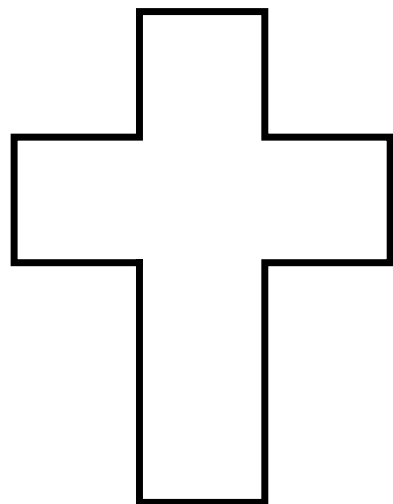
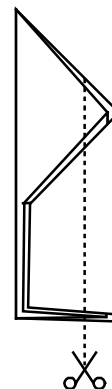
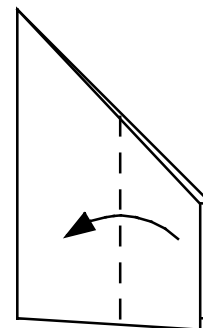
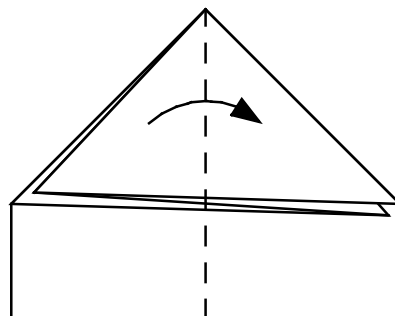
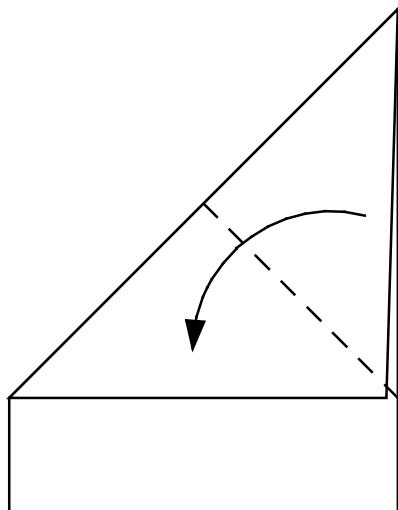
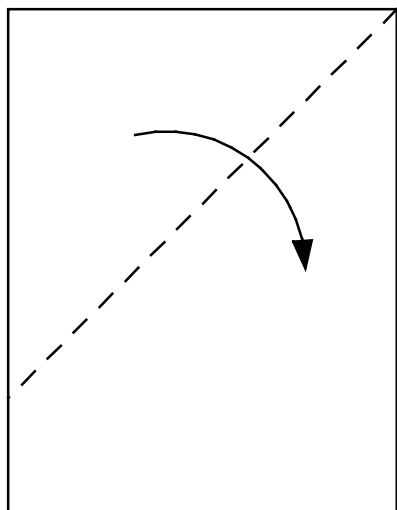


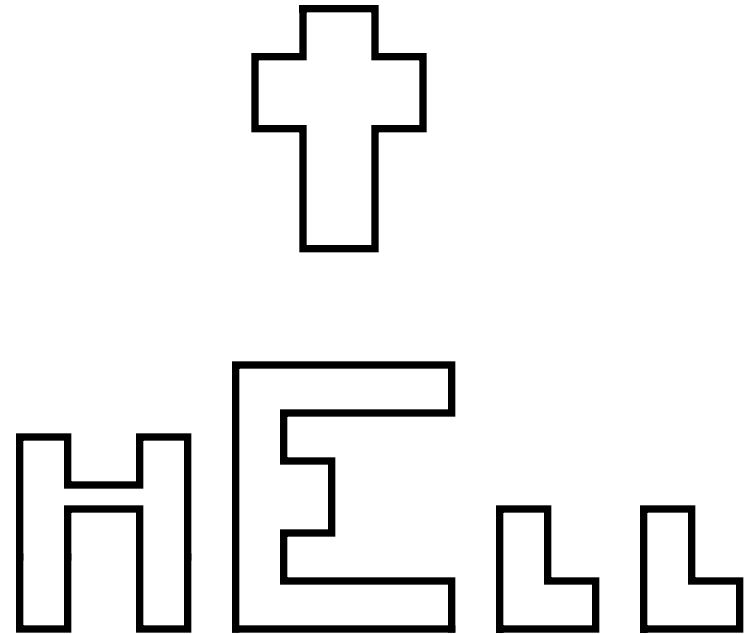
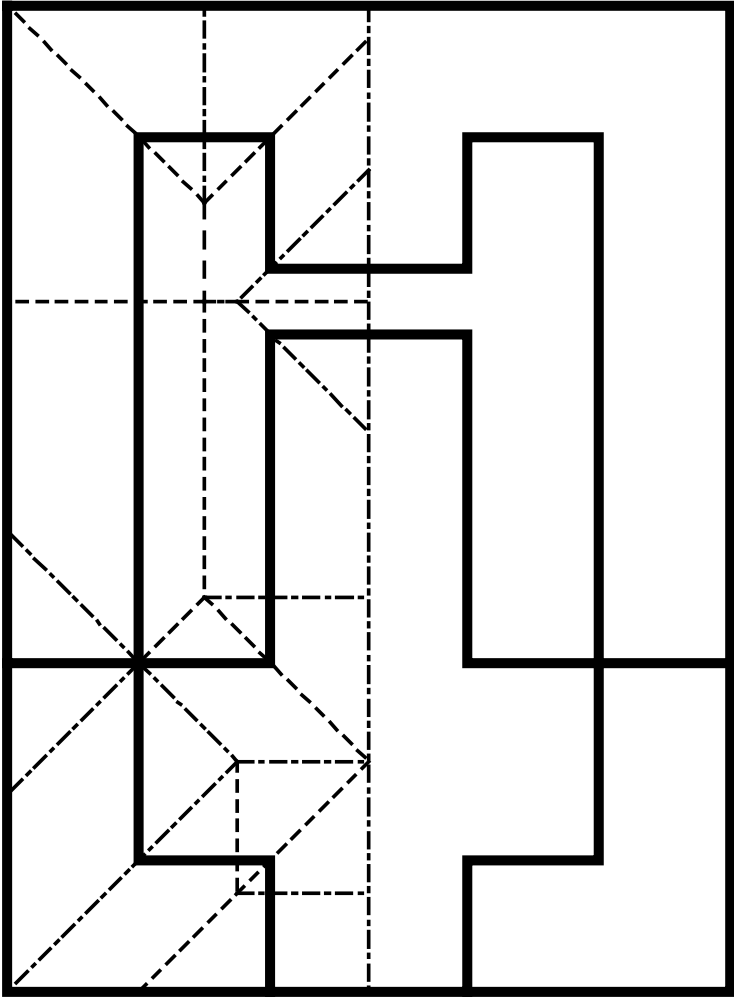
Sarah Eisenstat  
2010



Jason Ku  
2010



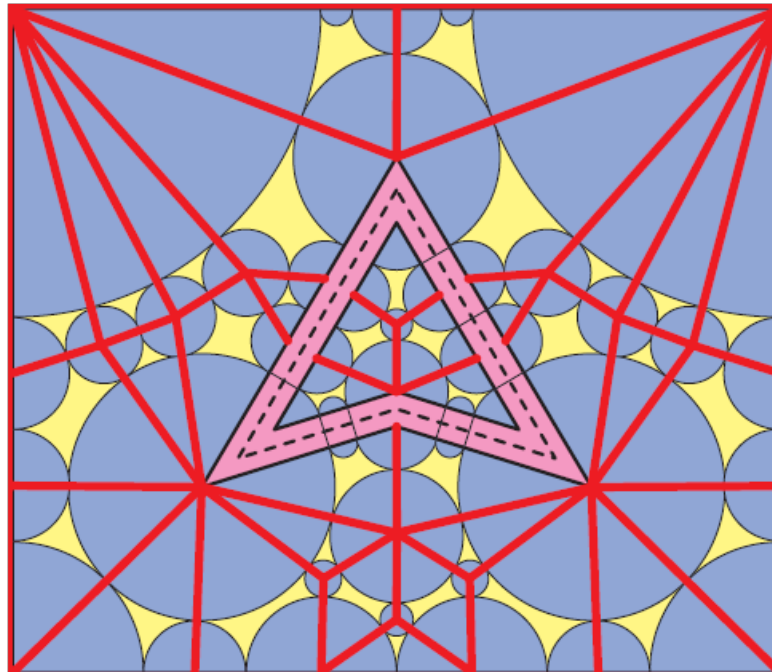
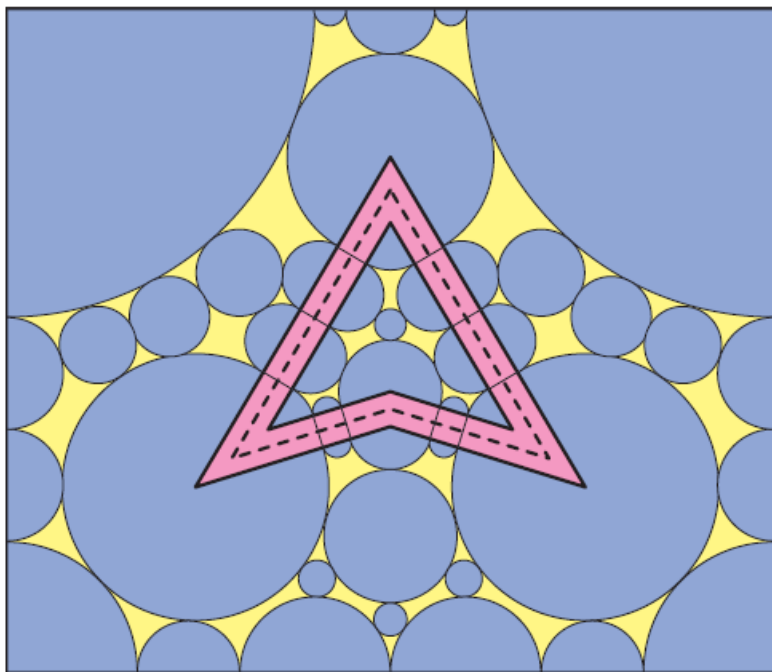
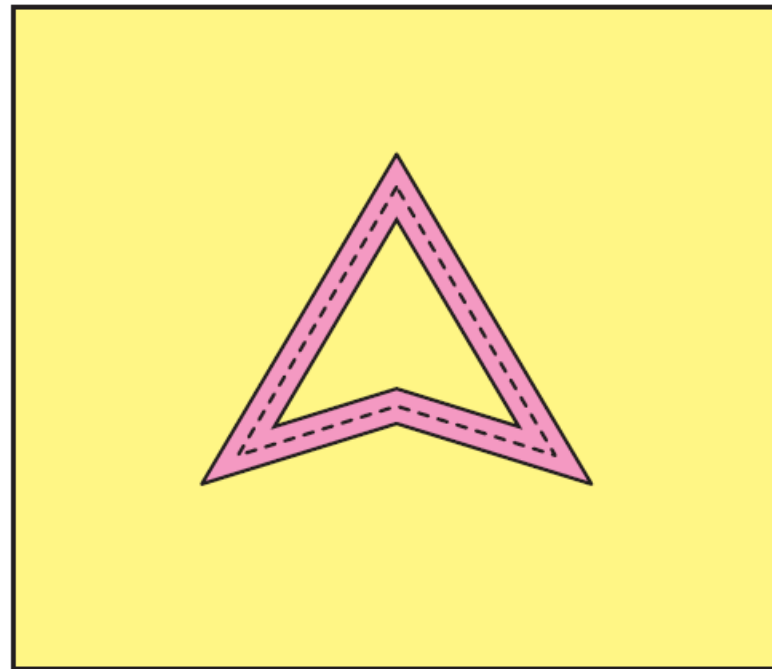
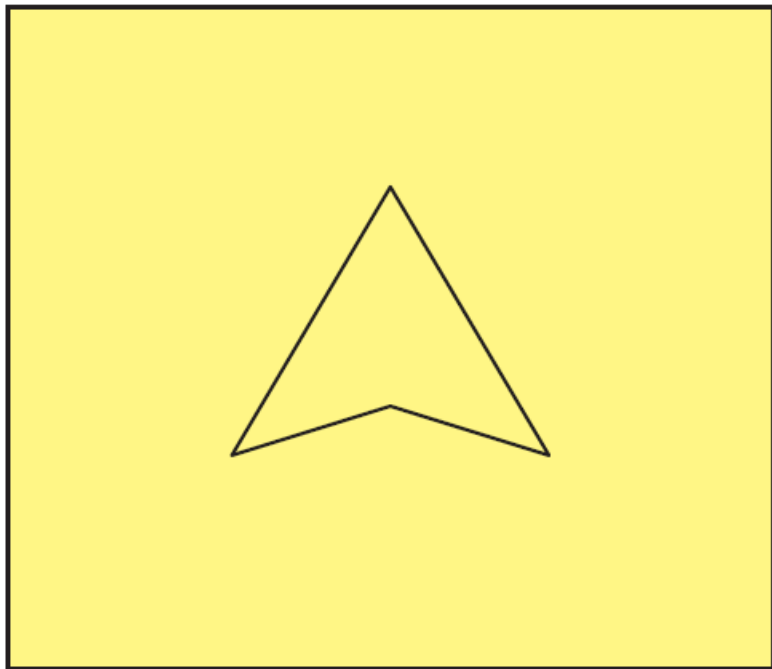




[Demaine & Demaine 2004]

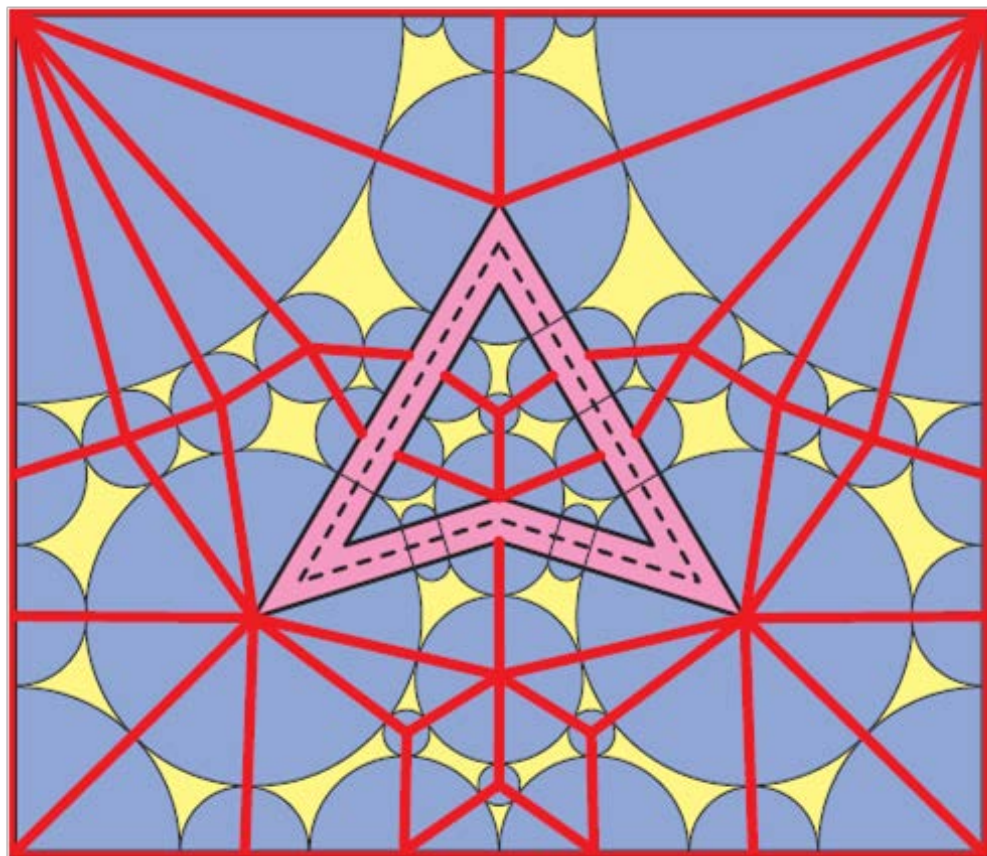


**I got a little confused in the disk-packing method, and specifically how you went from a disk-packing to the diagram with all the triangles. All in all, cool proof though.**

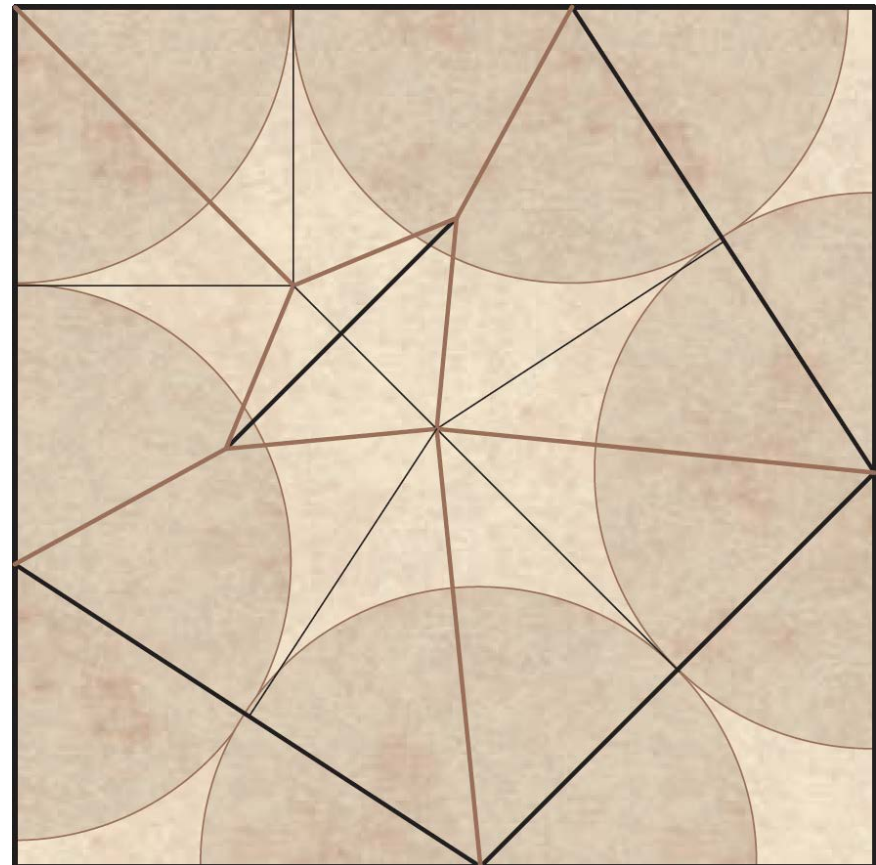


**There seem to be many different ways to allocate disks that satisfy the given conditions. Is any allocation good enough to use for a crease pattern? Is there some kind of “optimal” way of disk packing?**

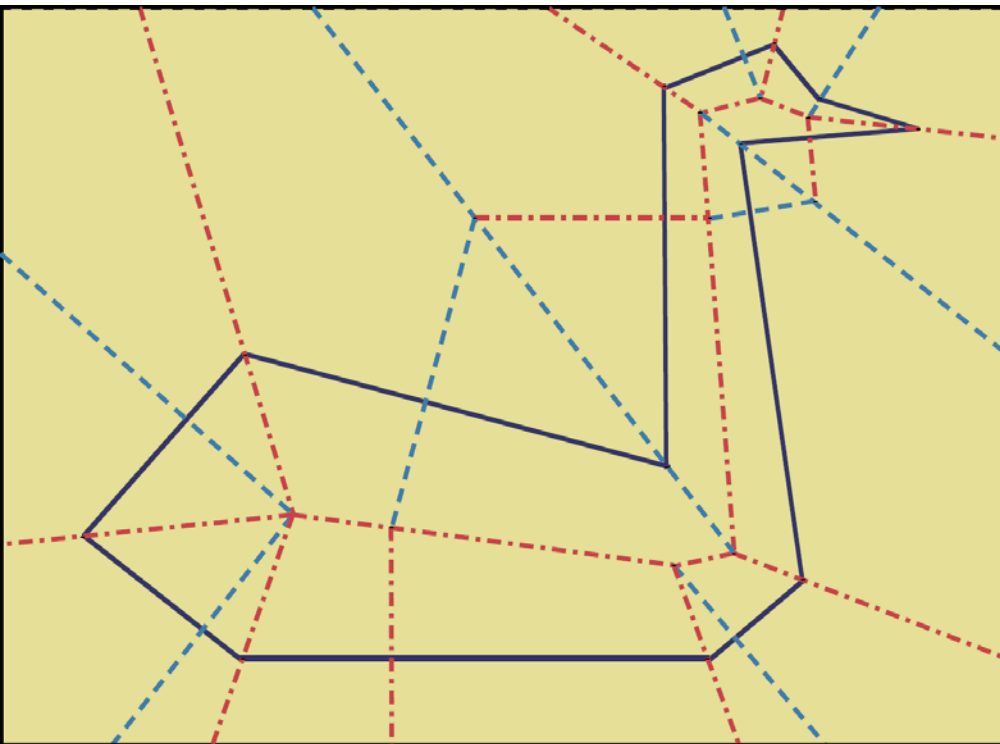
**How related is the tree method to the methods for this — is it just that rabbit ears and such come up everywhere, or do we actually have some sort of isomorphism (or not-quite-isomorphism) between fold-and-one-cut designs and uniaxial bases?**



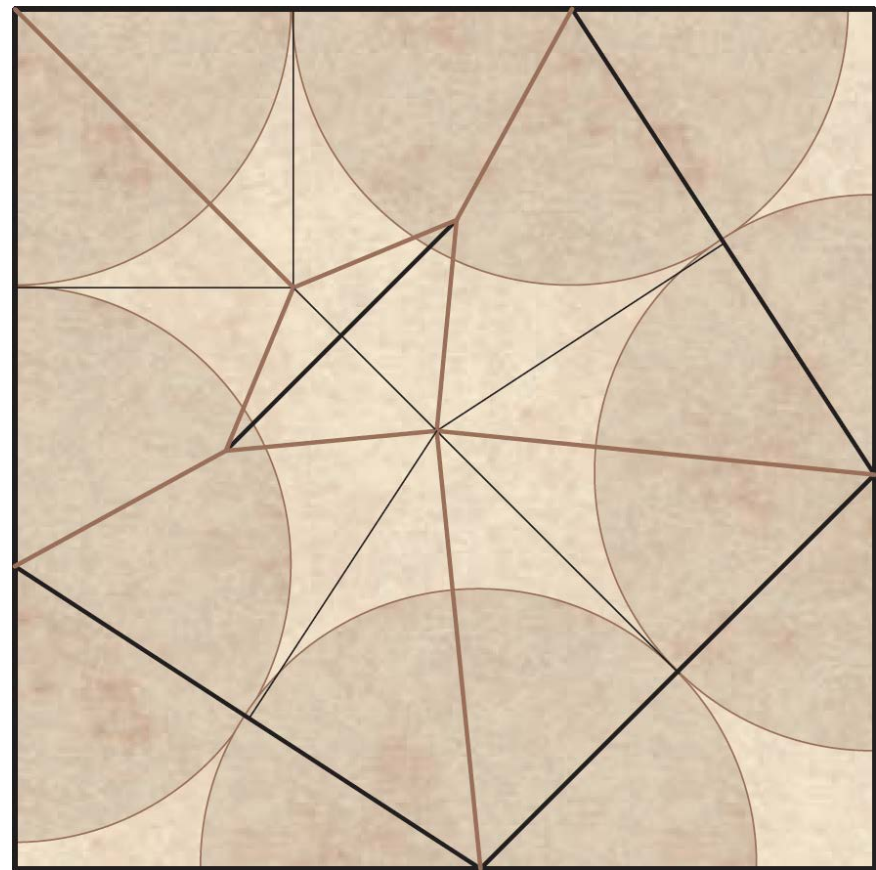
**fold & cut**  
(disk packing method)



**universal molecule**  
(tree method)



**fold & cut**  
(straight skeleton method)



**universal molecule**  
(tree method)

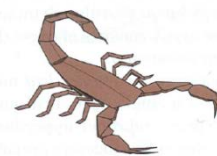




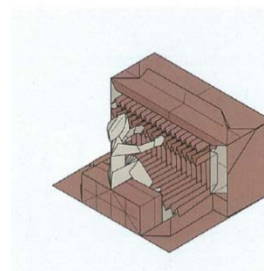
# ORIGAMI DESIGN SECRETS

Mathematical Methods  
for an Ancient Art

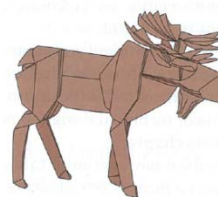
ROBERT J. LANG



11  
Tree Theory



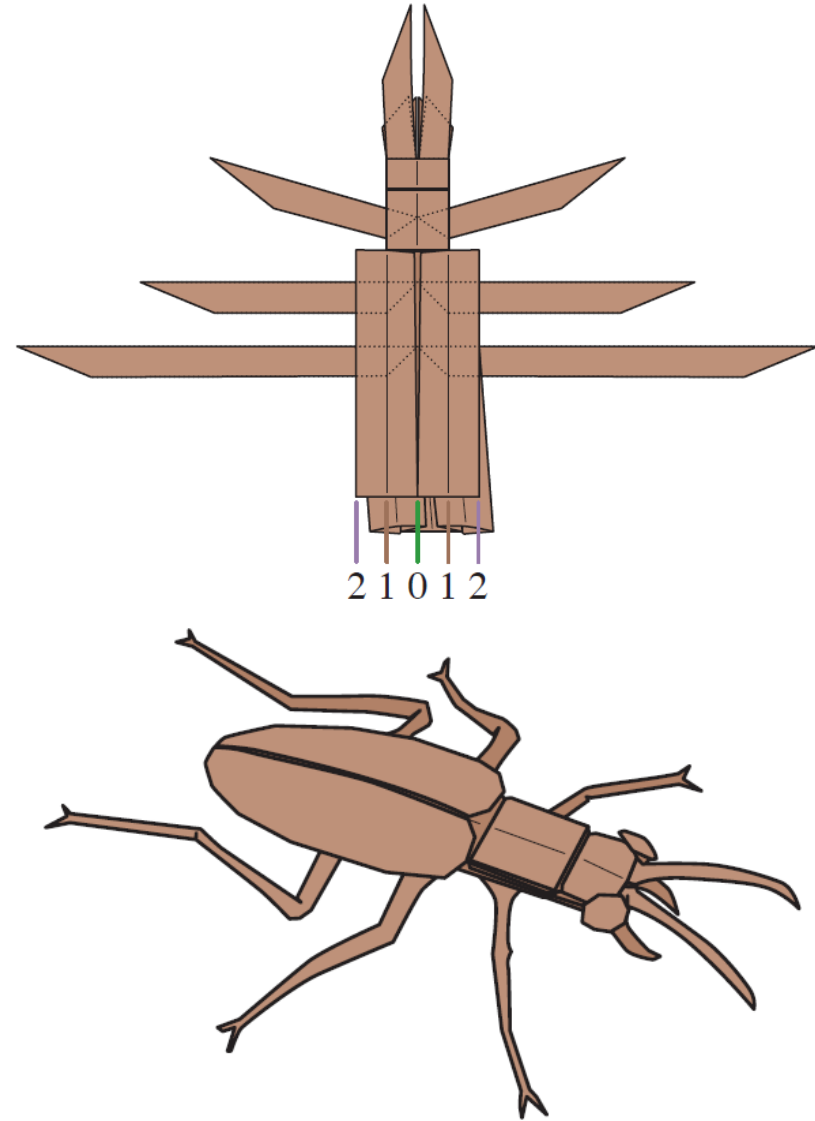
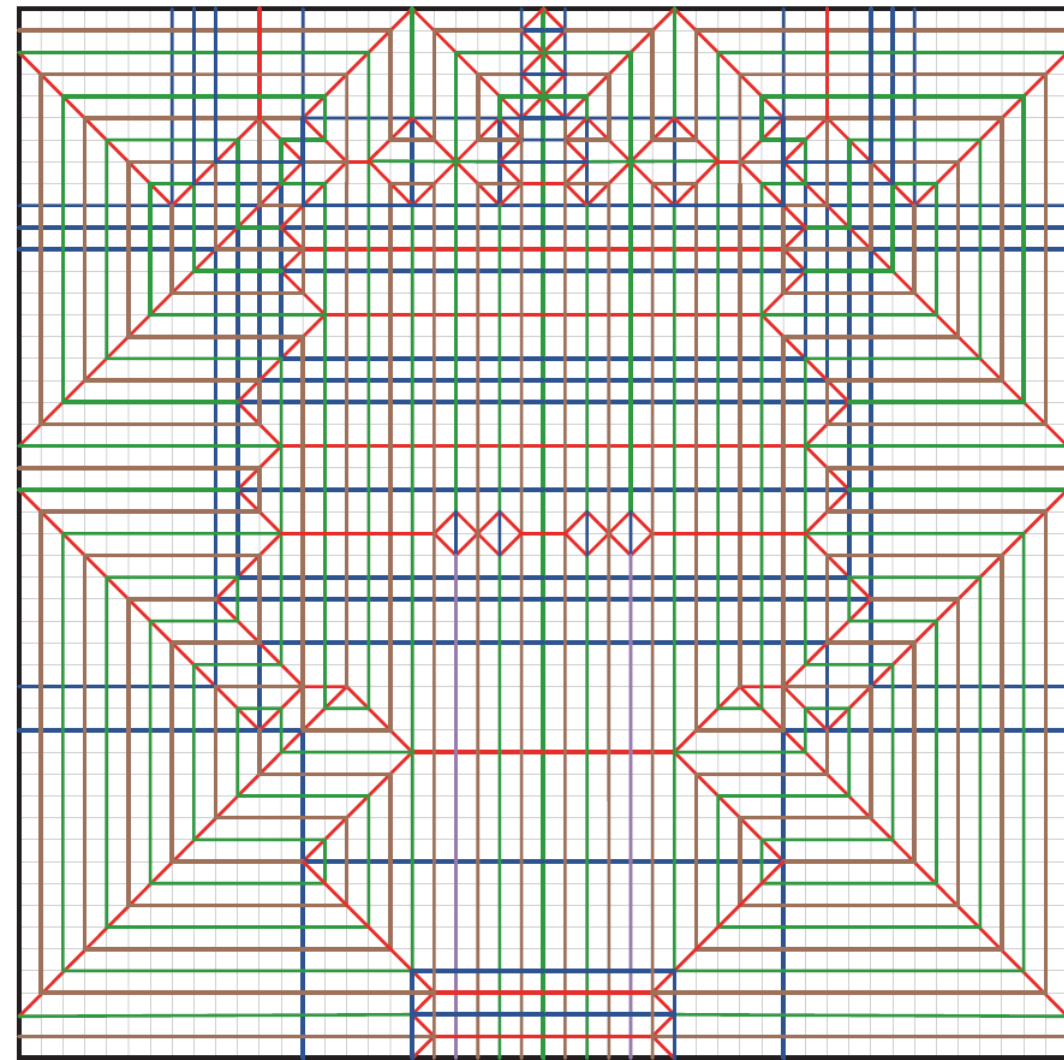
12  
Box Pleating



13  
Uniaxial Box Pleating



14  
Polygon Packing

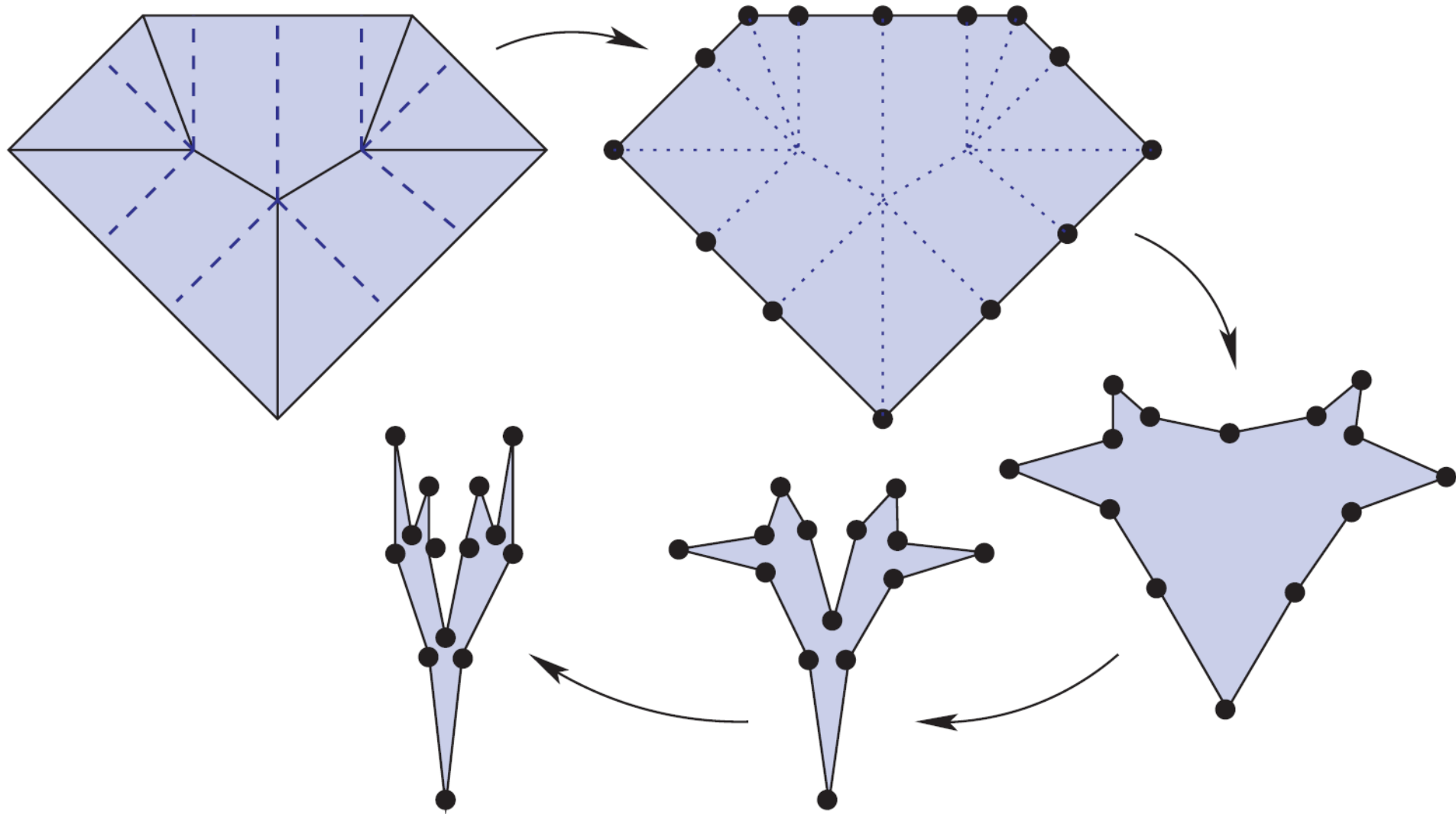


Salt Creek Tiger Beetle  
Lang 2012

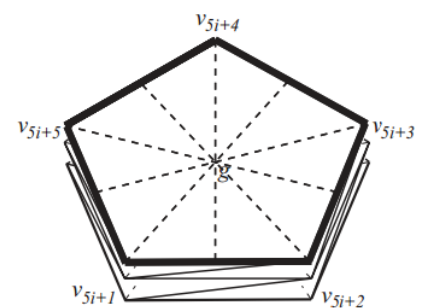
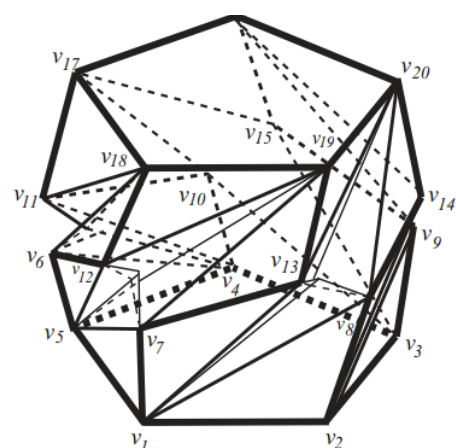
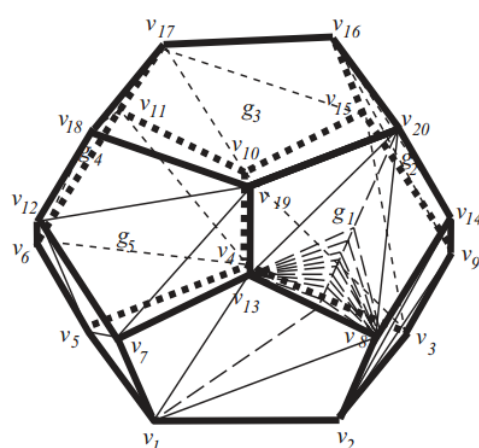
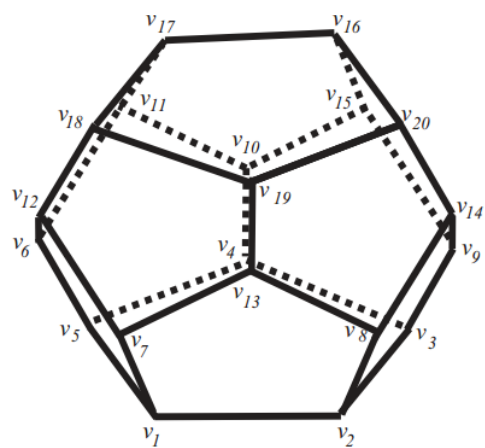
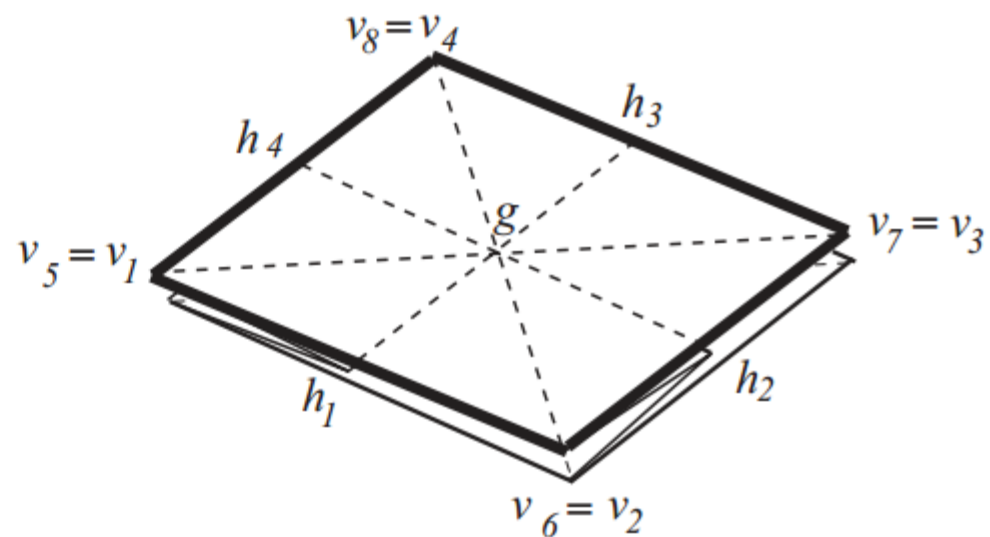
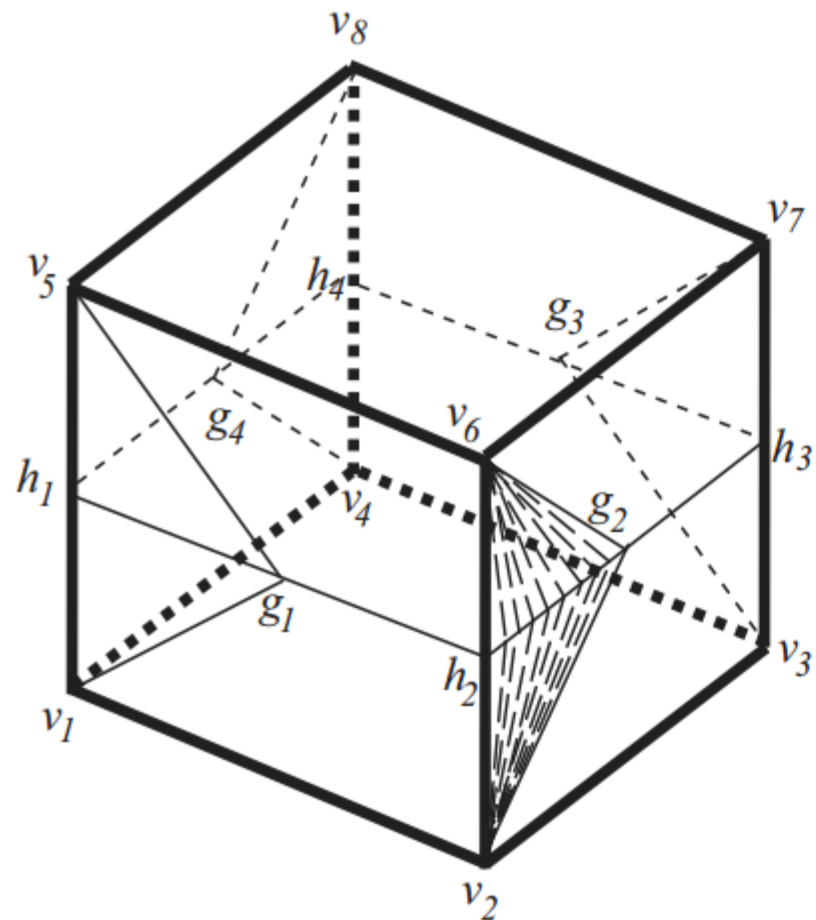


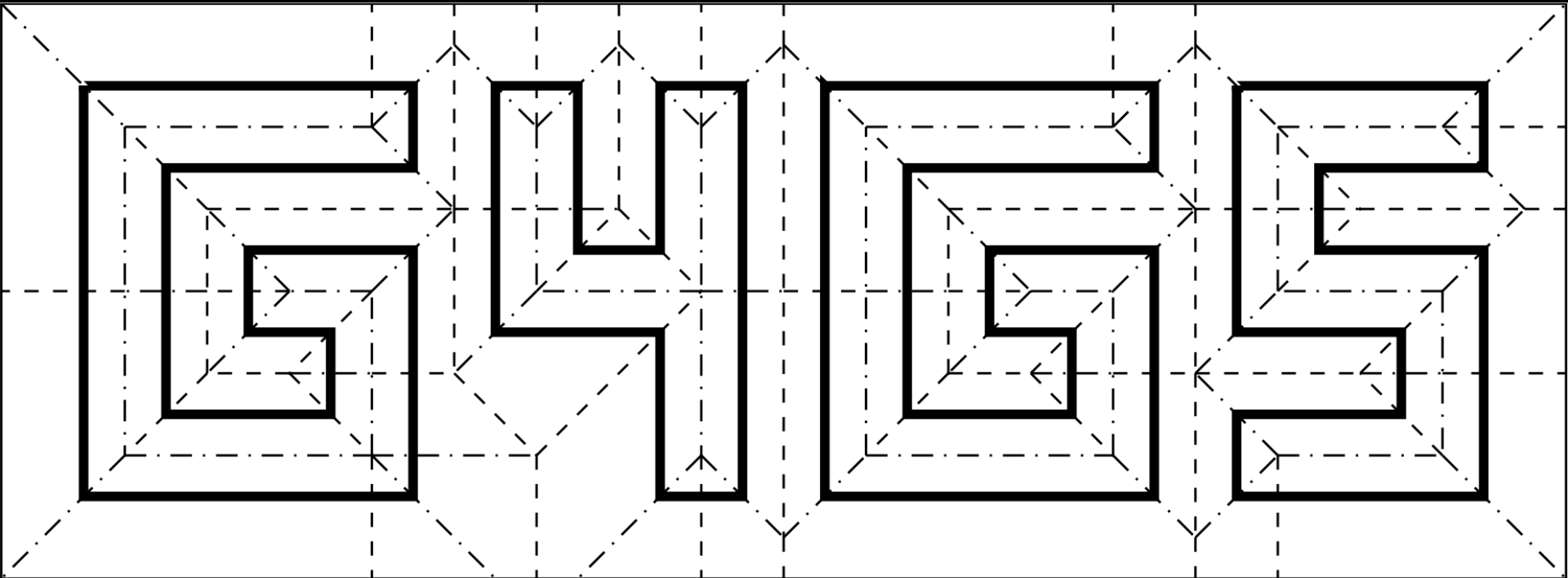
**I wonder how much this changes if you change from having a straight cut to one curved cut of fixed radius. Presumably, all your edges have to have that curve, but can you get interesting shapes out of it?**

**The explanation you gave a couple classes ago about what higher-dimensional folding means made sense to me at the time, but it makes considerably less sense now that you mentioned (this lecture) that you need to fold through the fourth dimension when you fold a grocery bag flat. [...] How do you explain this disconnect between theory and reality?**



[Itoh, Nara, Vîlcu 2011]





[Demaine & Demaine 2002]



# “Impenetrable Castle”

Peter Callesen  
2005



“Distant Wish”  
Peter Callesen  
2006



“The Dying Swan II”  
Peter Callesen  
2010

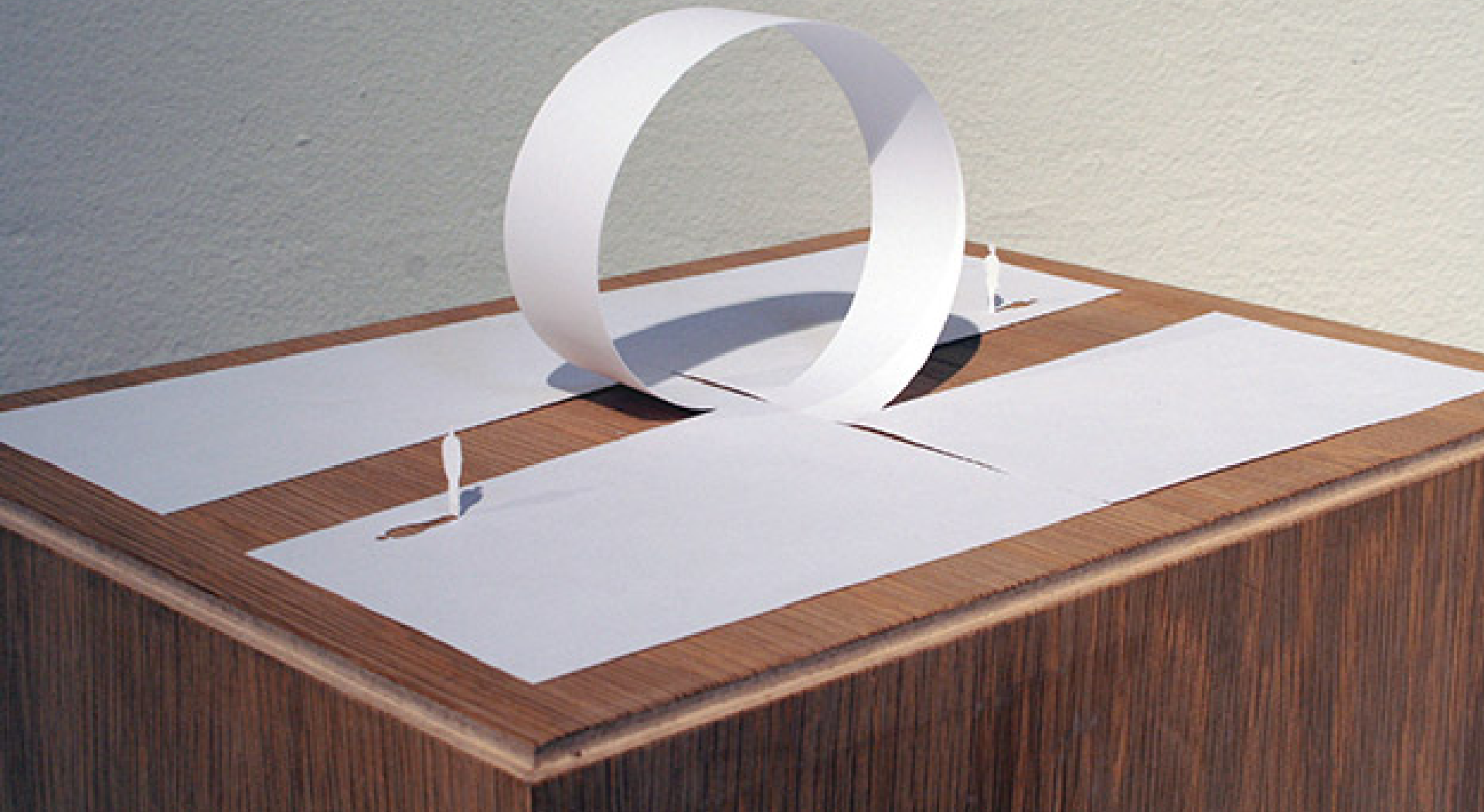






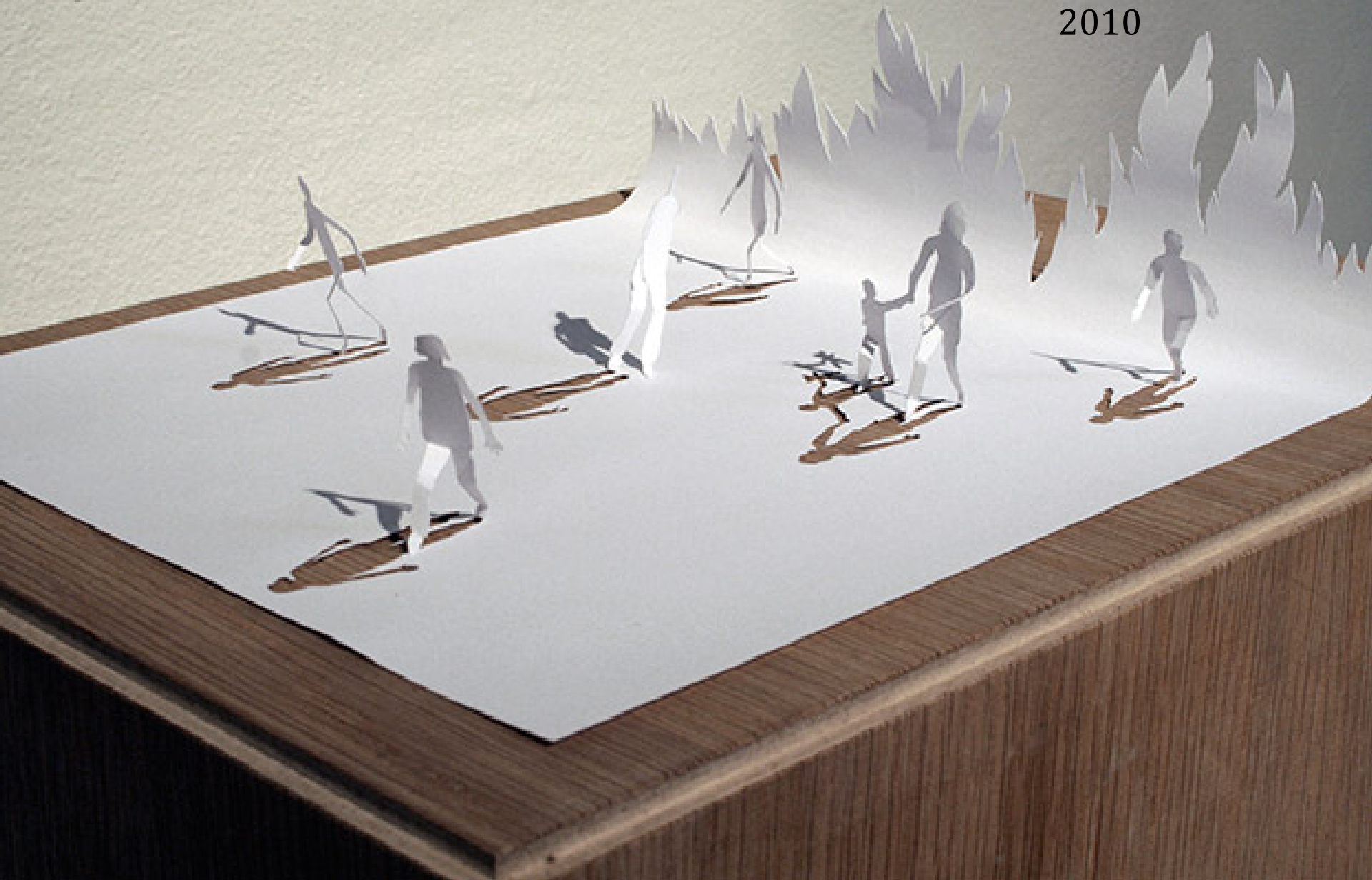
# “The End of the Road”

Peter Callesen  
2010



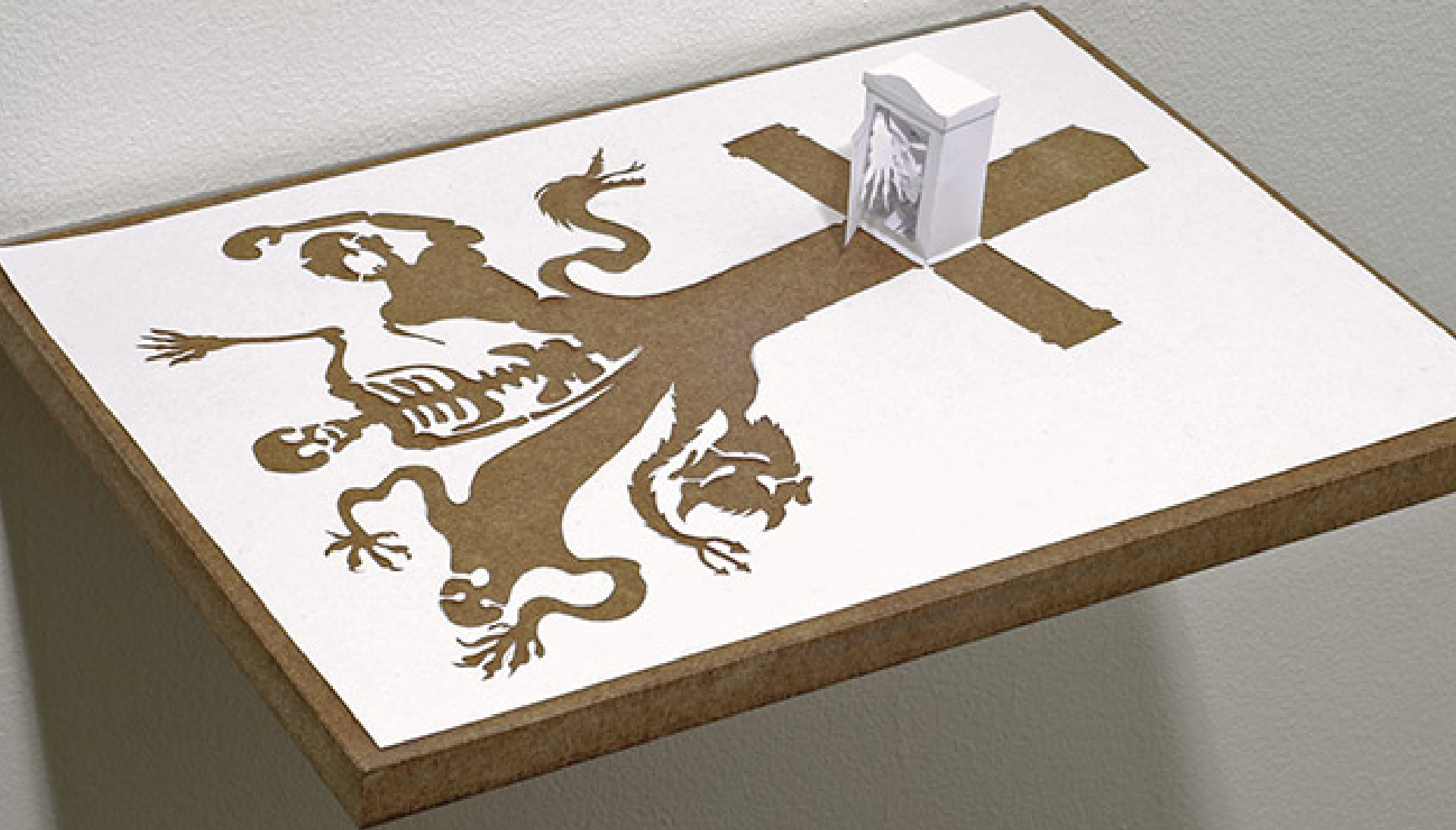


“Running Fire II”  
Peter Callesen  
2010



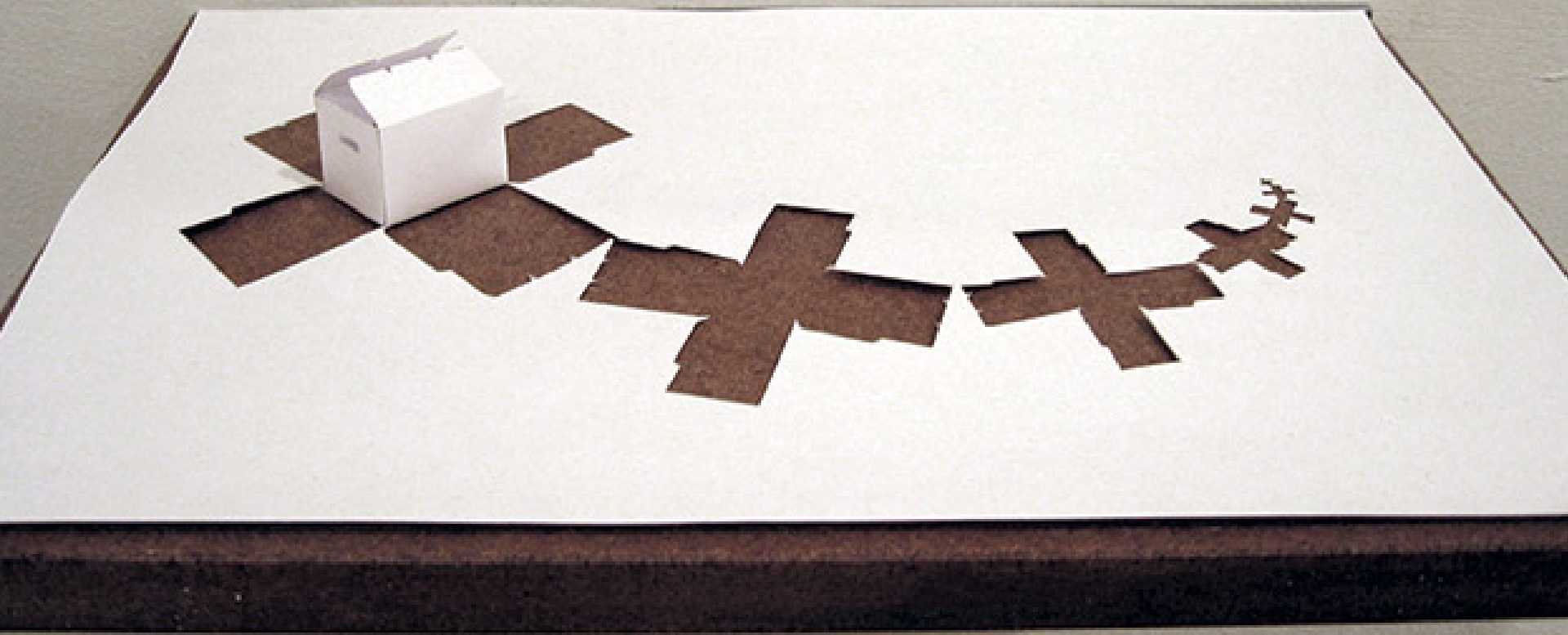


“Closet”  
Peter Callesen  
2006





“Pandora’s Box”  
Peter Callesen  
2005



“White Hand”  
Peter Callesen  
2007



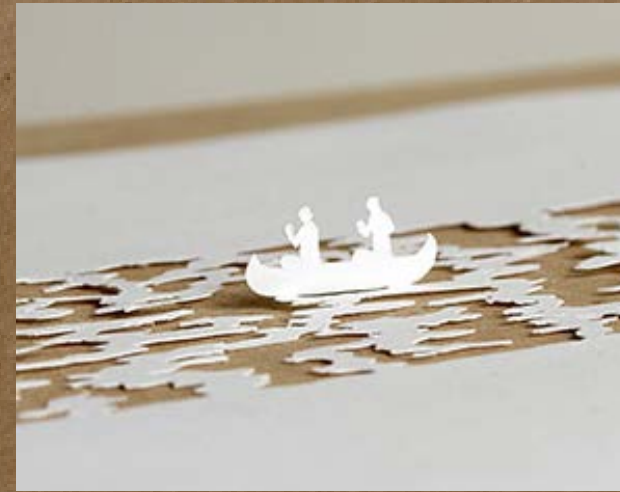


“The Short Distance  
Between Time and Shadow”

Peter Callesen

2006





“Down the River”  
Peter Callesen  
2005



“Angel”  
Peter Callesen  
2006