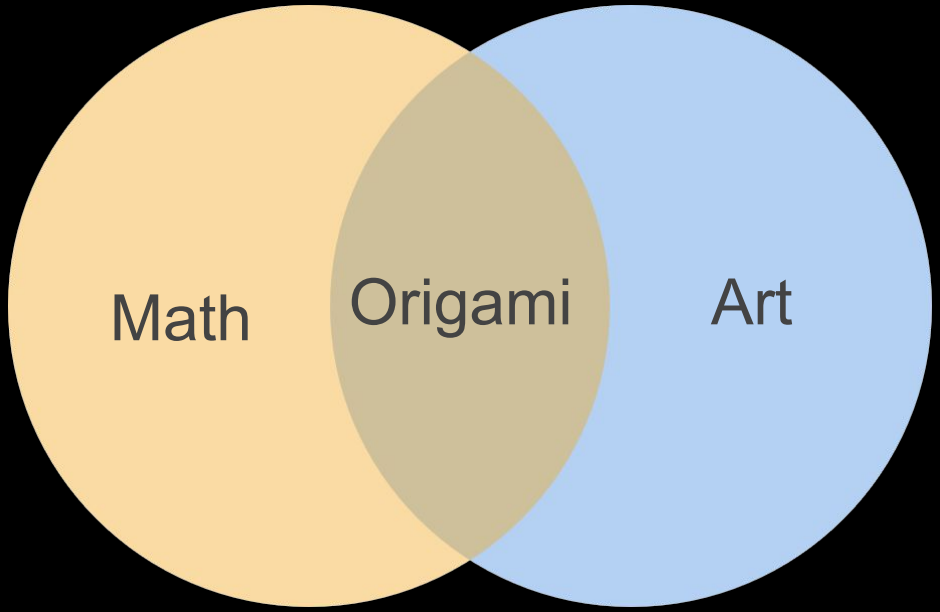
A geometrical introduction to Origami

Mateo Díaz

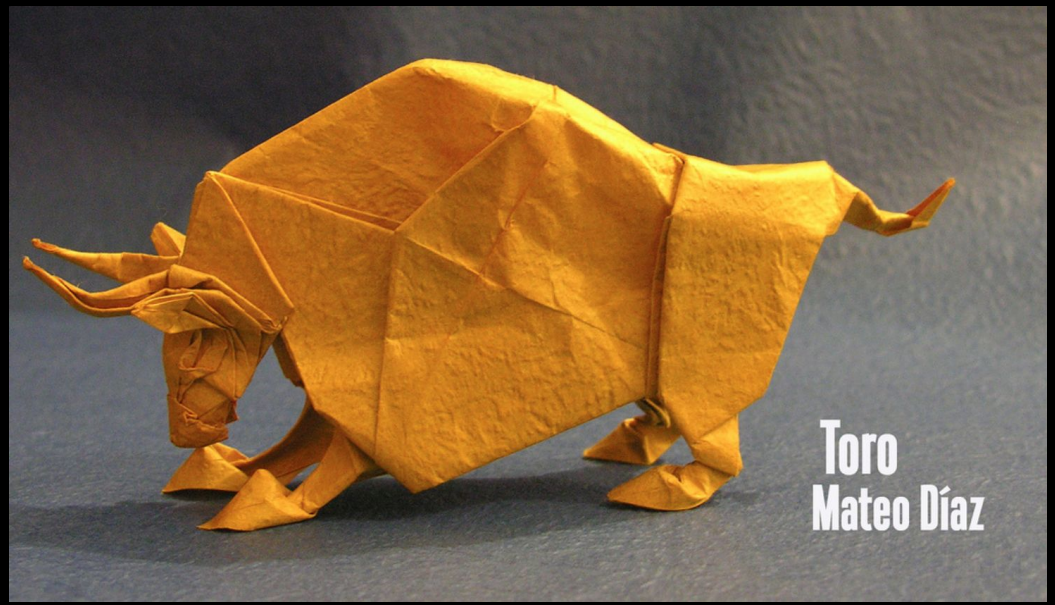
Origami

“The art or process, originating in Japan, of folding paper into shapes.”

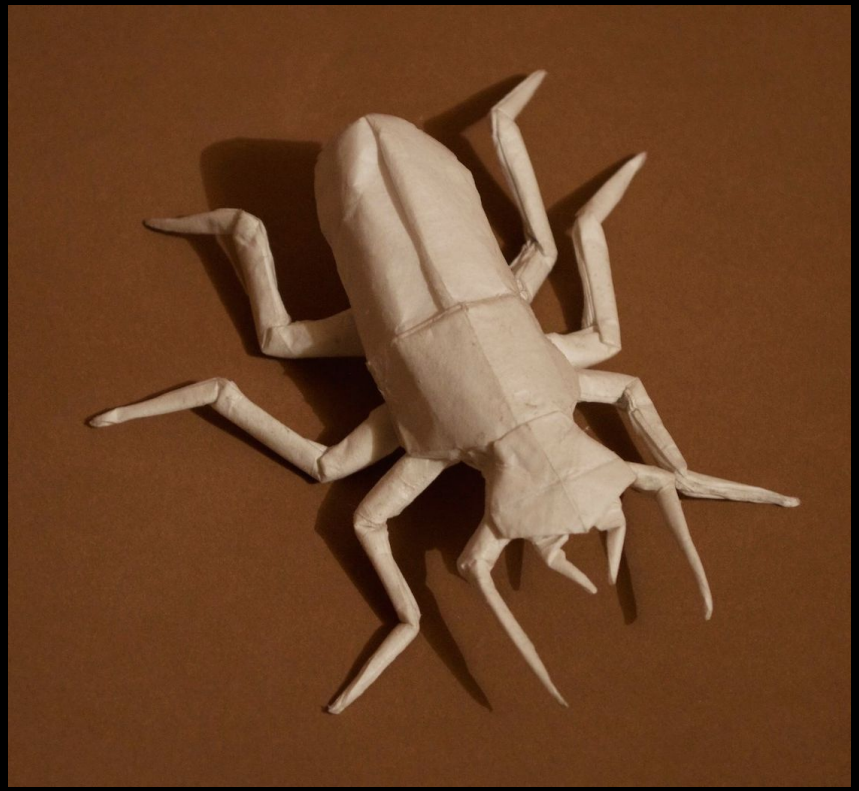
Ori = Fold
Gami = paper



Some designs from another era...



Some more...

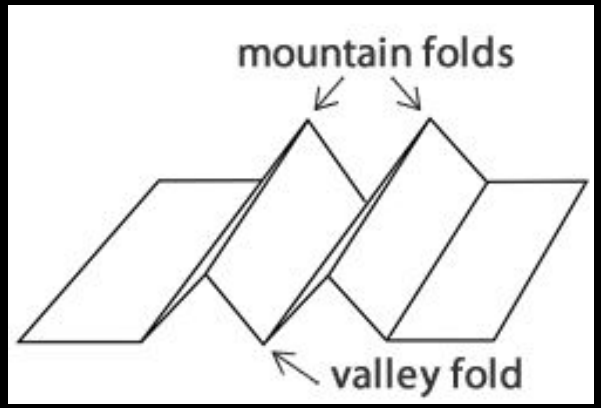


I didn’t have too much to do

Agenda

- ➔ The basics about origami
- ➔ Three kinds of origami
- ➔ Origami design 101
- ➔ The fun part: folding a crane

The basics of origami: mountains and valleys

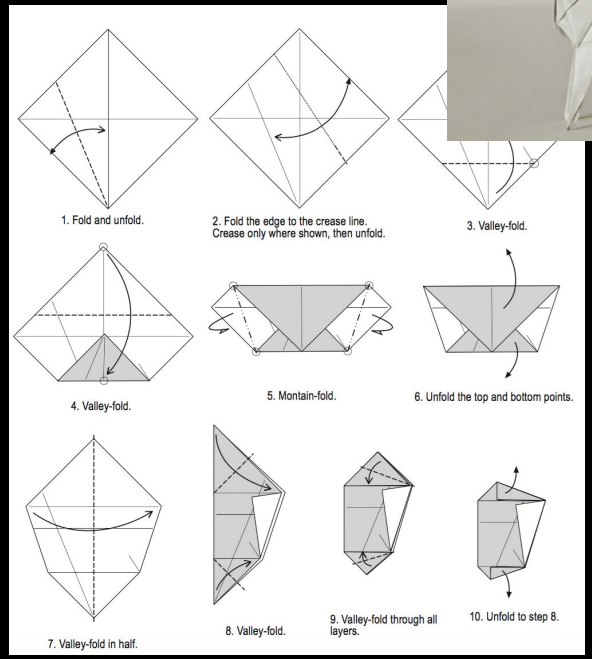


Mountain

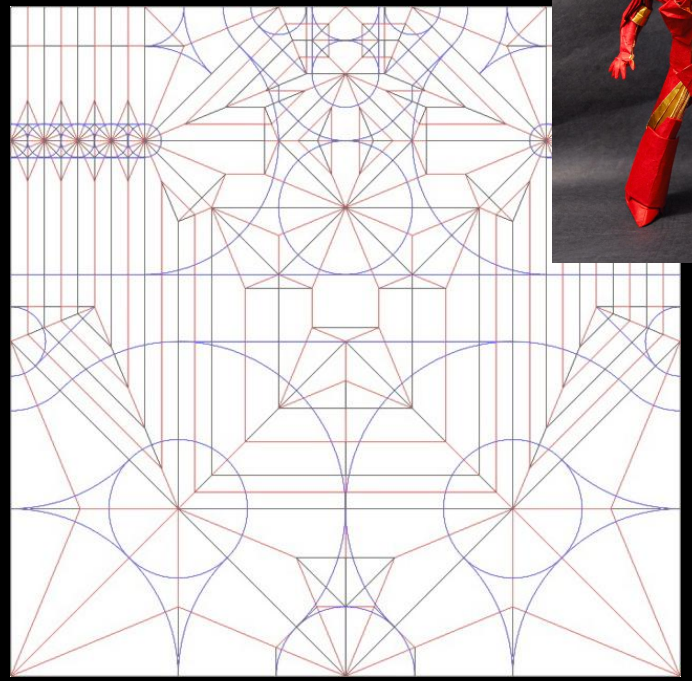
Valley

The basics of origami: how do we communicate?

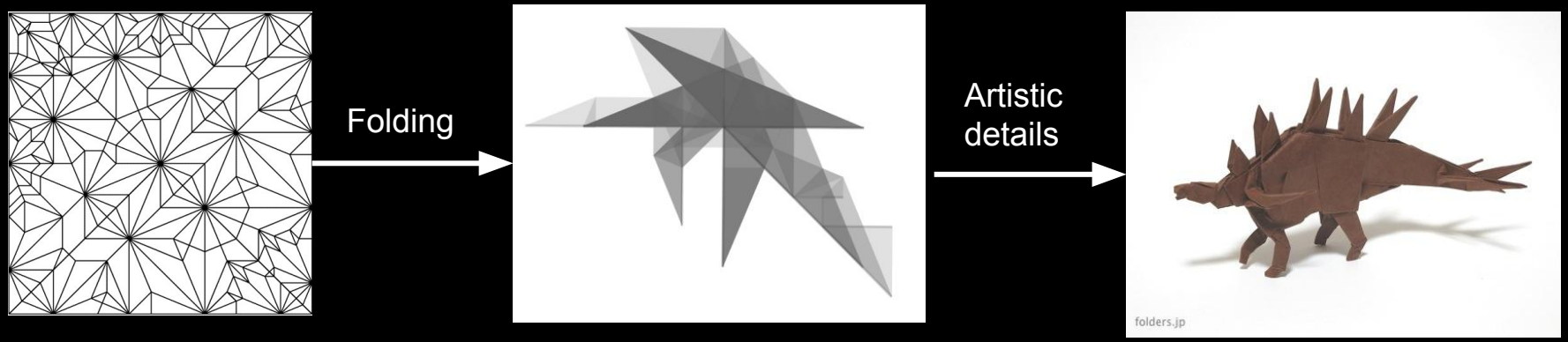
Diagrams



Crease Patterns

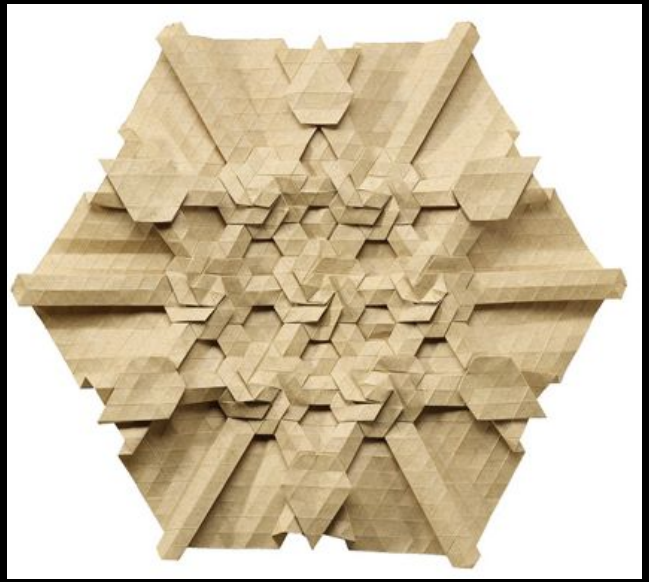


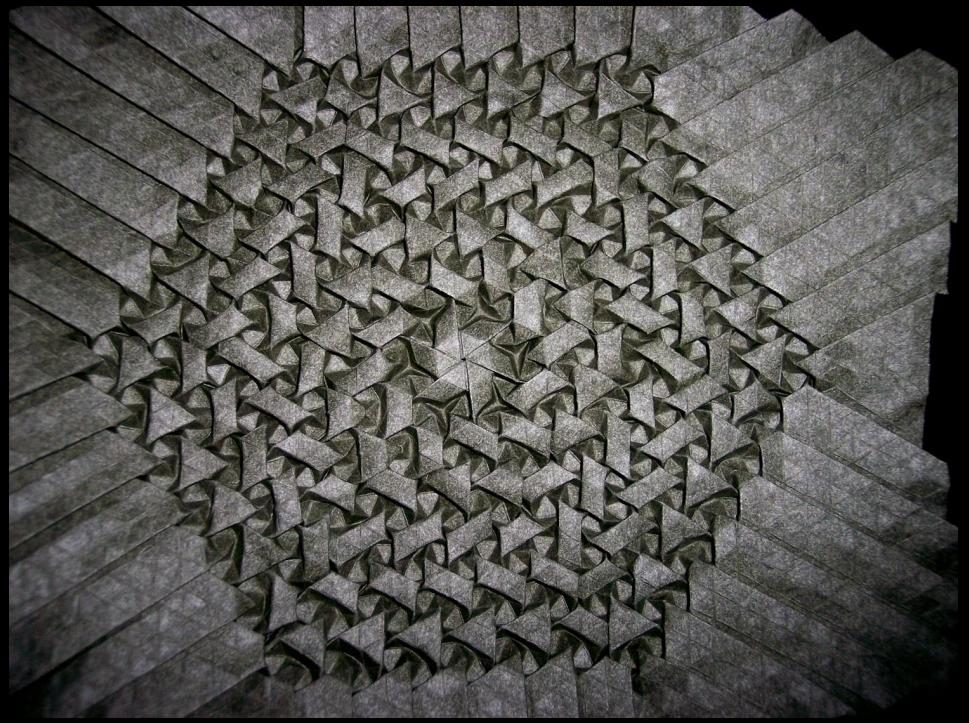
The process



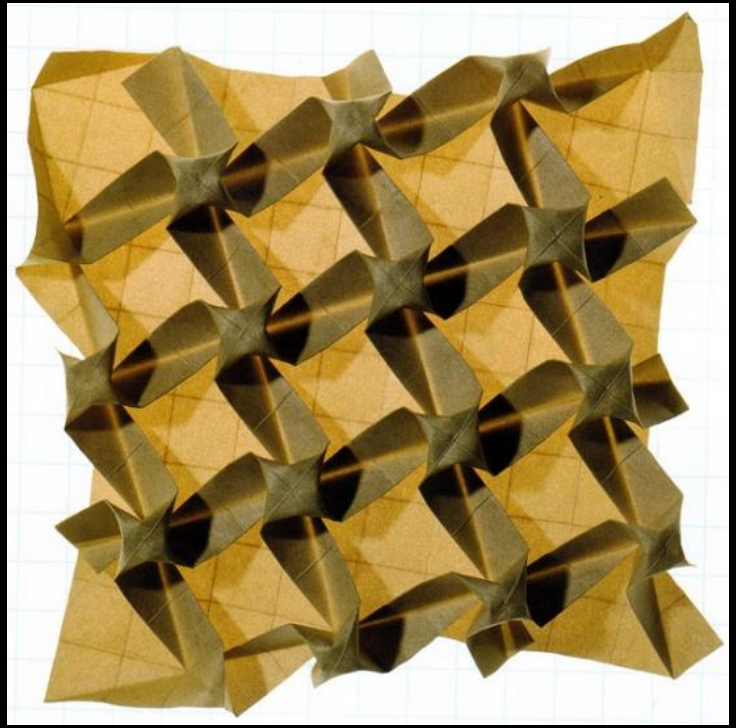
Three kinds of origami: Tessellations

“A tessellation of a flat surface is the tiling of a plane using one or more geometric shapes, called tiles, with no overlaps and no gaps.”



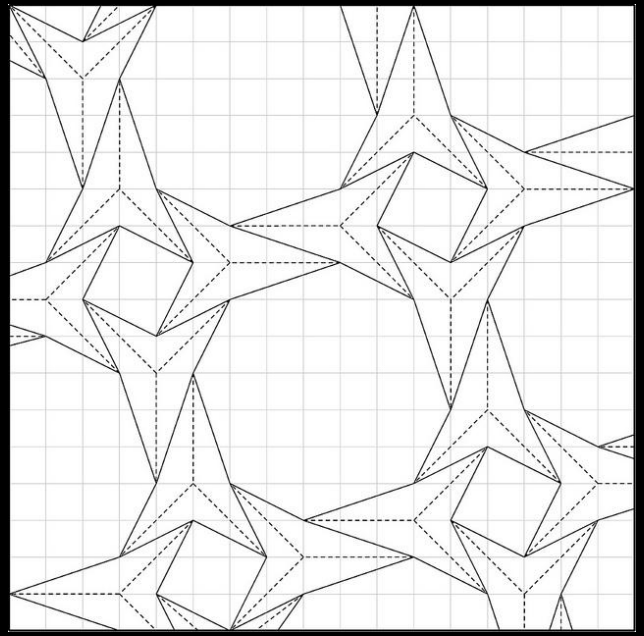


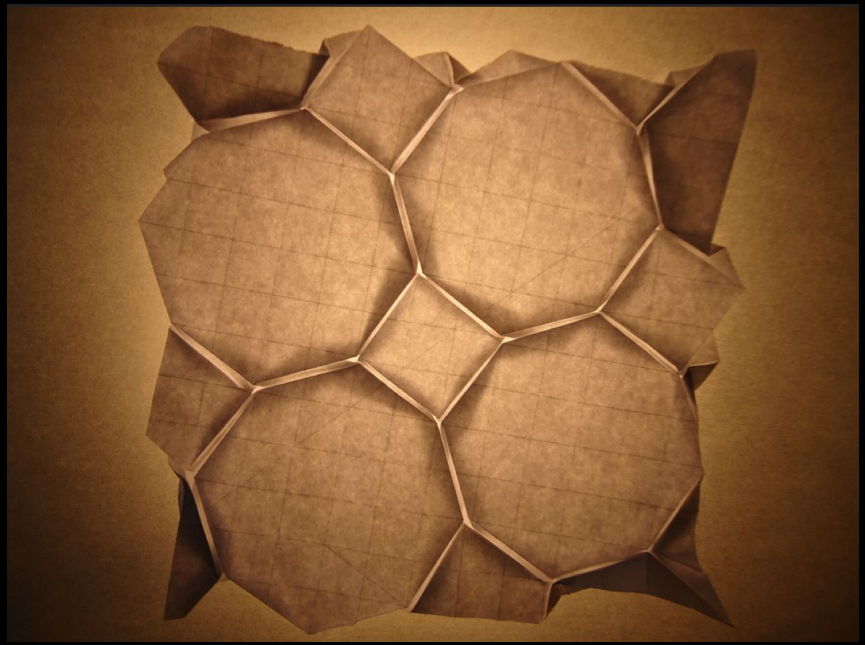
Three kinds of origami: Tessellations



Tessellations: Crease patterns

Very repetitive, we don’t really care about the orientation of the pattern.





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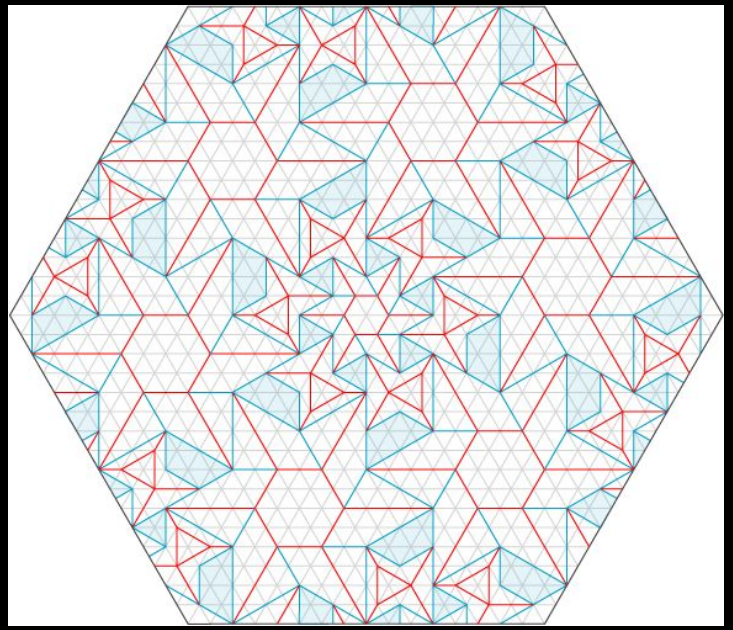
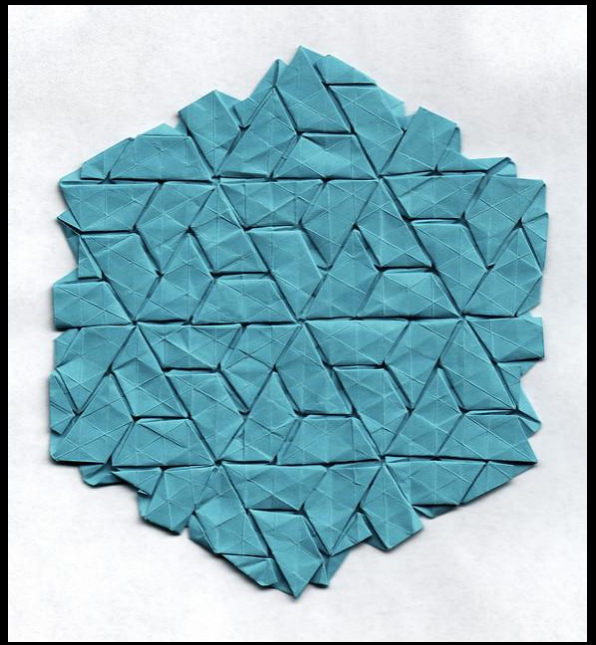
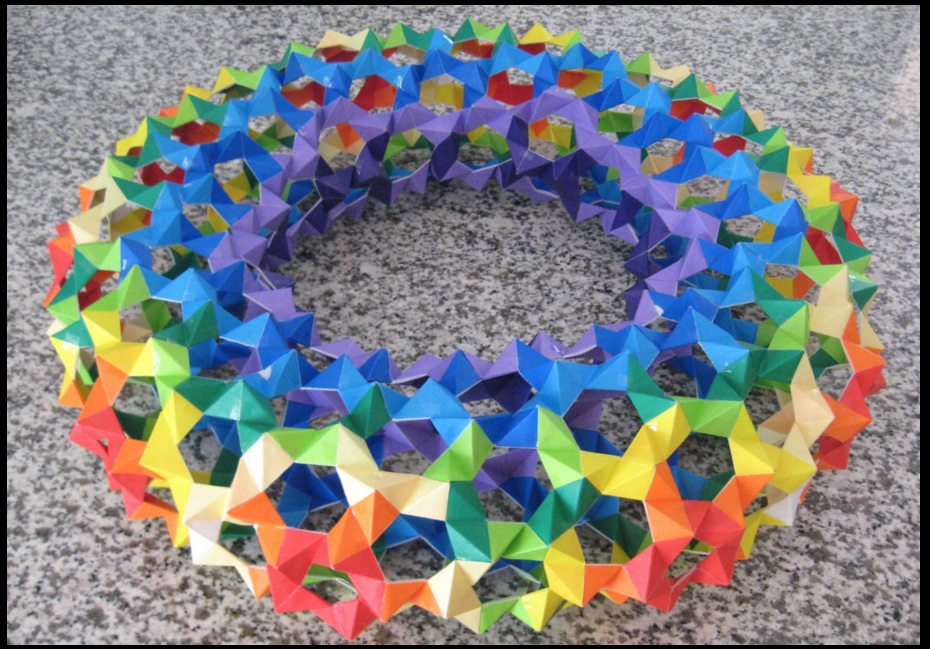


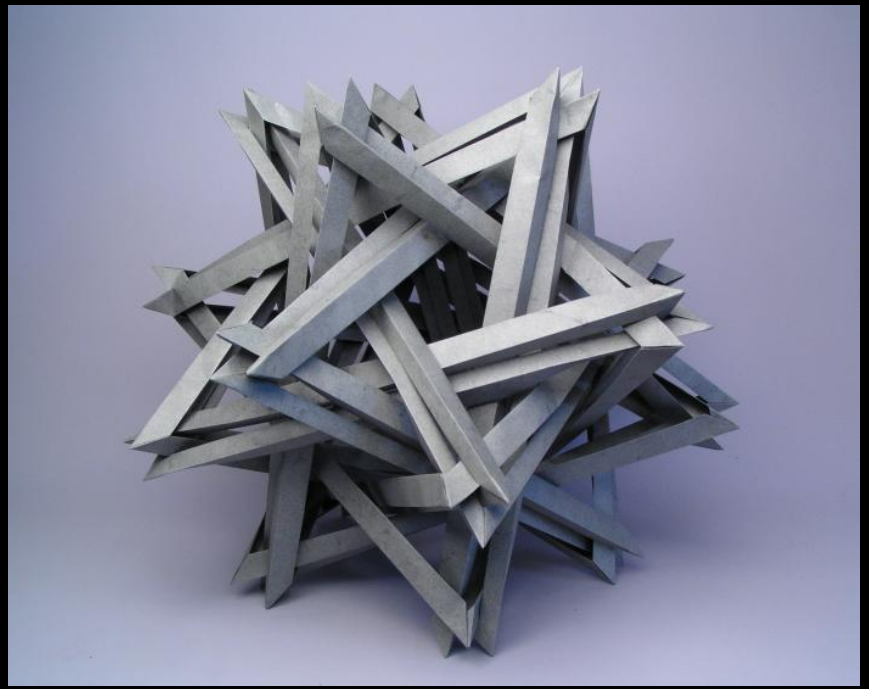


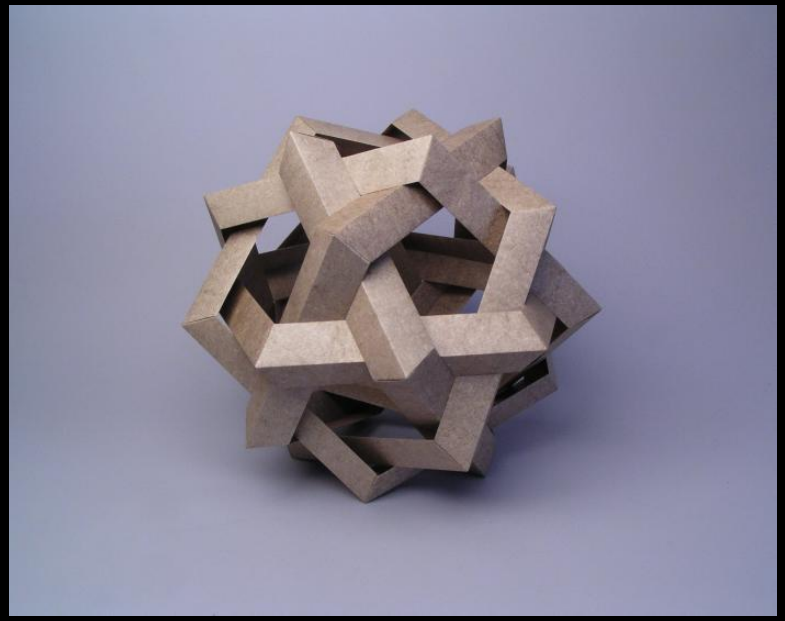
Three kinds of origami: Modulars

“Modular origami is a technique which uses two or more sheets of paper to create a larger and more complex structure.”



Three kinds of origami: Modulars



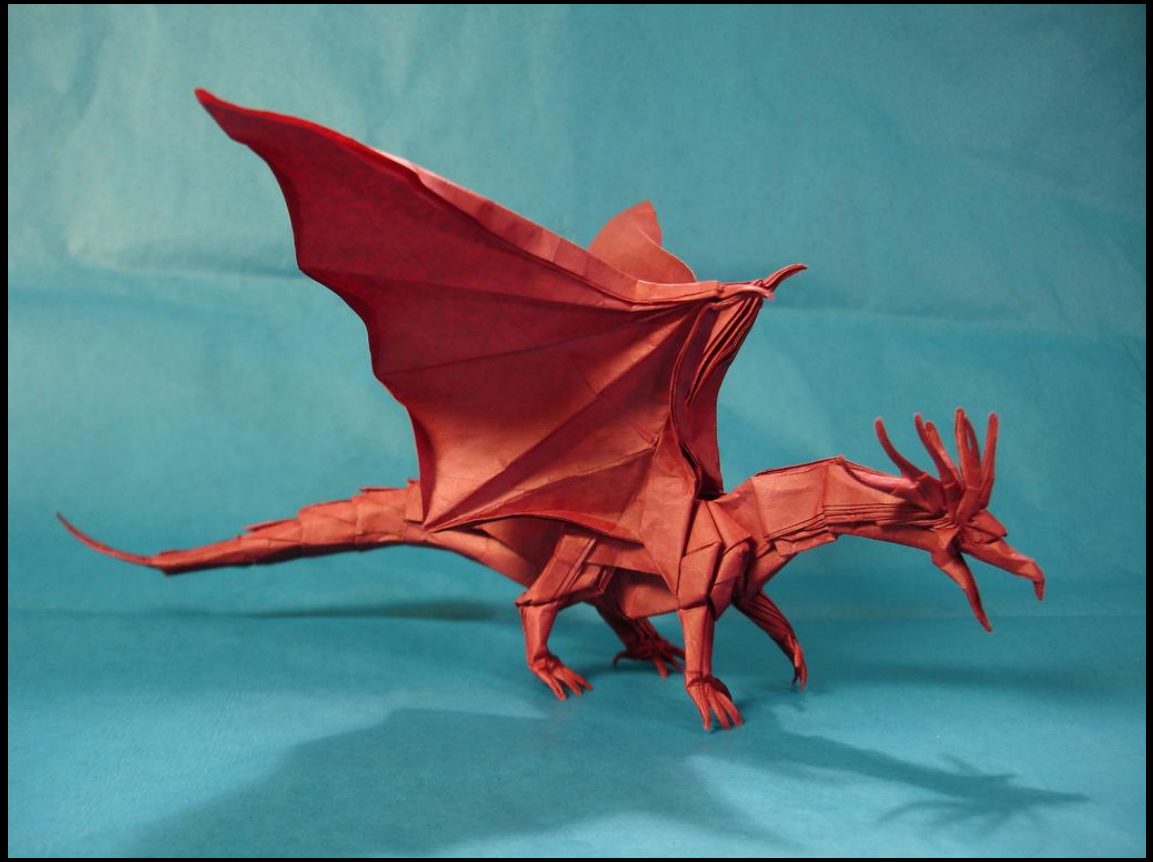


Three kinds of origami: Modulars

Three kinds of origami: Figurative

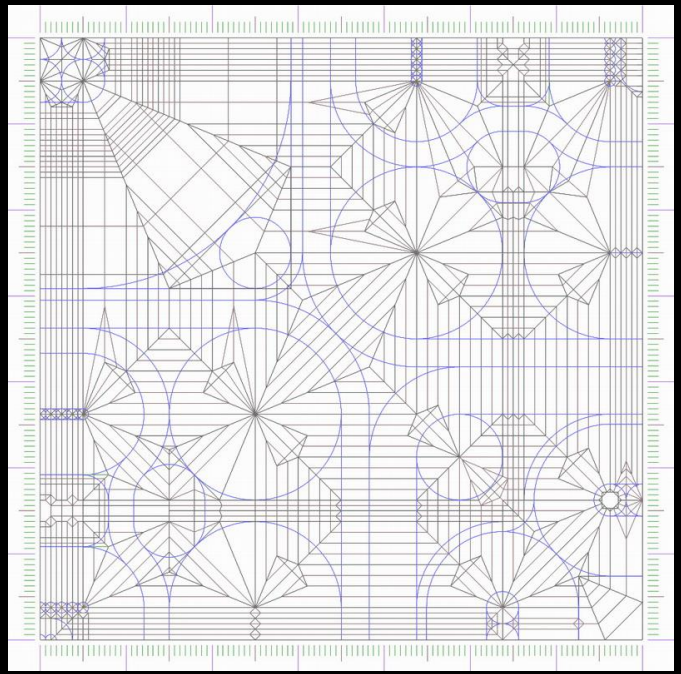
“Figurative origami is a technique which uses only one sheet of paper to create figures (animals, persons, ...)”

Three kinds of origami: Figurative

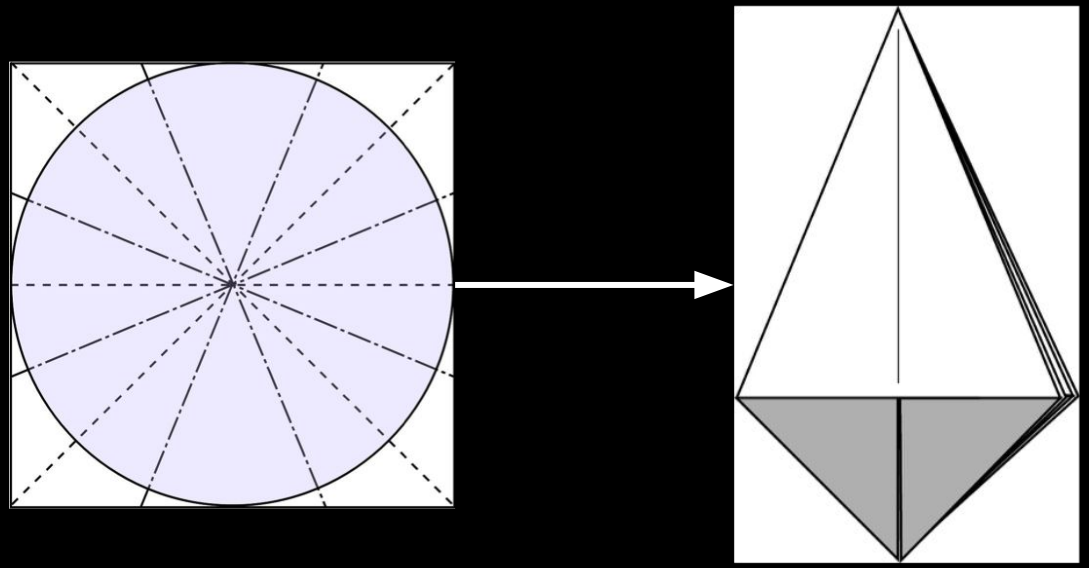


Figures: Crease patterns

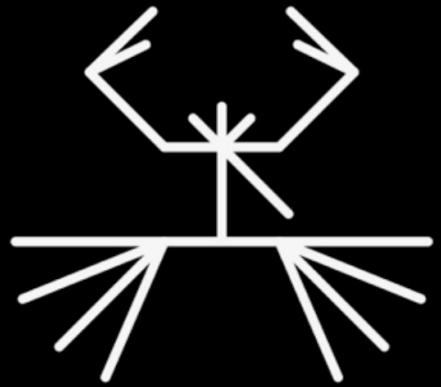
In this case, we do care about the orientation of the pattern and where is each “piece” of the figure.

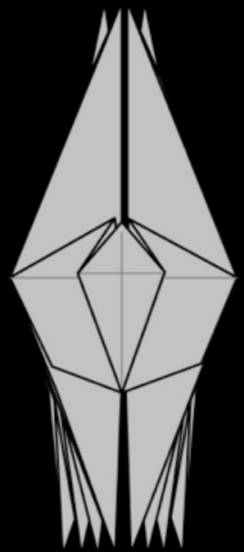


Origami design 101

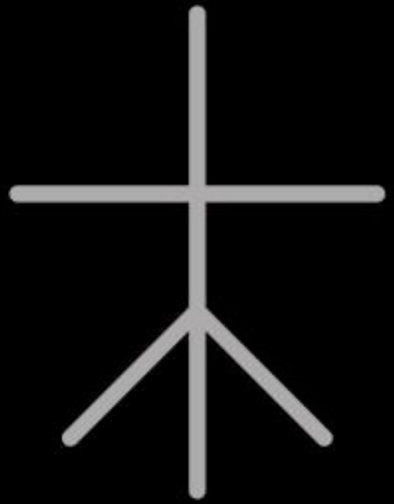


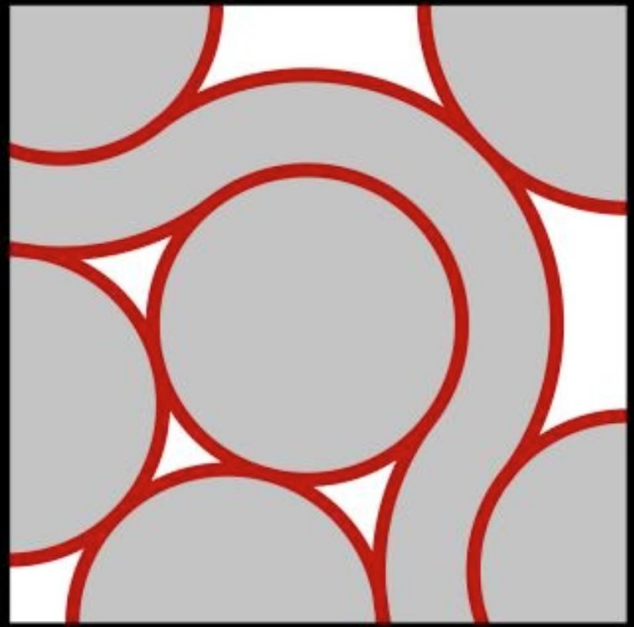
Origami design 101: tree theory





After the tree: circle packing





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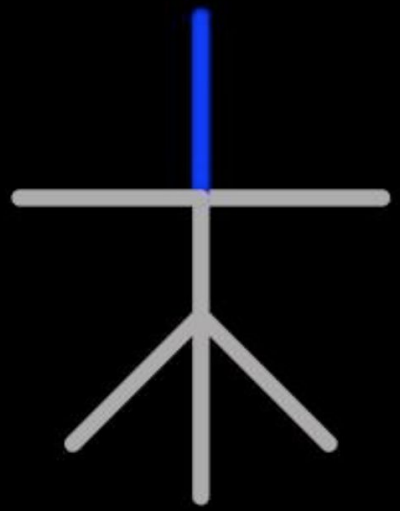

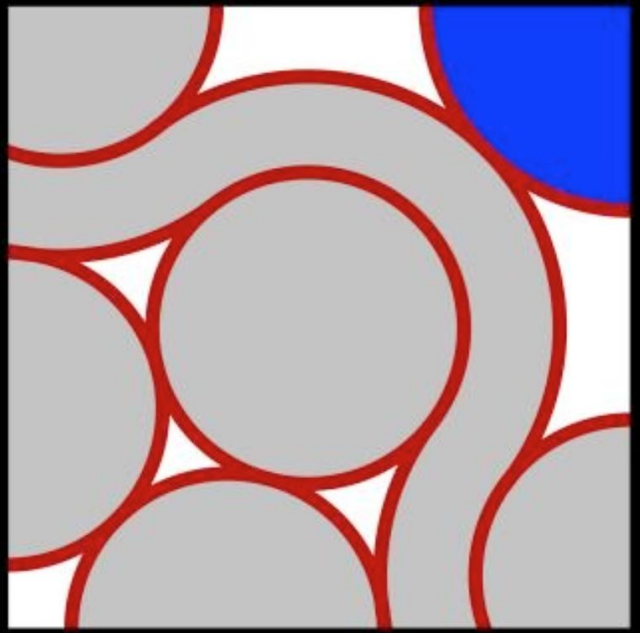

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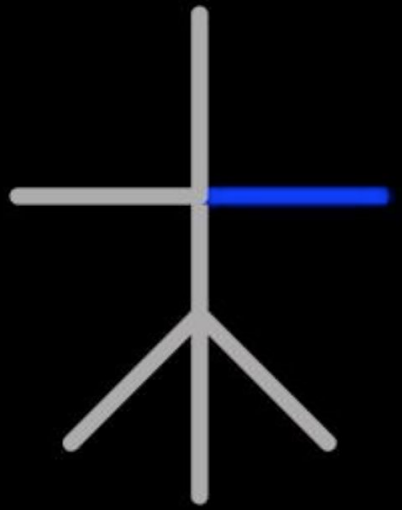

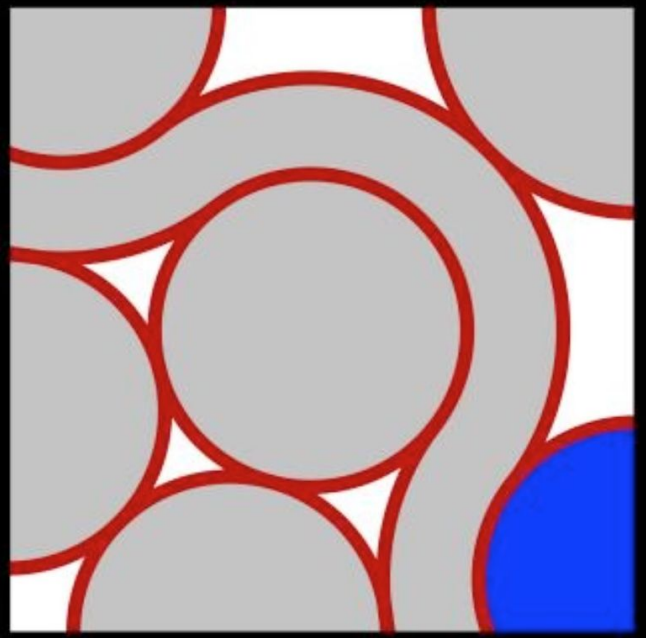

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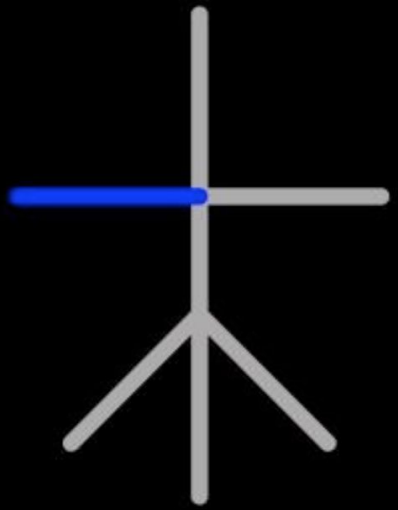
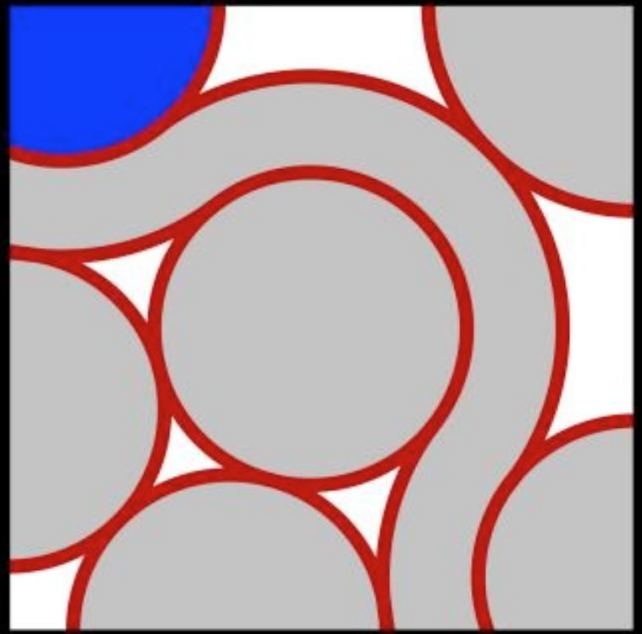
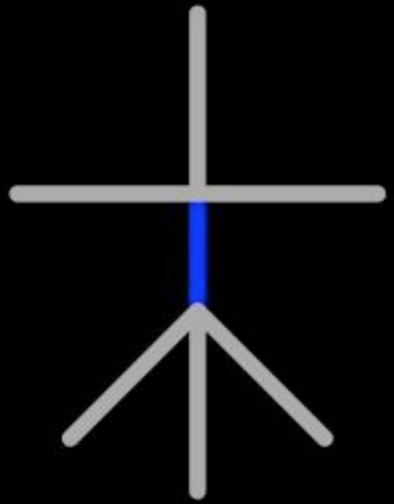
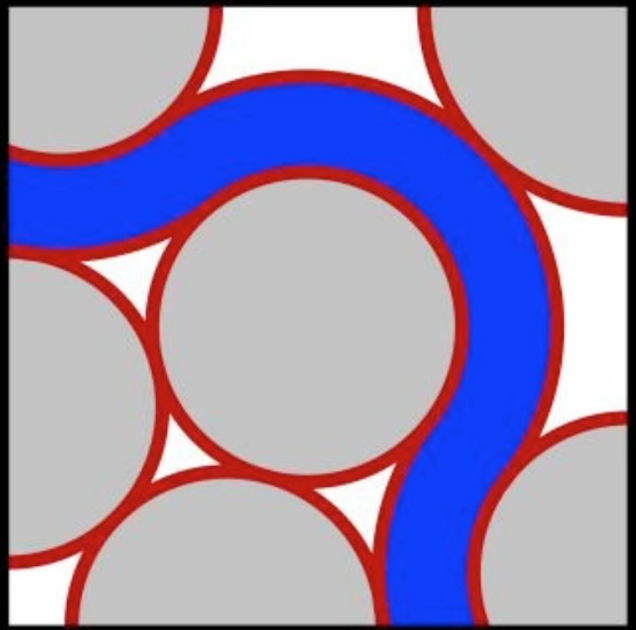


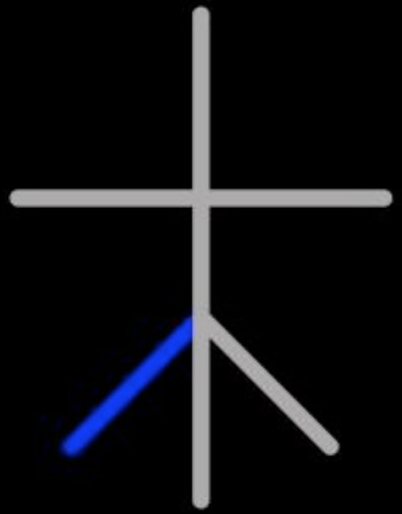


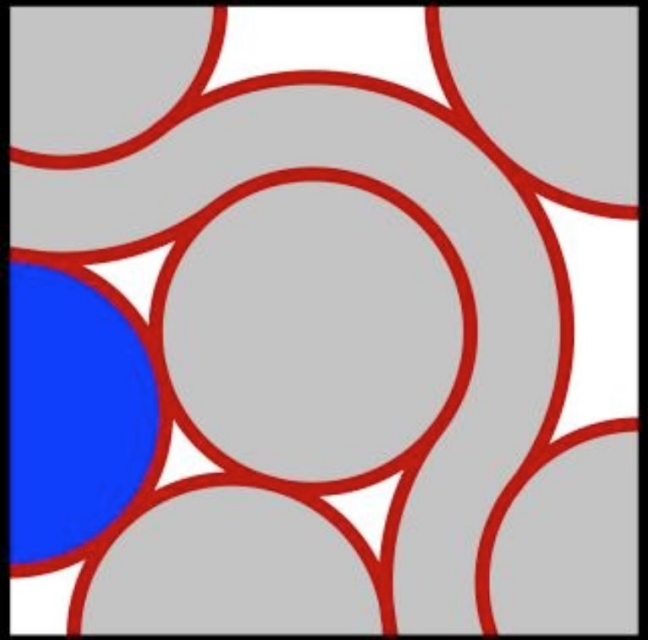
After the tree: circle packing (and rivers)



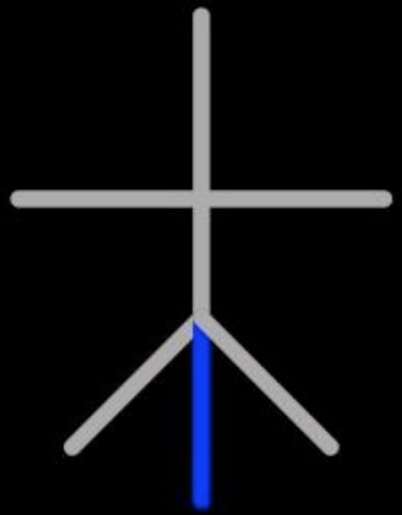


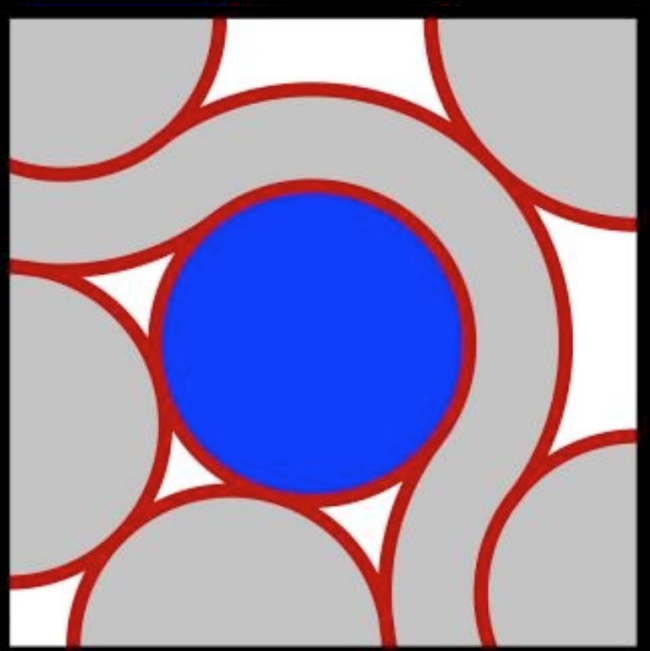
After the tree: circle packing



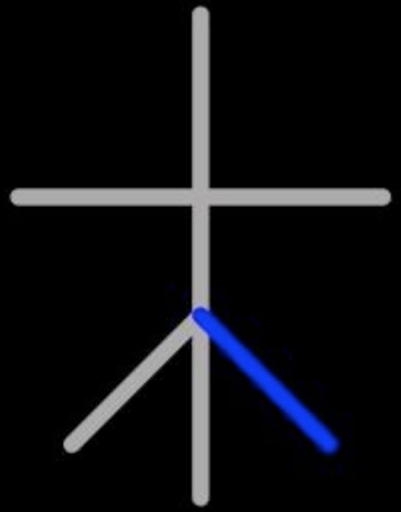


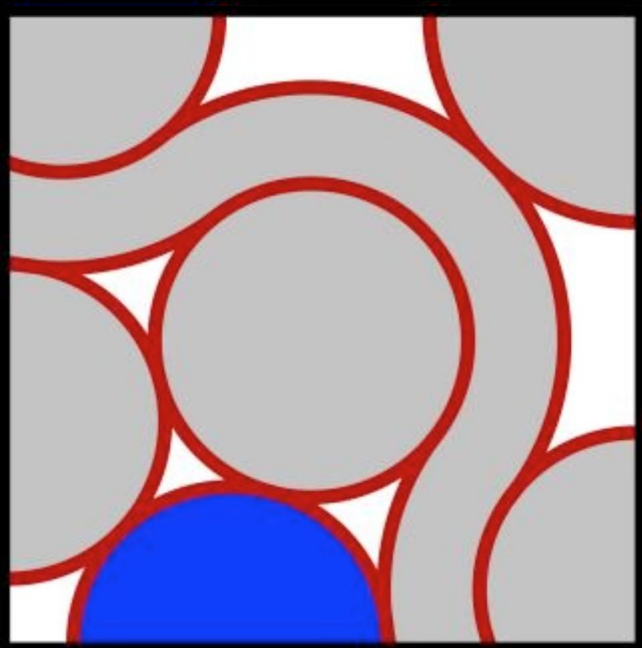
After the tree: circle packing



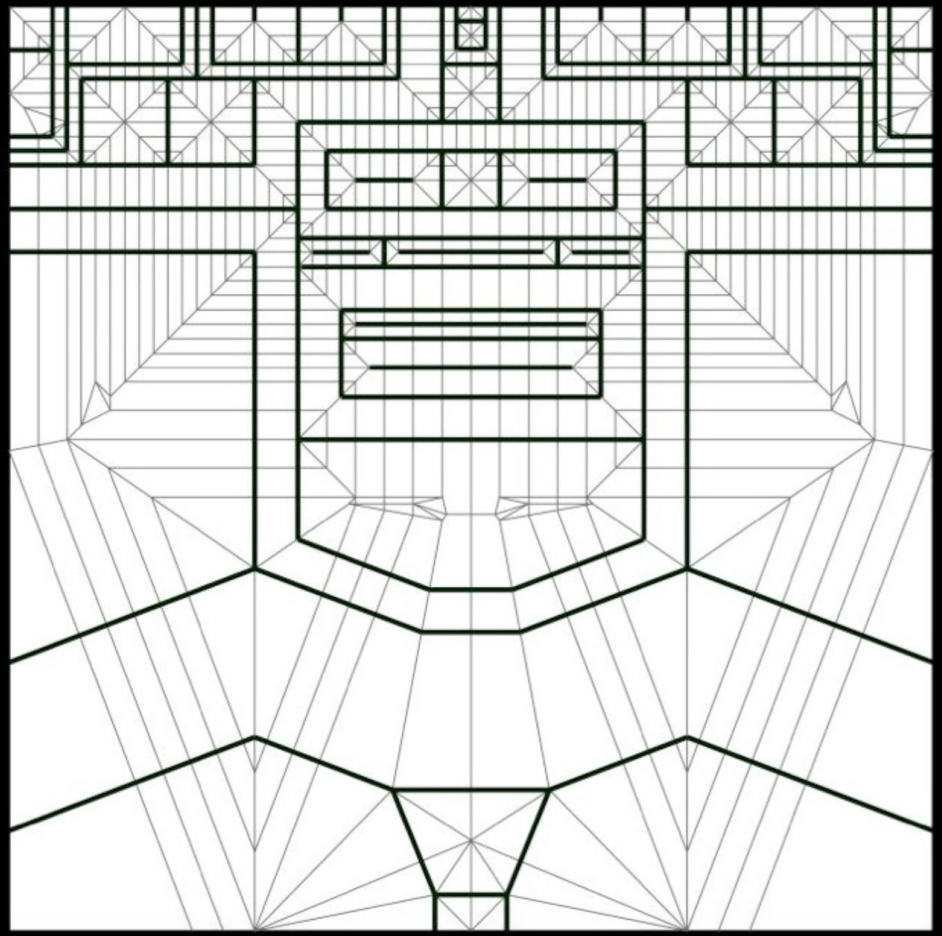


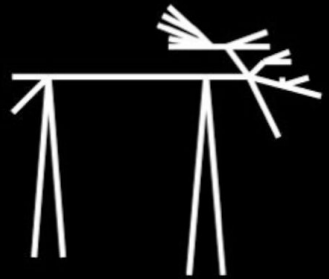
After the tree: circle packing



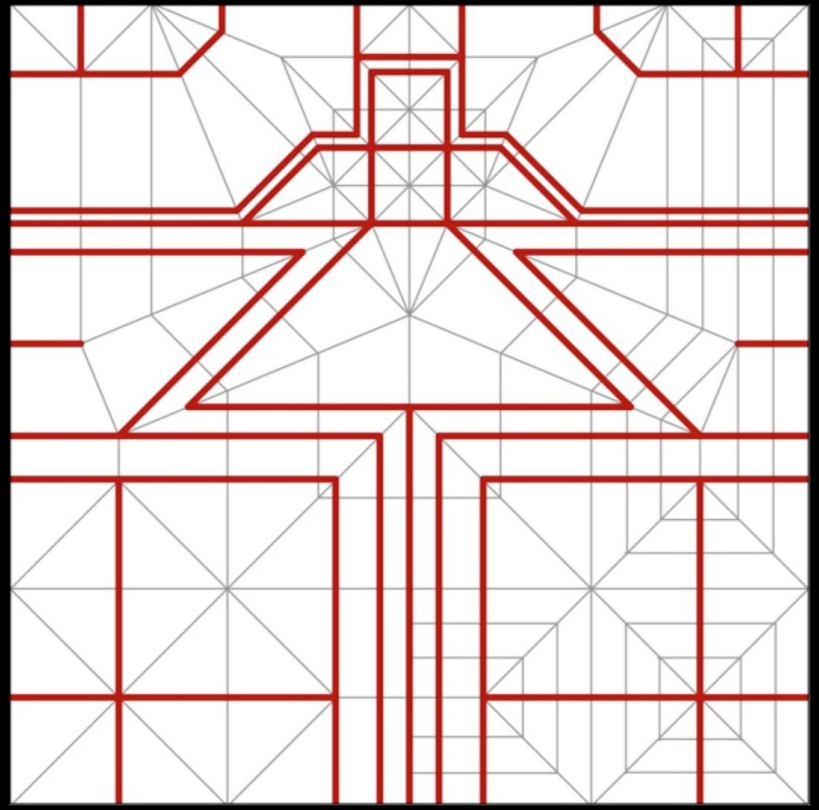


Model vs reality

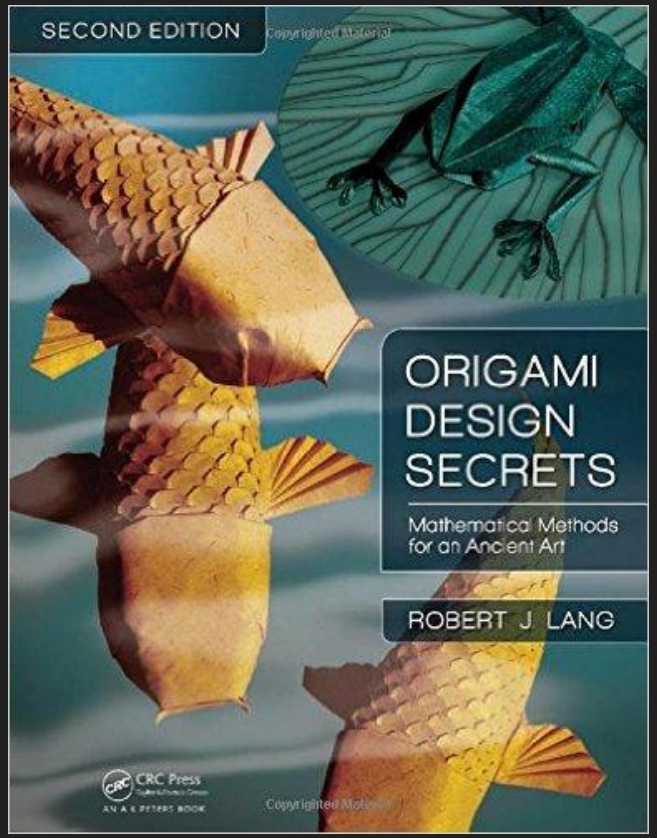




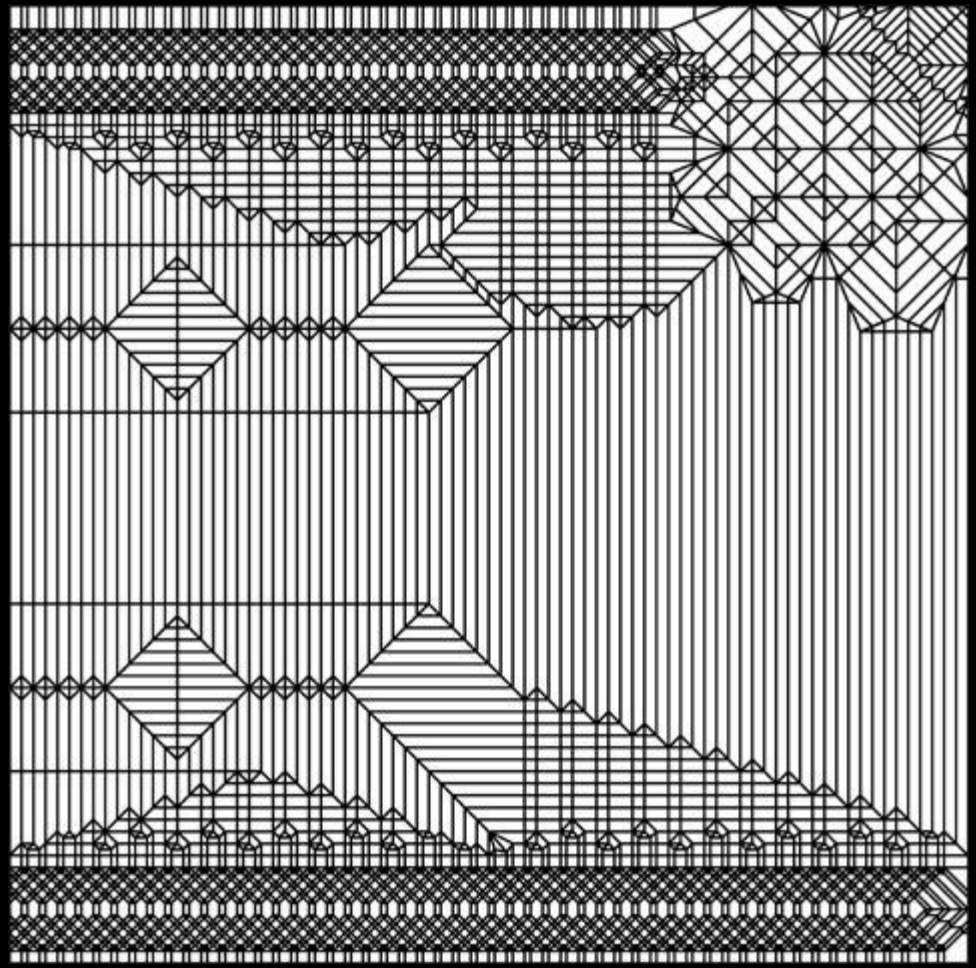
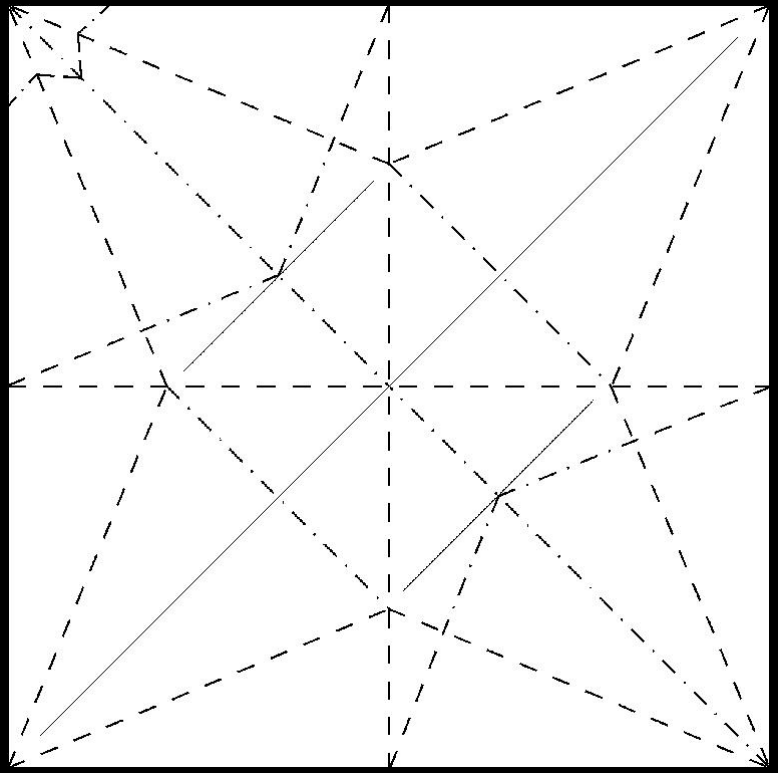
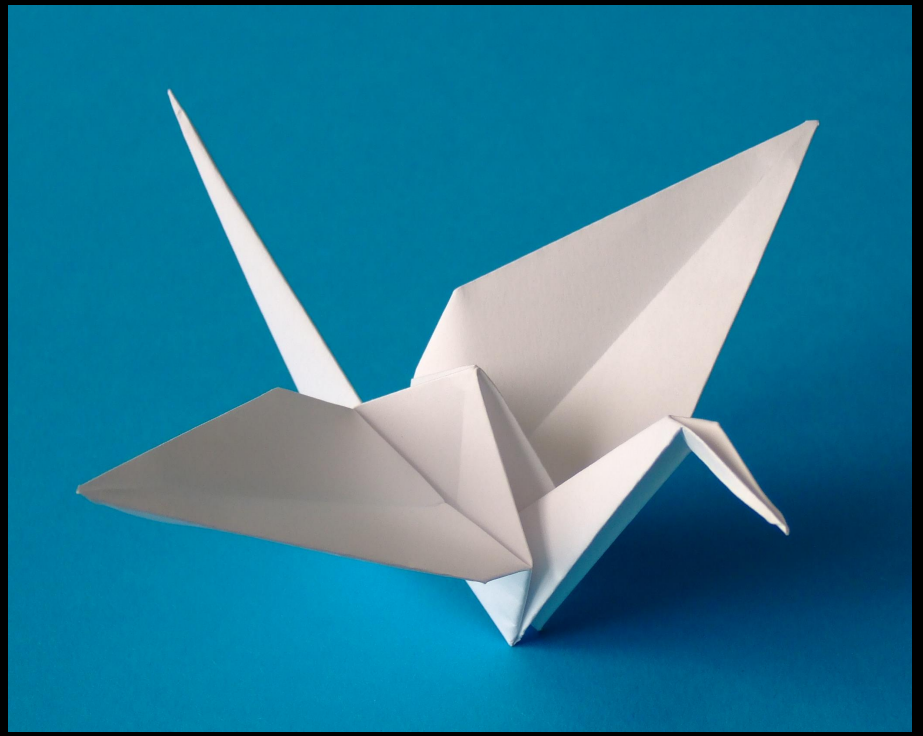
Another example



If you’re interested this is a good book to start



The fun part



Nah, just kidding