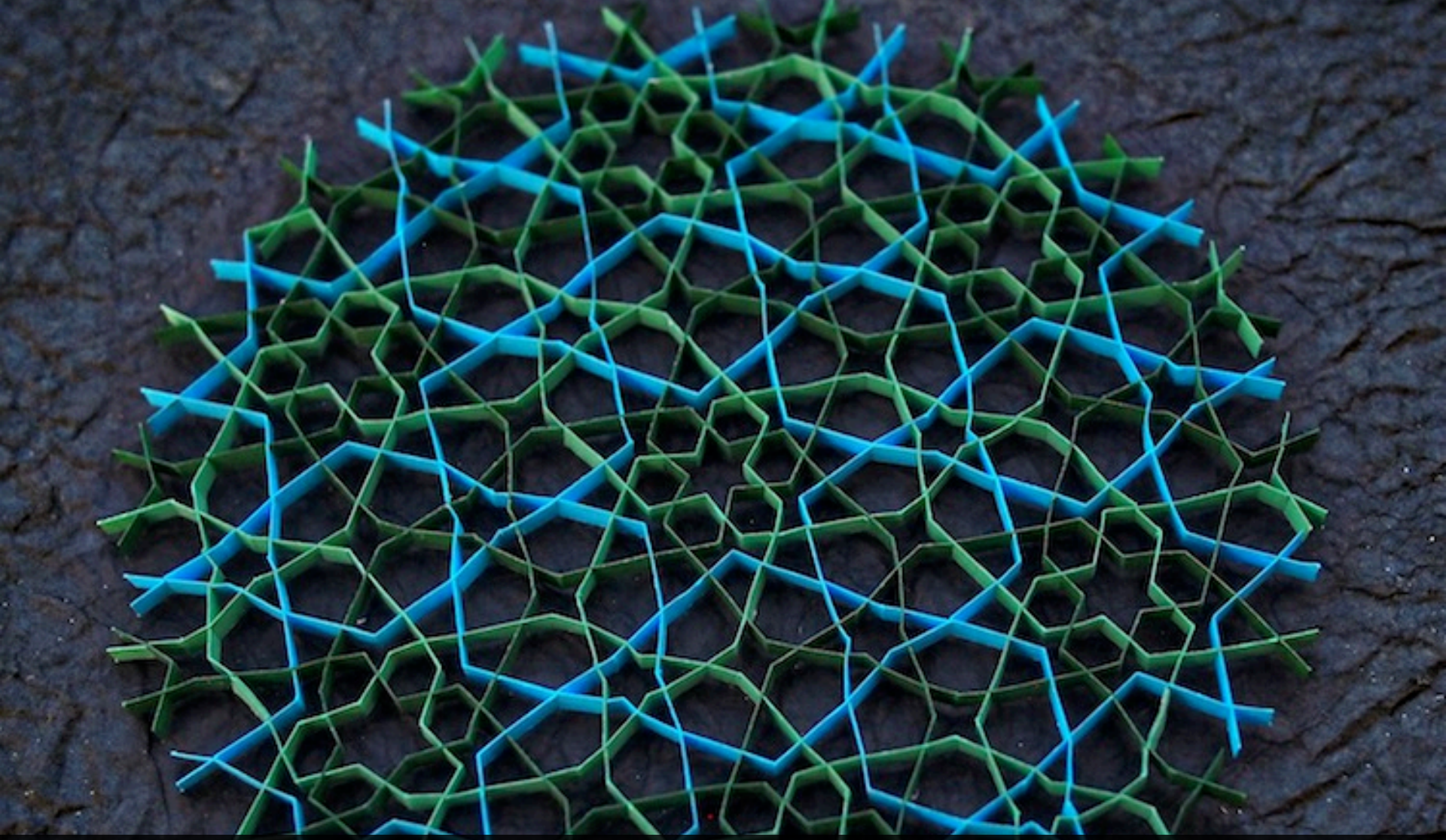
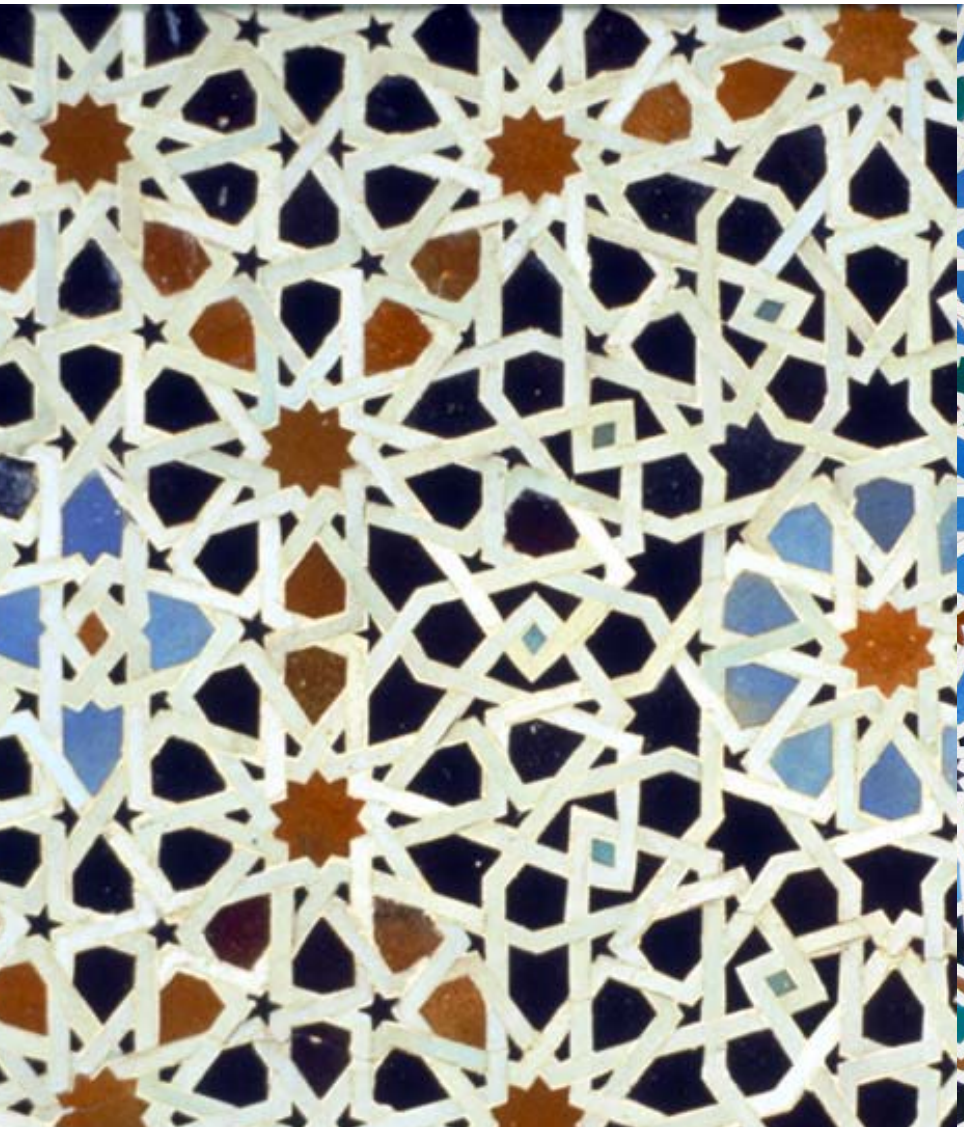
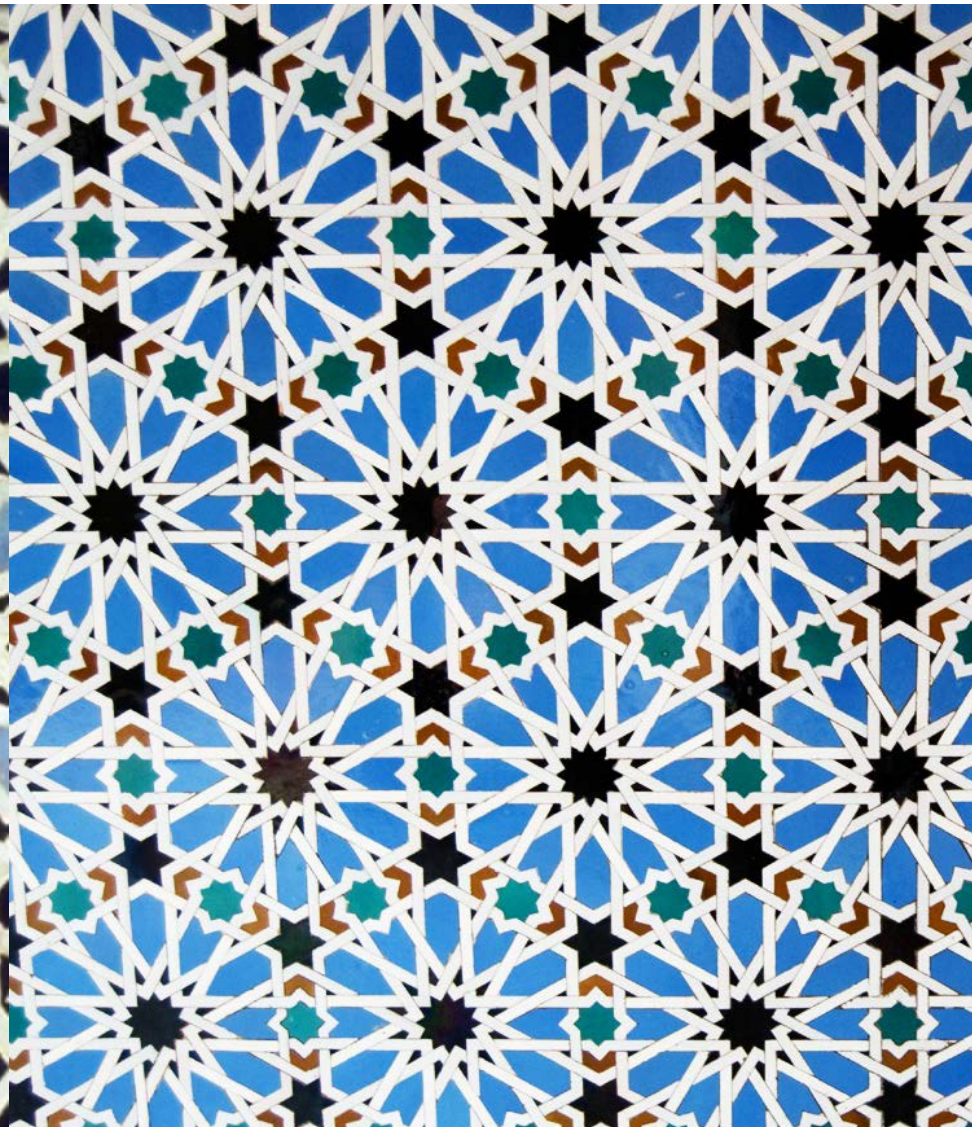


Designing Paper Sliceforms

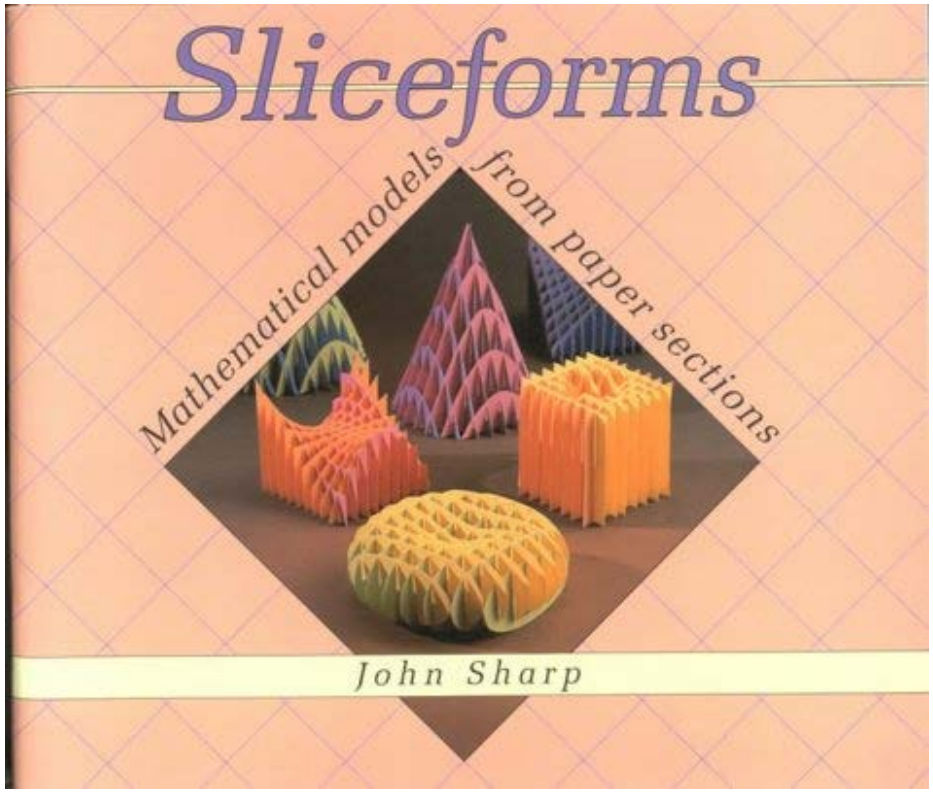
Yongquan ‘YQ’ Lu ‘16

Background – Islamic Star Patterns

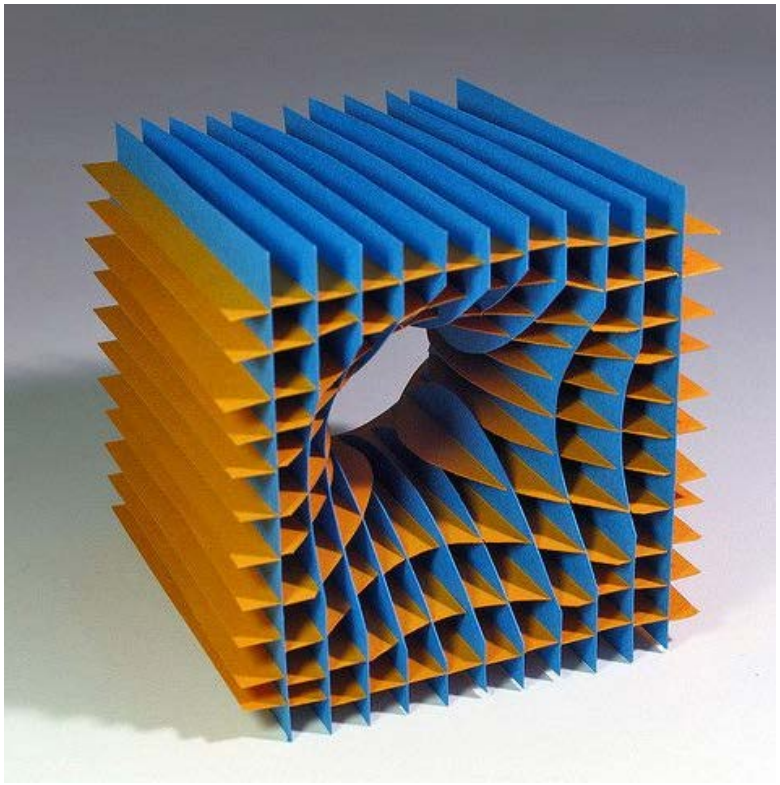




Classic Paper Sliceforms

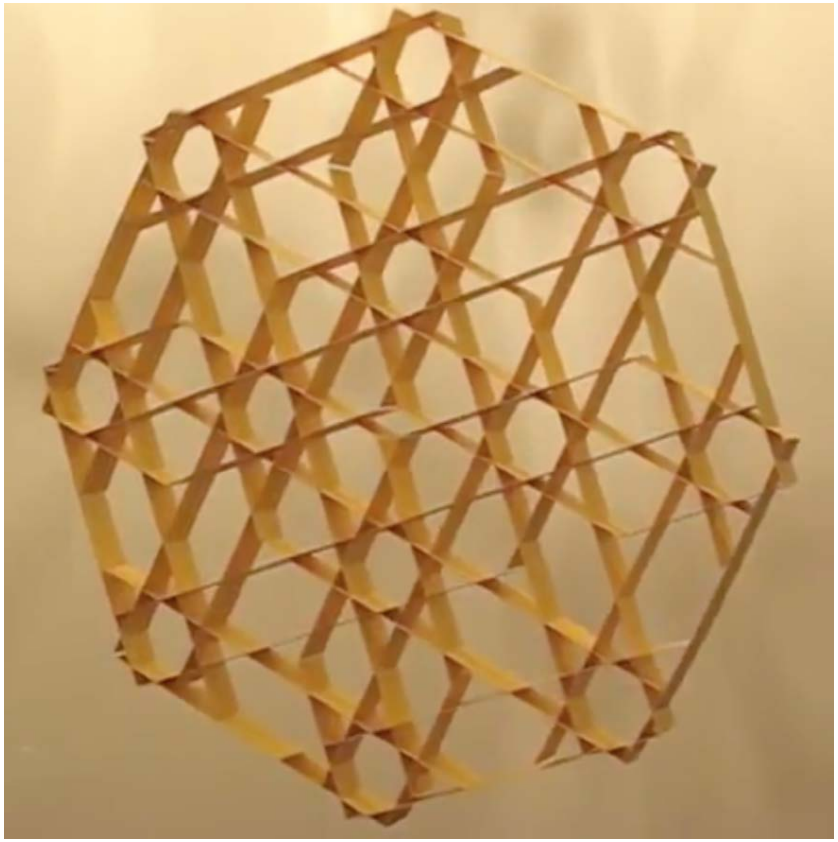


Sliceforms – Mathematical models from paper sections
John Sharp, 1994

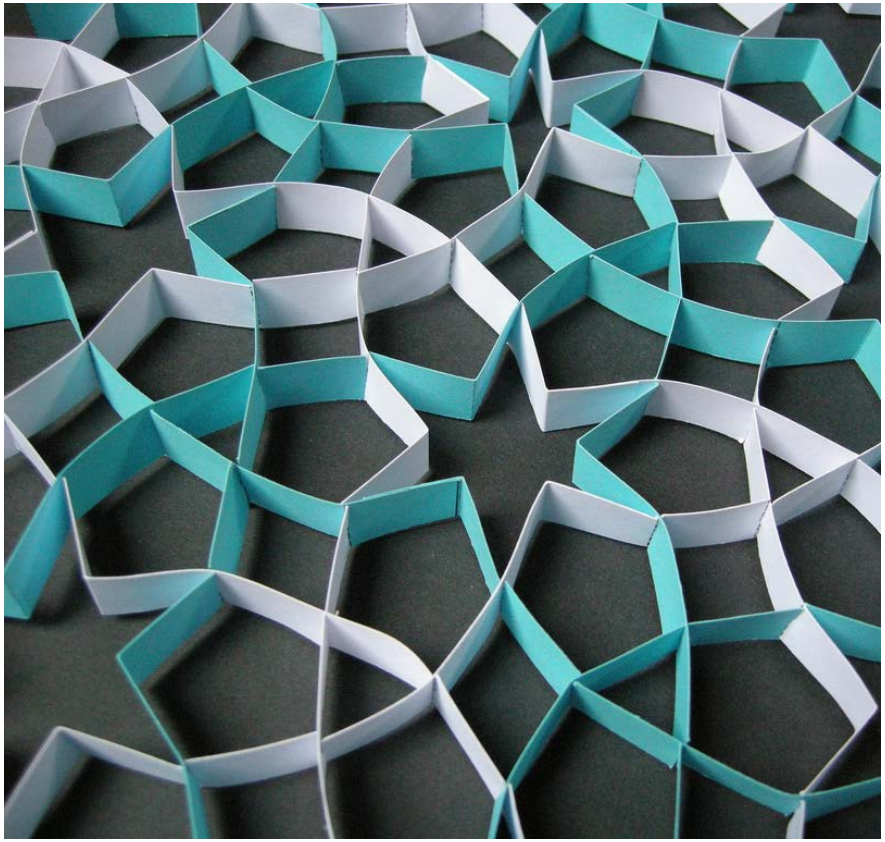


Sliceform
Richard Sweeney, 2006

Sliceforms x Islamic Geometry

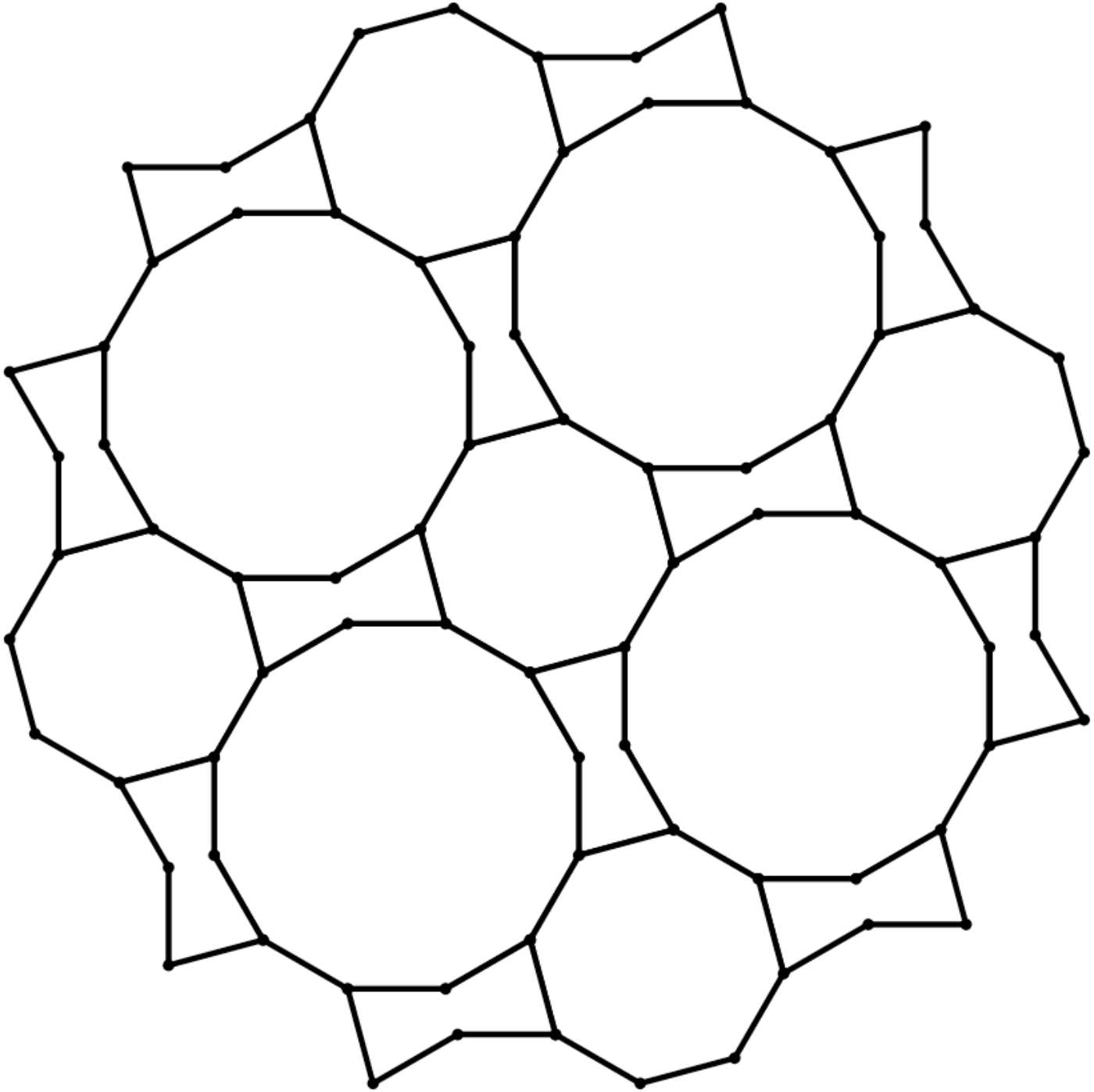


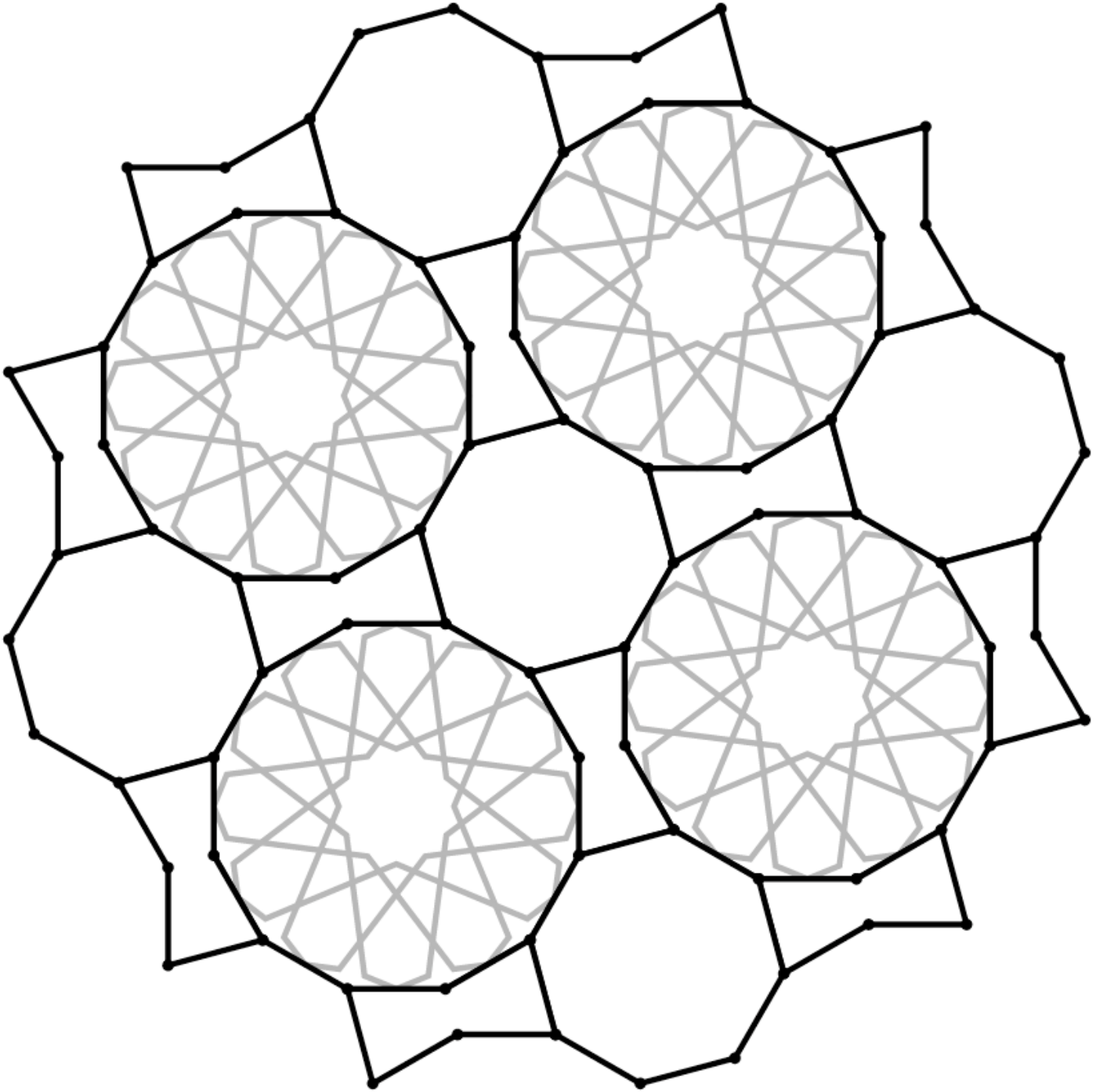
Zillij 8
Chris Palmer and Jeff Rutzky, 2009

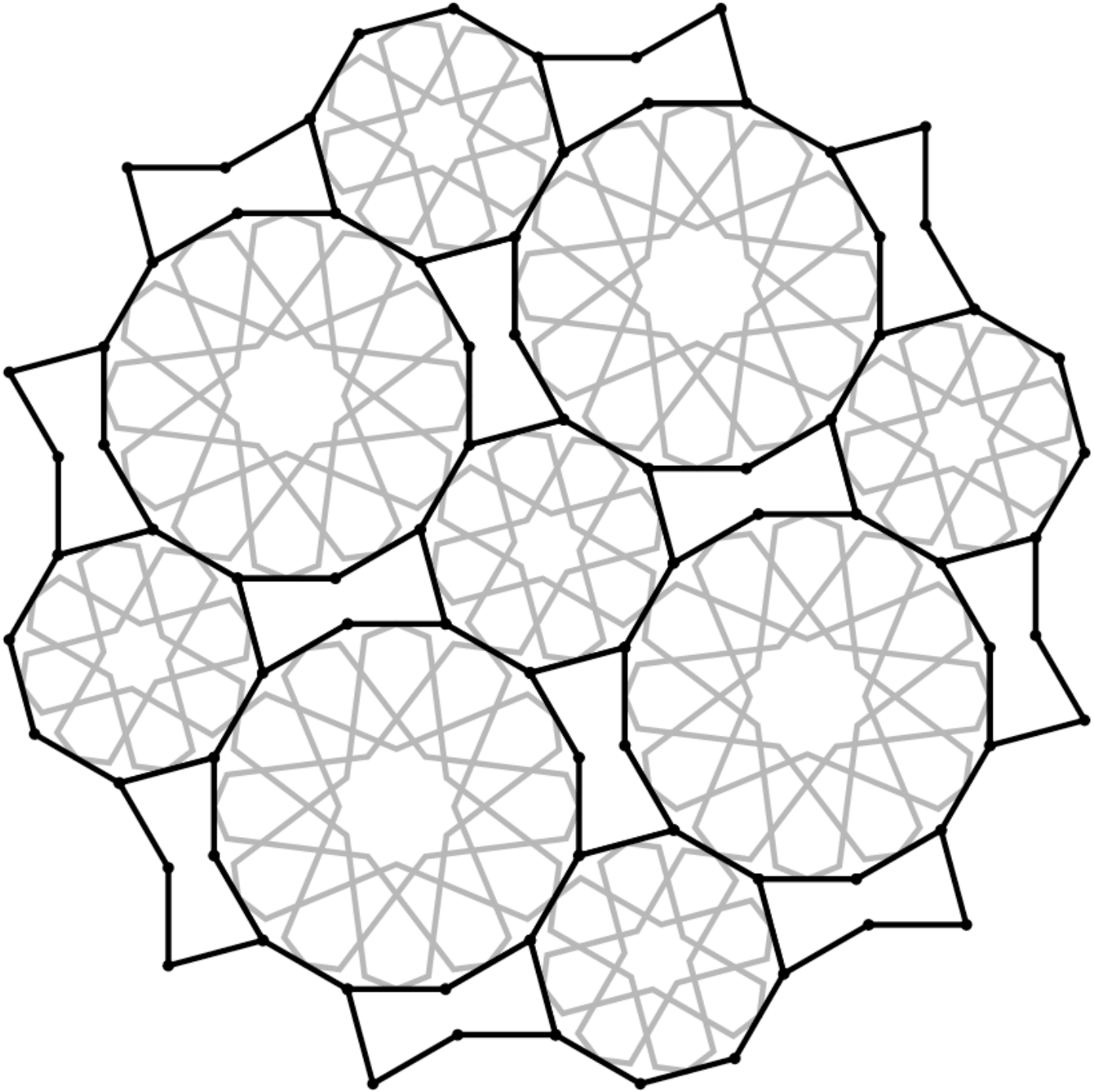


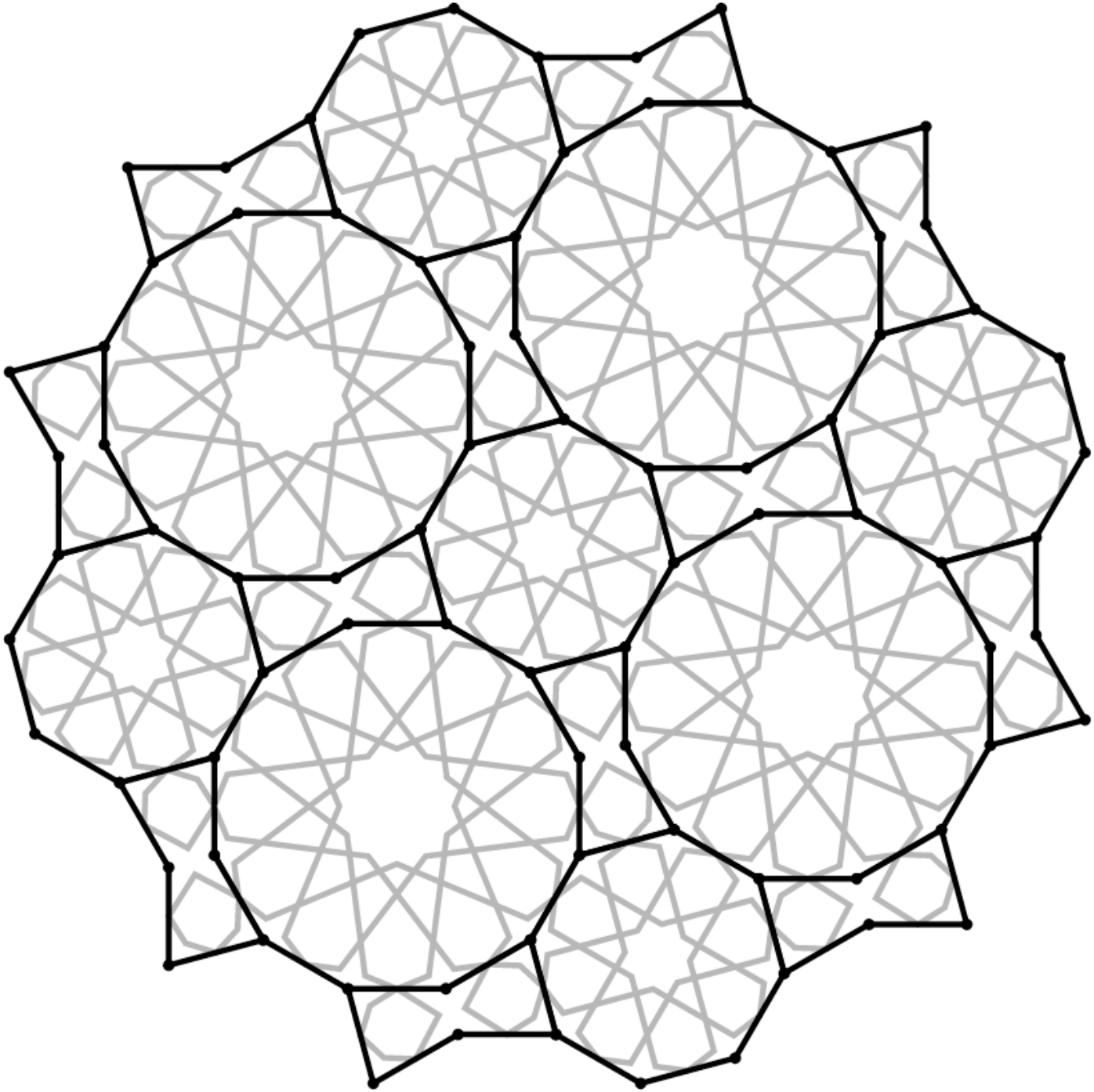
Ibn Tulun with curves
Christiane Bettens, 2009

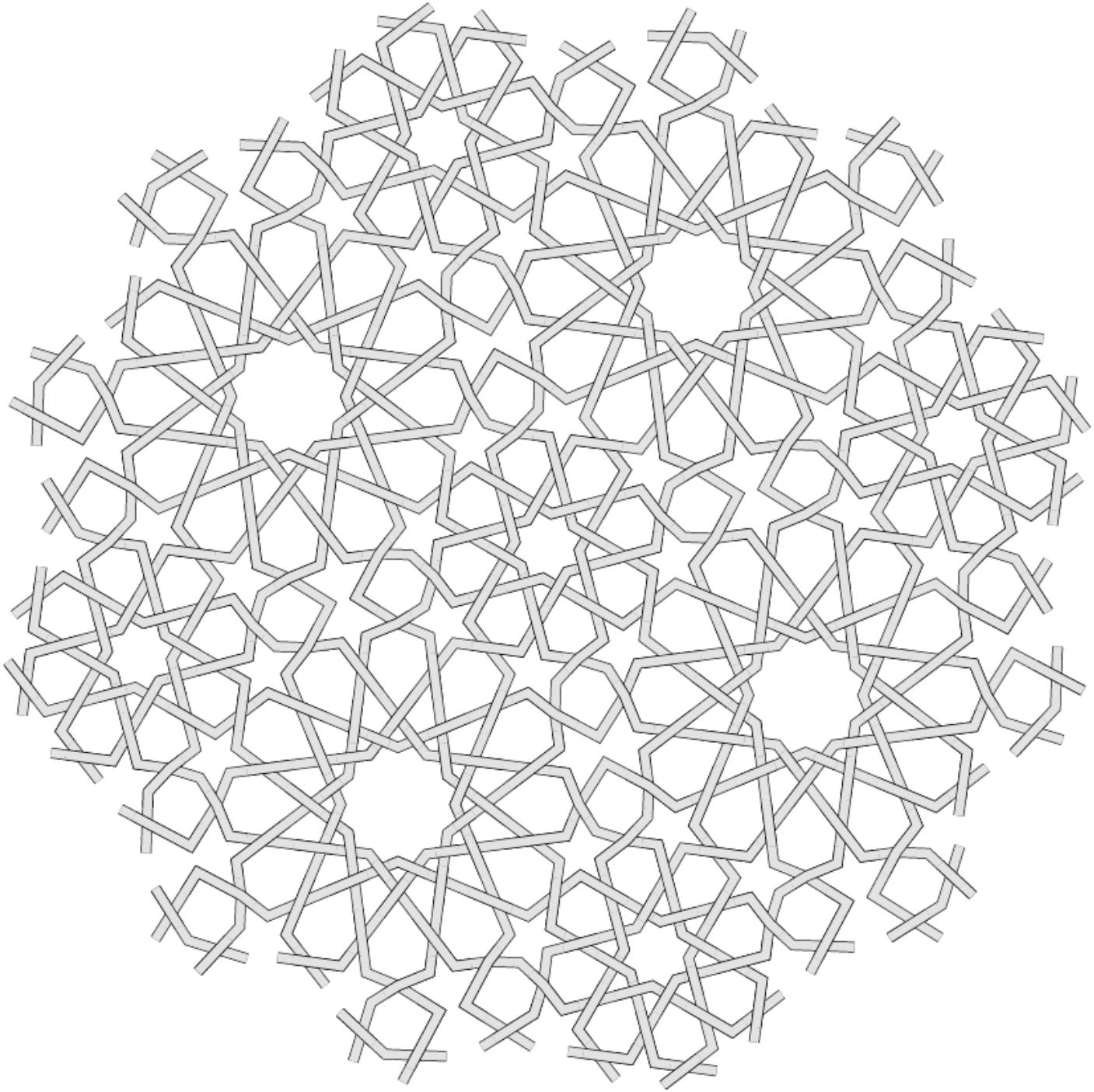
Paper Sliceform Artwork

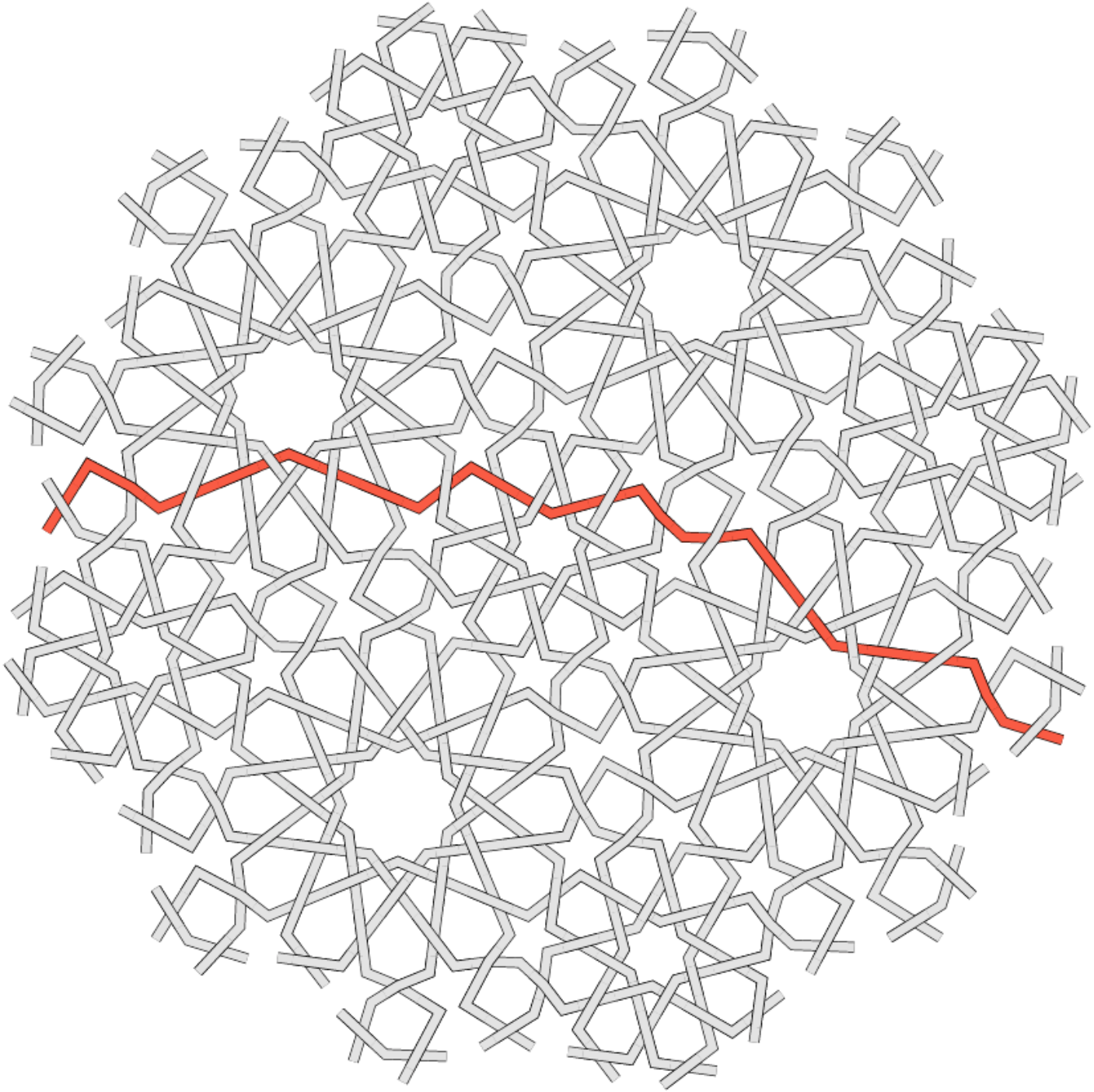








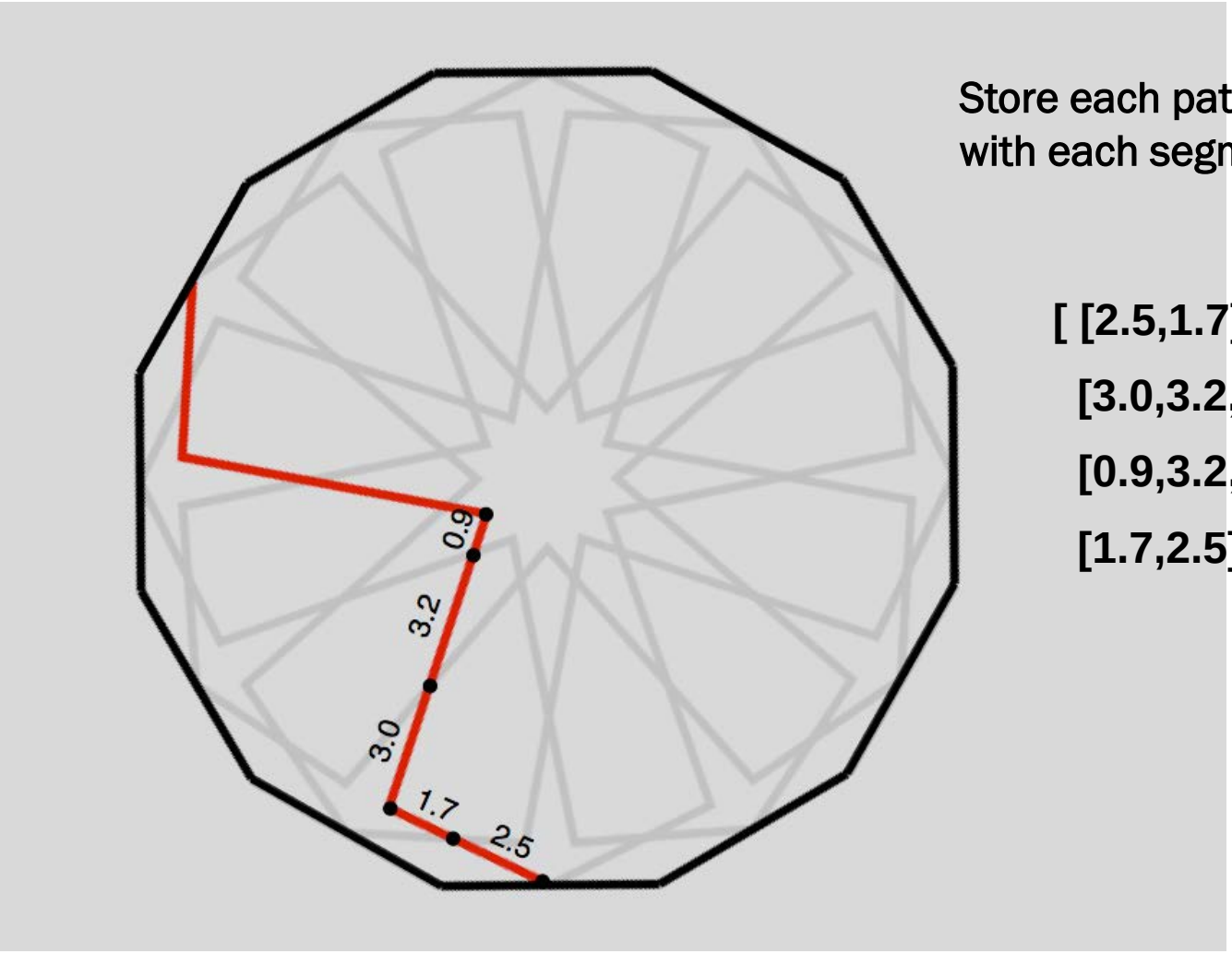




My First Attempts...


Sliceform Studio – Demo Time!

Representing patterns as data



Store each pattern as a list of segments, with each segment itself a list of lengths

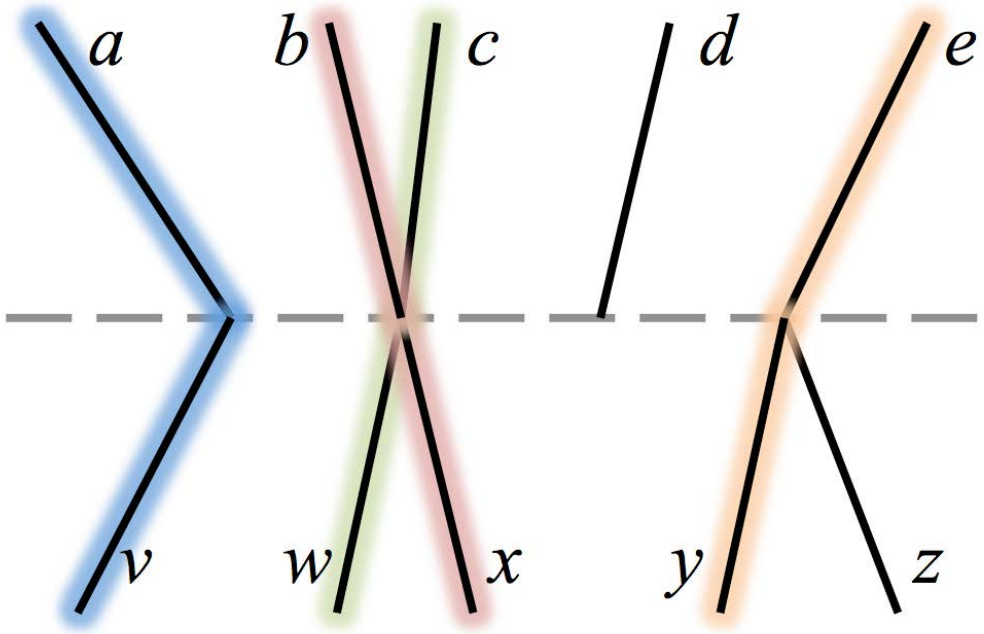
[[2.5,1.7] ,

[3.0,3.2,0.9],

[0.9,3.2,3.0],

[1.7,2.5]]

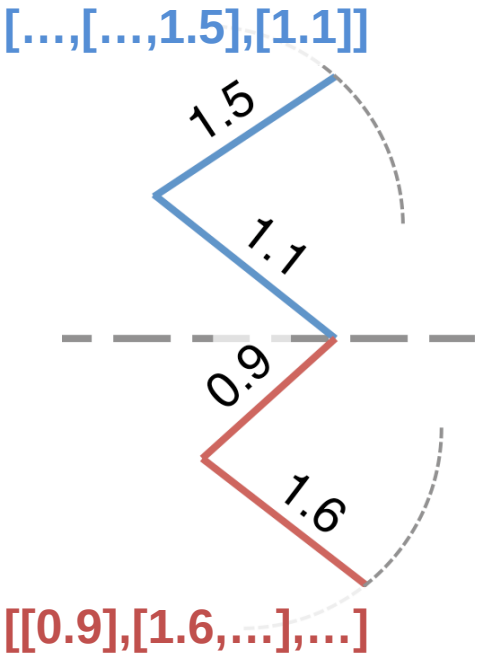
Tracing patterns across tiles



If there is only one corresponding pattern, match it up

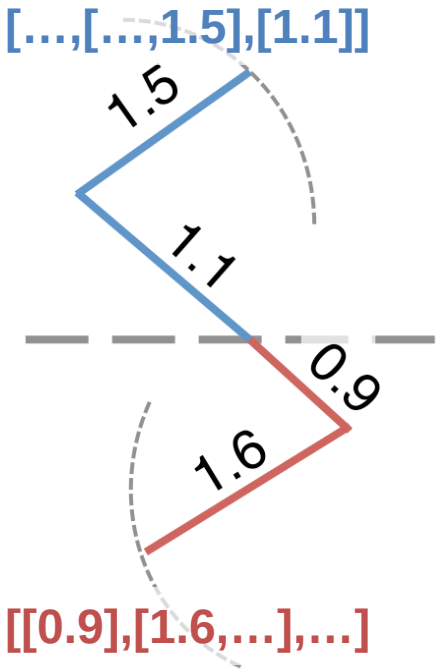
If there are multiple patterns terminating at that point, match up the pair with the most similar incident angle

Concatenating pattern lists



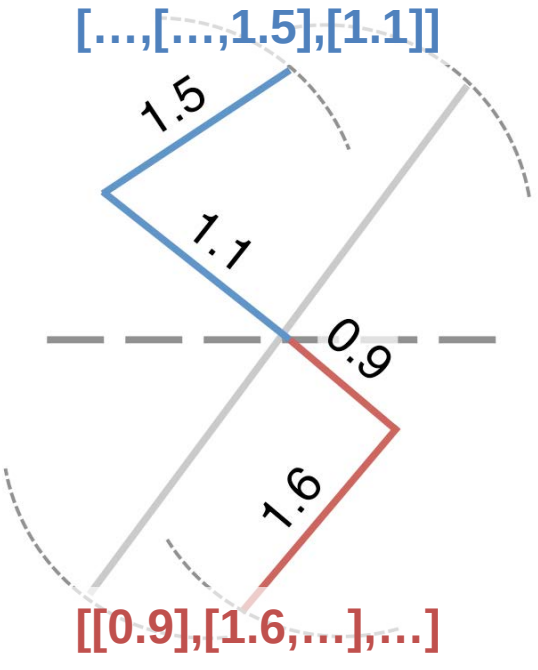
Case 1: patterns meet with different incident angles

[…,[…,1.5],
[1.1],
[0.9],
[1.6,…],…]



Case 2: patterns meet with same incident angle

[…,[…,1.5],
[2.0],
[1.6,…],…]

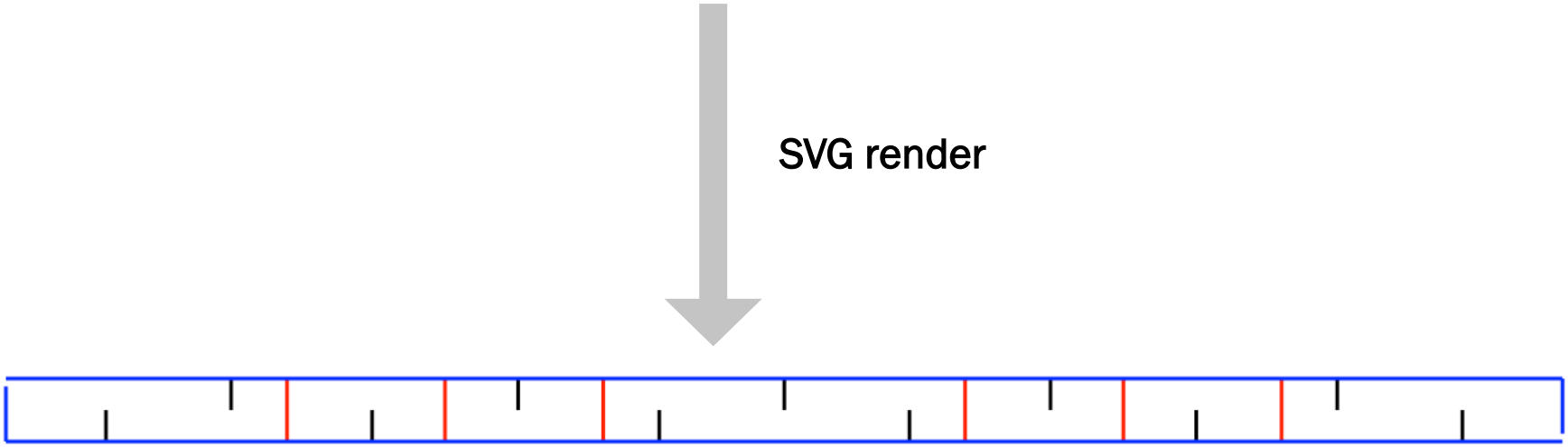


Case 3: patterns meet while crossing another strip

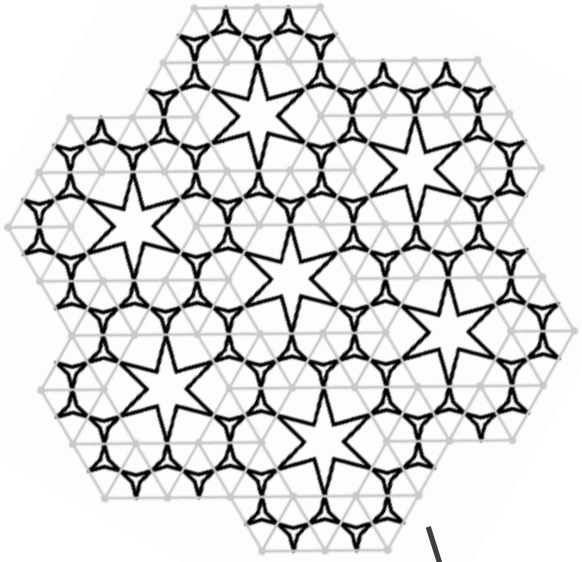
[…,[…,1.5],
[1.1,0.9],
[1.6,…],…]

Rendering strips in SVG

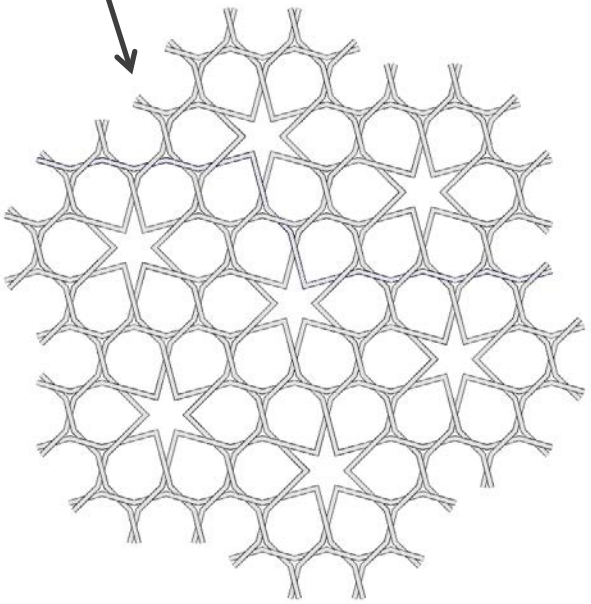
[[20,25,11.1], [17,14], [14,17], [11.1,25,11.1], [17,14], [14,17], [11.1,25,20]]



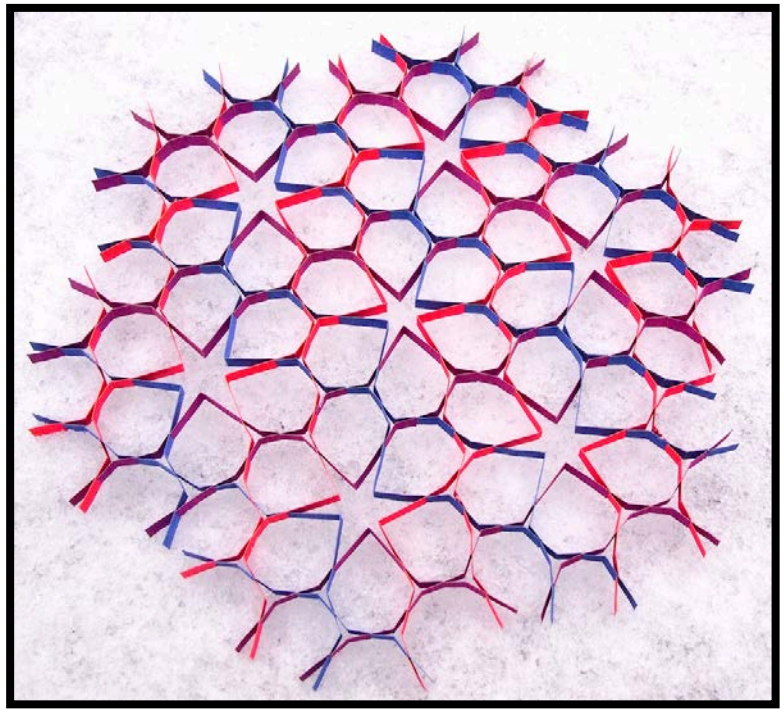
Recap



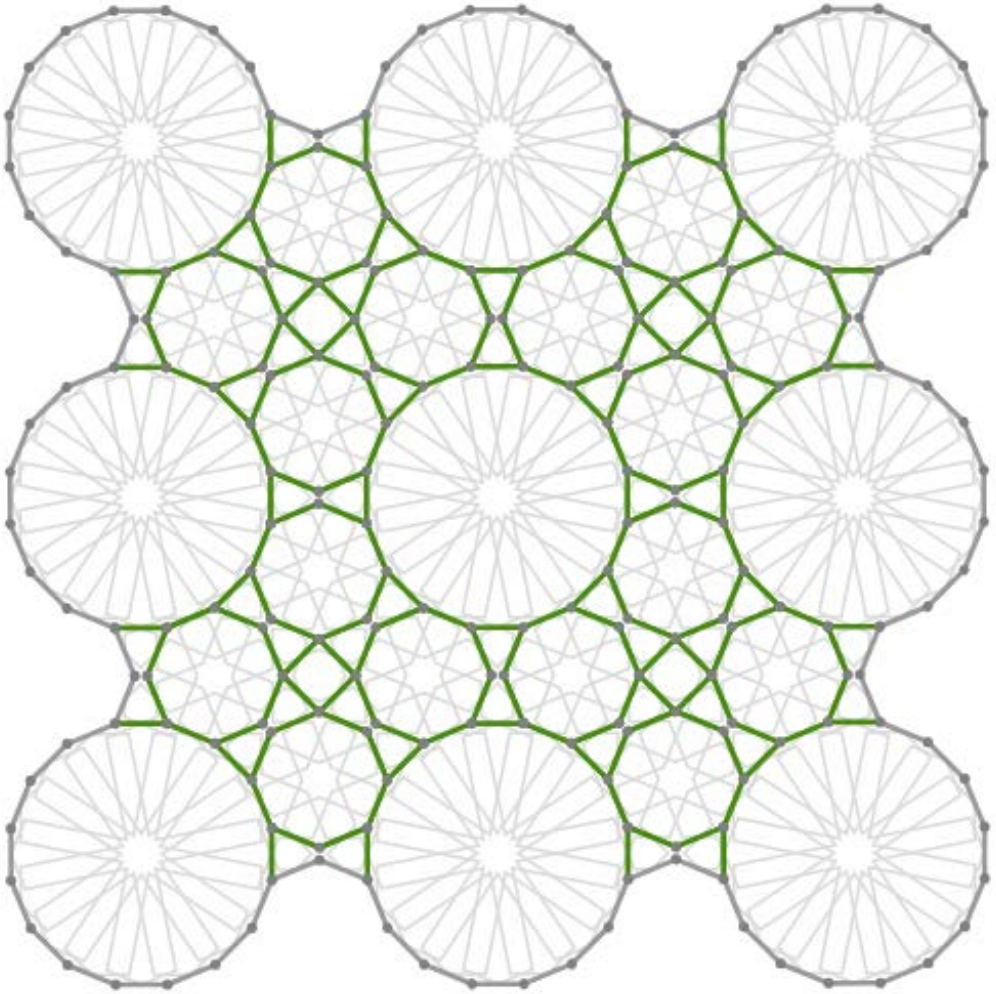
calculating lengths
tracing strips across tiles
concatenating patterns



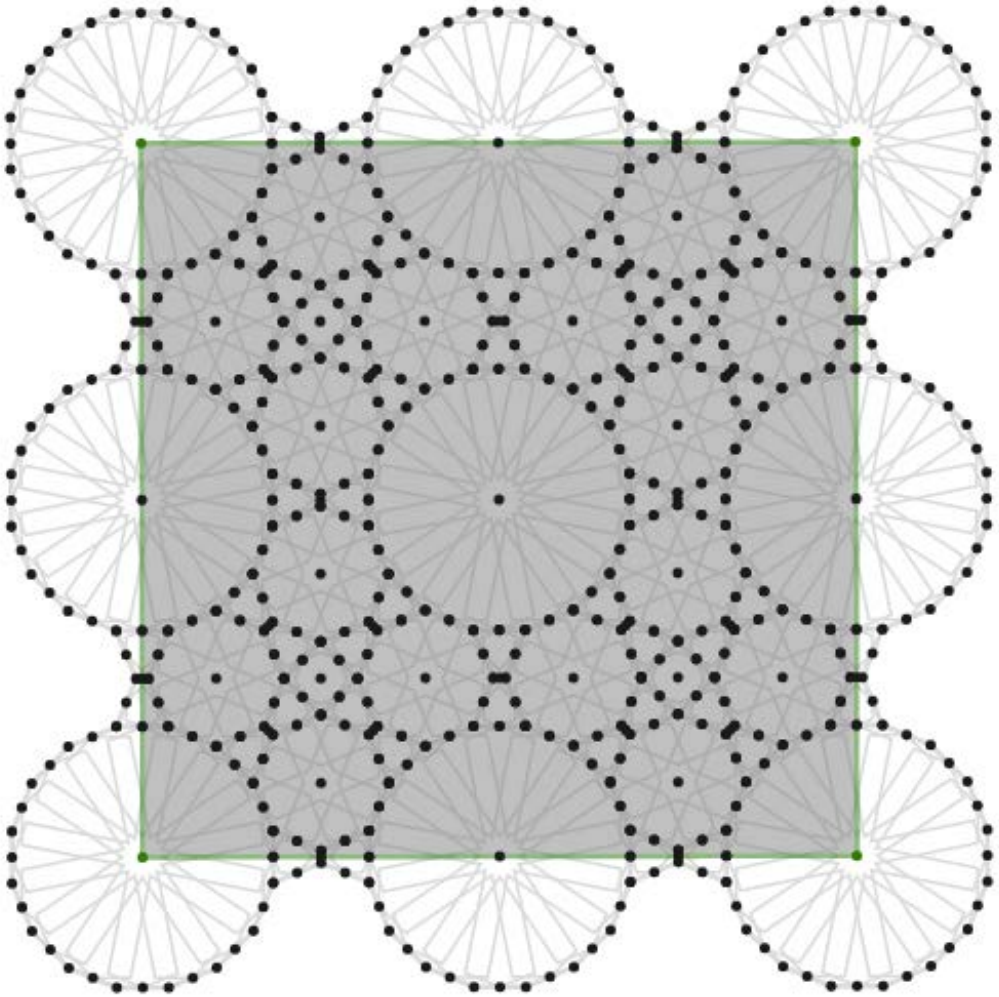
generate SVGs
laser cut paper
hand-assemble paper strips



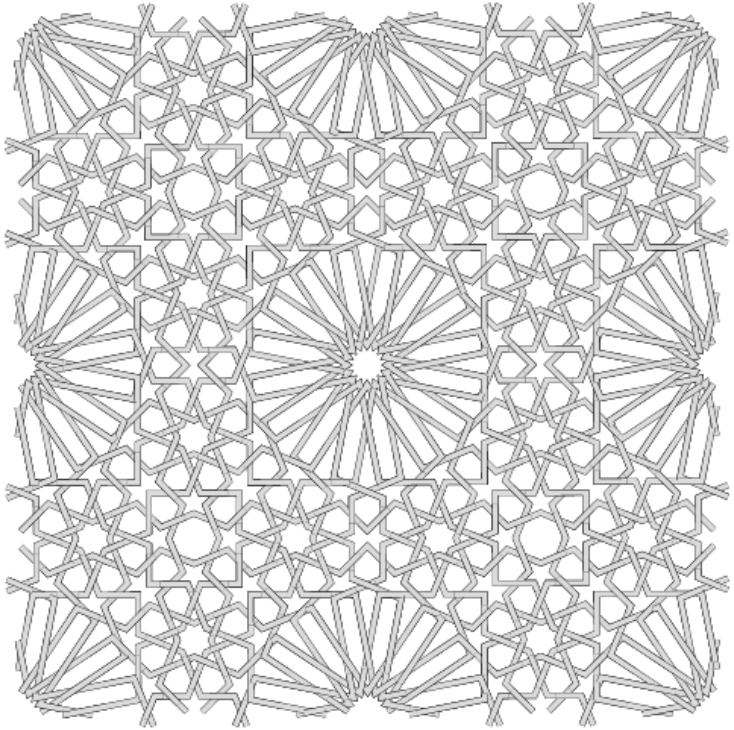
Extension 1 – Cropping



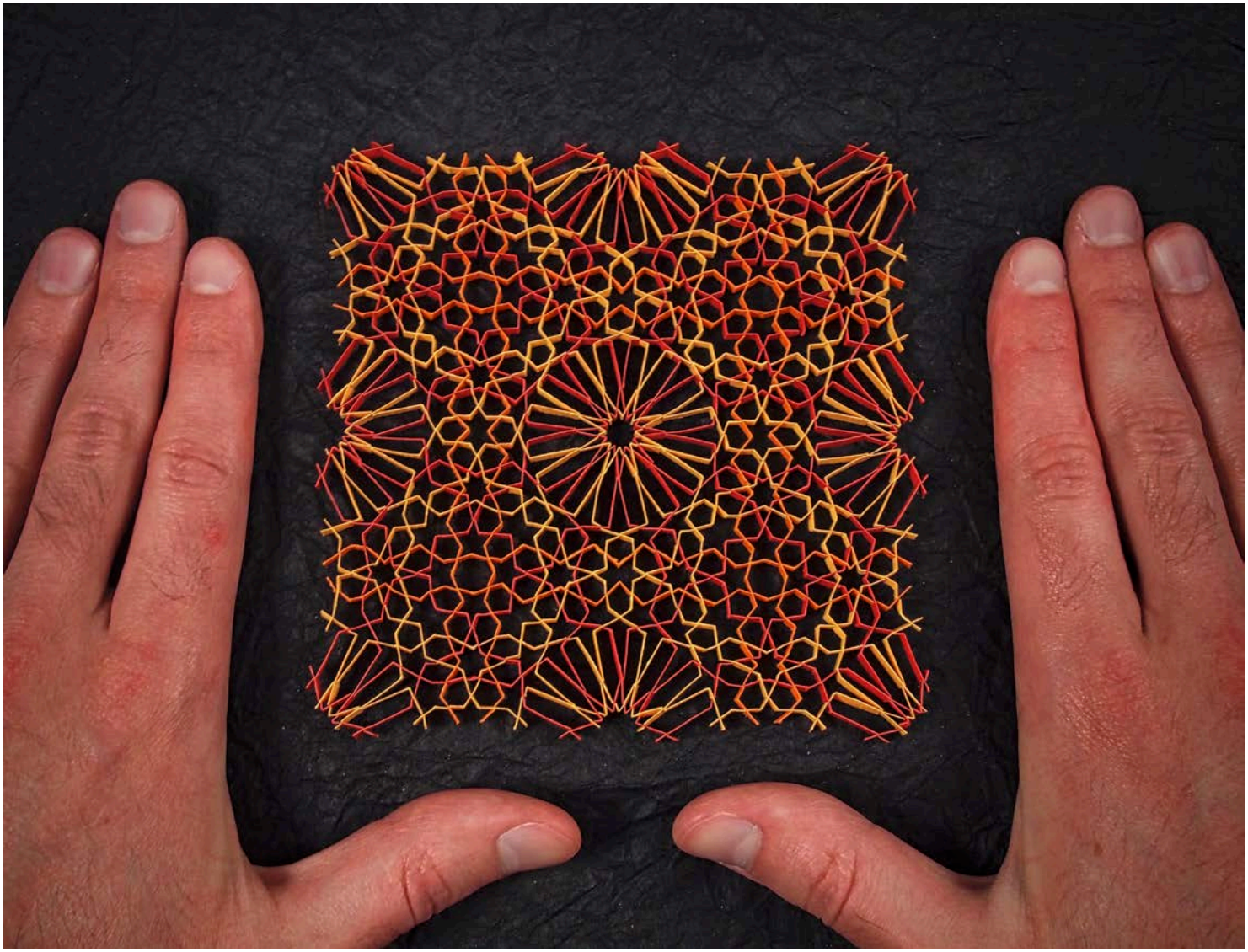
Extension 1 – Cropping



Extension 1 – Cropping

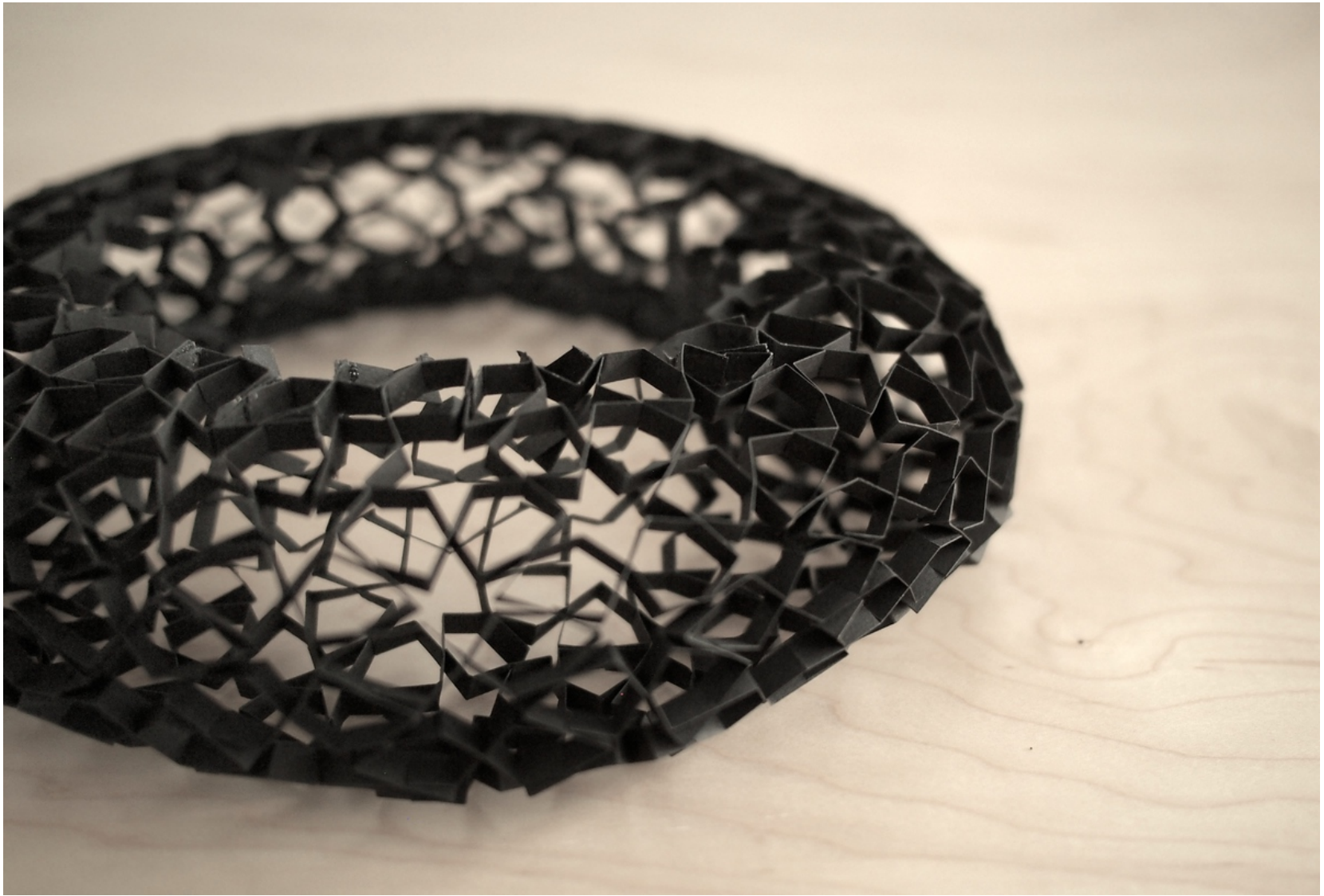


Extension 1 – Cropping

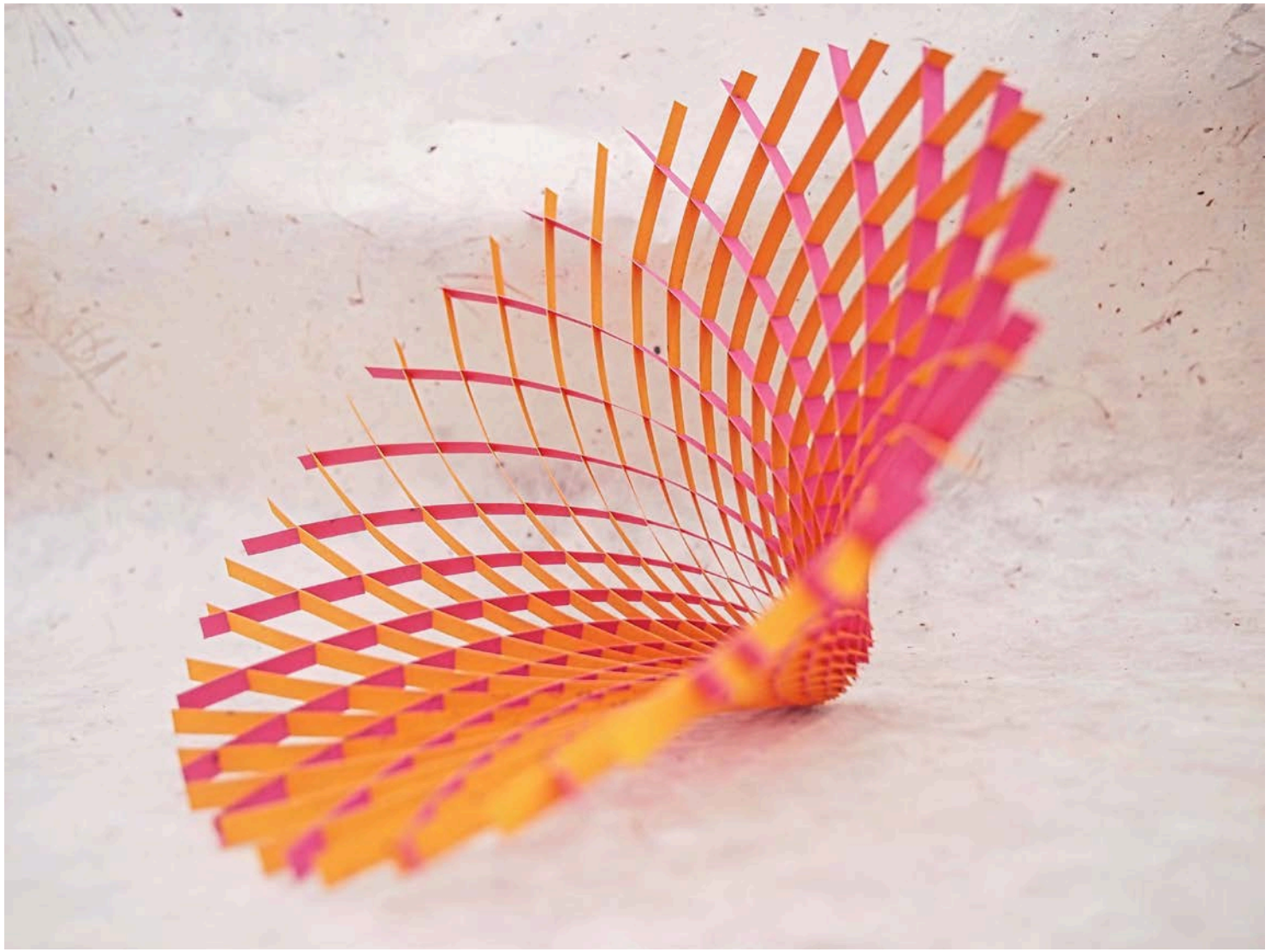


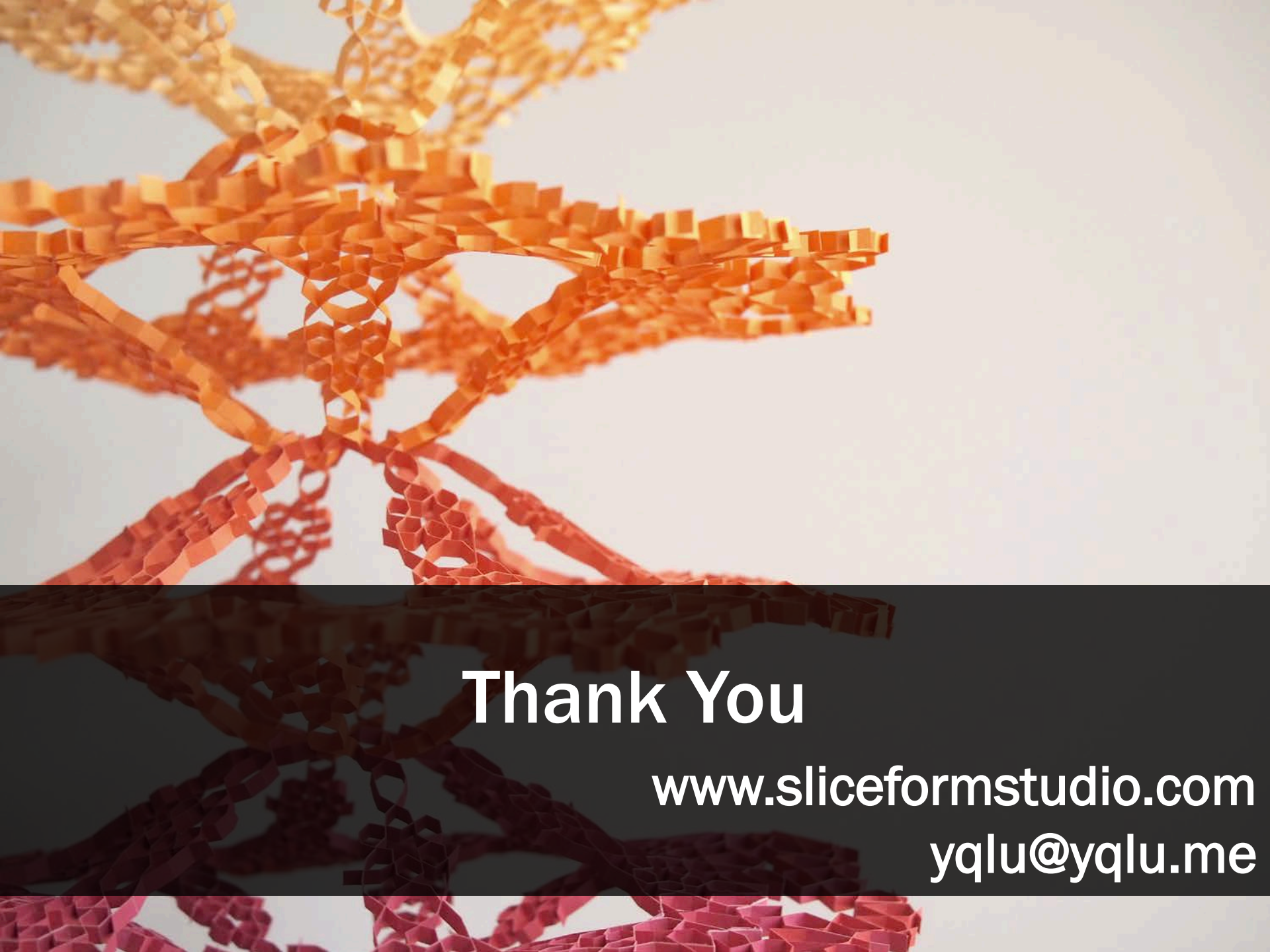
Extension 2 – 3D Sliceforms

Extension 2 – 3D Sliceforms



Extension 3 – Tile-less Sliceforms





Thank You

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yqlu@yqlu.me