





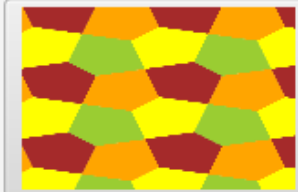
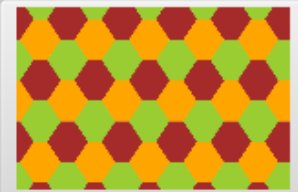
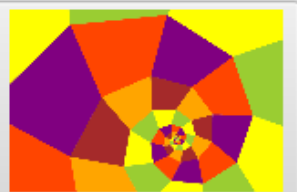
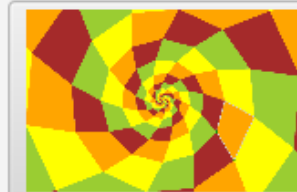
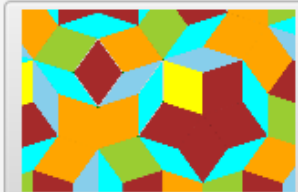
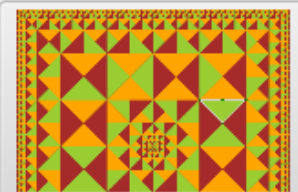
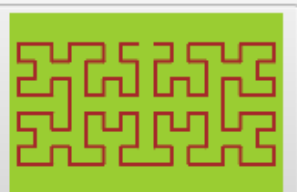

Morphing Tessellations

Tis Veugen

Fashion Tech Farm, 13 March 2026



Tissellator

			
Triangle	Quadrilateral	Pentagon	Hexagon
			
Spiral	Circle	Non-periodic	Fractal
			
Space-Filling Curve	Reptile		



Morphing example – IH28

- Click on: [URL to 1_ani_ih28.mp4](#)
- Based on reworked Escher's plates:
3, 14 and 20

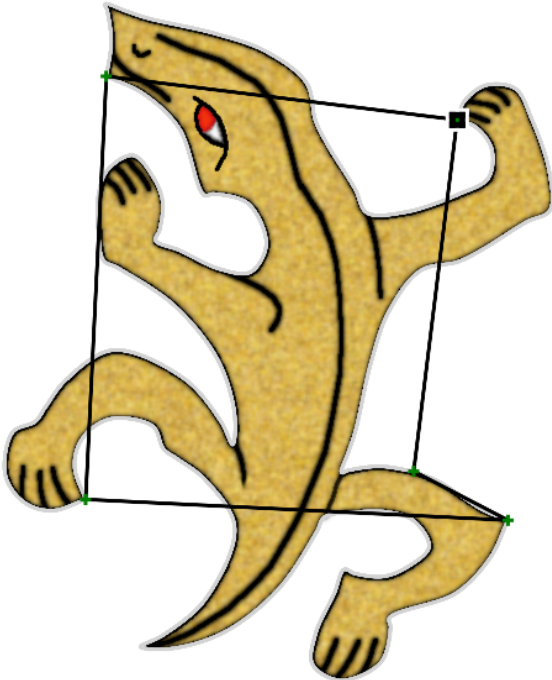
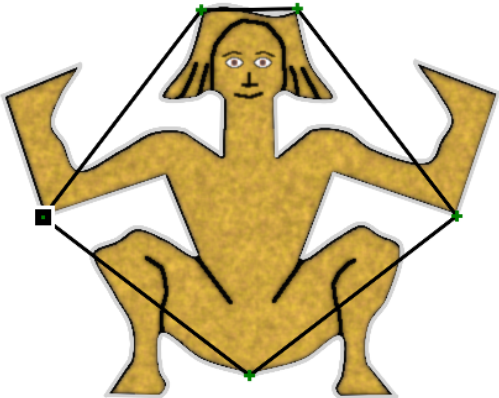


Constraints

- Both tessellations of same type
- Morphing of a single prototile to another one
- Photographic/painted imagery
- Automatic, non-interactive transition
- Few control parameters
 - Unknown length of final gif animation



Morphing prototiles



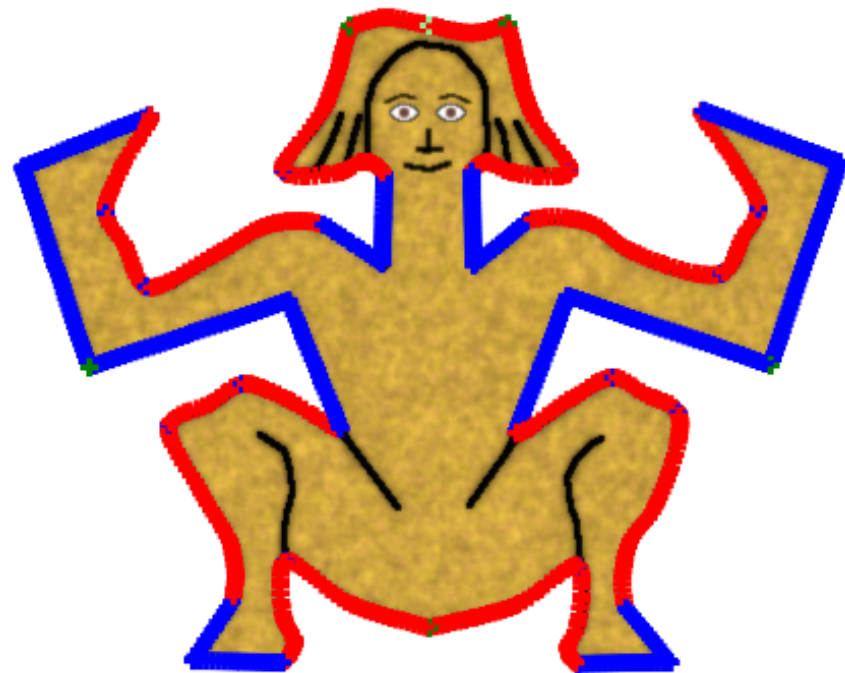
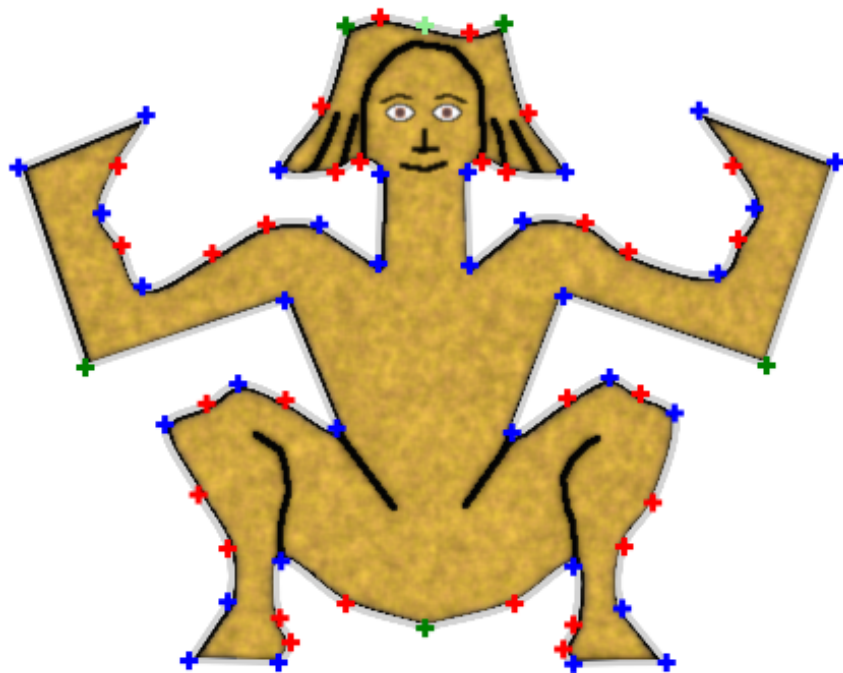


Morphing phases

- Phase 1, for prototile 1
 - Make outline projectable on edge
- Phase 2, for both prototiles 1 + 2
 - Global rotation
 - Corners moving
 - Interpolate outlines between corners
 - Blending of both tessellations
- Phase 3, for prototile 2
 - As phase 1, in backward direction

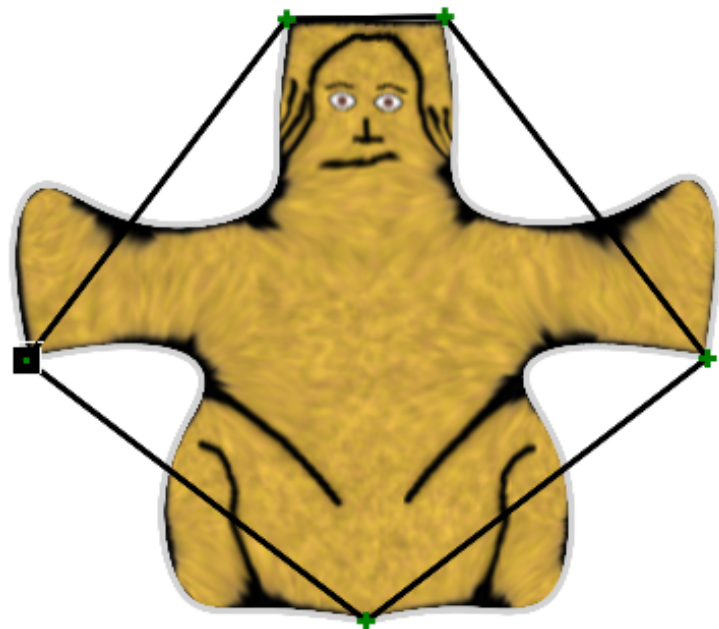
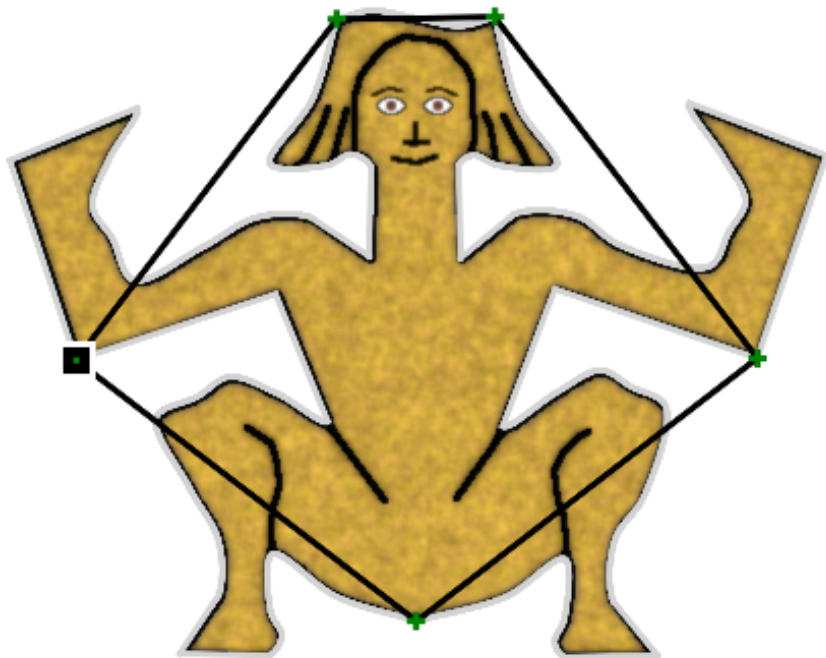


Prototile outline





Prototile projectable





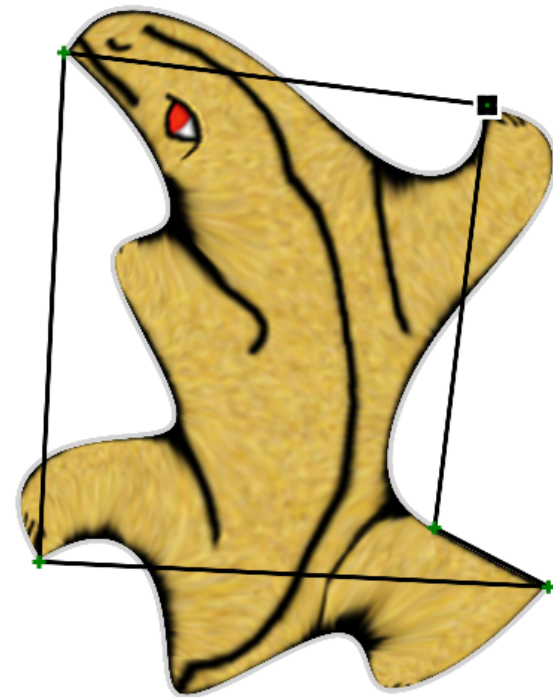
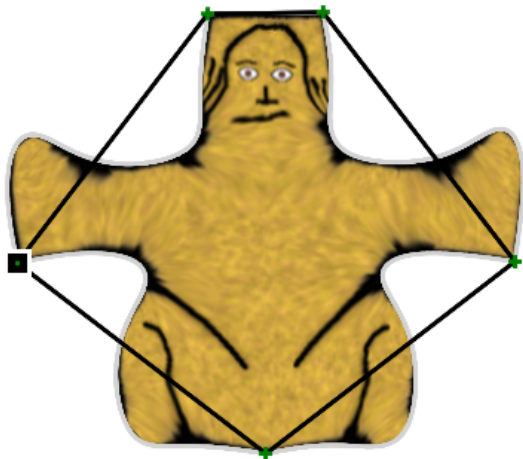
Phase 1 algorithm

- Literature?
 - Bridges paper of Kevin Lee
 - Benchmark: Curly Elephants
- Own algorithm:
 - Moving average of outline points
 - Deltas limited to parameter “maximum delta”
 - Remove outline points that are close to each other



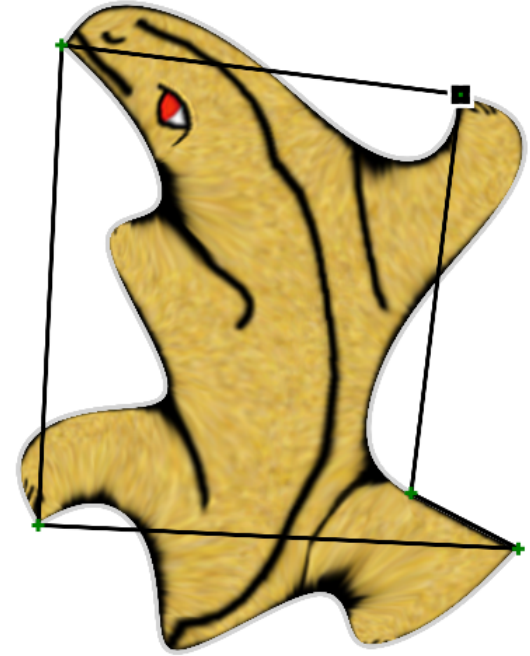
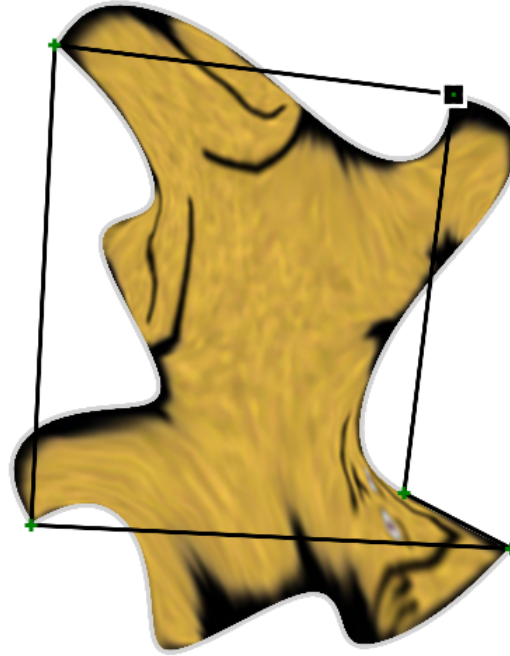
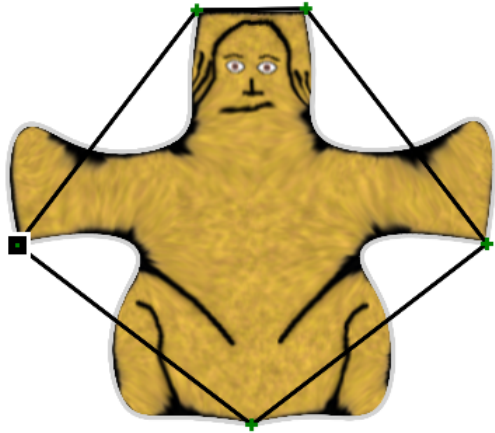


Phase 2 prototiles-1



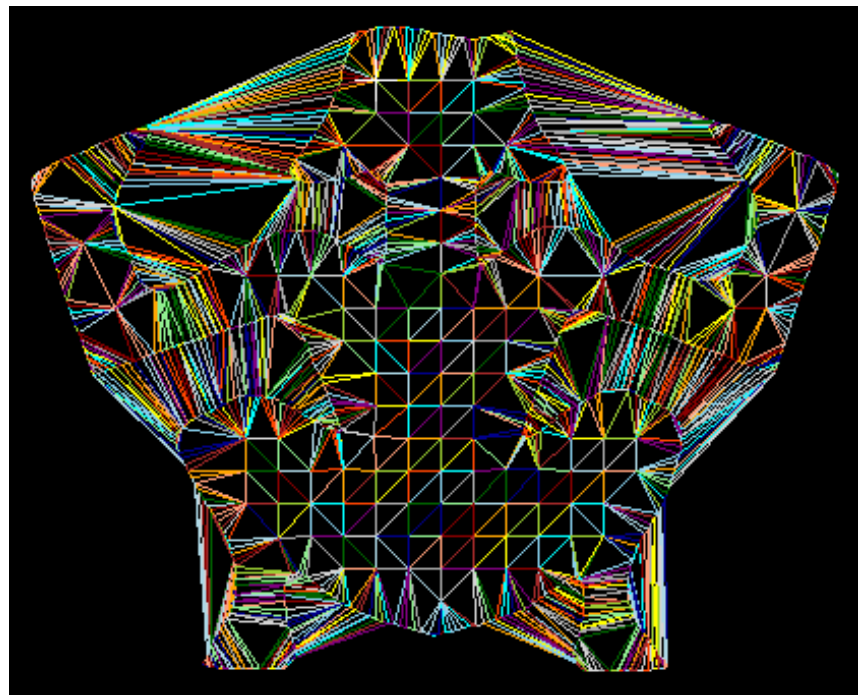
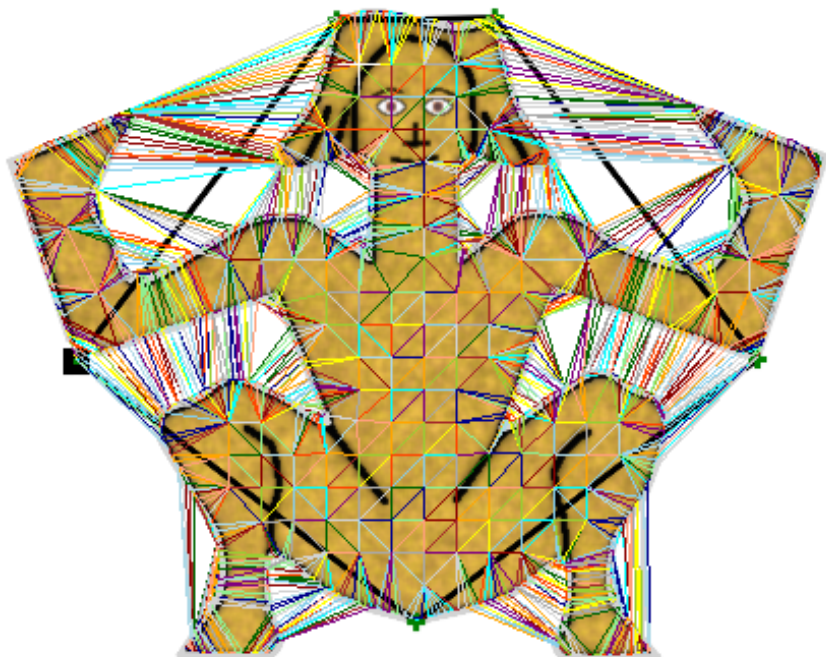


Phase 2 prototiles-2





Morphing images-1





Morphing images-2

- Add internal points, 16x16
- Triangles based on Delaunay Triangulation
 - AI generated java code
 - Not robust, in my case !
- Moving Least Squares for moving internal points
- Resampling based on previous prototile image
- Pixels in triangle: barycentric coordinates



Morphing example – IH4

- Click on: [URL to 2_ani_ih4.mp4](#)
- Based on reworked Escher's plates:
1, 7 and 11 (in 4 colors)



Morphing example – fractal

- Click on: [URL to 3_ani_swan.mp4](#)
- The swan morphs to its mirror image



Morphing example – circle

- Click on: [URL to 4_ani_circle_73_105.mp4](#)
- Escher's plates 73 and 105 have been reworked and transformed to circle tessellations



Morphing example – IH53

- Click on: [URL to 5_ani_ih53.mp4](#)
- Based on reworked Escher's plates:
36, 77, 98 and 116



Questions ?