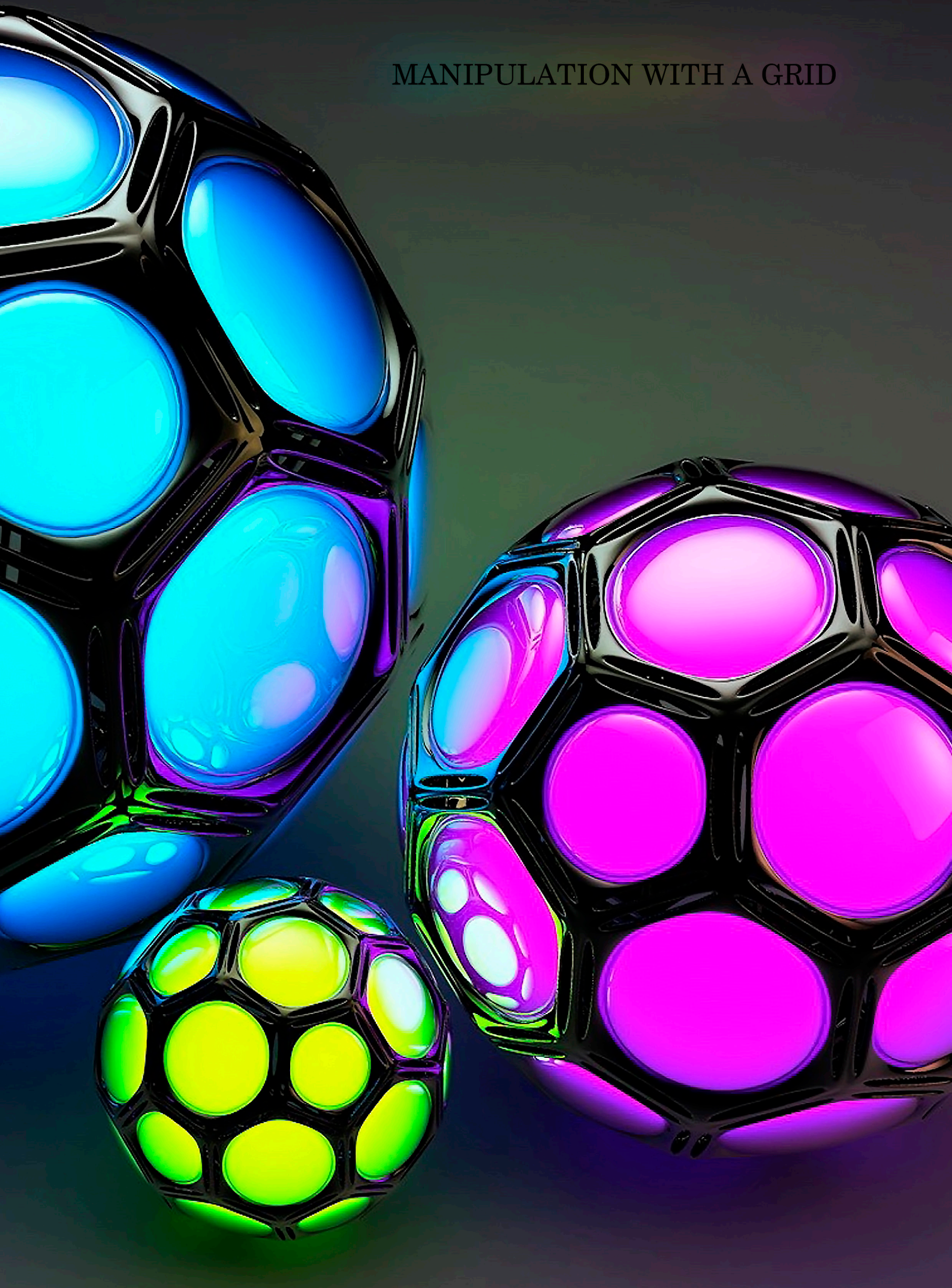
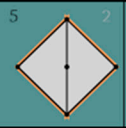
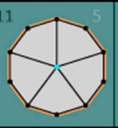
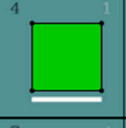
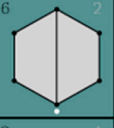
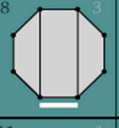
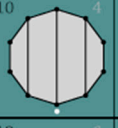
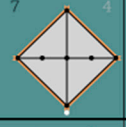
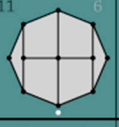
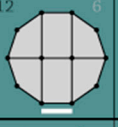
MANIPULATION WITH A GRID



Polygon Table for 3D Modeling

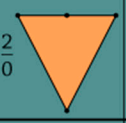
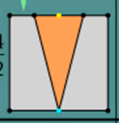
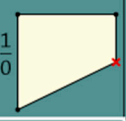
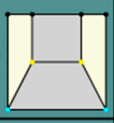
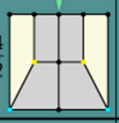
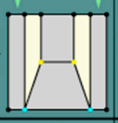
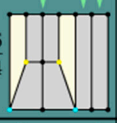
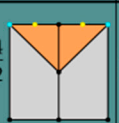
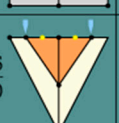
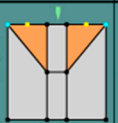
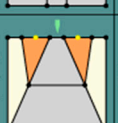
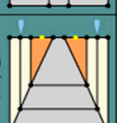
v0.4

Different mesh configurations within the same boundary

Boundary's Vertex Number	4	5	6	8	10	12	n (Extrapolation)
Central Division							Subpatch Sharp Edges Calculation Each Suptached Edge needs more two hold edges to be sharp. So its a total of three edges per edge. n = 3 x Enclosed Polygon Vertices No.
Parallel Division							Result in a Triangle $n = 2z+1$ Result in Odd Quads $n = 4z$ Result in Even Quads $n = 4z+2$
Grid Division							Result in a Triangle $n = 2z+1$ Result in Even Quads $n = 2z$
Quads Squares Triangles Standing on Element No. Vertices No. Polygons	Central Two Quads sharing two edges. Two FourpointTris. Grid Four FourPointTris.	Odd Boundary's Vertex numbers result in a triangle.	Central The 3 Edge Pole.	Central Mirrored Flow. Lowest number for round meshes.	Central The 5 Edge Pole.	Central Enclosed Square with mirrored flow.	n = Boundary's Vertex Number $2z$ = Multiple of 2 $4z$ = Multiple of 4 e = Edge Number

Linear Stepping

A small example of flows resulting of adding different Edge Loops to simple Stepping Elements.

Boundary's Vertex Number	4	5	6	8	10	12	e (Extrapolation)
Odd Step Amounts		$\frac{2}{1}$  $\frac{2}{1}$ 	Odd Step Amounts result in a triangle inside the margins. This is something to take in account in the whole process of stepping, since a bad connection or division may lead to this.				$\frac{e}{e}$  $\frac{e}{1}$  Solutions: Find a triangle in a margin to merge with or, add an Edge Loop to one of the margins.
FourPointTriangle Adding Link Loops only for Constant Step Amount of 2	$\frac{2}{0}$ 	Best method for straight flat steps. All other methods create vertices between margins.	$\frac{3}{1}$ 	$\frac{4}{2}$ 	$\frac{5}{3}$ 	$\frac{6}{4}$ 	$\frac{e}{e\text{-}2}$ No vertices causing pinching between margins. Tough, there will be pinching on the margin. If it troubles, add an Edge Loop between the margin and the stepping to hold the mesh.
Trapezium (works in pairs) Adding Link Loops only for Constant Step Amount of 2	$\frac{1}{0}$ 	Stable flow, with vertices between margins to shape the mesh.	$\frac{3}{1}$ 	$\frac{4}{2}$ 	$\frac{5}{3}$ 	$\frac{6}{4}$ 	$\frac{e}{e\text{-}2}$ The placing of Link Edge Loops, in or out of the pair of Trapeziums, control the amount of vertices between margins.
		For modeling between margins there are many solutions, depending of the desired flow. Here are some examples but the possibilities are infinite.	$\frac{4}{0}$ 	$\frac{4}{2}$  $\frac{6}{0}$ 	$\frac{5}{3}$  $\frac{7}{1}$ 	$\frac{7}{3}$  $\frac{9}{1}$ 	$\frac{e}{e}$  Link and Close Edge Loops $\frac{e}{e}$ Link and Close Edge Loops.
			$\frac{2}{2}$	$\frac{4}{2}$	$\frac{6}{2}$	$\frac{8}{2}$	$\frac{e}{2}$ Close Edge Loops increase the Step Amount and Factor.

Stepping Structure

Stepping Elements
FourPointTriangle Trapezium

M - L = Step Amount

$\frac{M}{L}$ = Step Factor

Edge Loop Types
Close Loop Link Loop

Basic Flow. Plus Edge Loops to control Stepping's Amount and Factor.

Random Example of Combining Steps

Many times it's easier and better to divide the stepping operation in small ones. So there is more control of each area's shape and the math gets easier. Divisions might create two Odd Step Amounts from one Even Step Amount, so they have to be well placed.

Subdivision Elbows v.02b

Triquads Pole
Pentaquads Pole
(first row)

Round shape corners

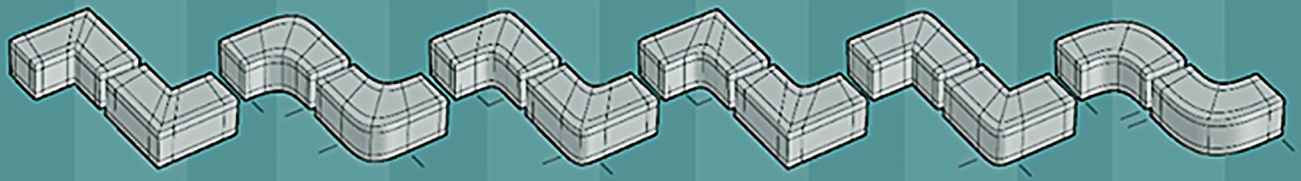
100% Edge Weight
0% Edge Weight
(last row)

Solutions to make elbow shapes in subdivision modeling. Notes
Click each sample to enlarge and blue text for additional info.

Shape

Cross Hatch - Grid mesh using Control Edges. Contains Poles

Tube - Edge loops follow the elbow's shape. Since the topology is the same, Control Edges can be easily animated to achieve any sharp/smooth stage.



Edge Weight - Low mesh density since Edge Weight is used instead of Control Edges to sharpen the object. Catmull-Clark subdivision only.

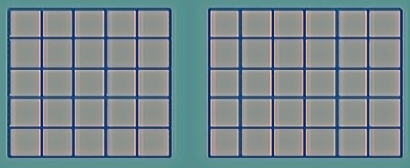
Object

Grid Cut

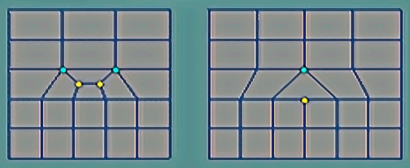
Diagonal Cut

Catmull-Clark Stepping Elements Wraps

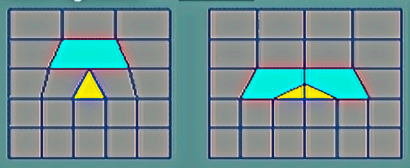
The Grid (Reference)
All Vertices have valence of 4
All Polygons have valence of 4



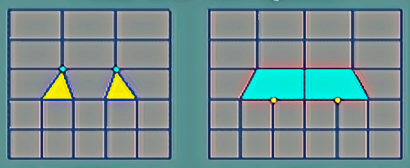
Poles All Polygons have valence of 4



Non-Quads All Vertices have valence of 4



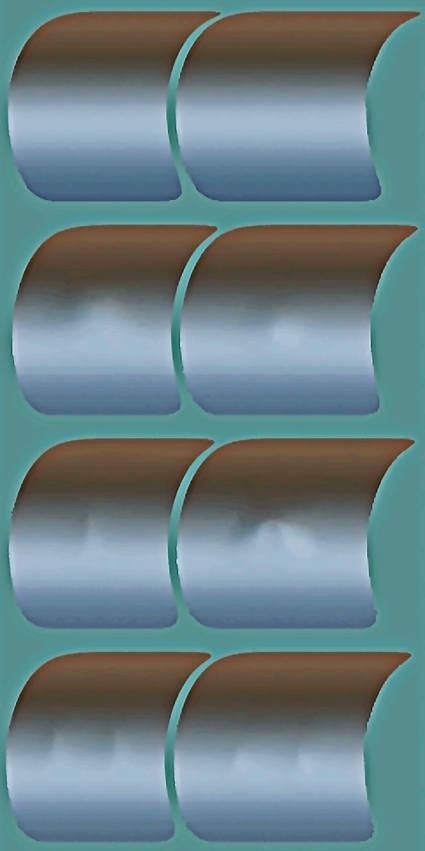
Poles and Non-Quads



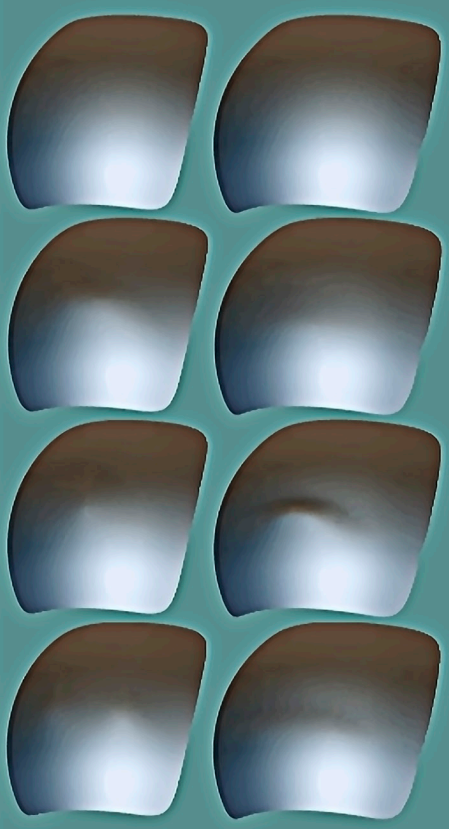
3/5 4/6

Stepping Ammount = 2

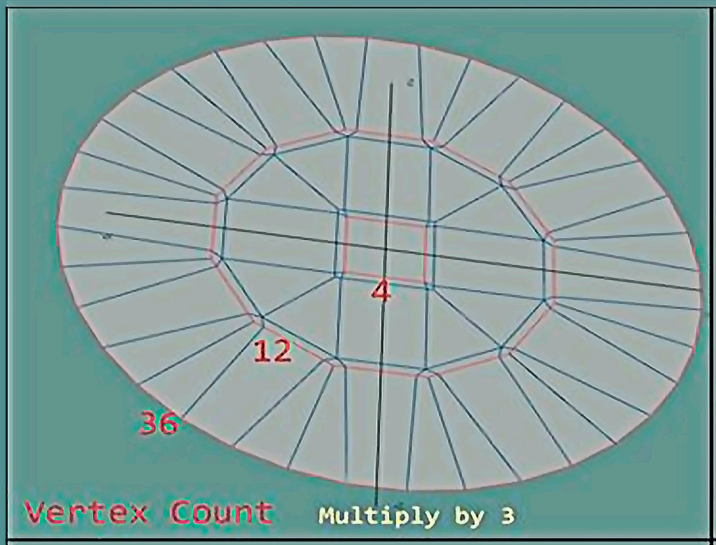
Cylindrical Wrap

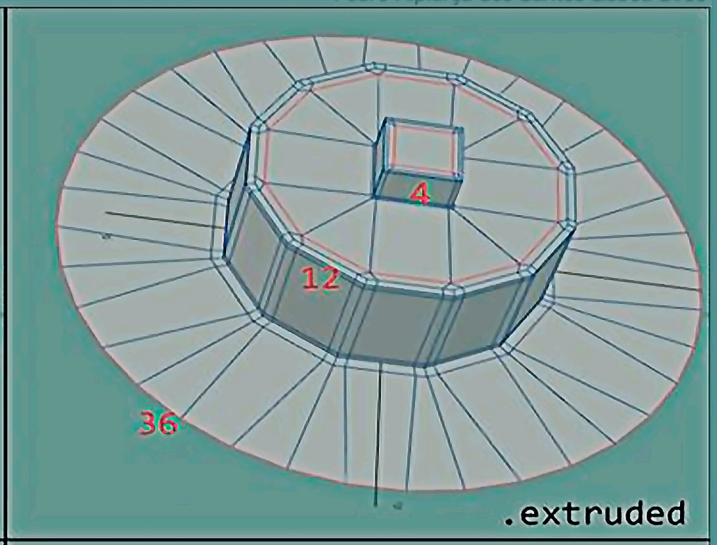


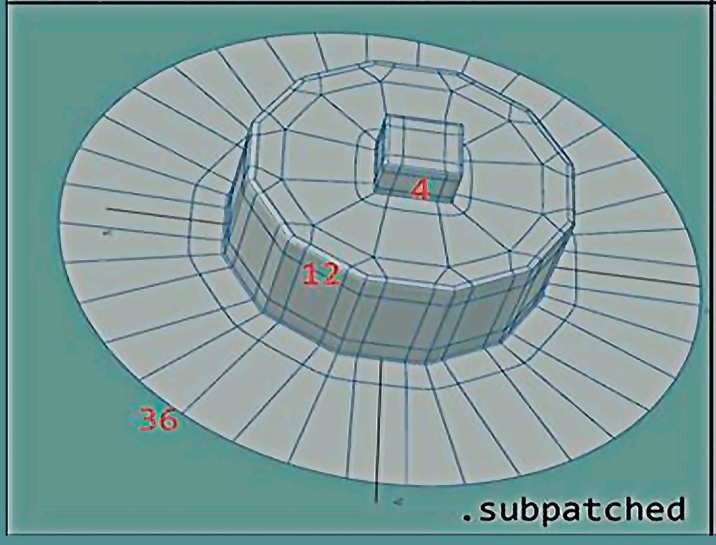
Spherical Wrap

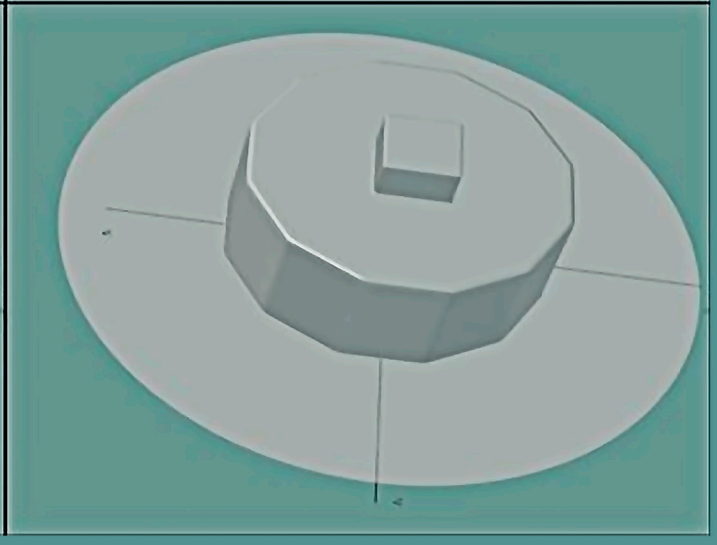


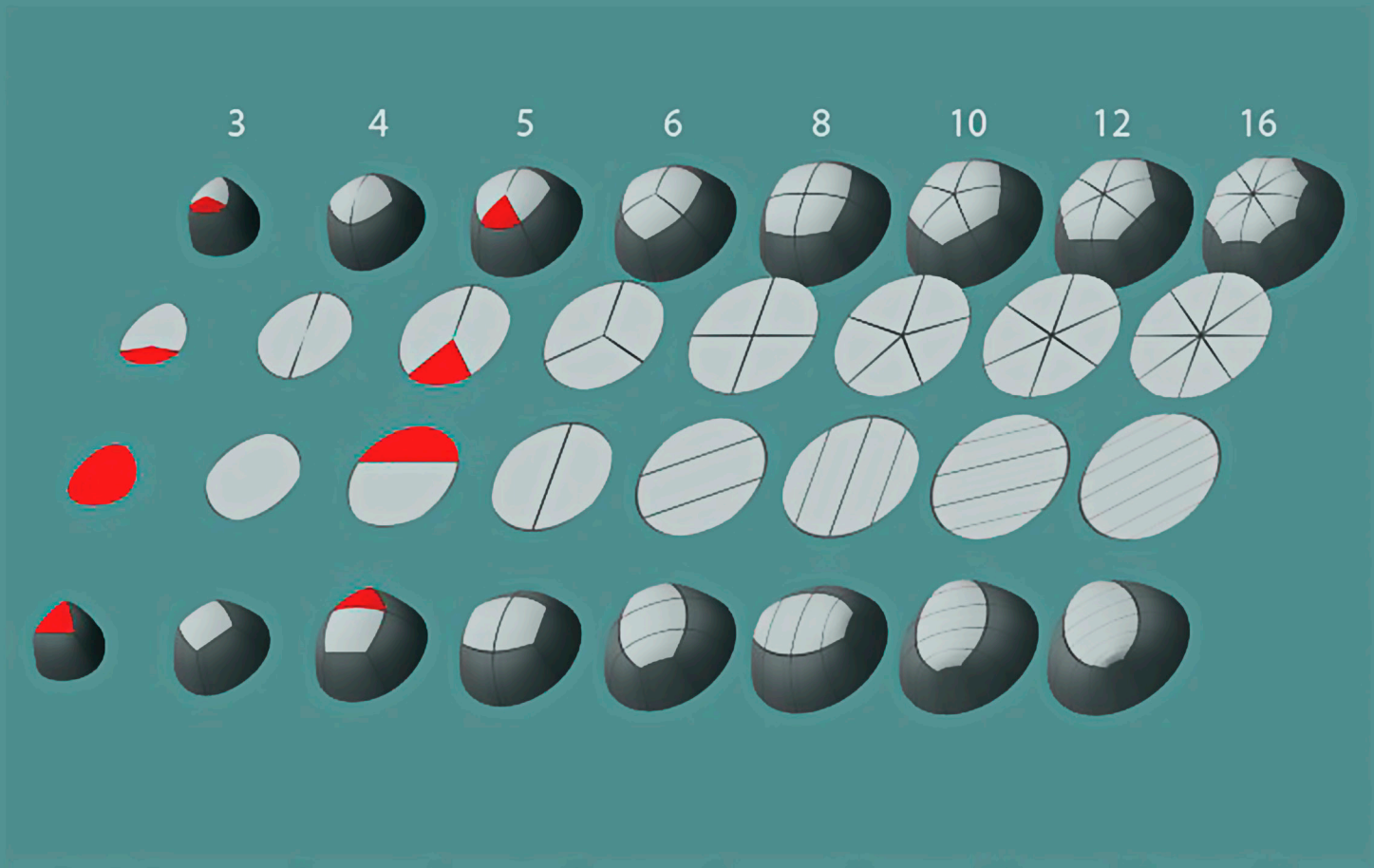
Pedro Alpiarça dos Santos Lisboa 2011

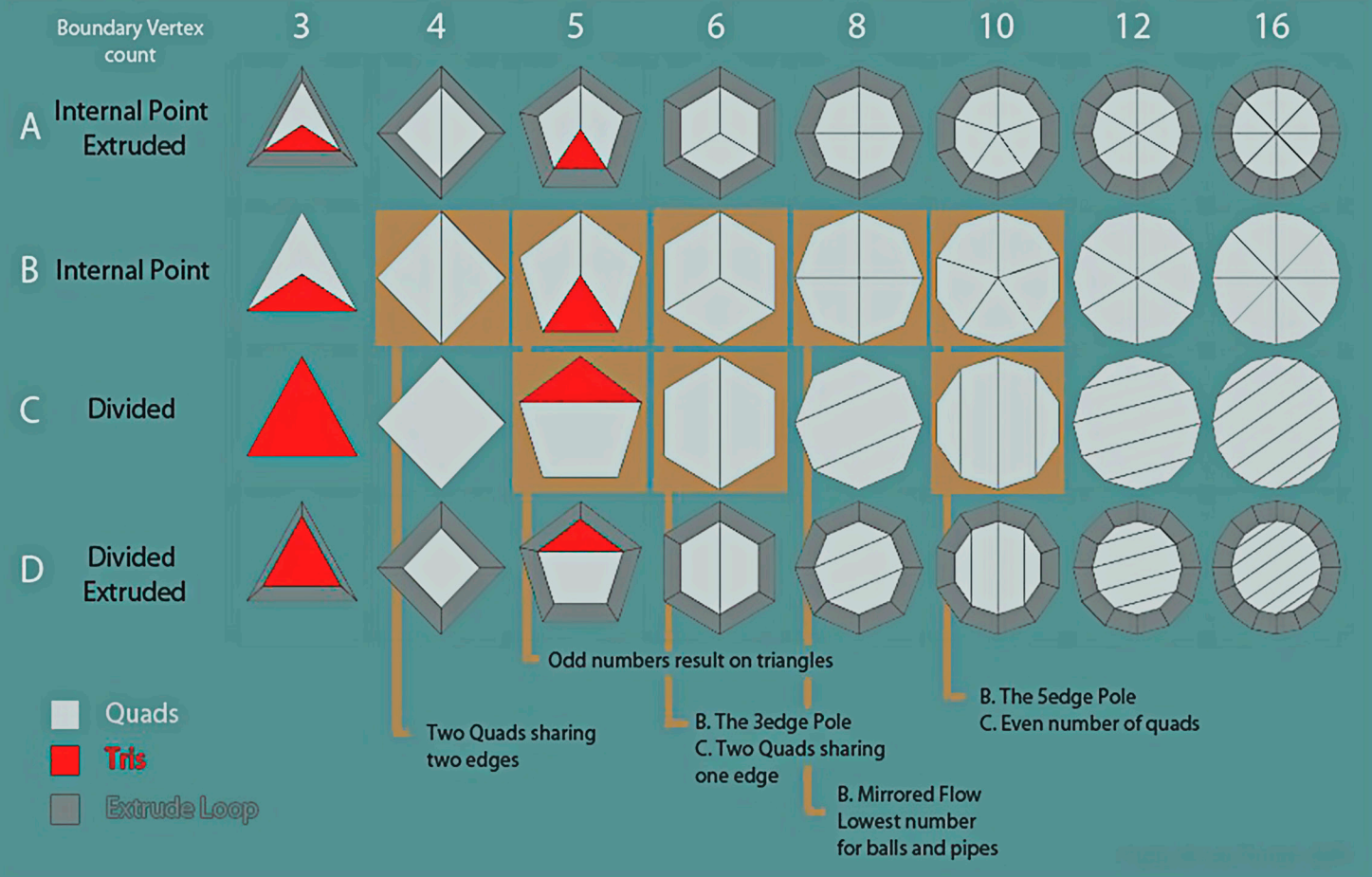









3
4
5
6
8
10
12
16

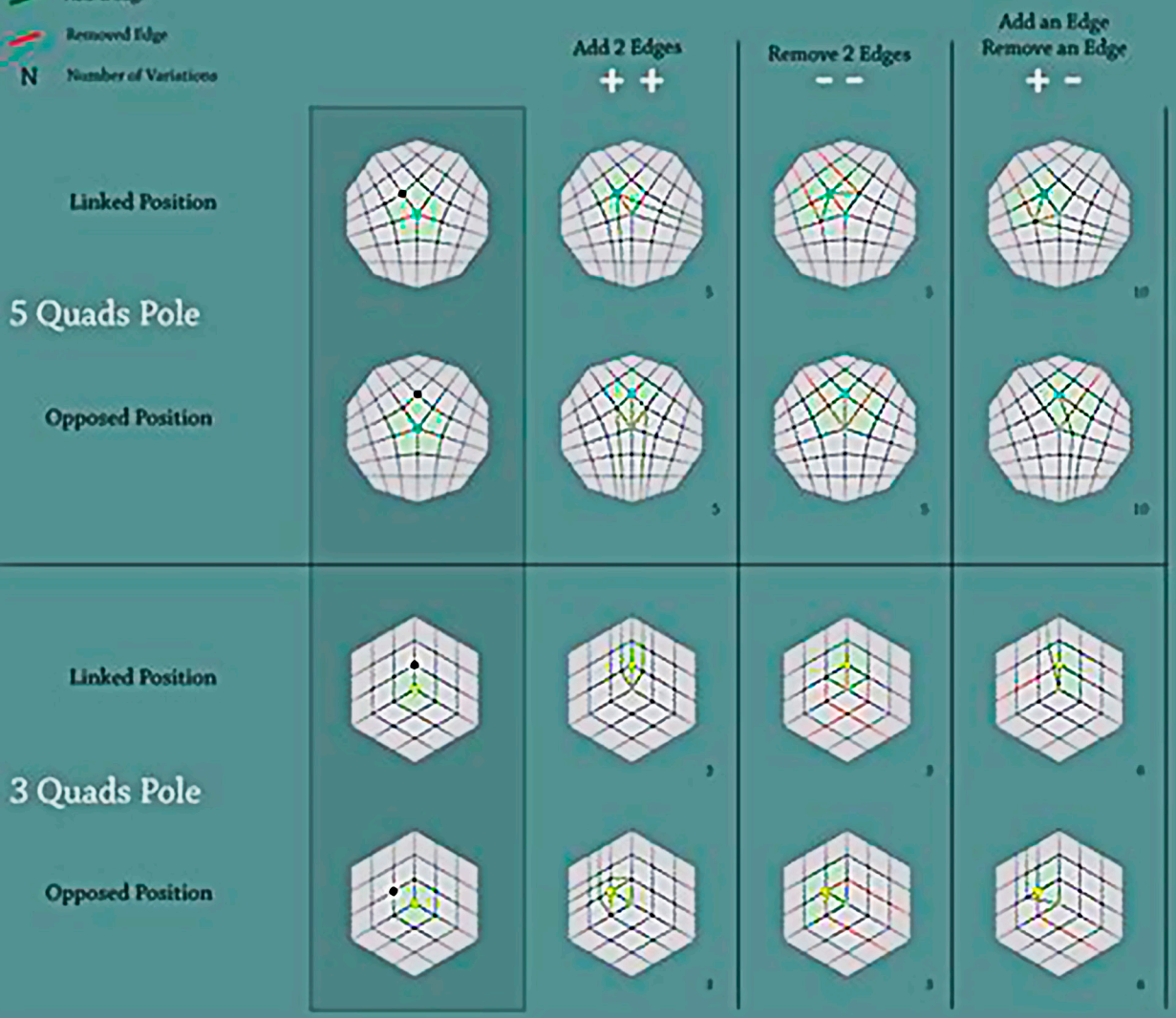

Boundary Vertex count
3
4
5
6
8
10
12
16
A Internal Point Extruded
B Internal Point
C Divided
D Divided Extruded
Quads
Tris
Extrude Loop
Two Quads sharing two edges
Odd numbers result on triangles
B. The 3edge Pole
C. Two Quads sharing one edge
B. Mirrored Flow
Lowest number for balls and pipes
B. The 5edge Pole
C. Even number of quads

Moving Poles v0.1

5 Quads Pole vertex
3 Quads Pole vertex
Quad from the Pole
Added Edge
Removed Edge
N Number of Variations

Single Pole

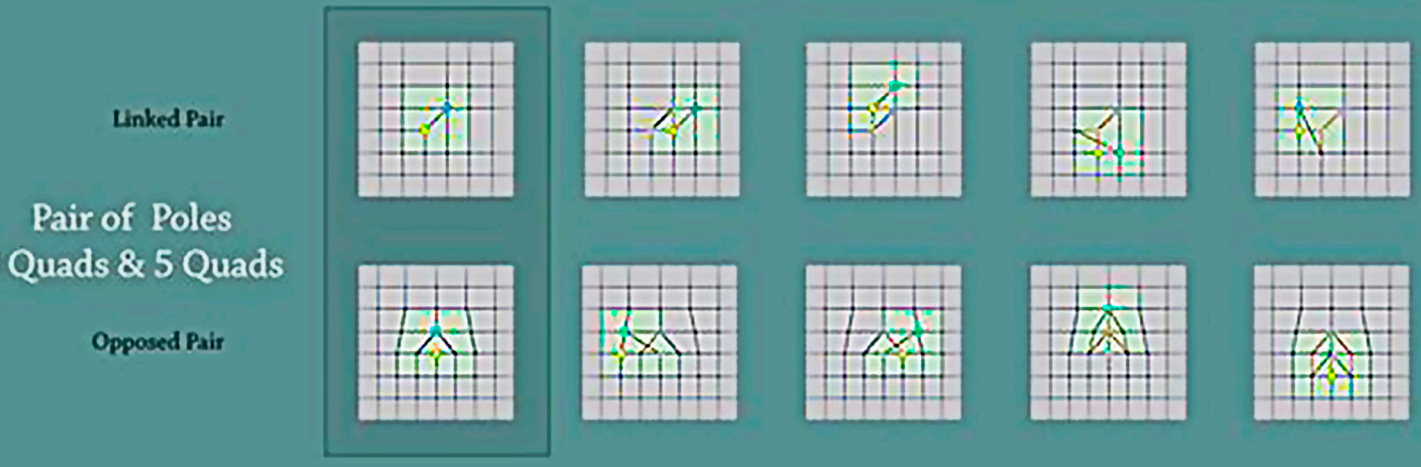
Changing the vertex position of a single pole means having to add and/or remove edges.



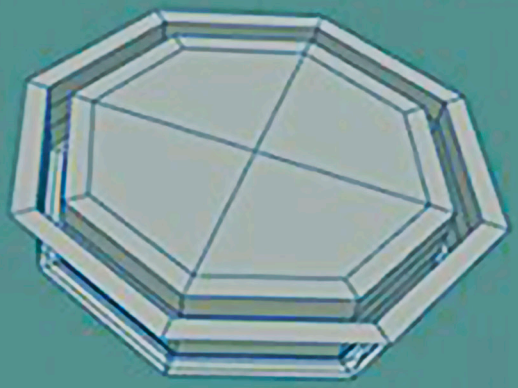
Pair of Poles

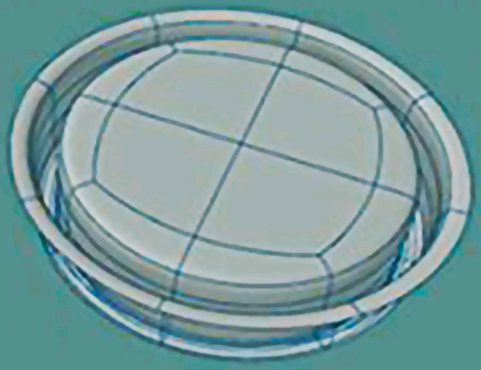
In this case, when moving a pair, composed by a 3 Quads Pole and a 5 Quads Pole, there is no need to change the edge configuration.

There're many possibilites to move them. Here, 4 examples wich allow to reach any position.

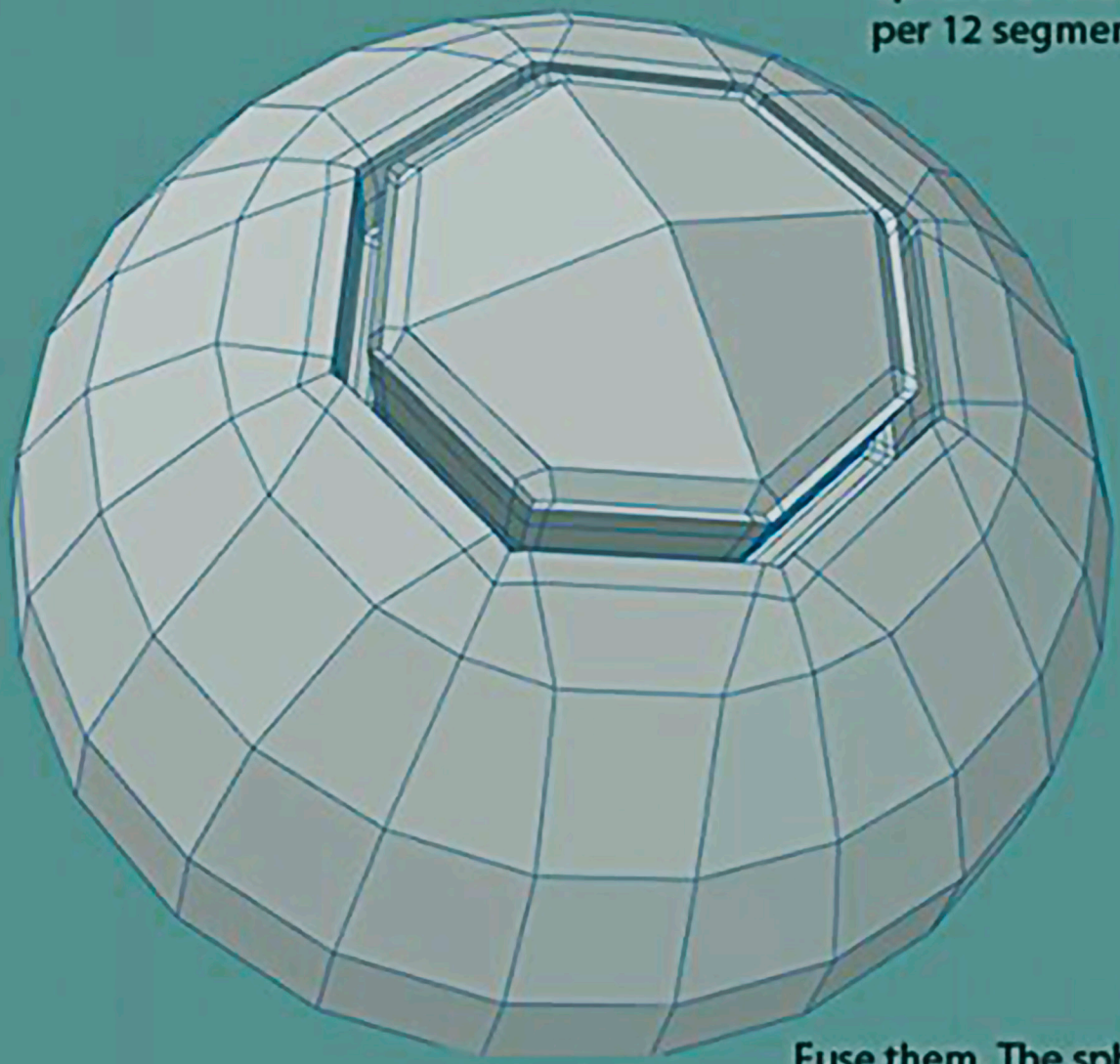


Estrusions of a 8 sided polygon

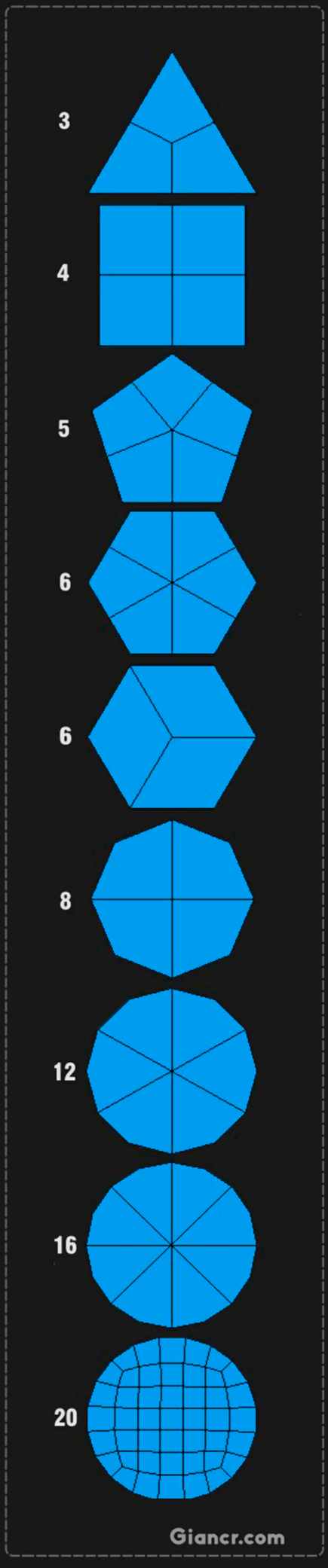


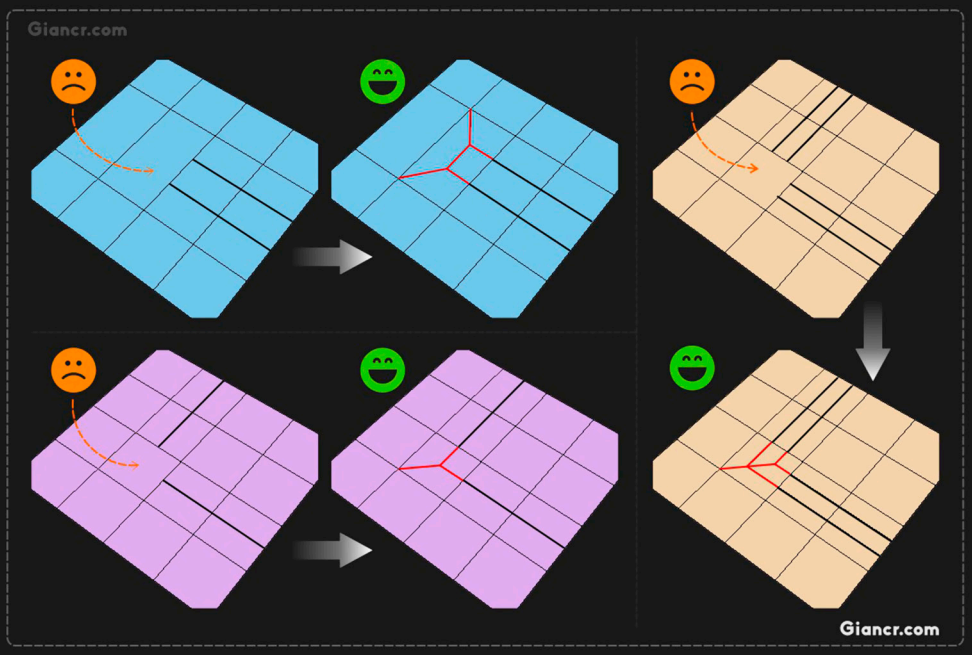


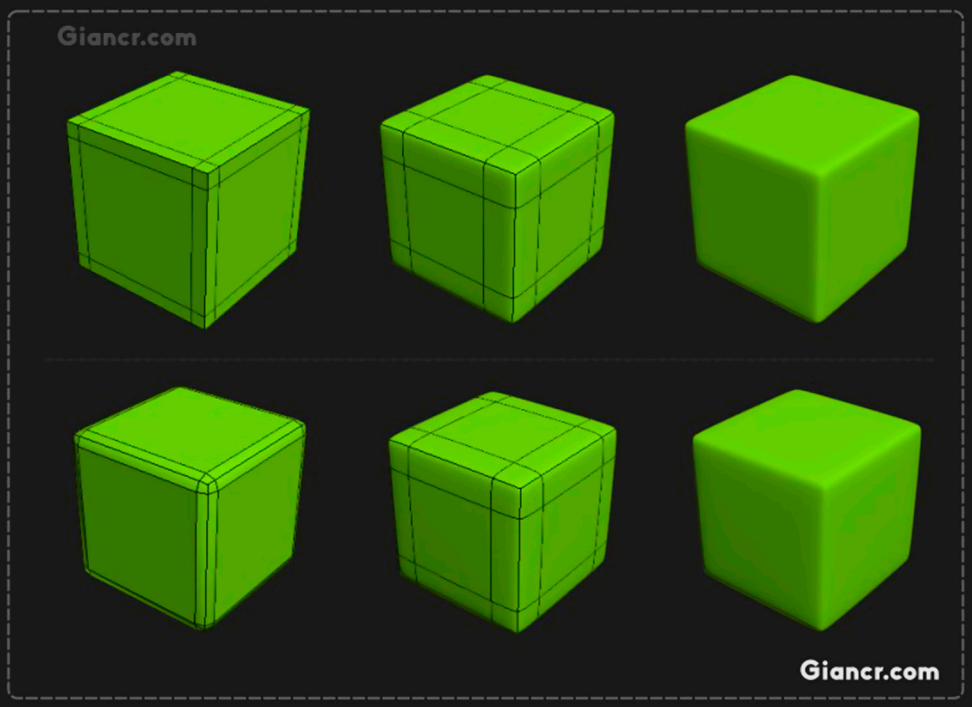
Sphere. 24 sides (8x3)
per 12 segmensts

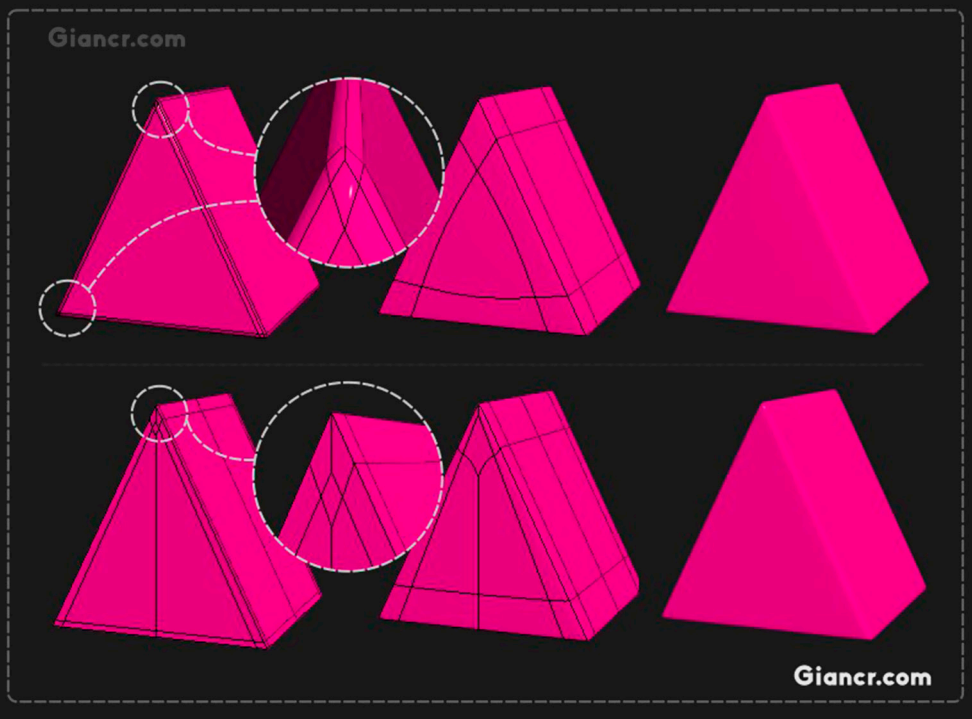


Fuse them. The sphere
has 24 sides because each
edge of the octogon
need 2 hold edges.
So 8x3 = 24.

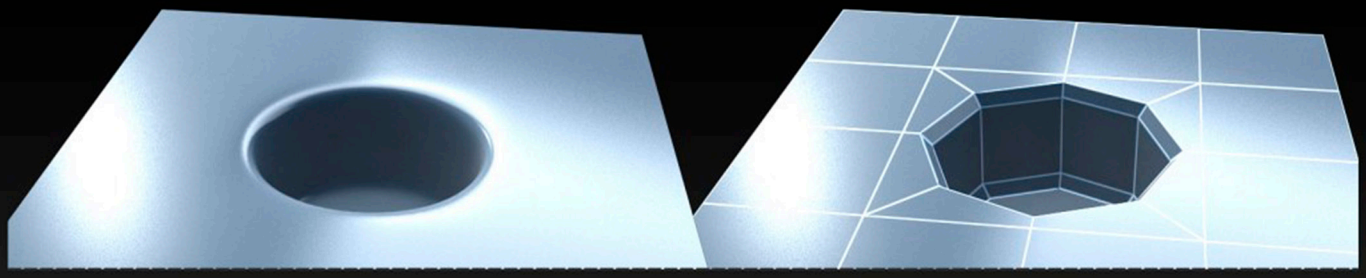

3
4
5
6
6
8
12
16
20
Giancr.com

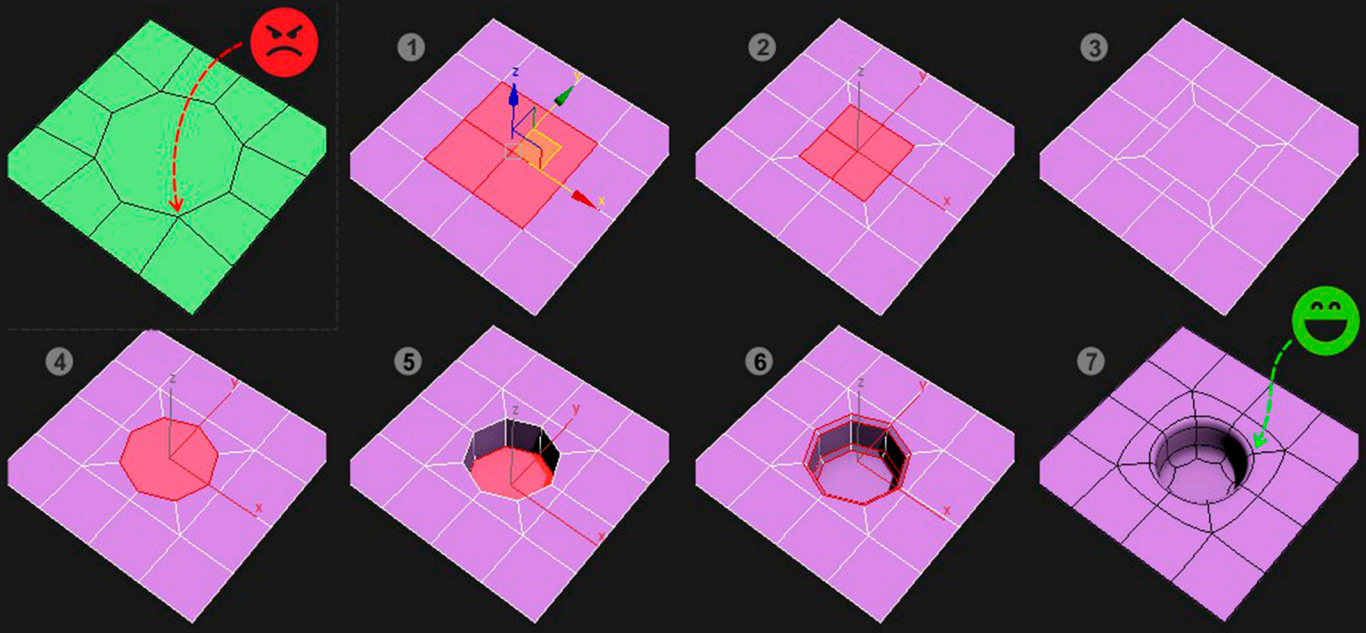

Giancr.com
Giancr.com


Giancr.com
Giancr.com

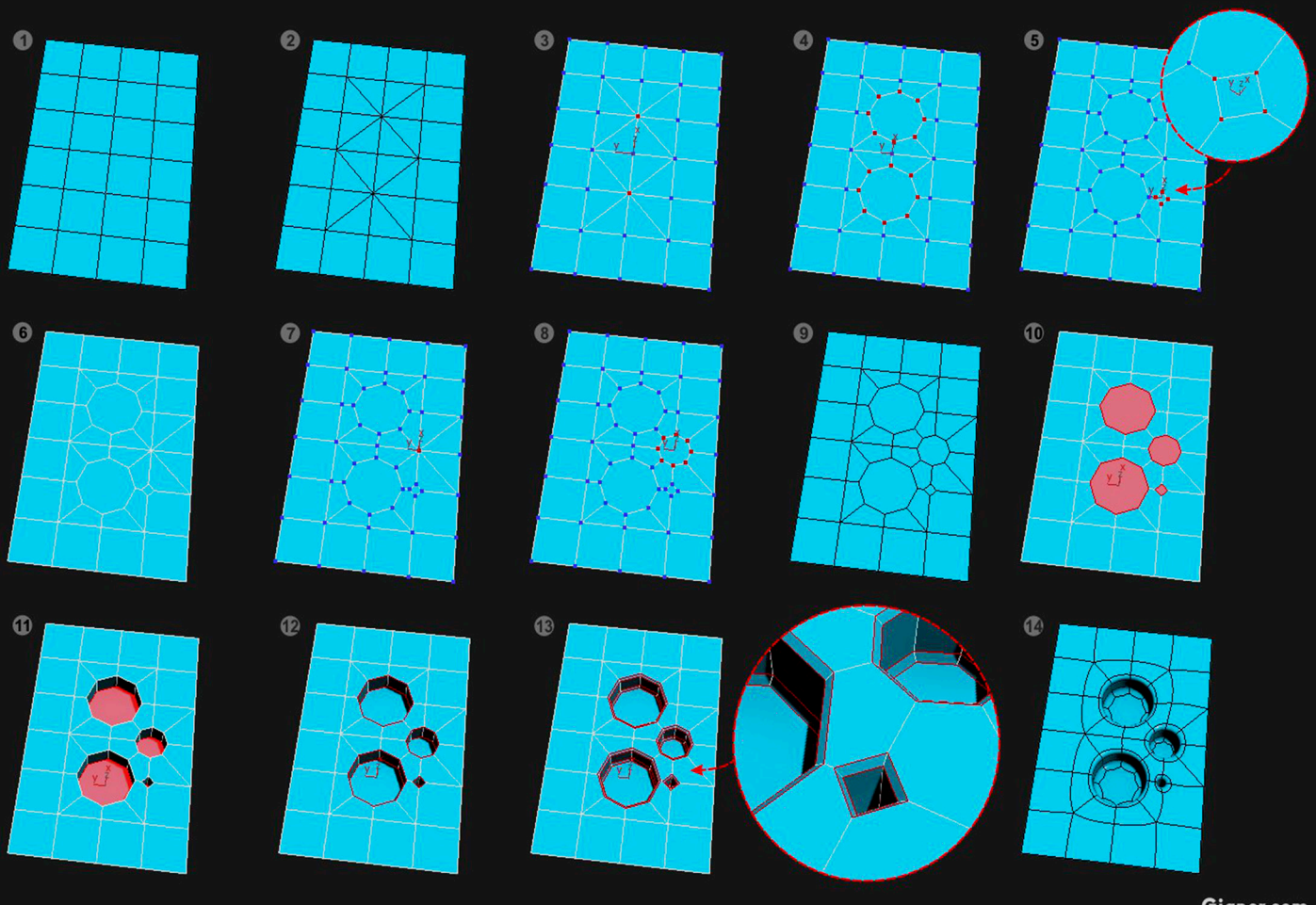

Giancr.com
Giancr.com

Giancr.com

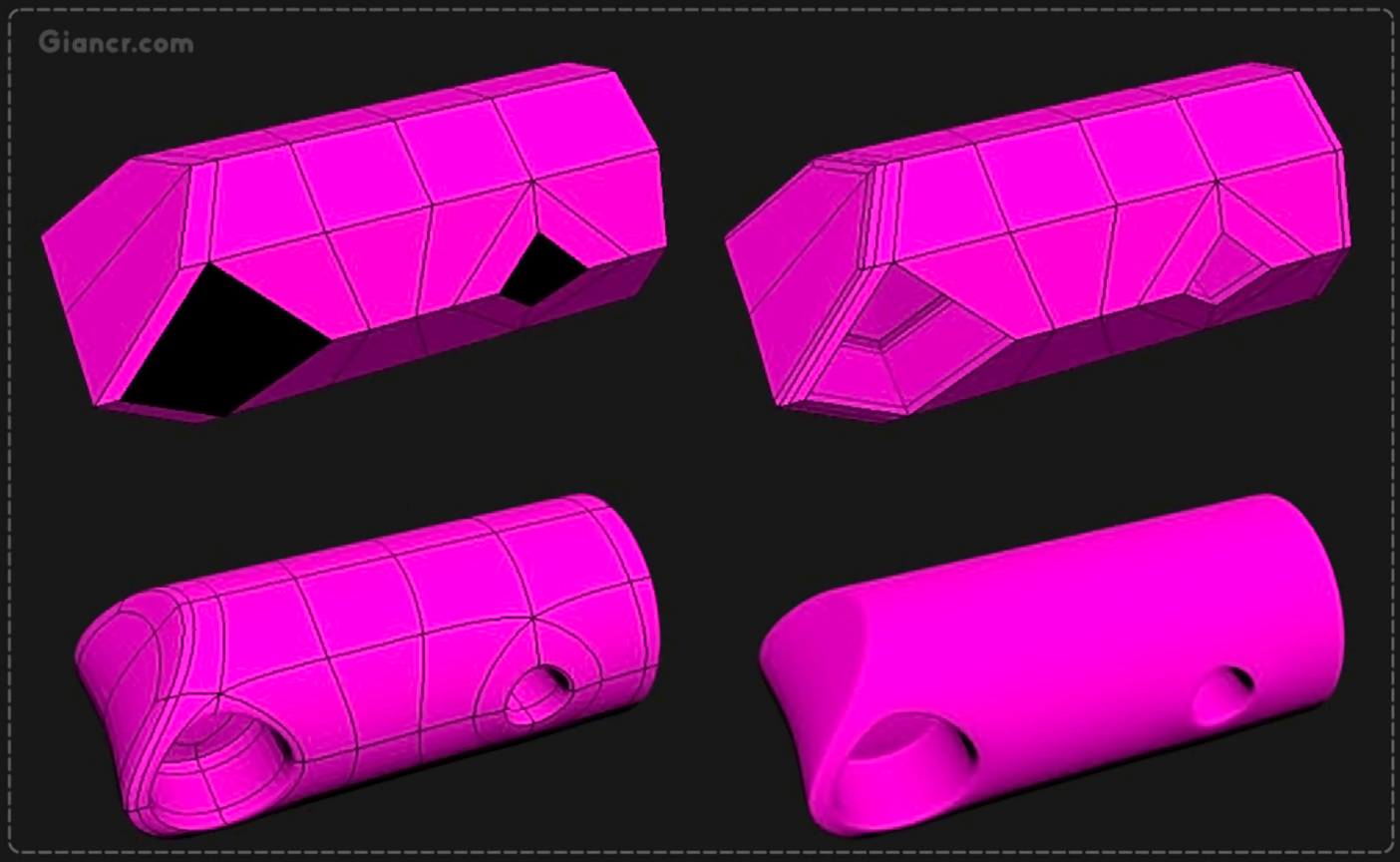


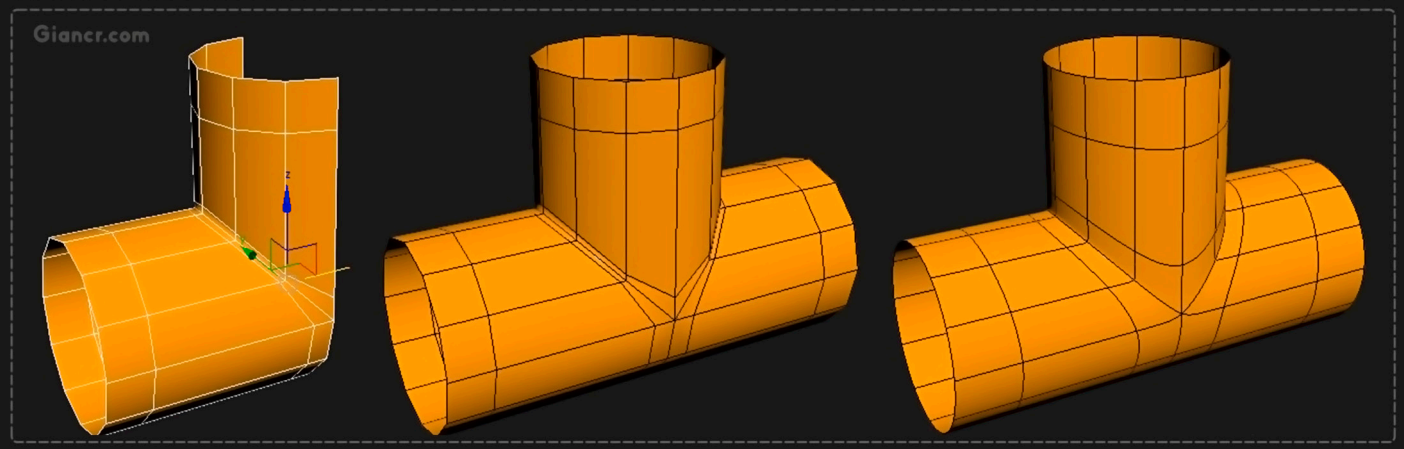


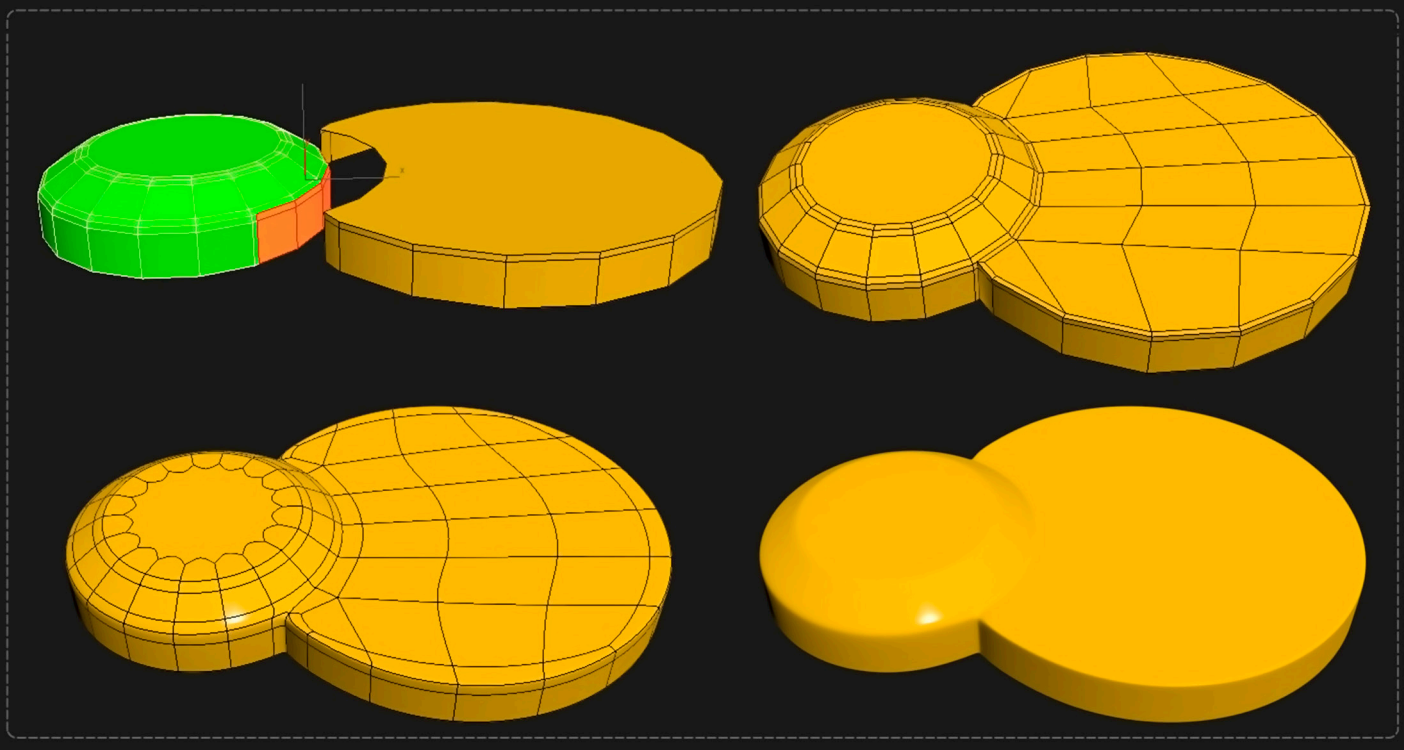
Giancr.com

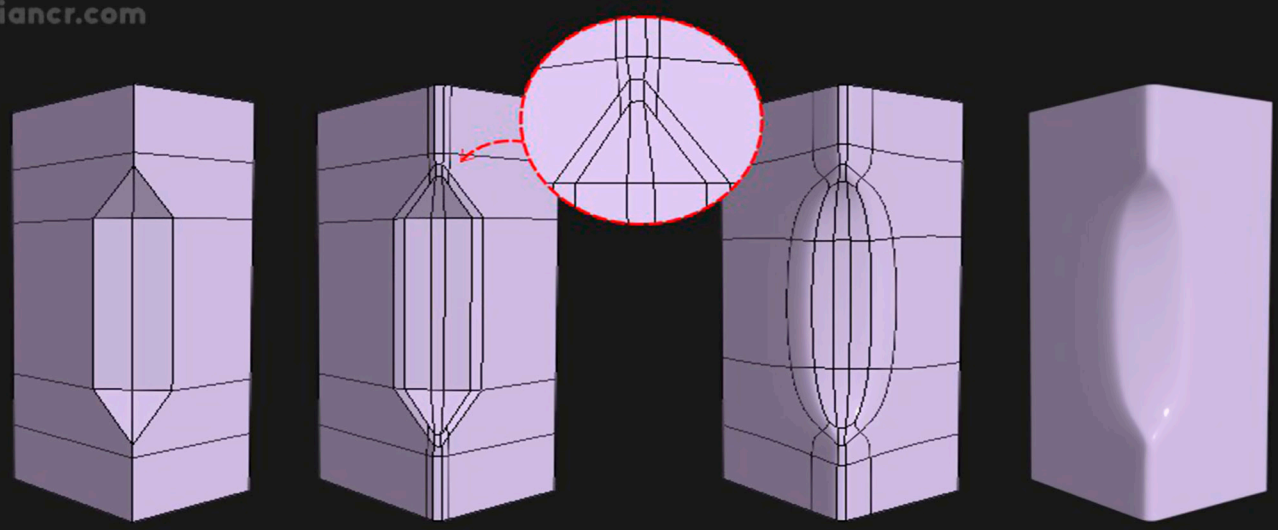


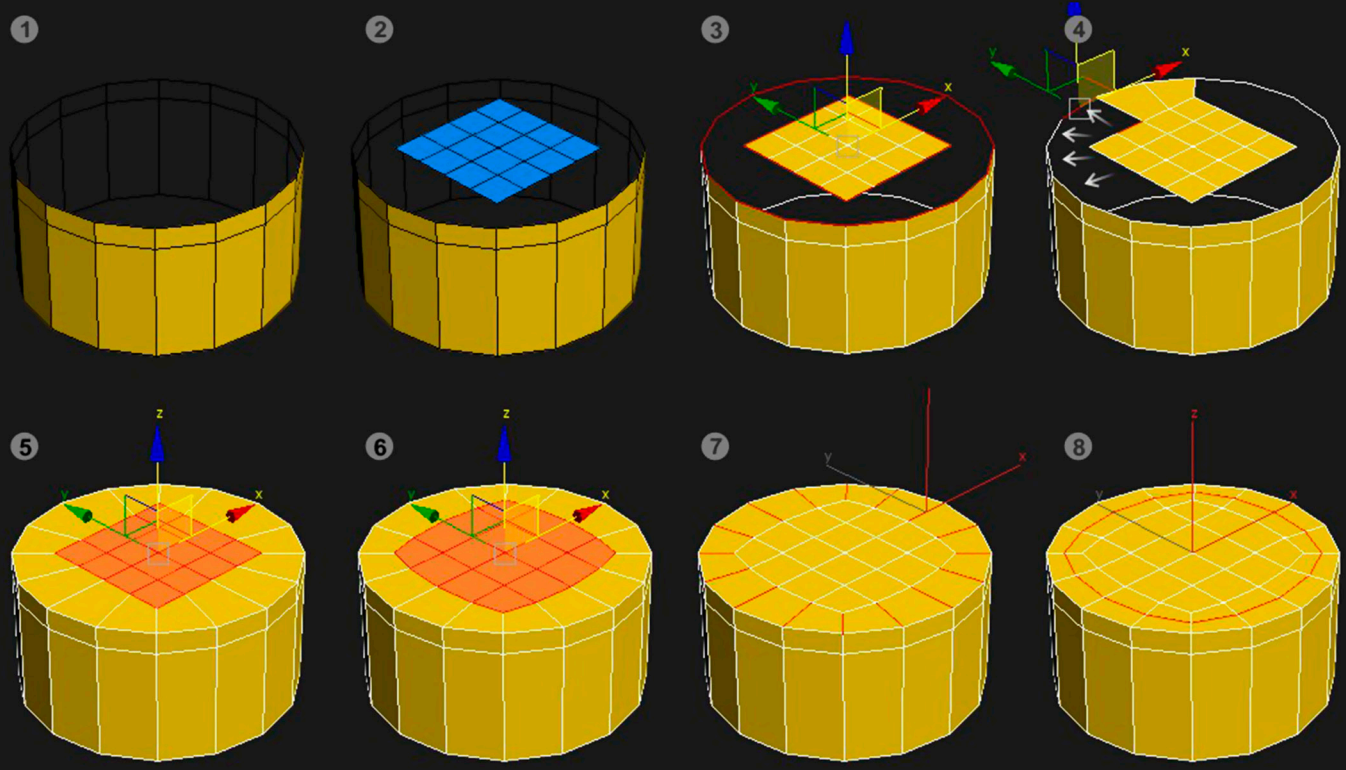
Giancr.com

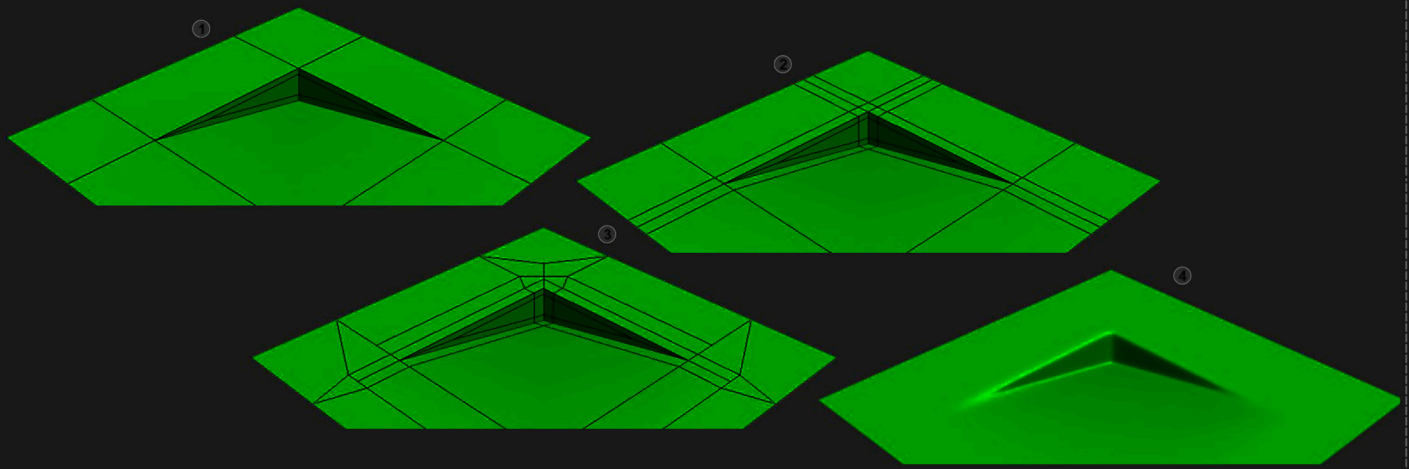

Giancr.com

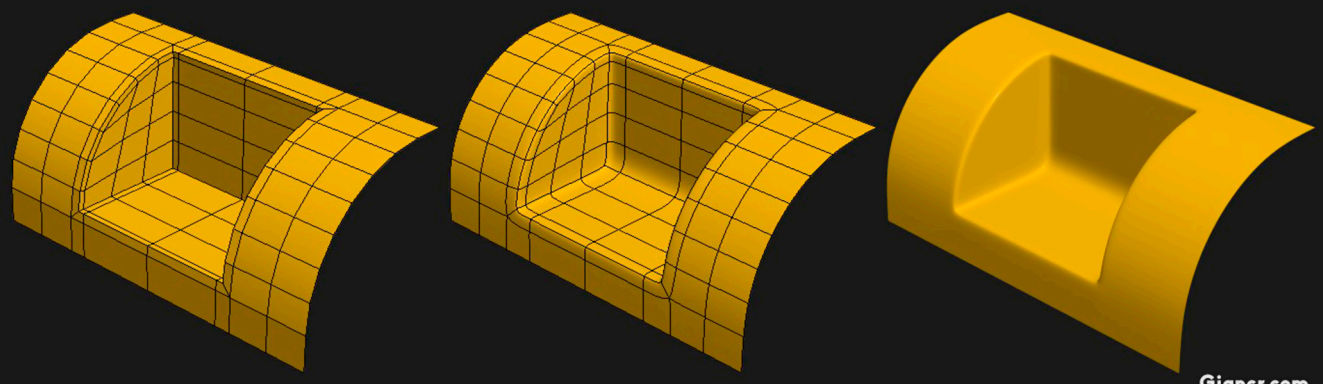

Giancr.com

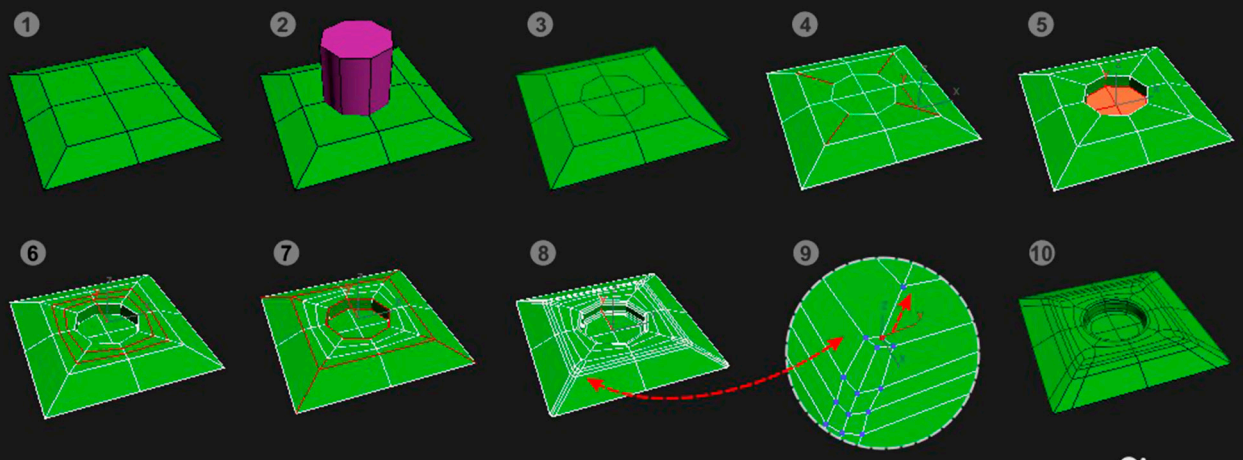


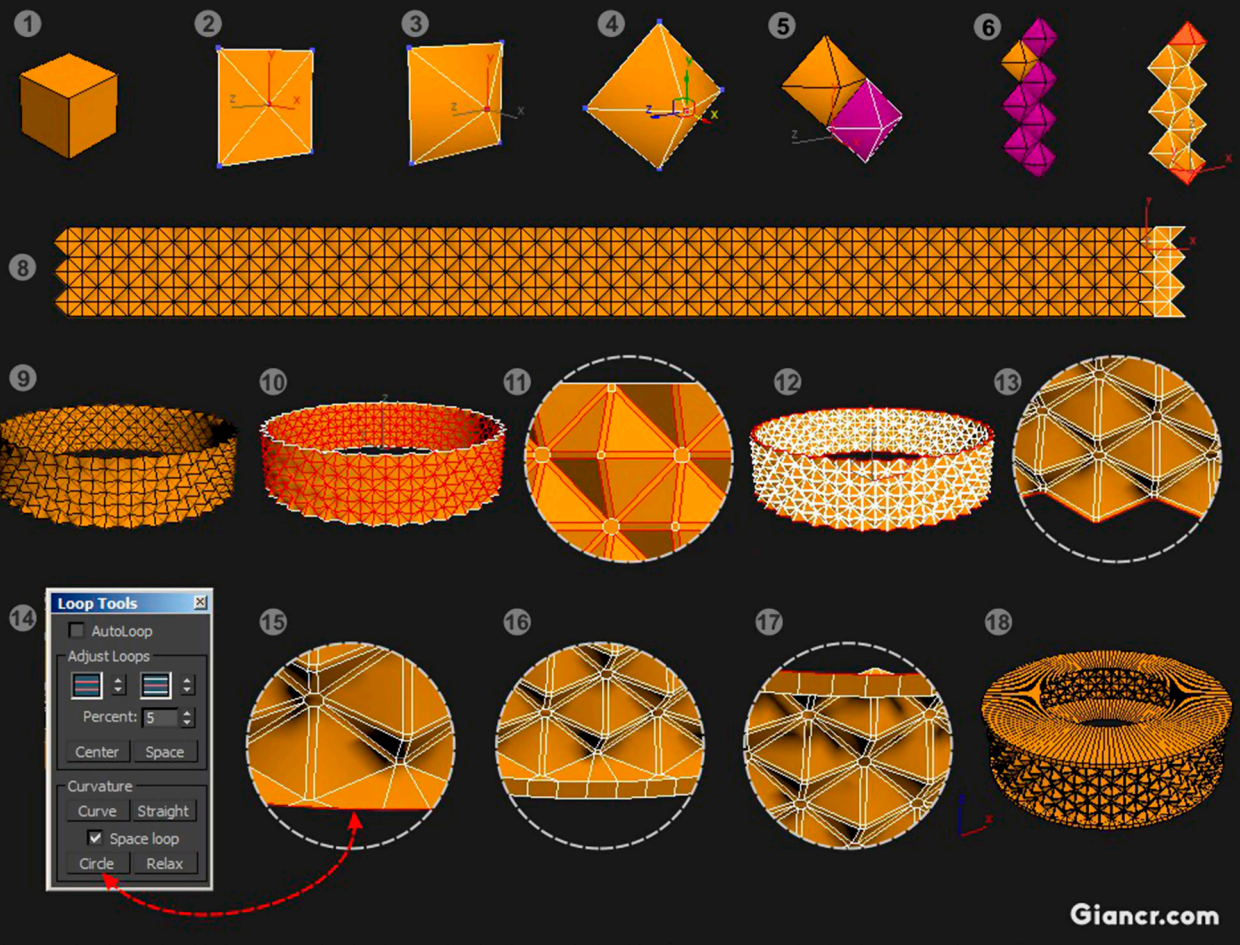


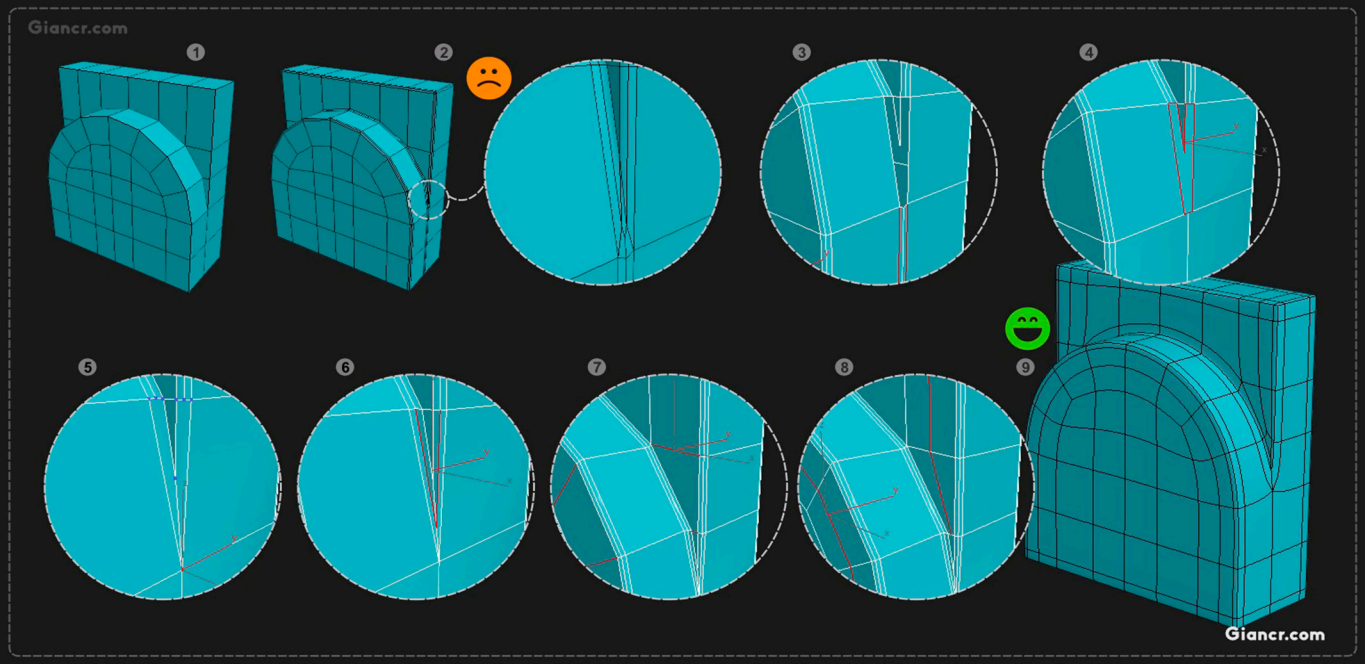


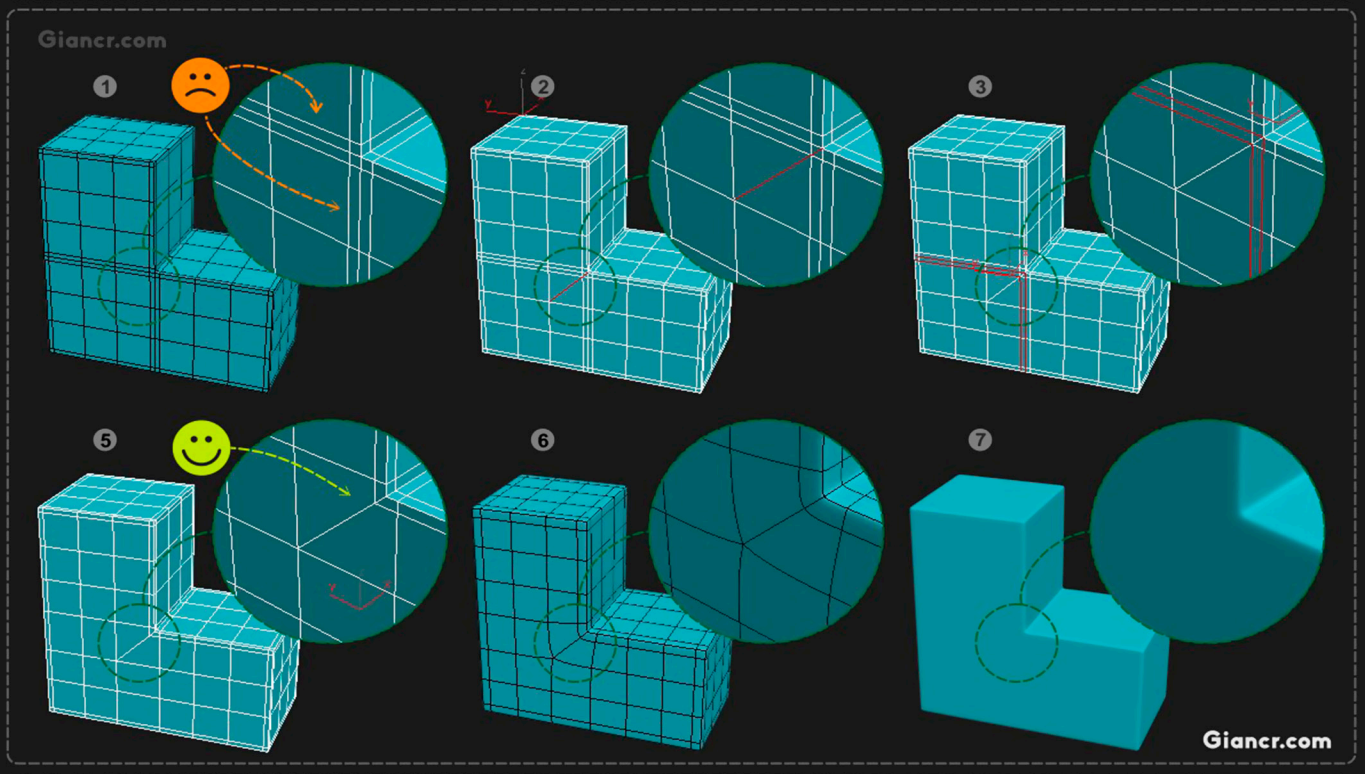


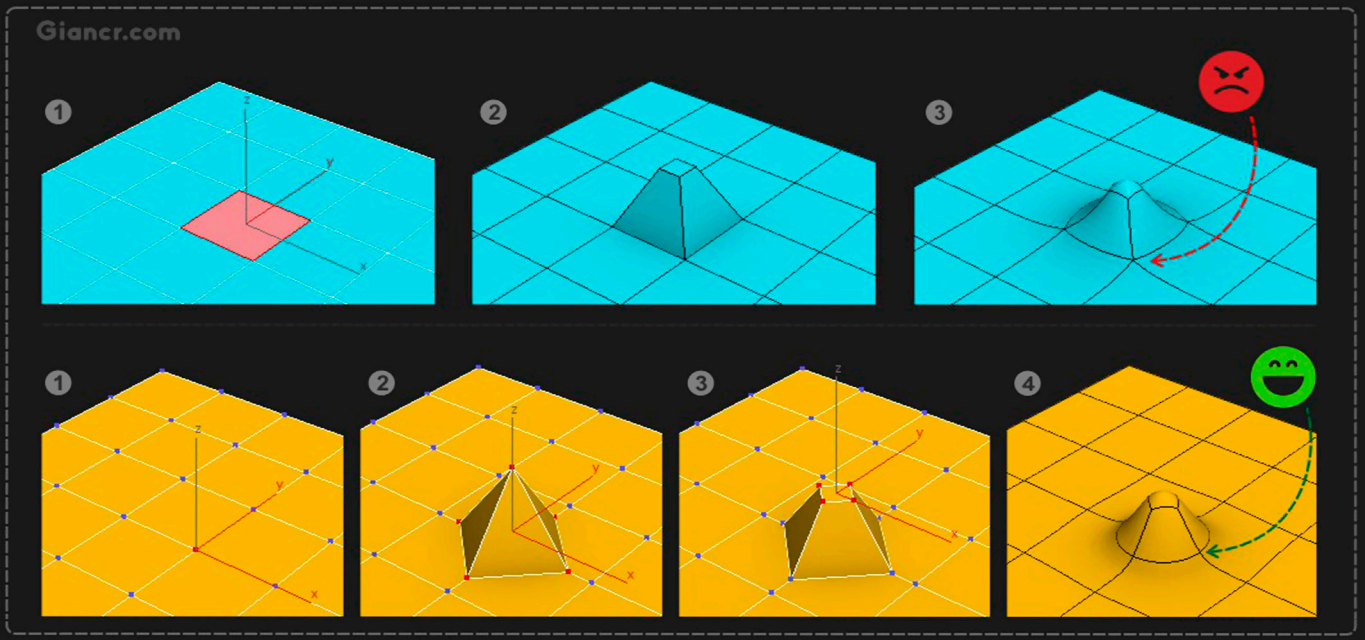


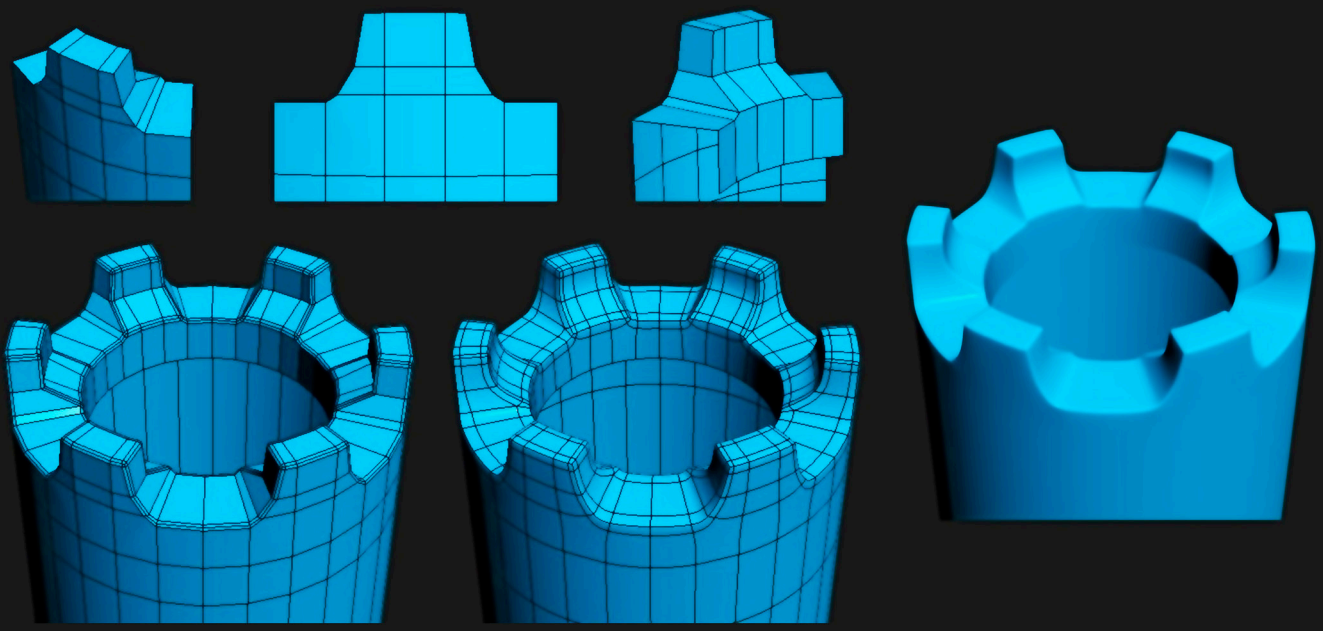


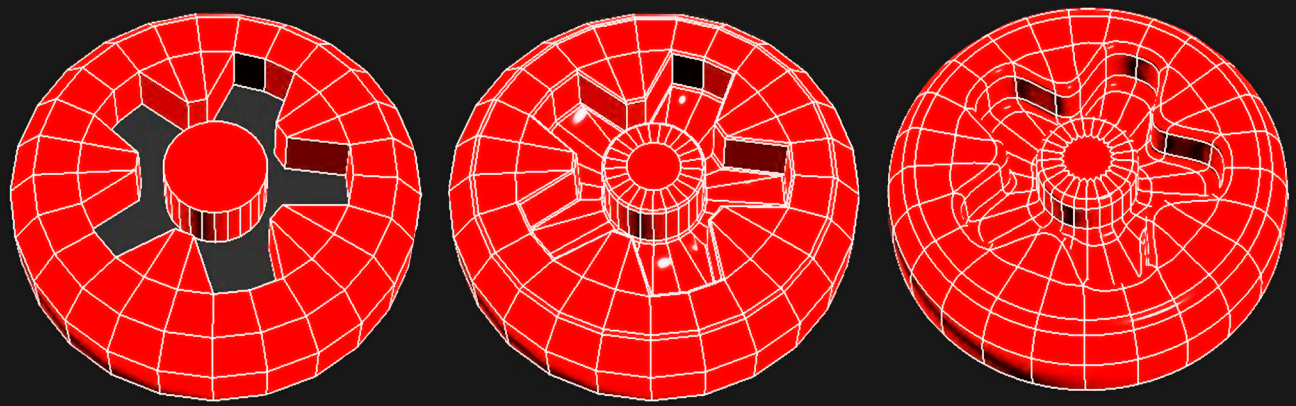


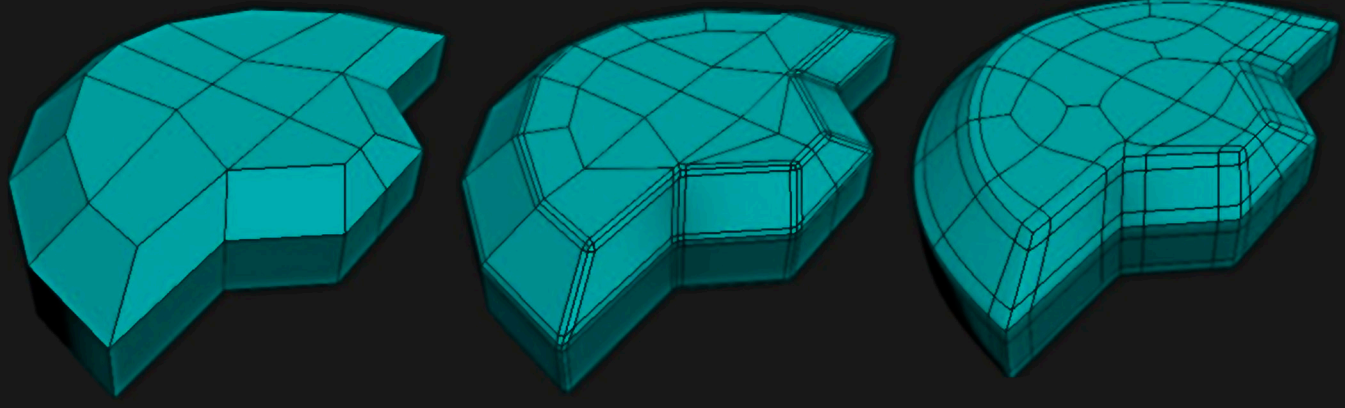

Giancr.com
1
2
3
4
5
6
7
8
9
Giancr.com

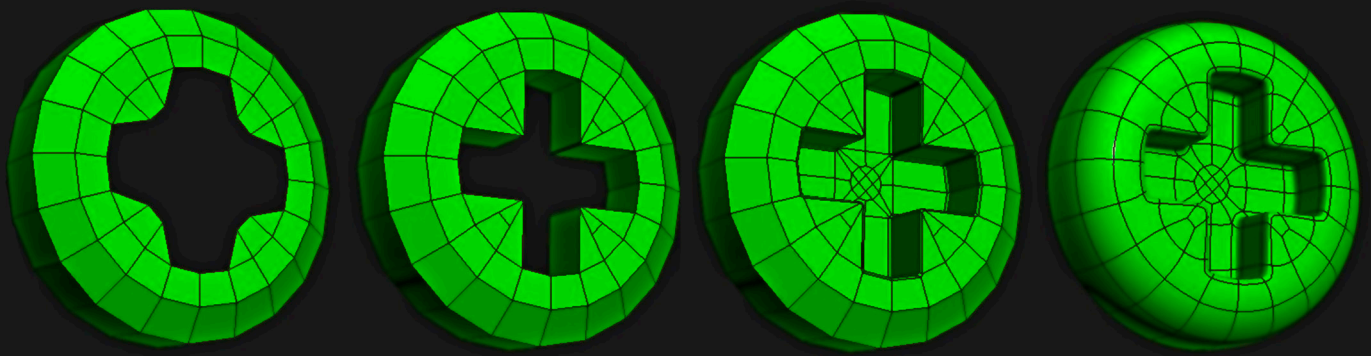

Giancr.com
1
2
3
5
6
7
Giancr.com

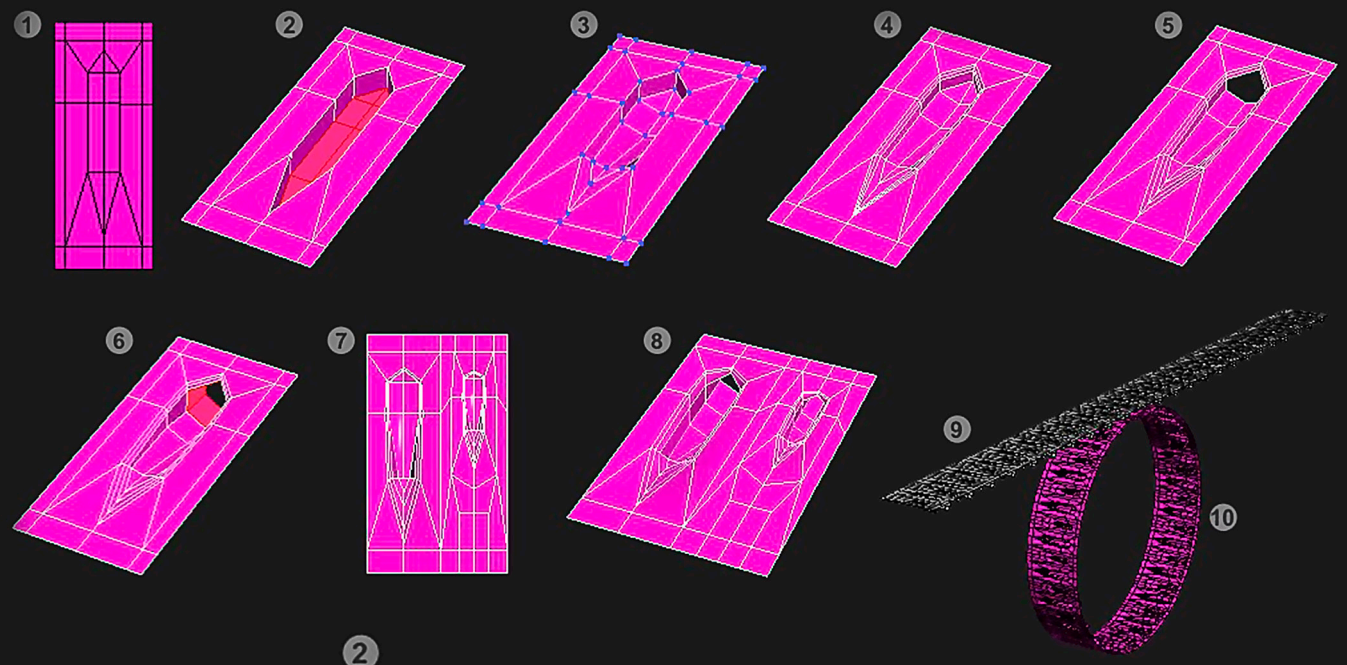

Giancr.com
1
2
3
1
2
3
4

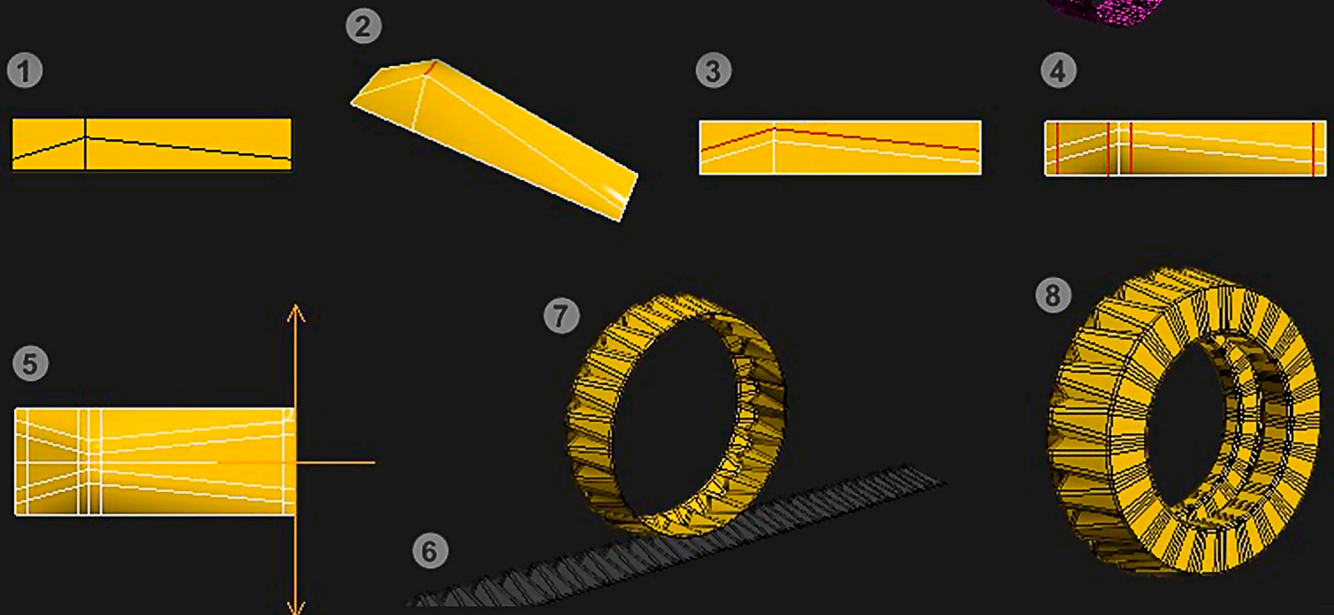


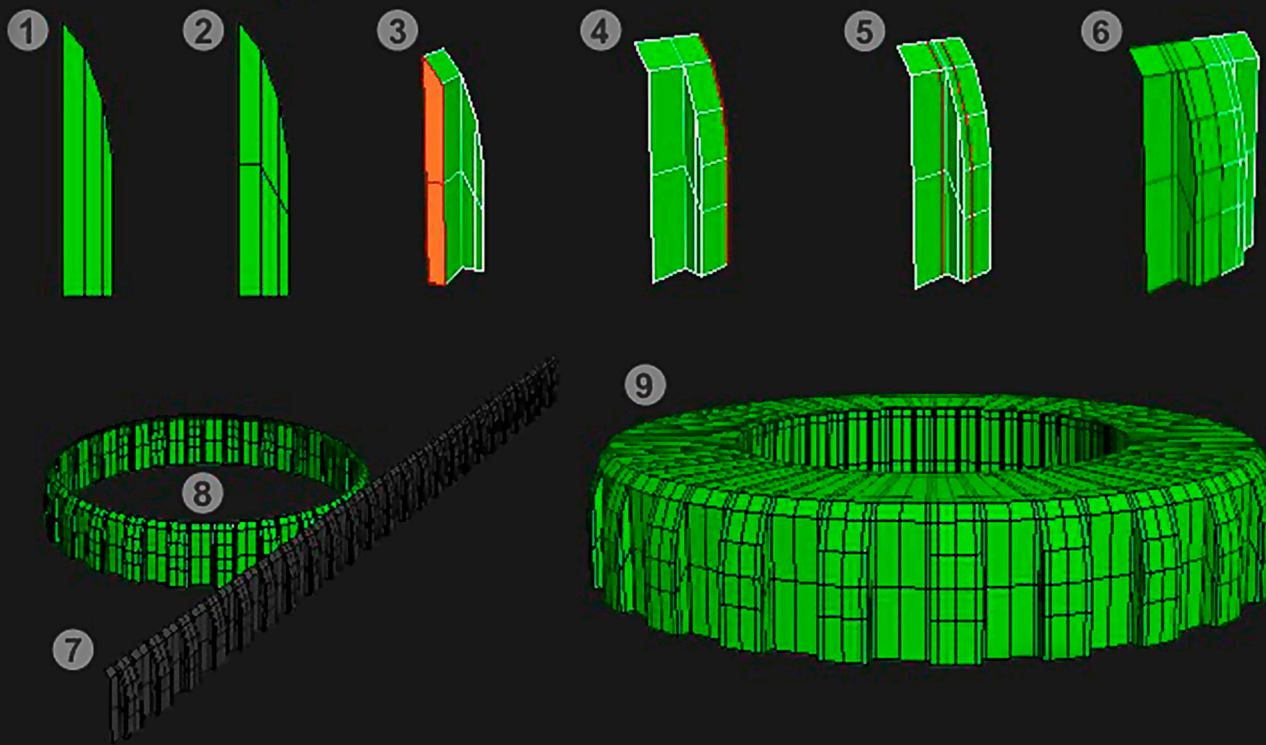


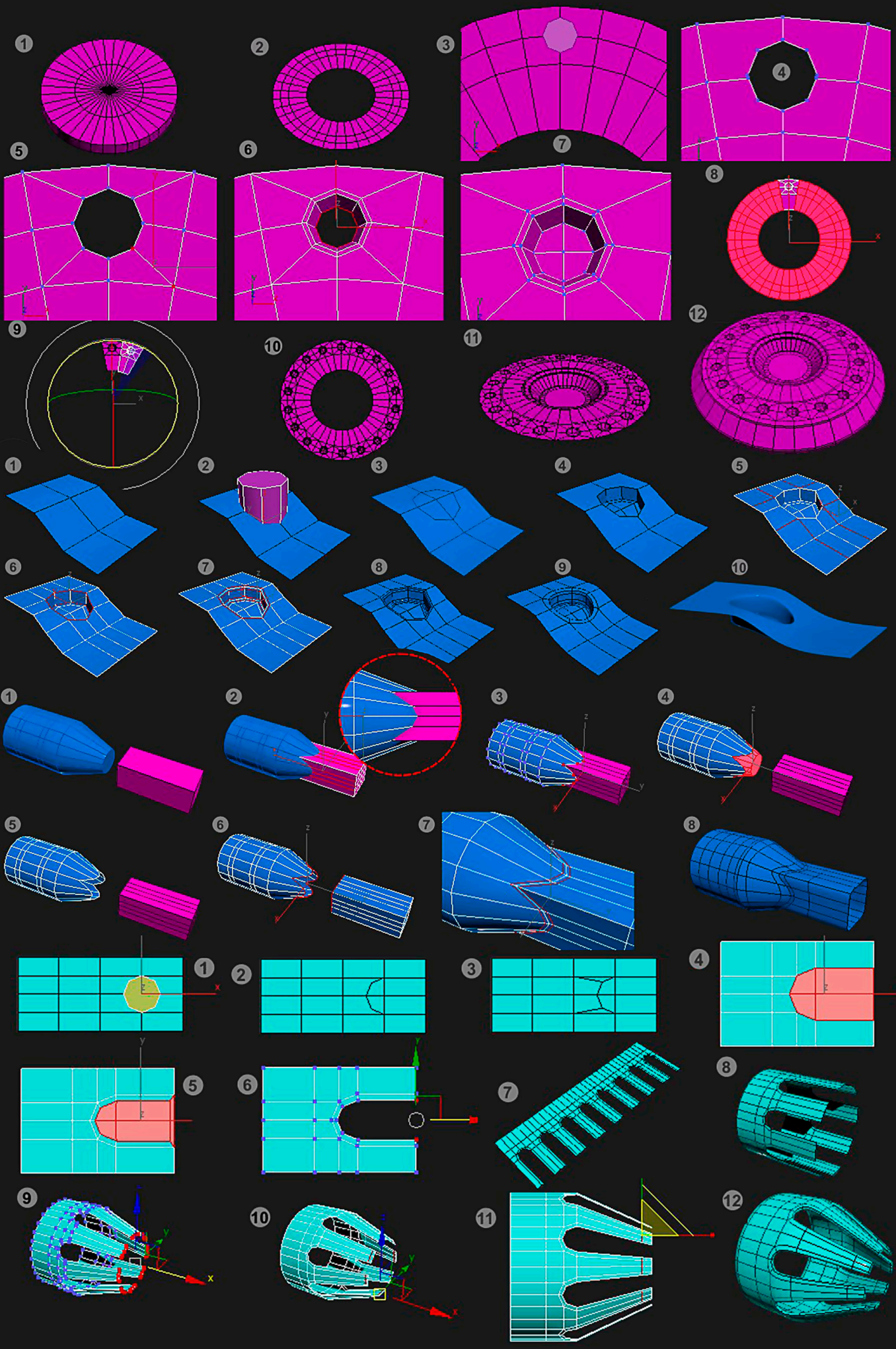





1
2
3
4
5
6
7
8
9
10


1
2
3
4
5
6
7
8

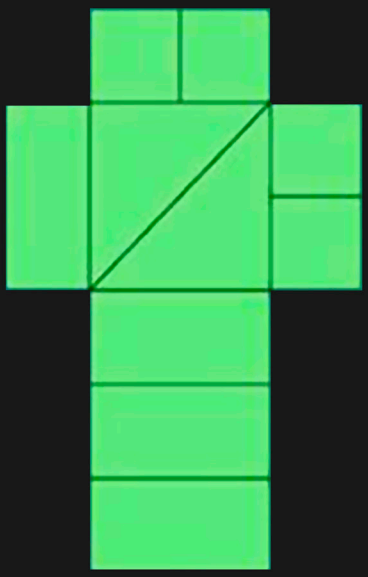

1
2
3
4
5
6
7
8
9



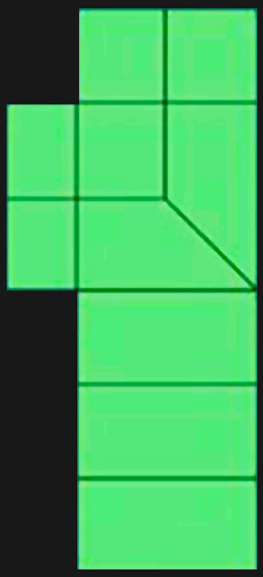
quad topology tips for 3d arts

1 to 1

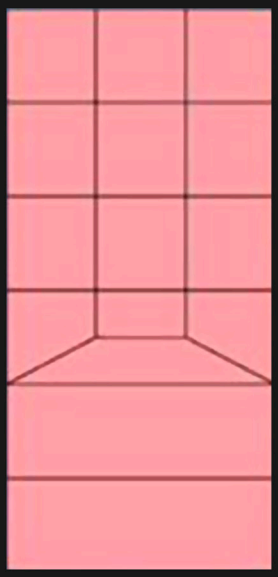
2 to1



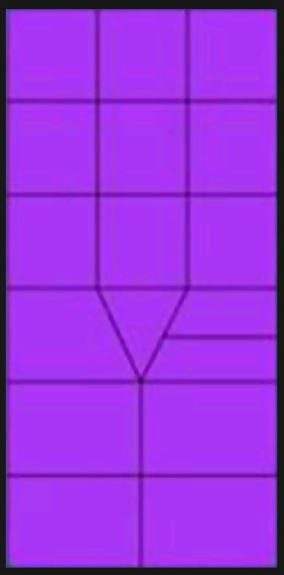
2 to 1



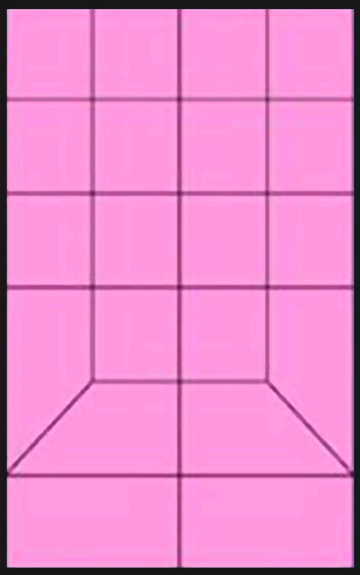
3 to 1



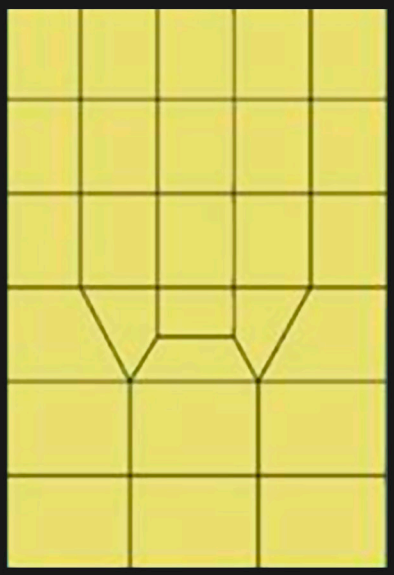
3 to 2

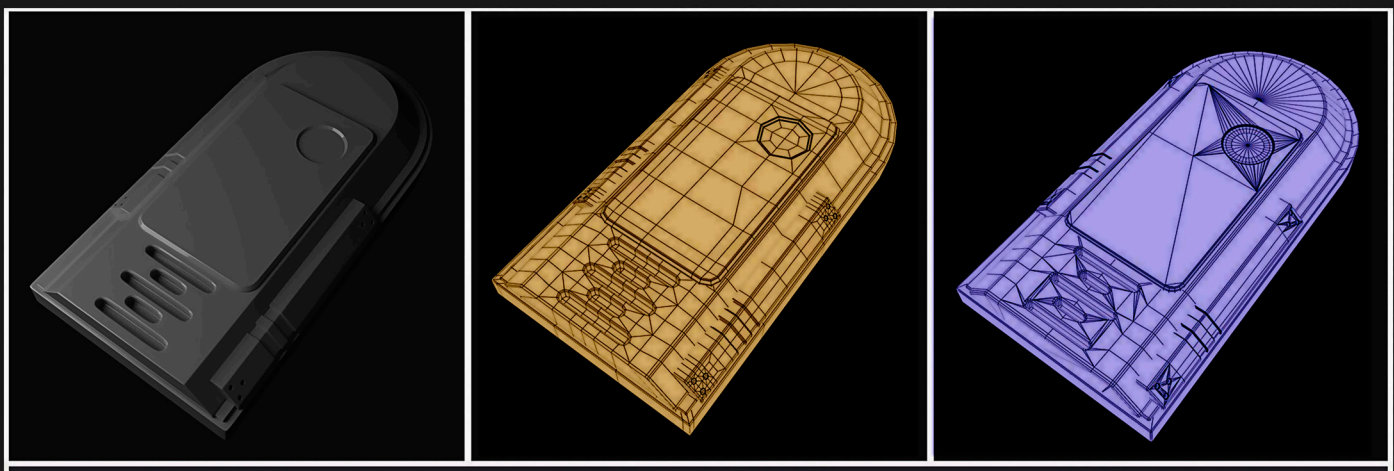


4 to 2

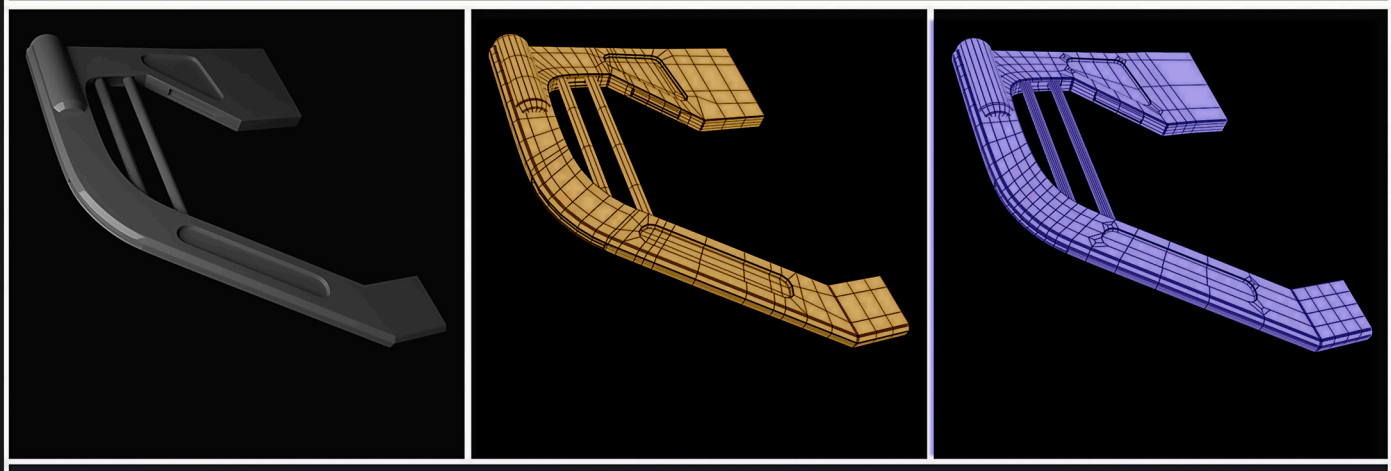


5 to 3

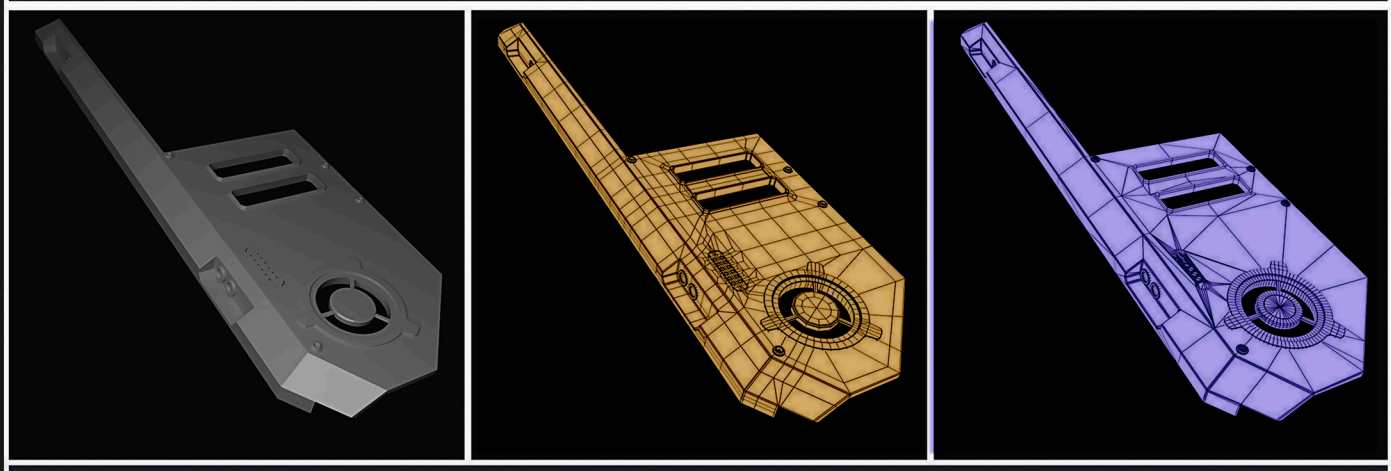




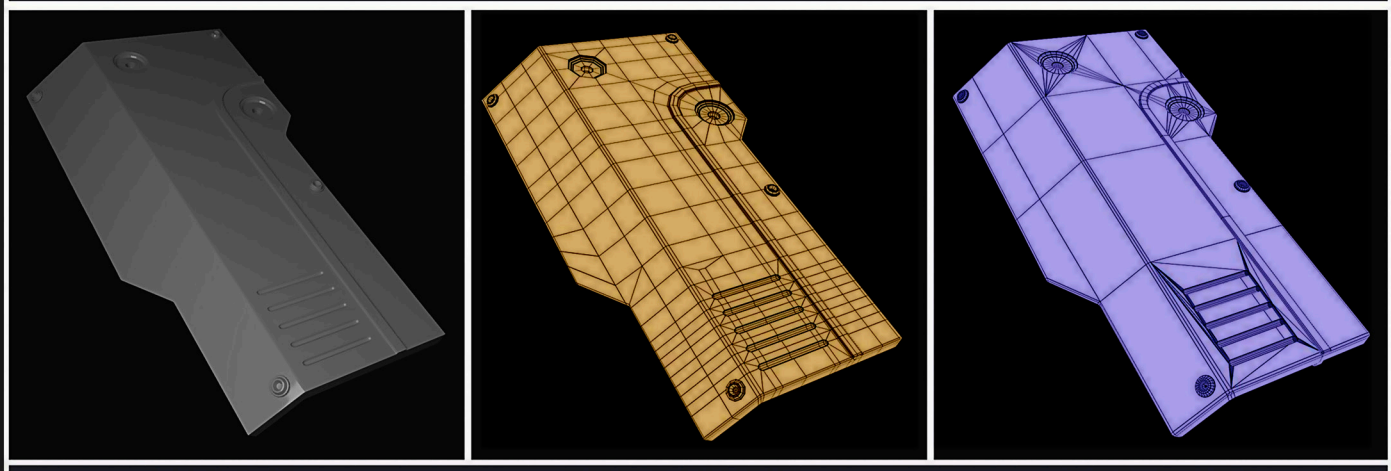
SUBD 2 PRODUCTION CONCEPT



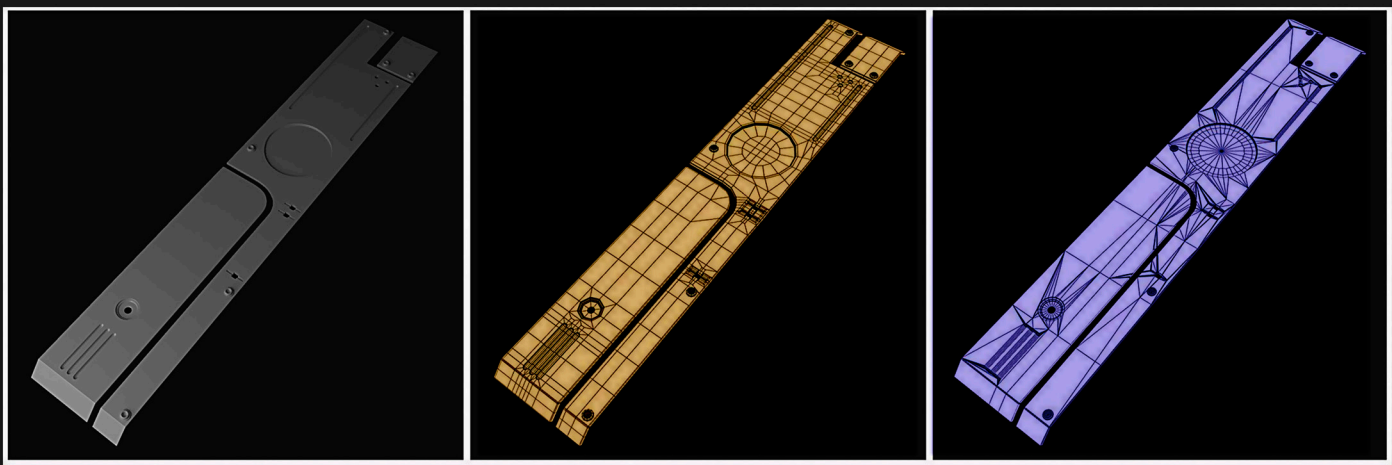
SUBD 2 PRODUCTION CONCEPT



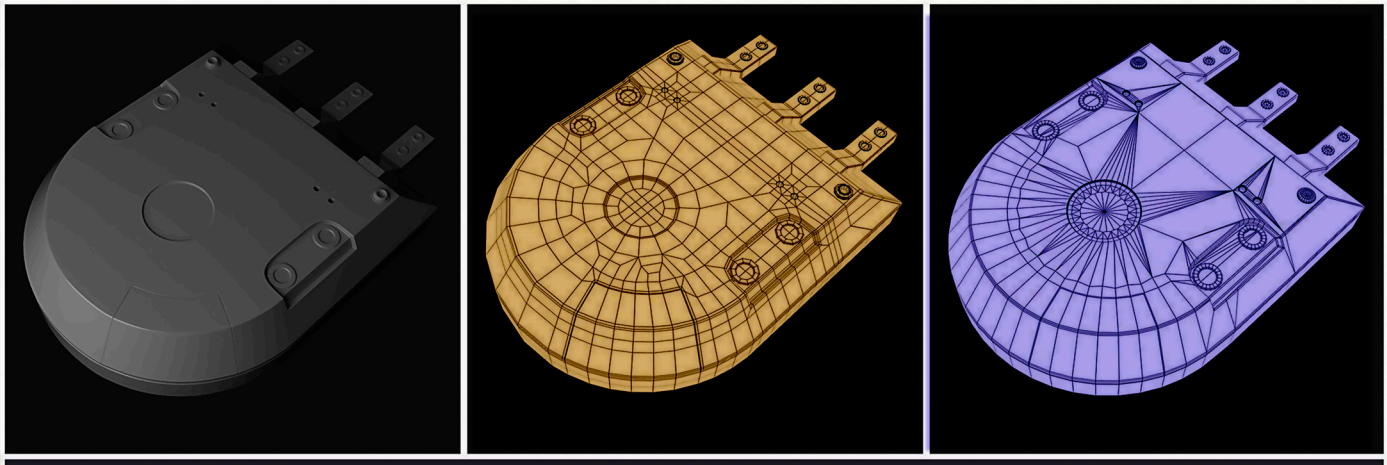
SUBD 2 PRODUCTION CONCEPT



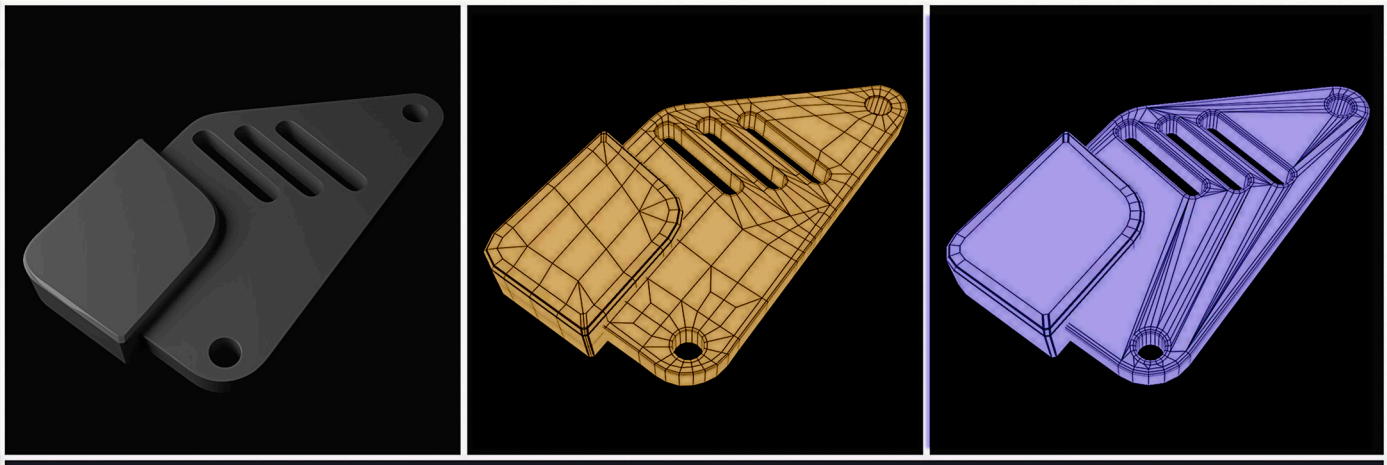
SUBD 2 PRODUCTION CONCEPT



SUBD 2 PRODUCTION CONCEPT



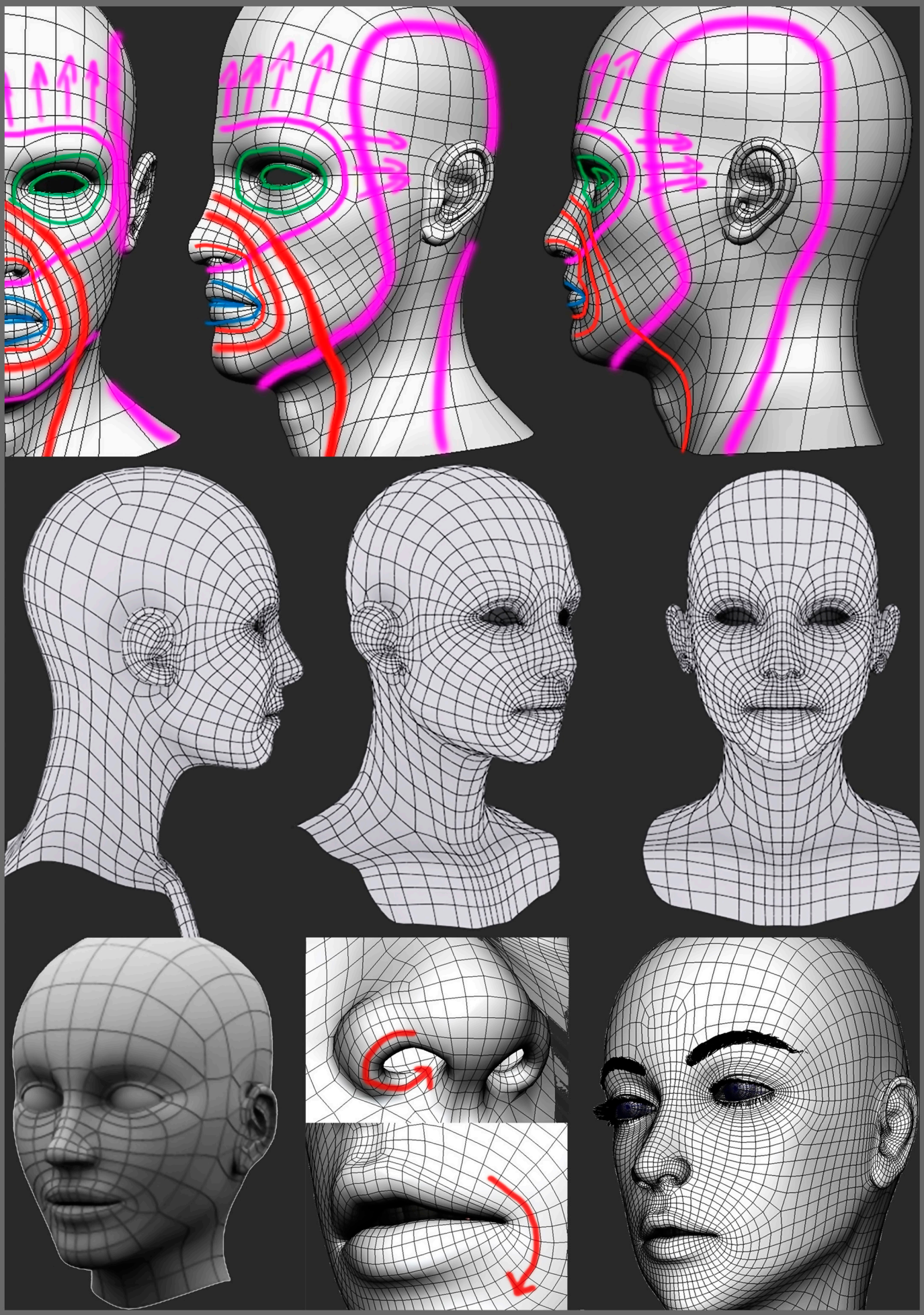
SUBD 2 PRODUCTION CONCEPT

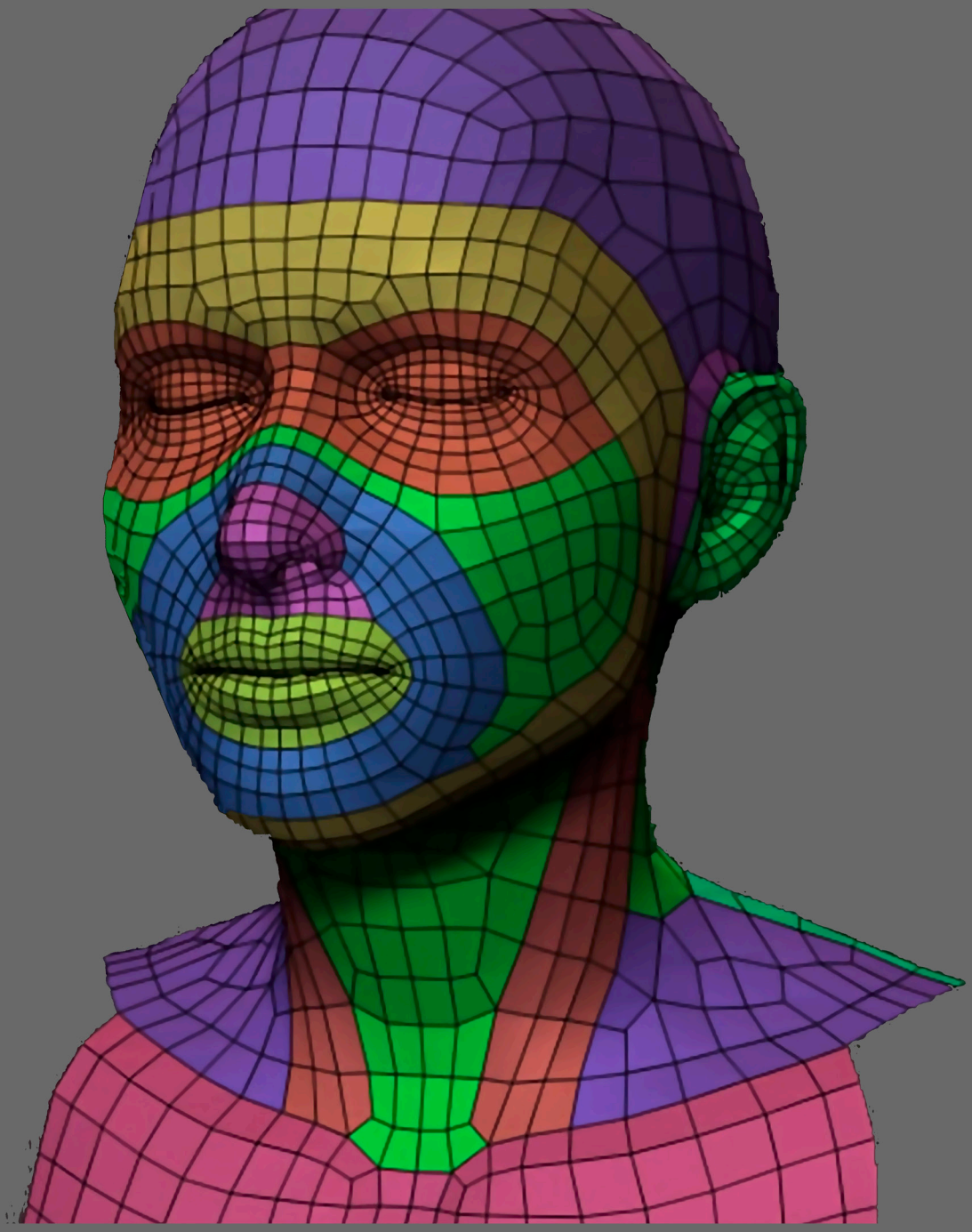


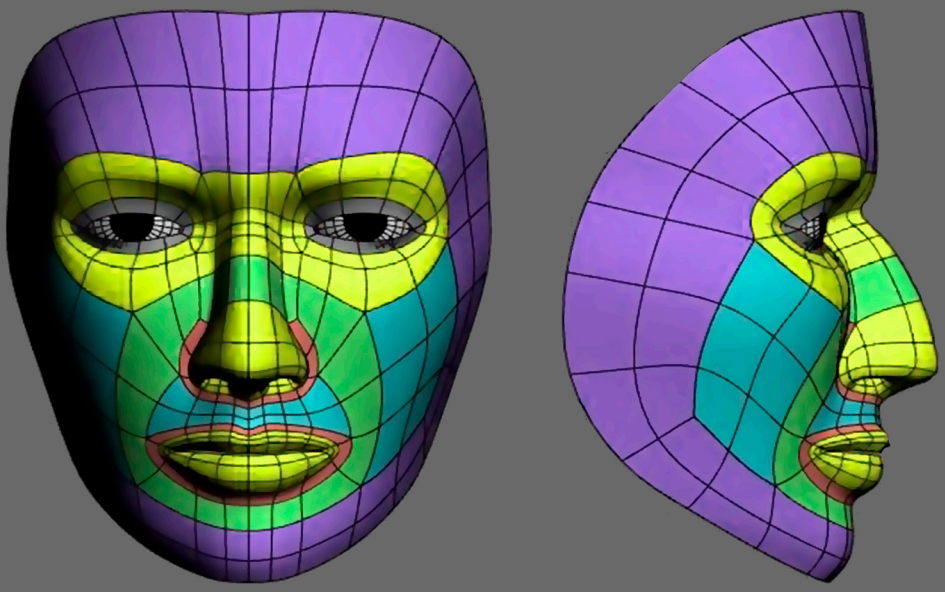
SUBD 2 PRODUCTION CONCEPT

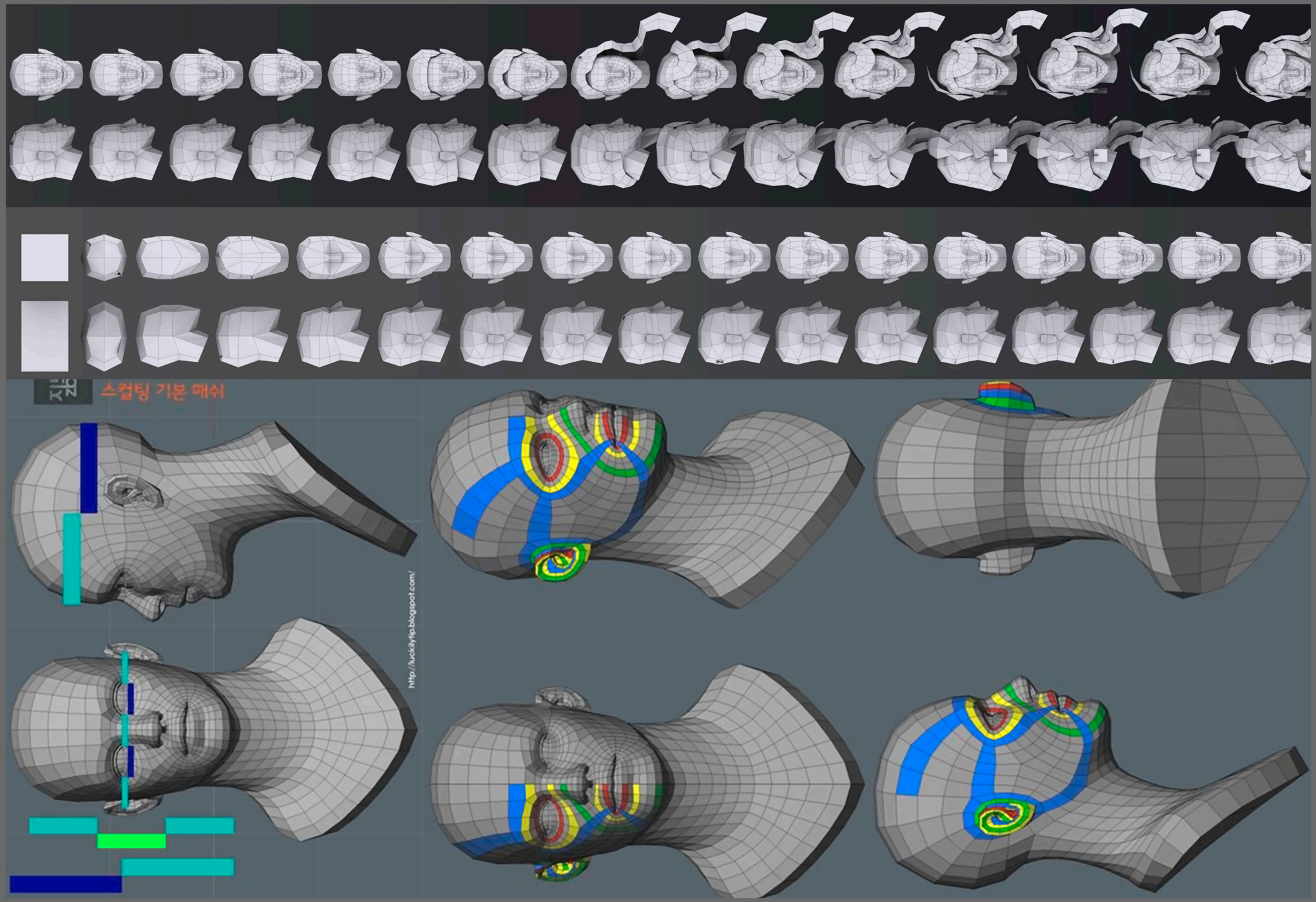
SUBD 2 PRODUCTION CONCEPT

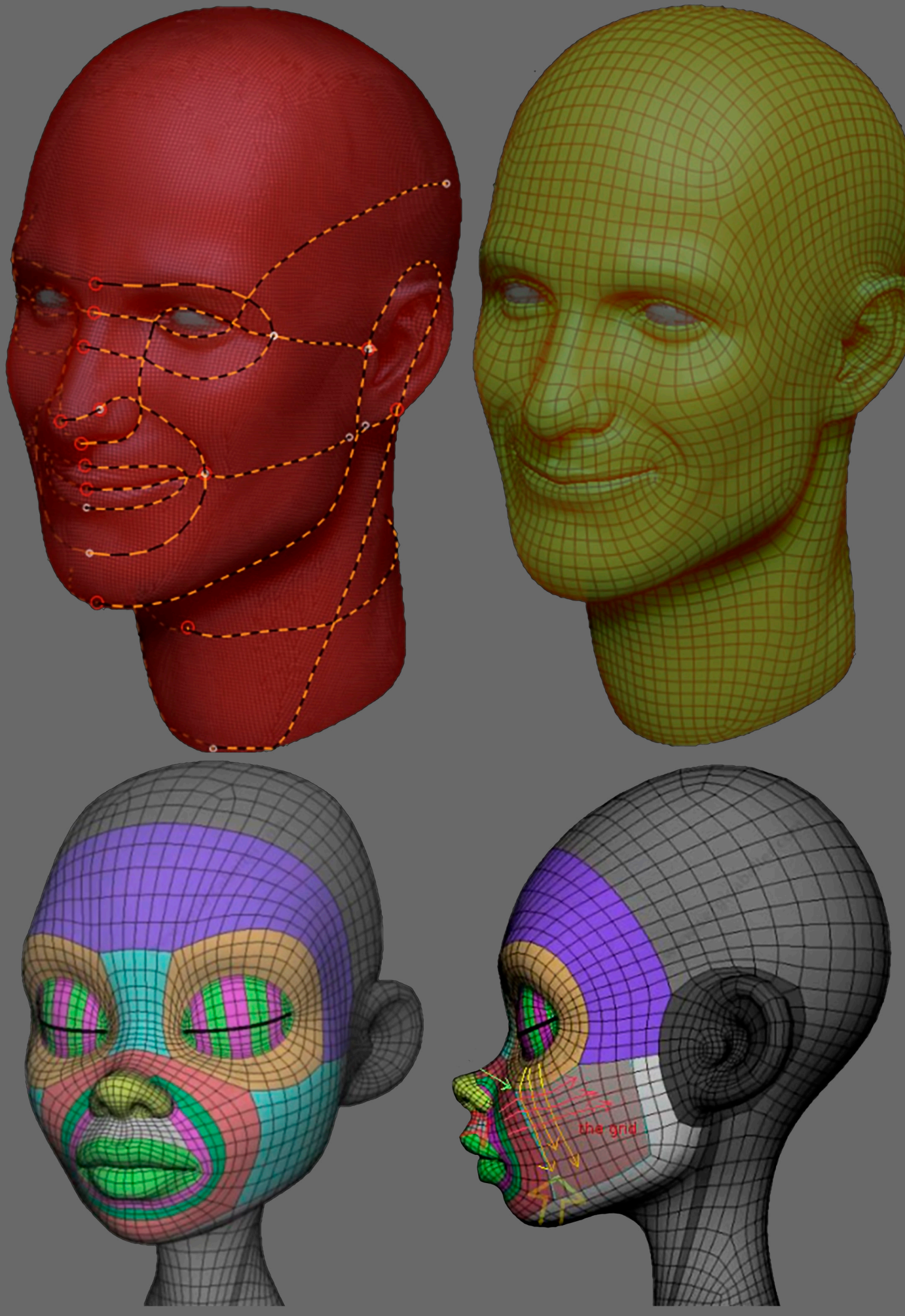
head retopology

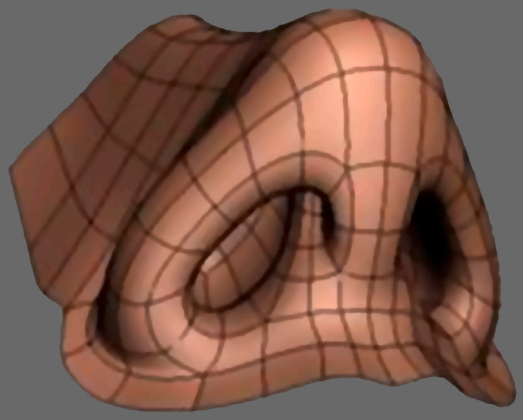


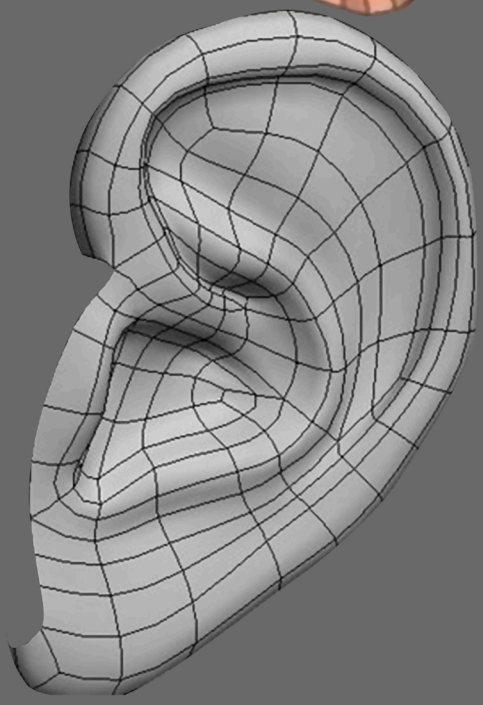


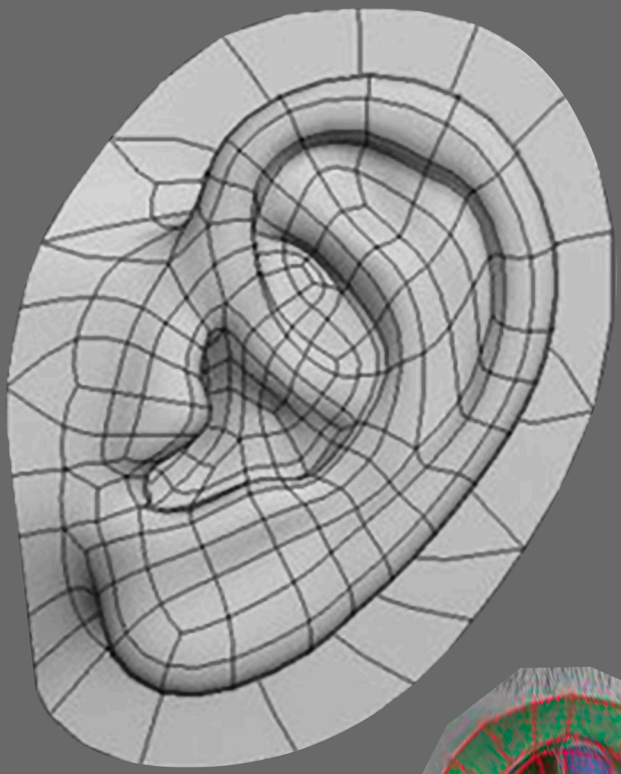


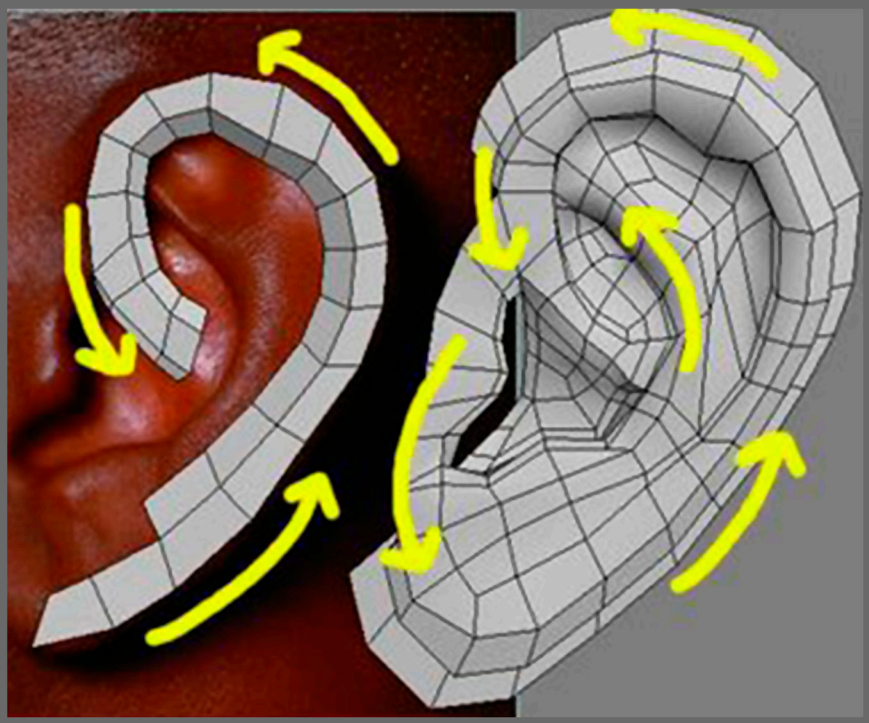

스컬팅 기본 매쉬
http://luckkiytip.blogspot.com/

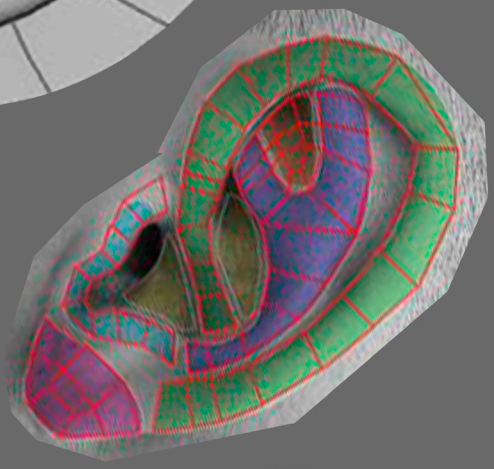

the grid

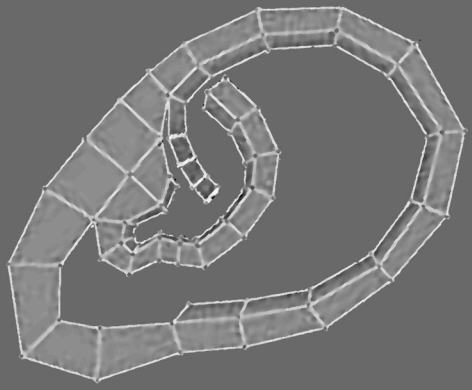


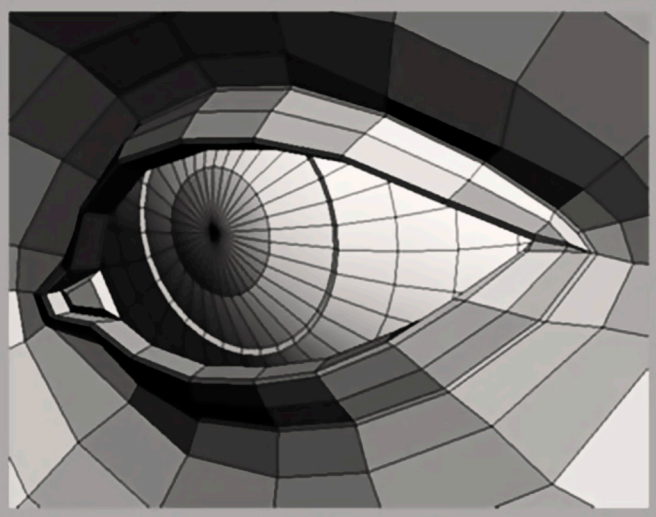


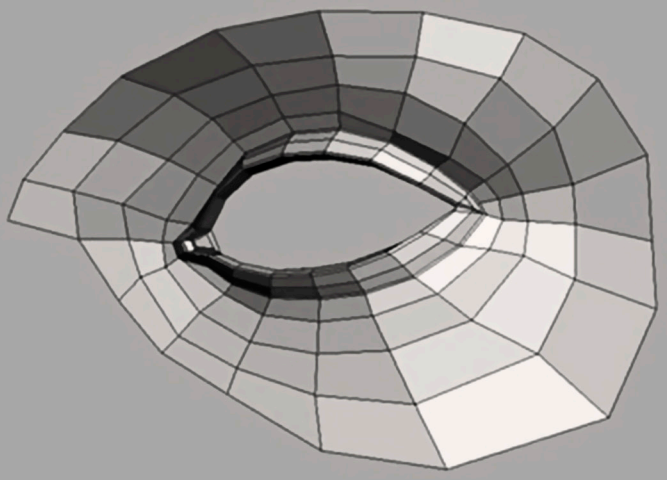


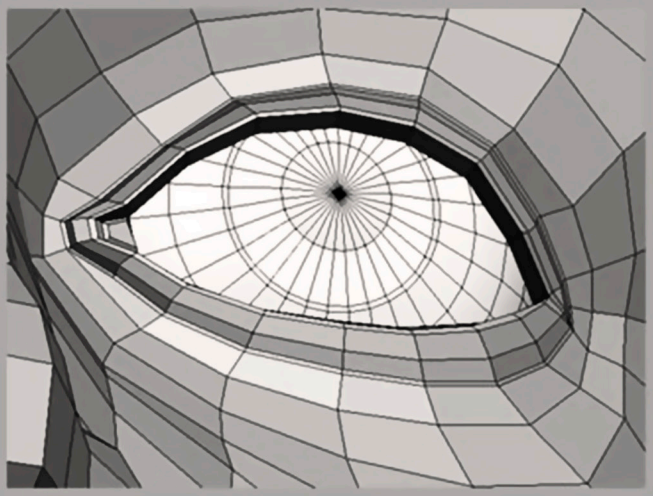


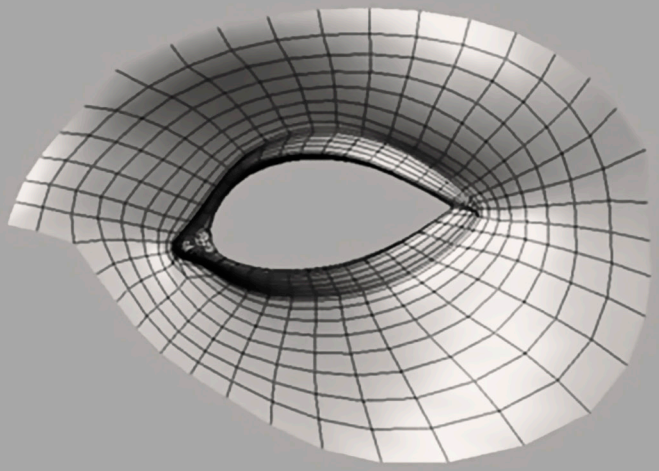


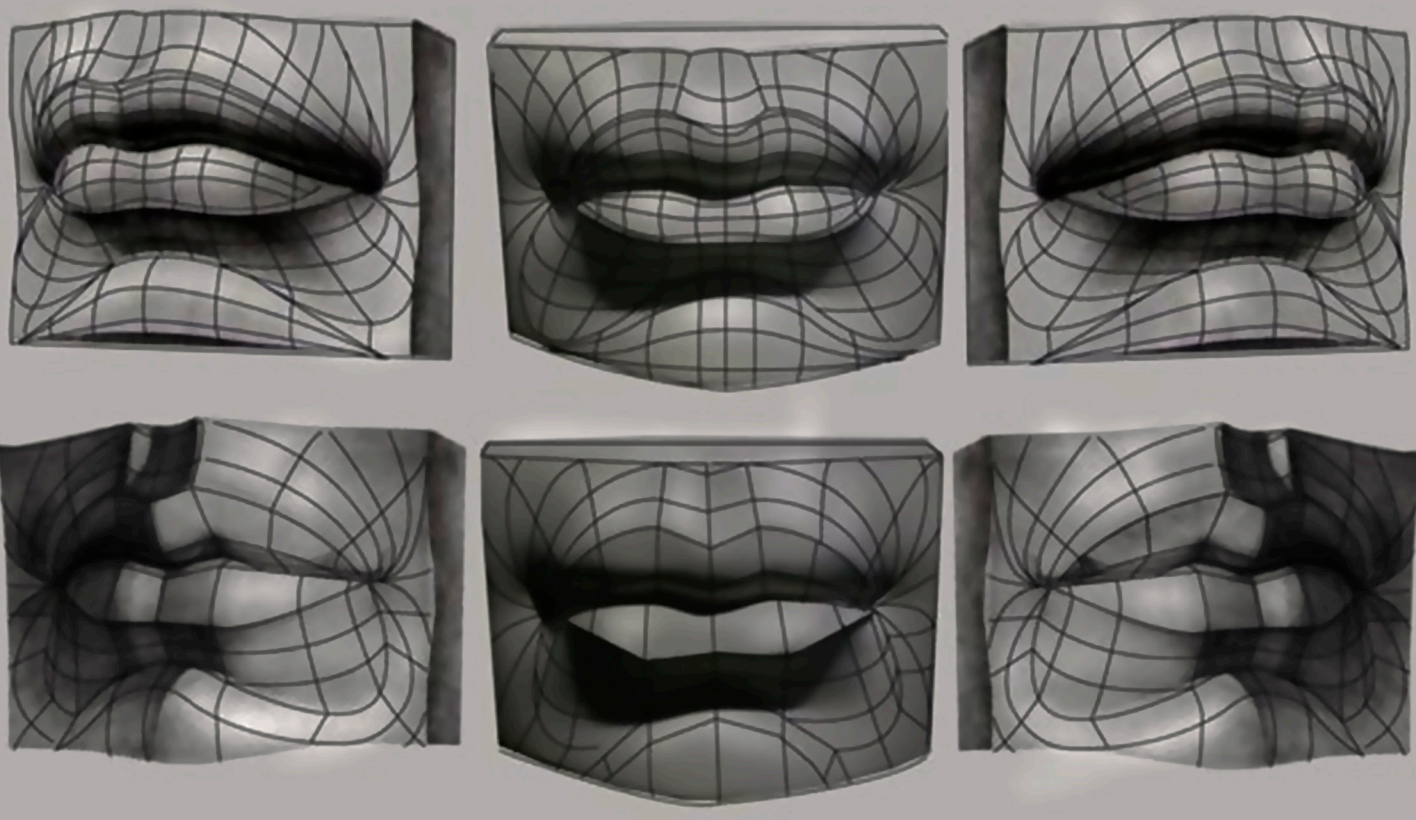




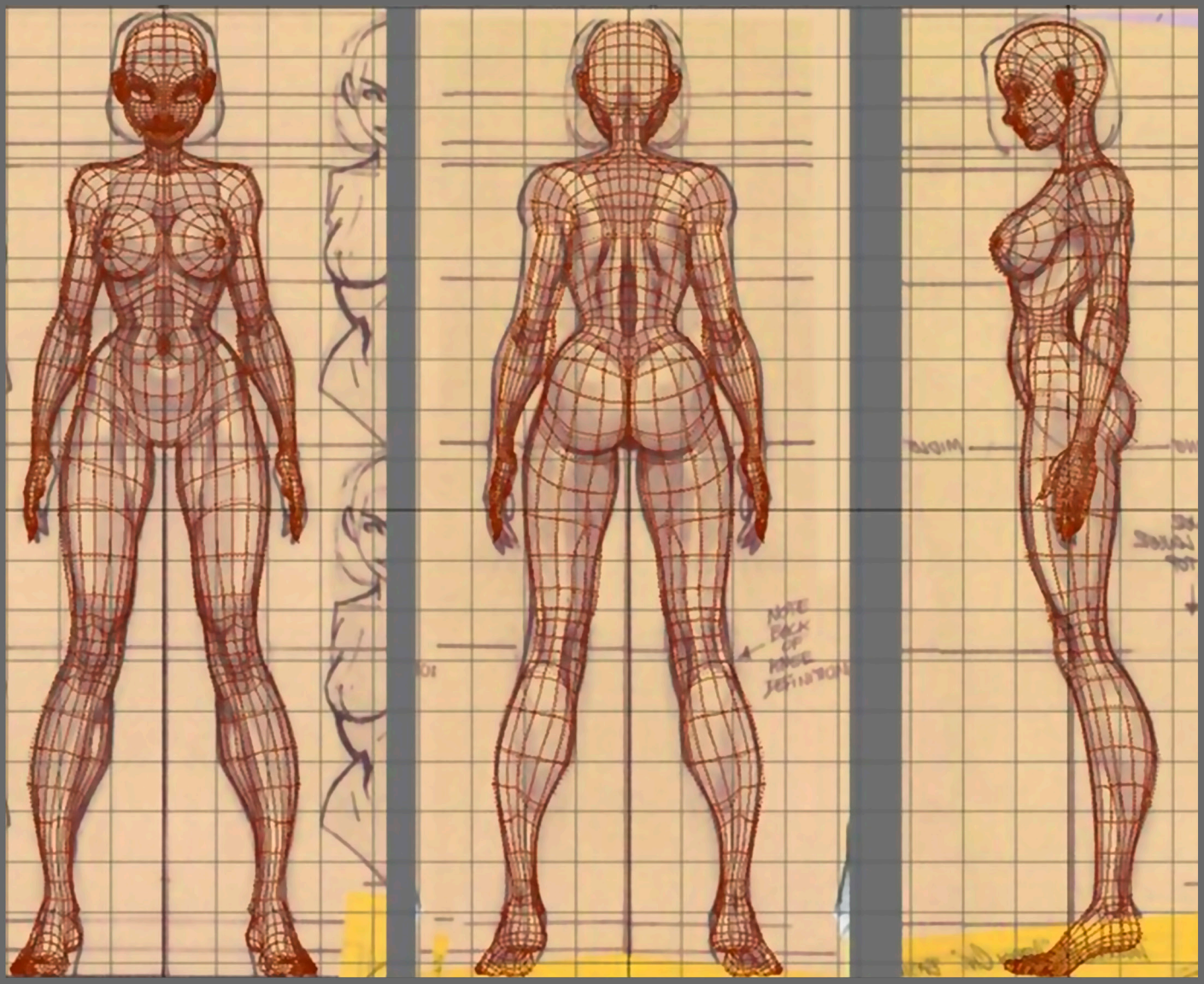


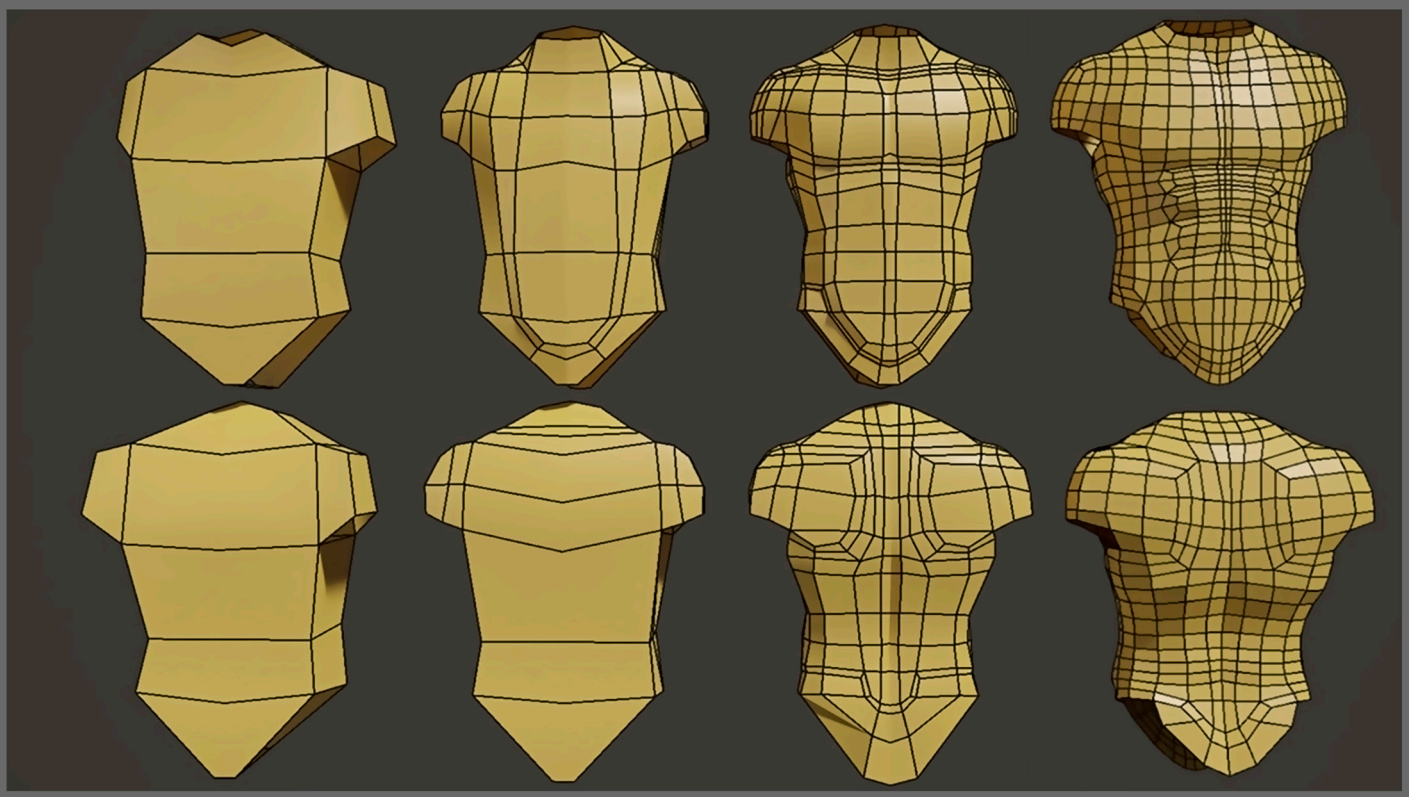


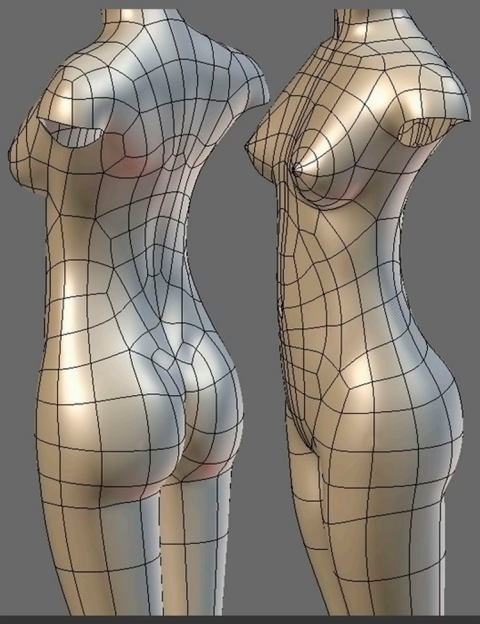


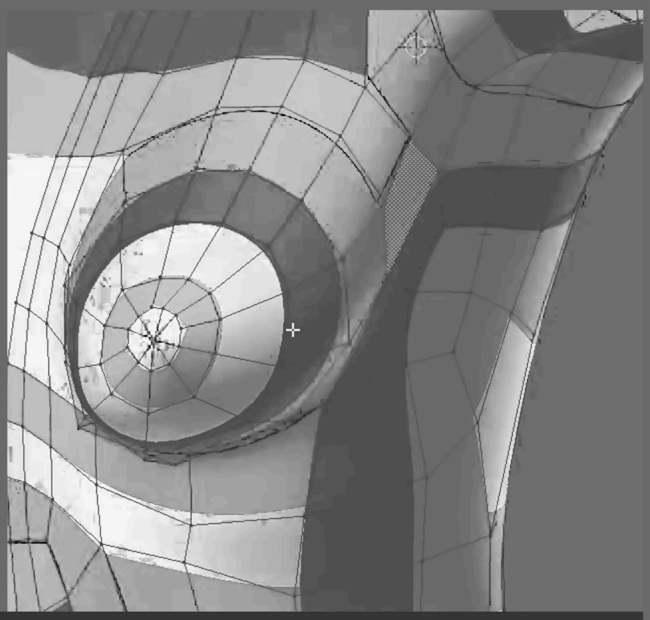


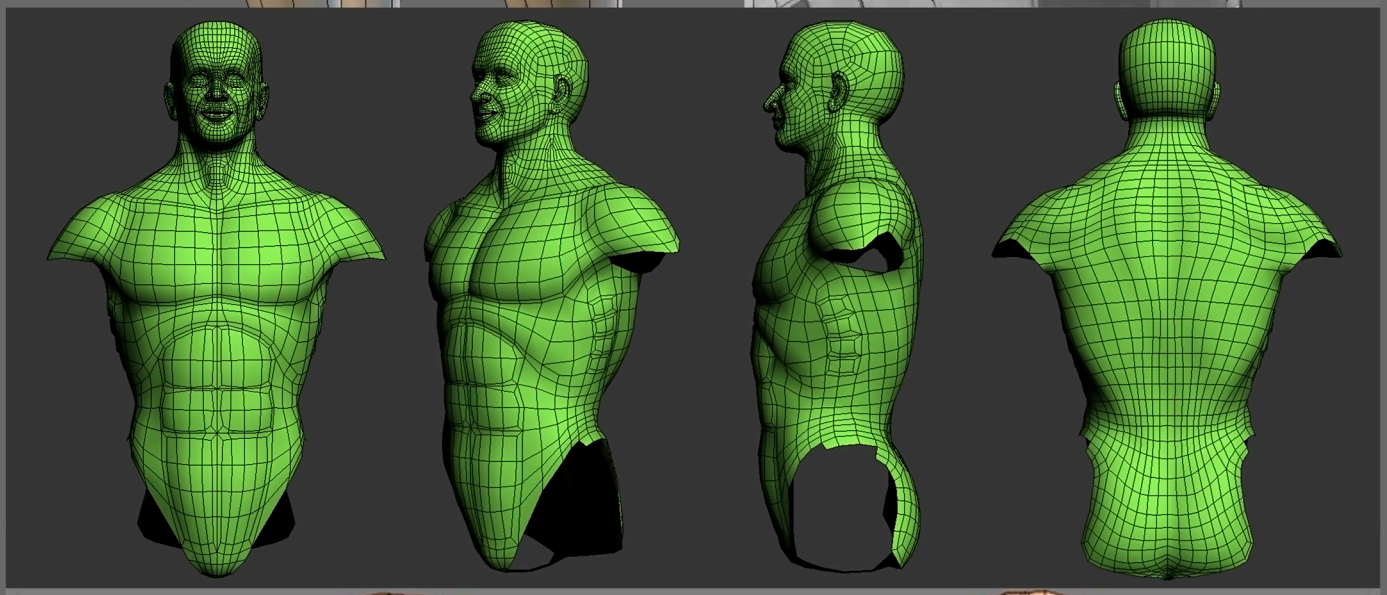
retopology of the torso

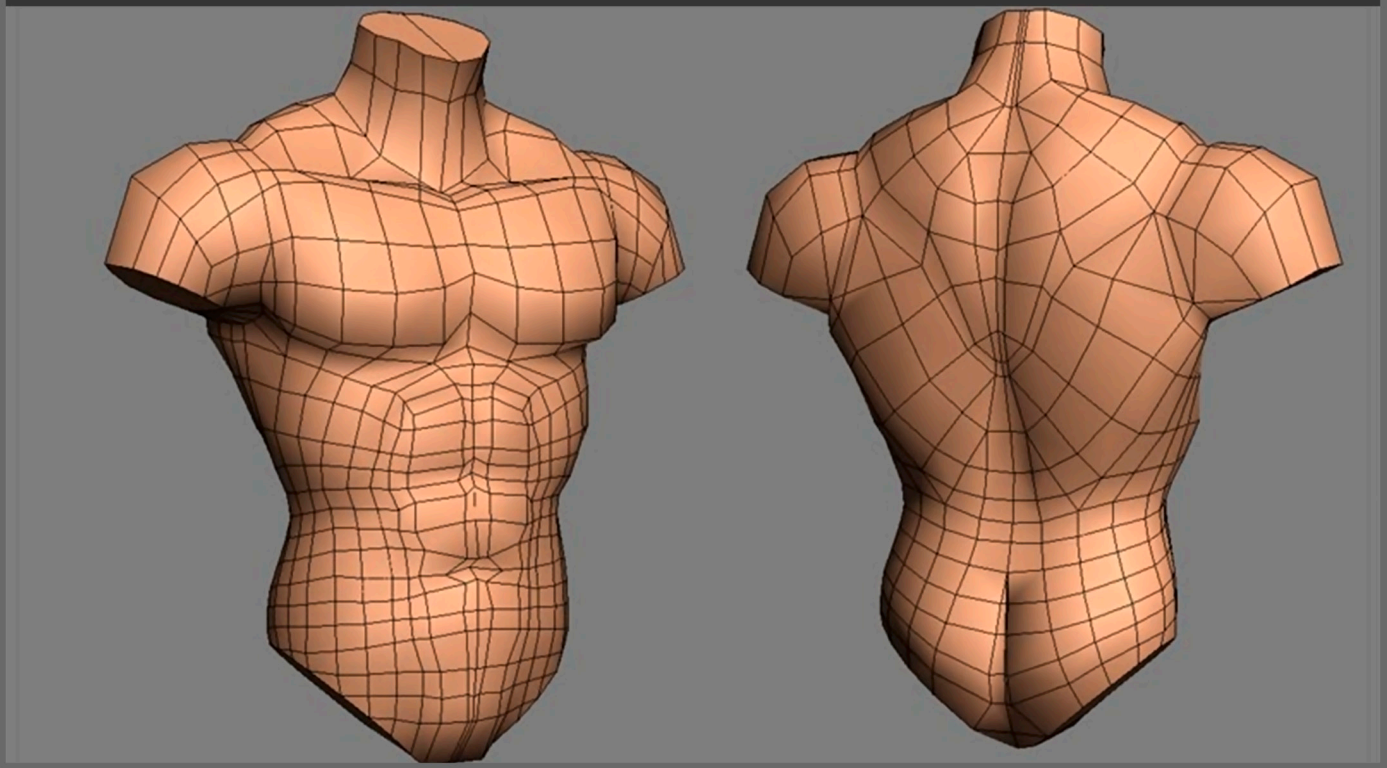


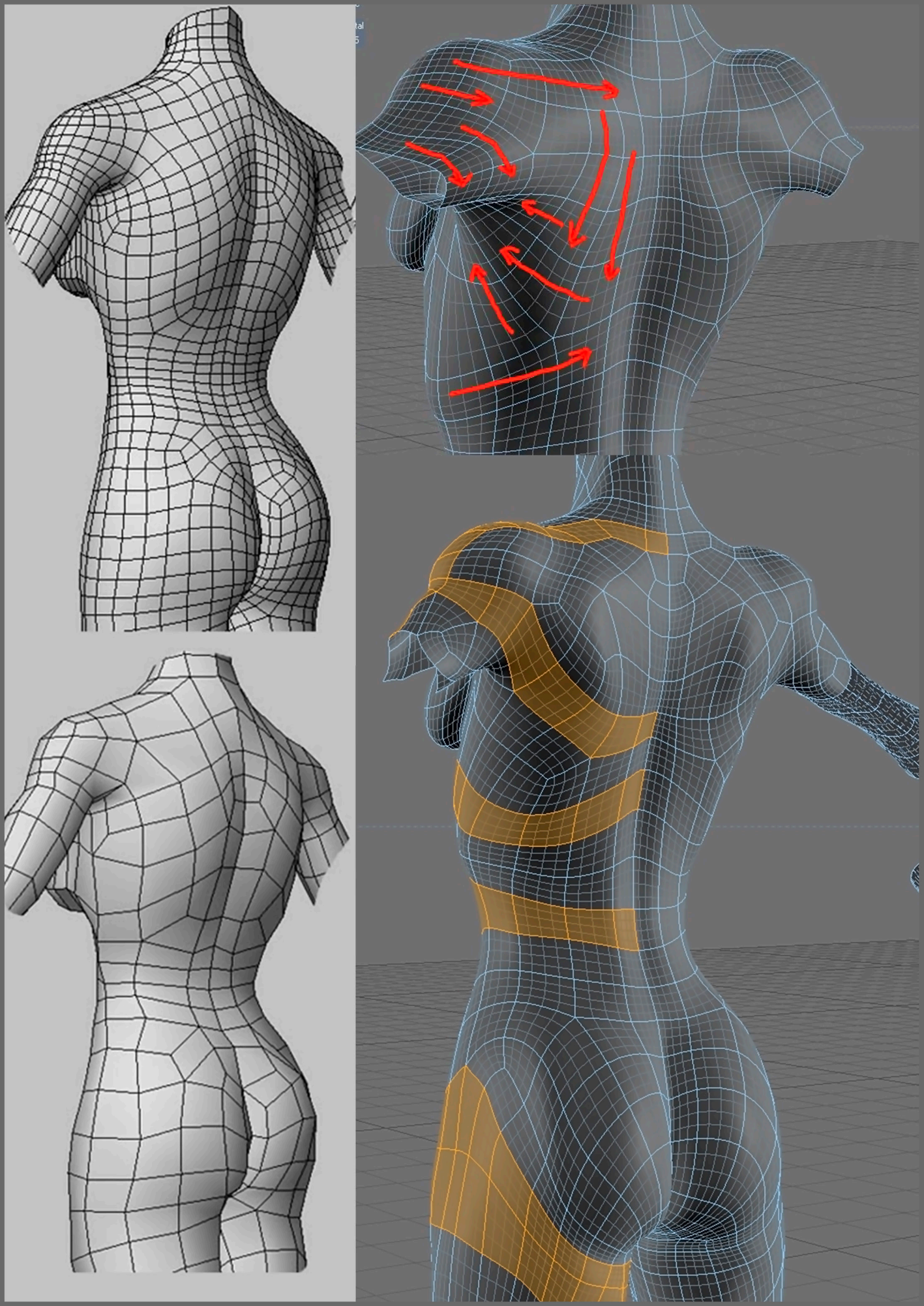


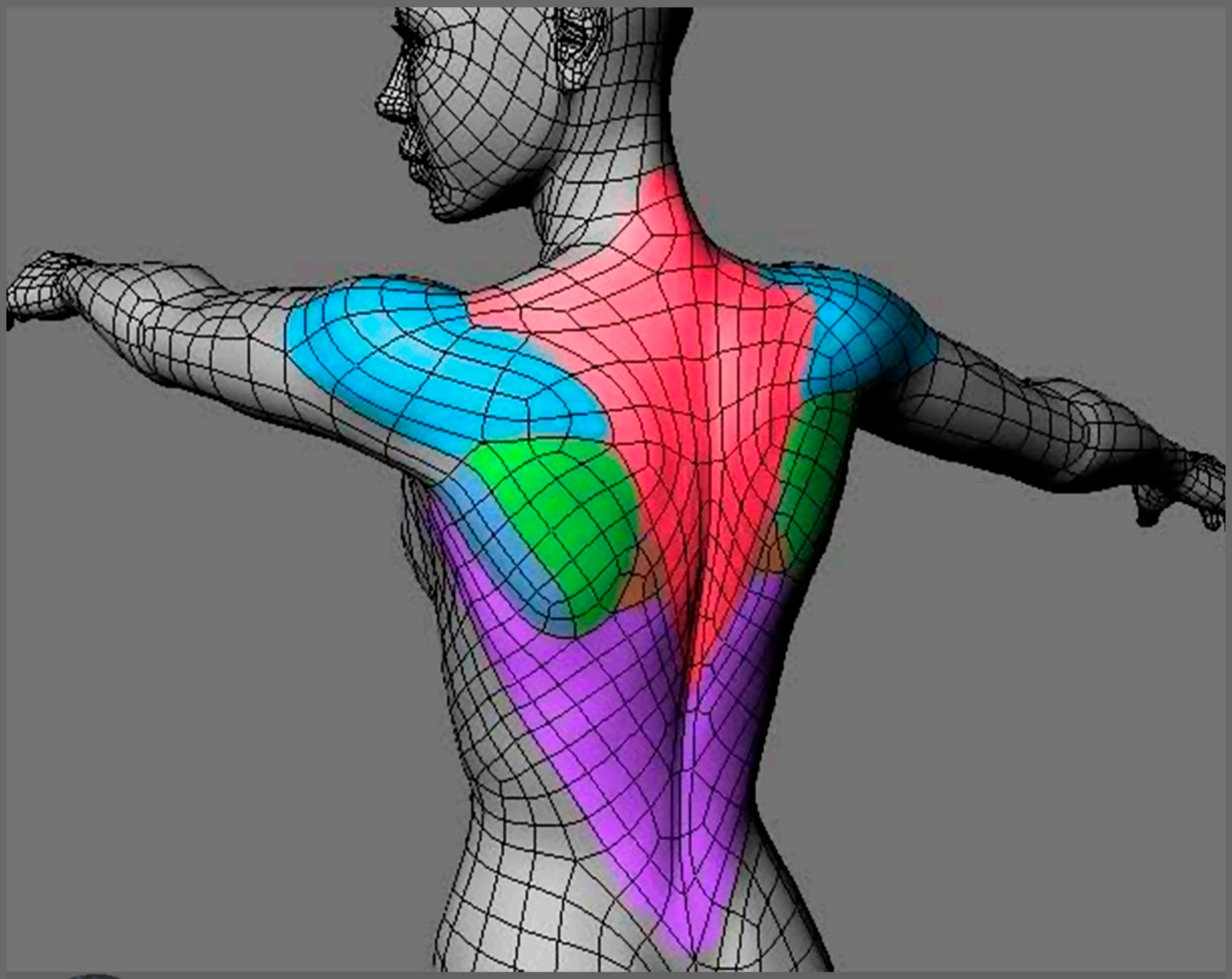


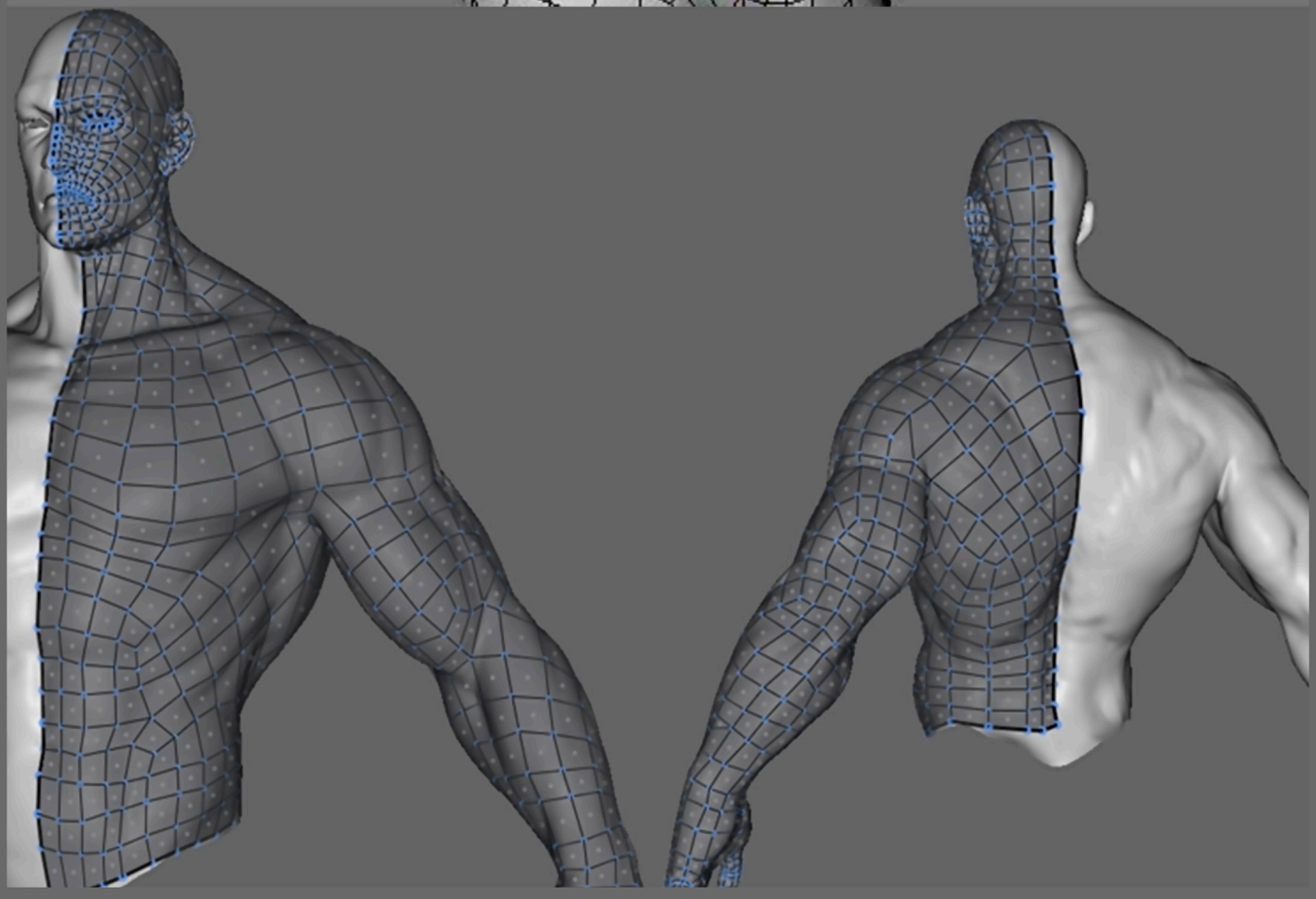


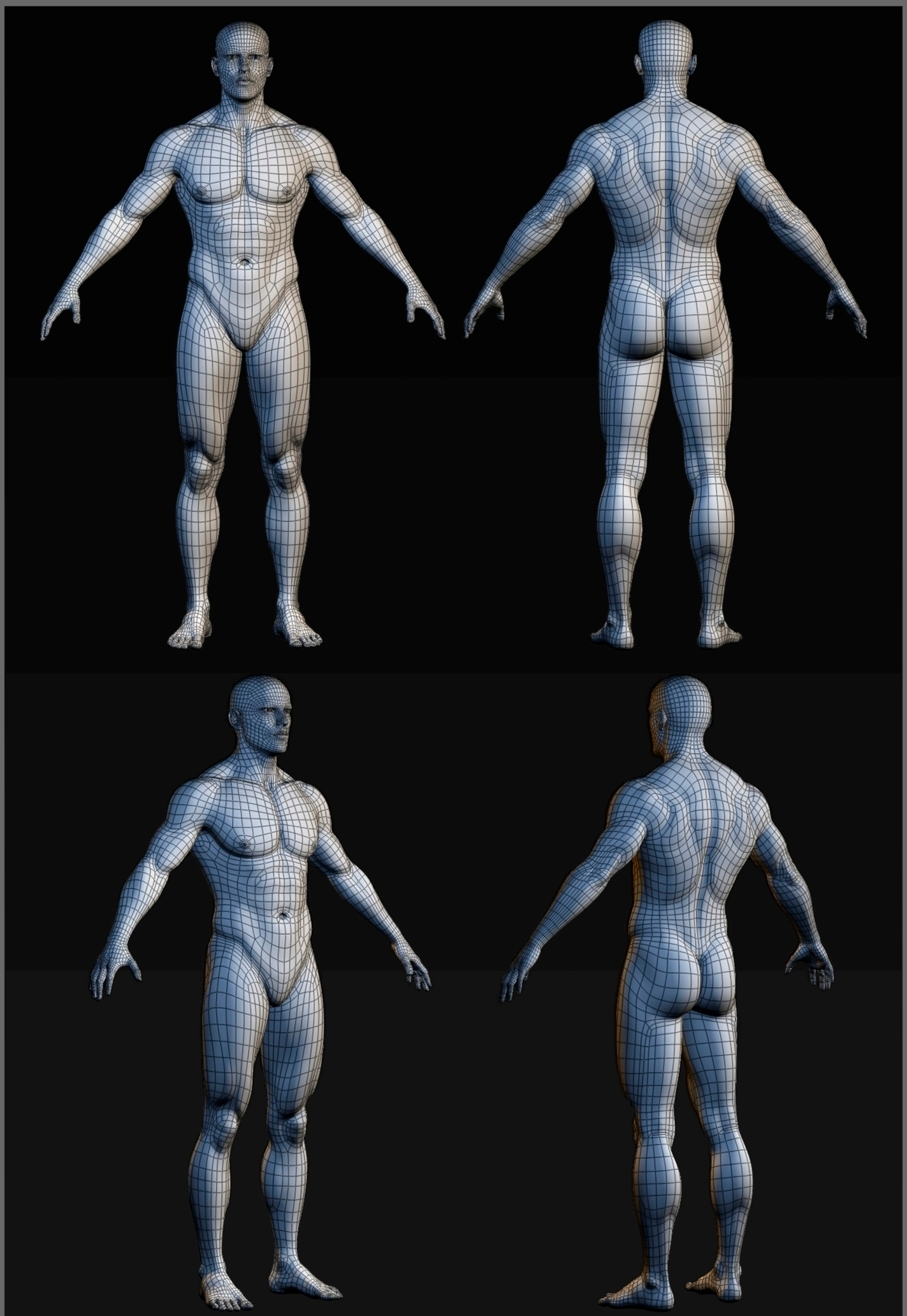


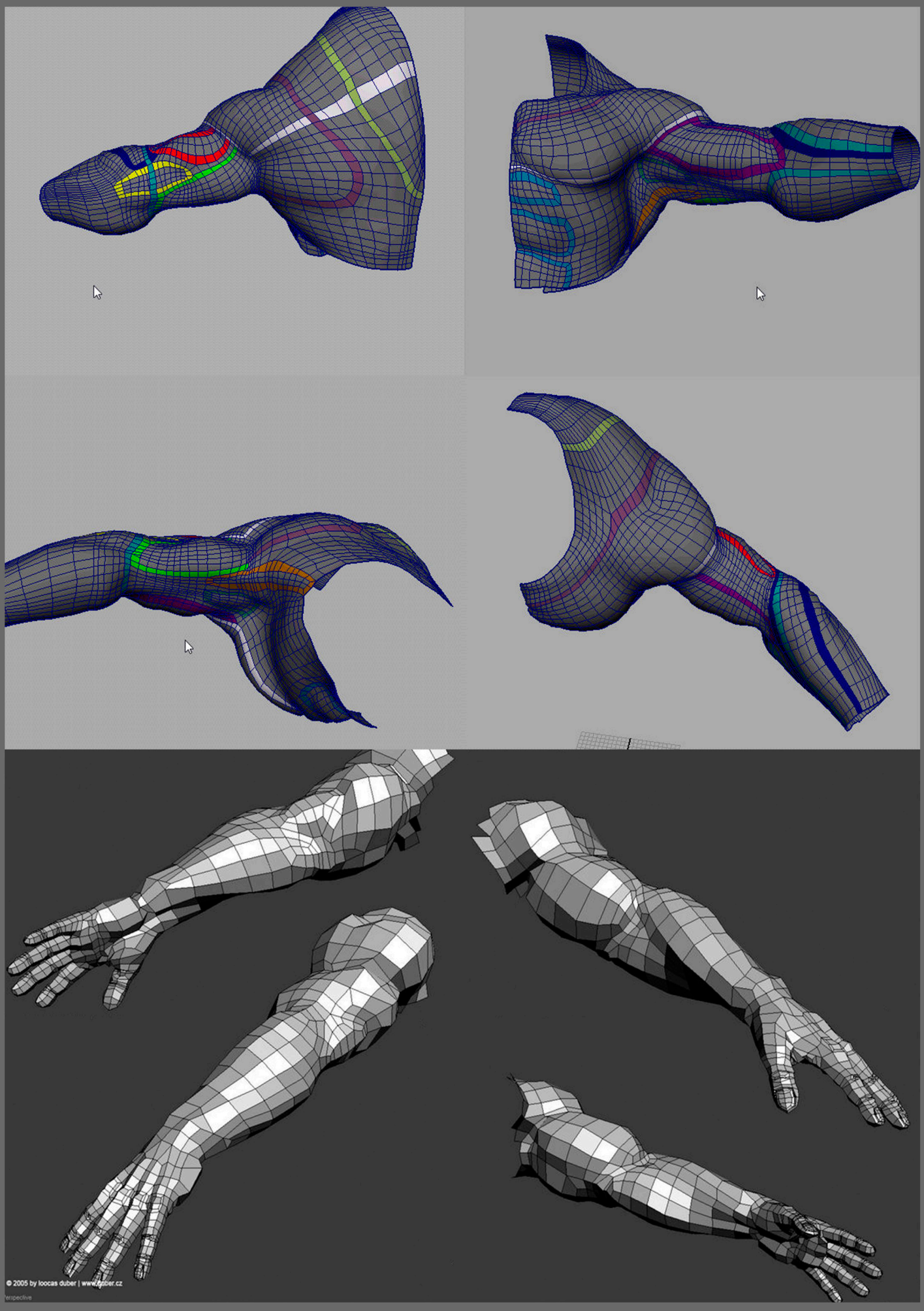


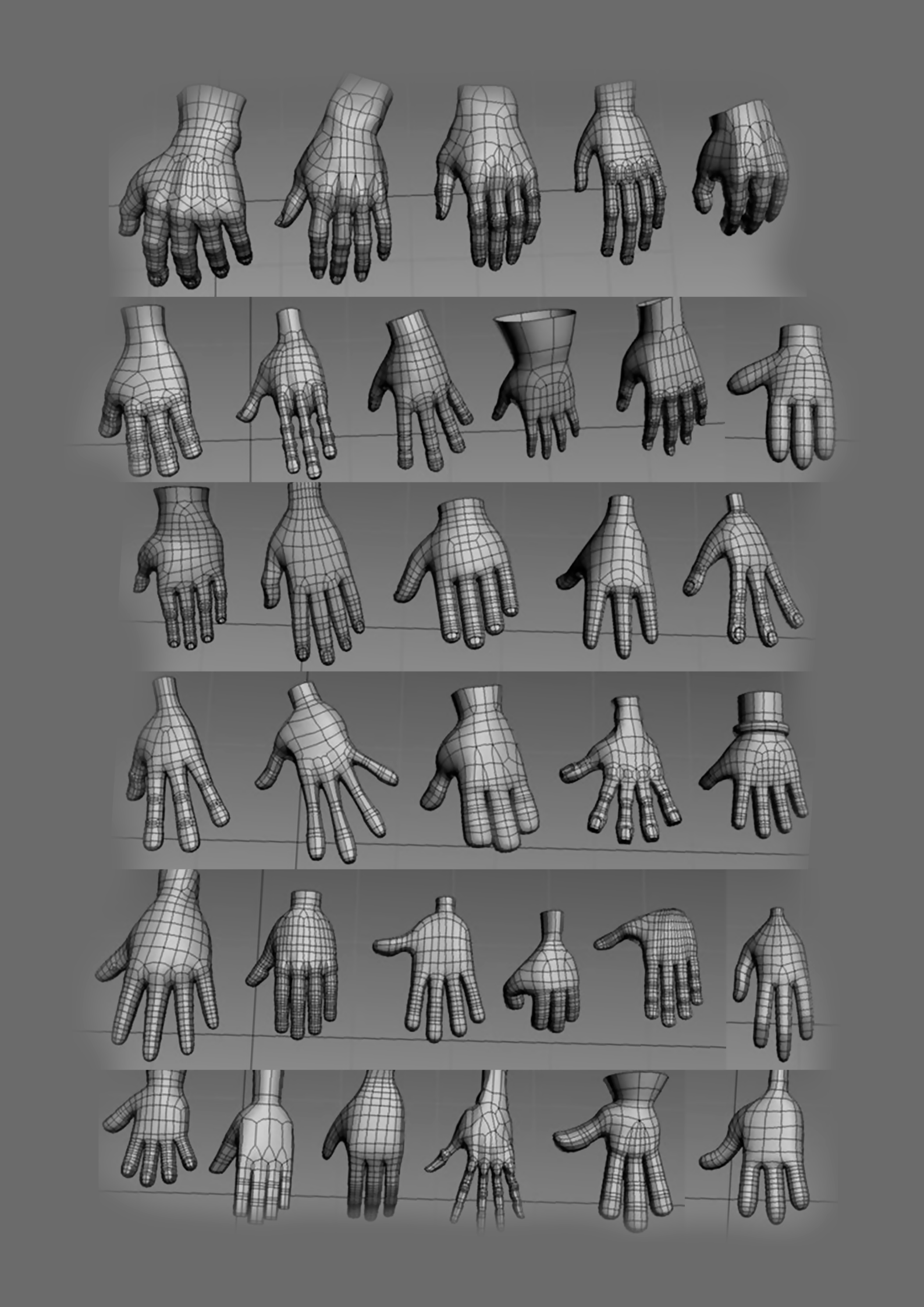


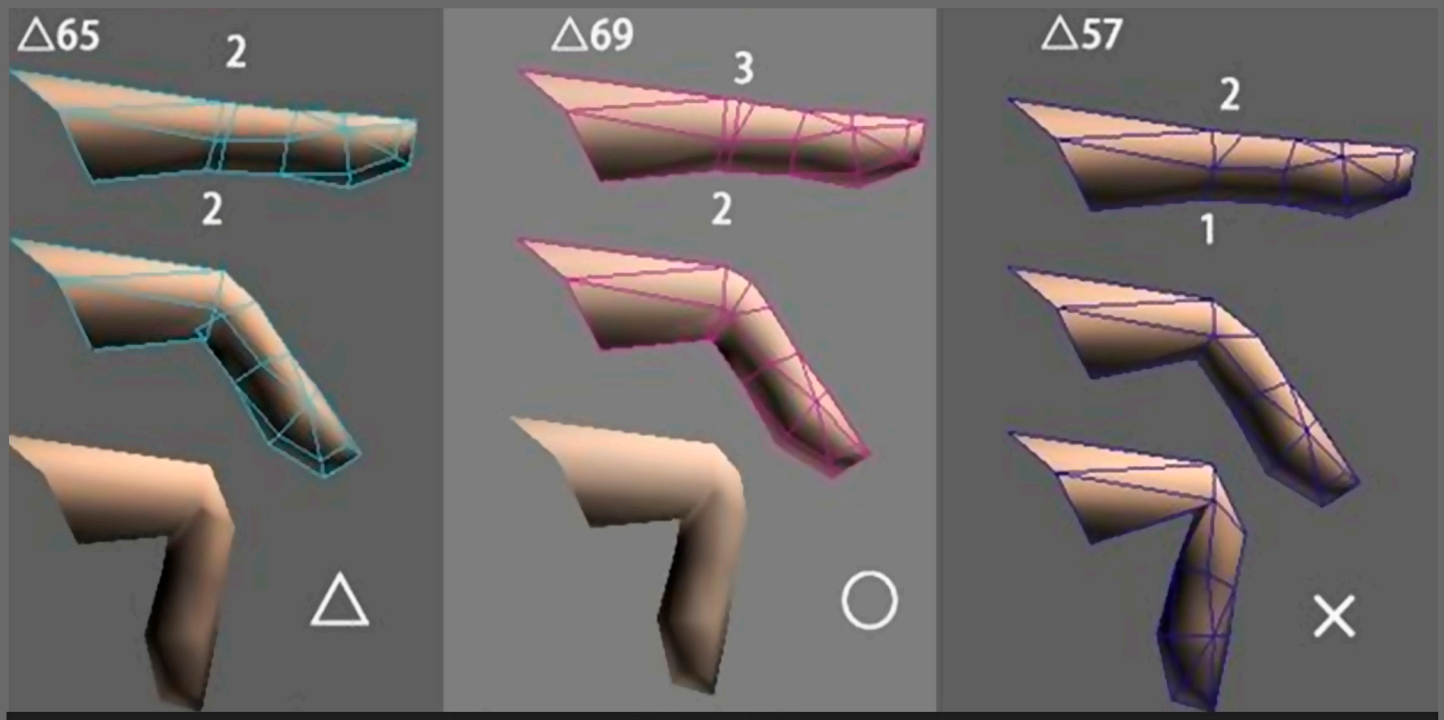


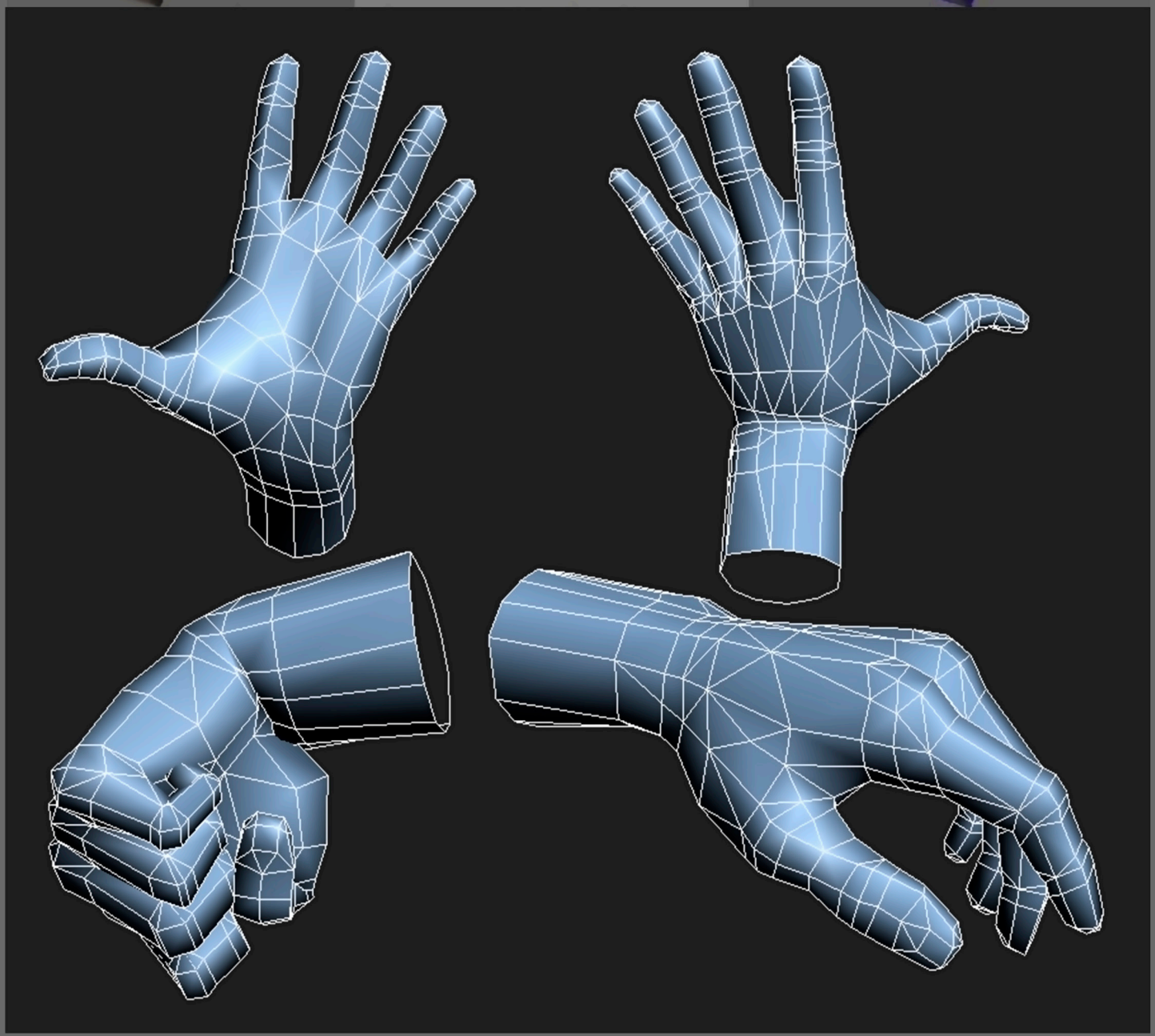


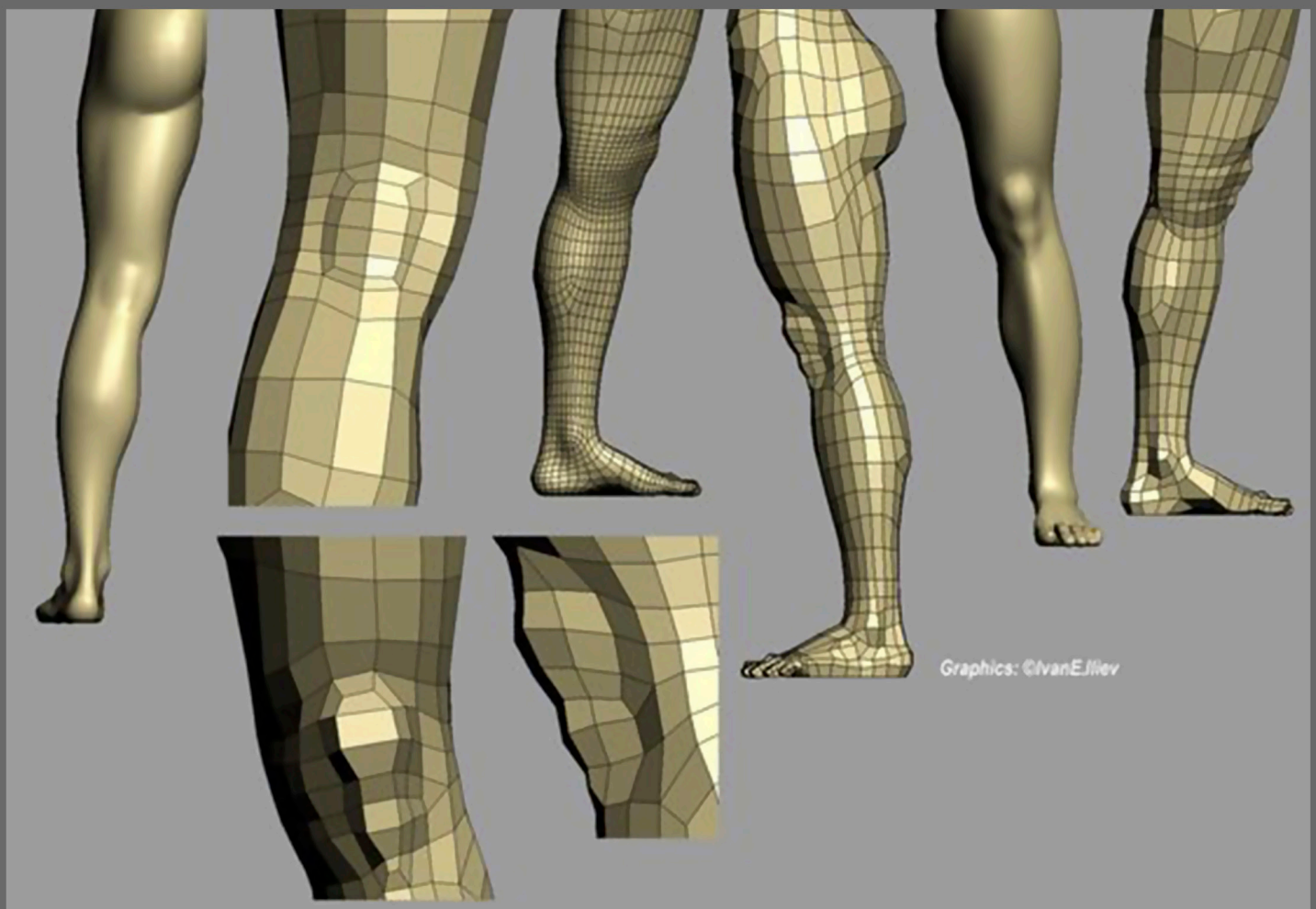


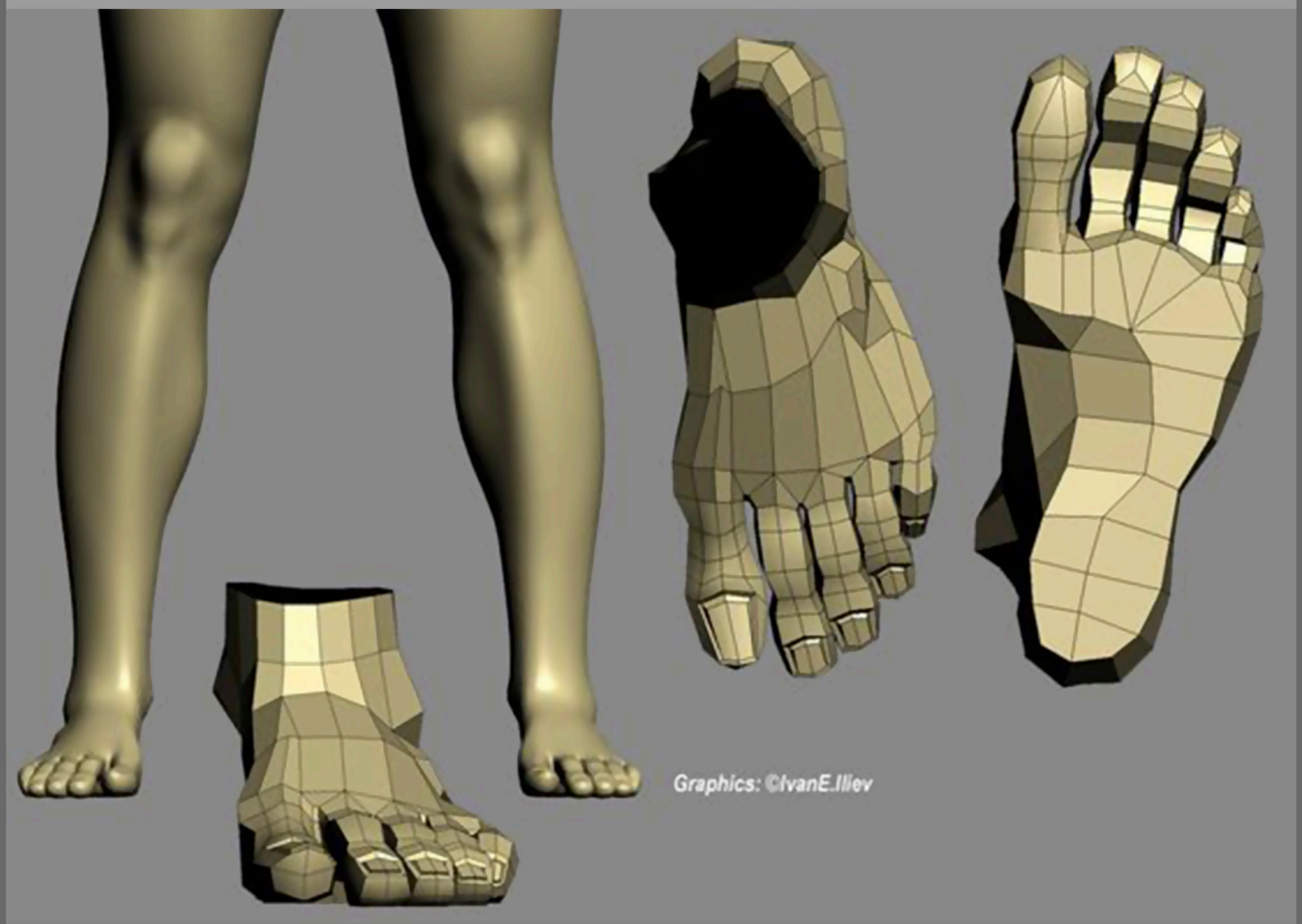

© 2005 by loocas duber | www.duber.cz
perspective

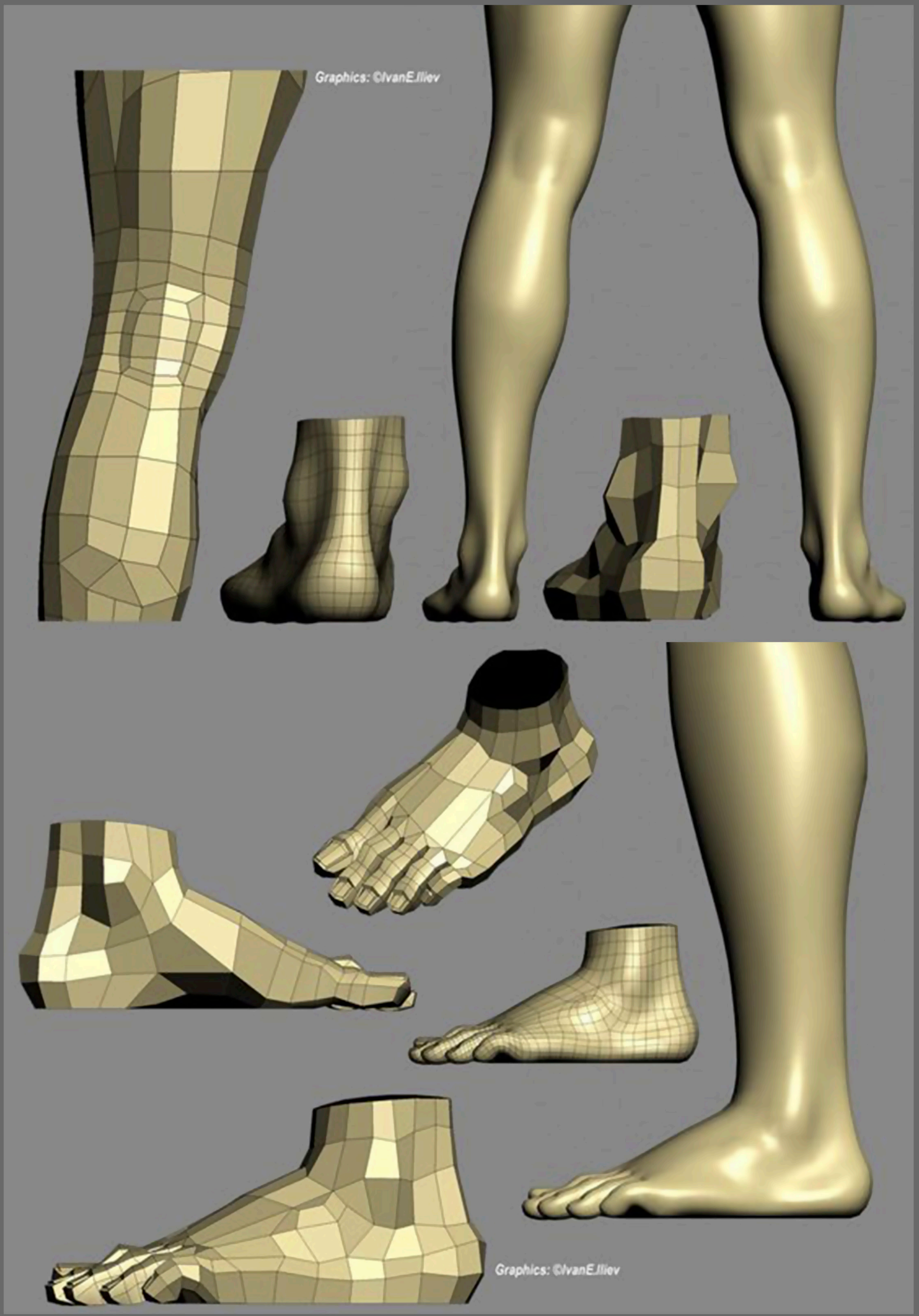


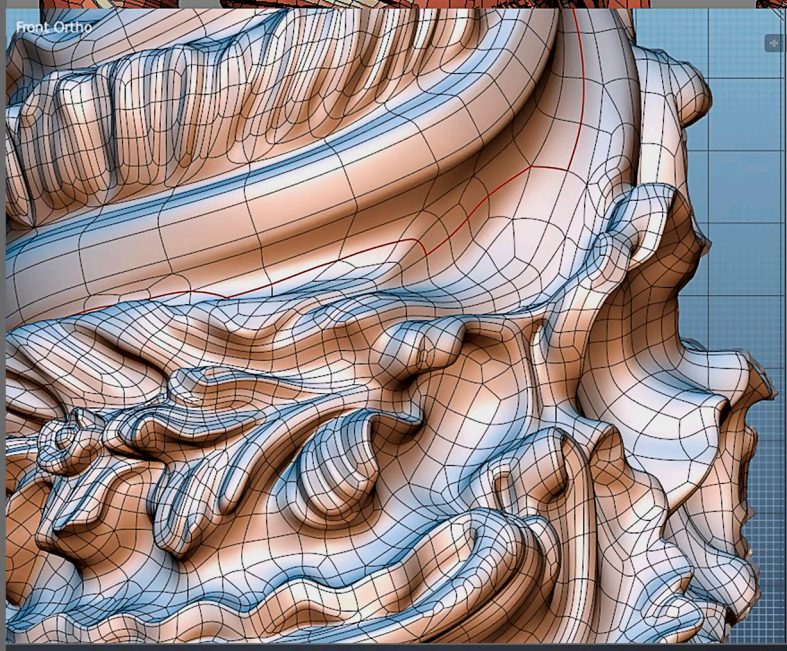

△65
2
2
△
△69
3
2
○
△57
2
1
×

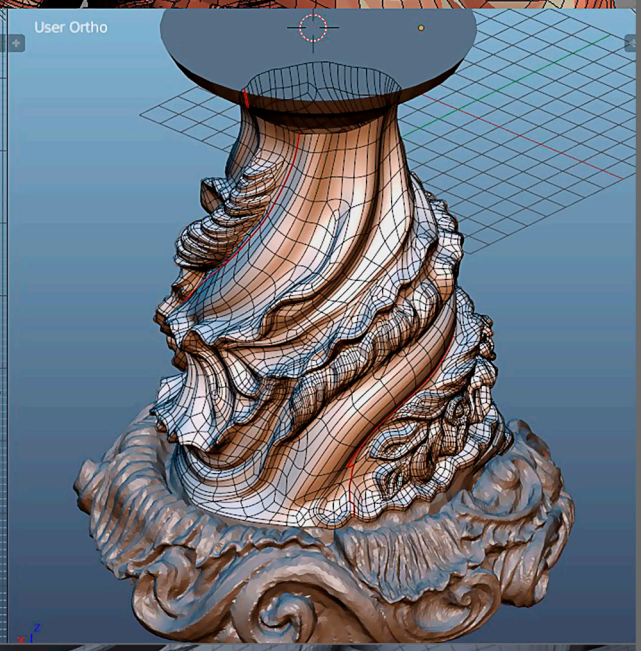


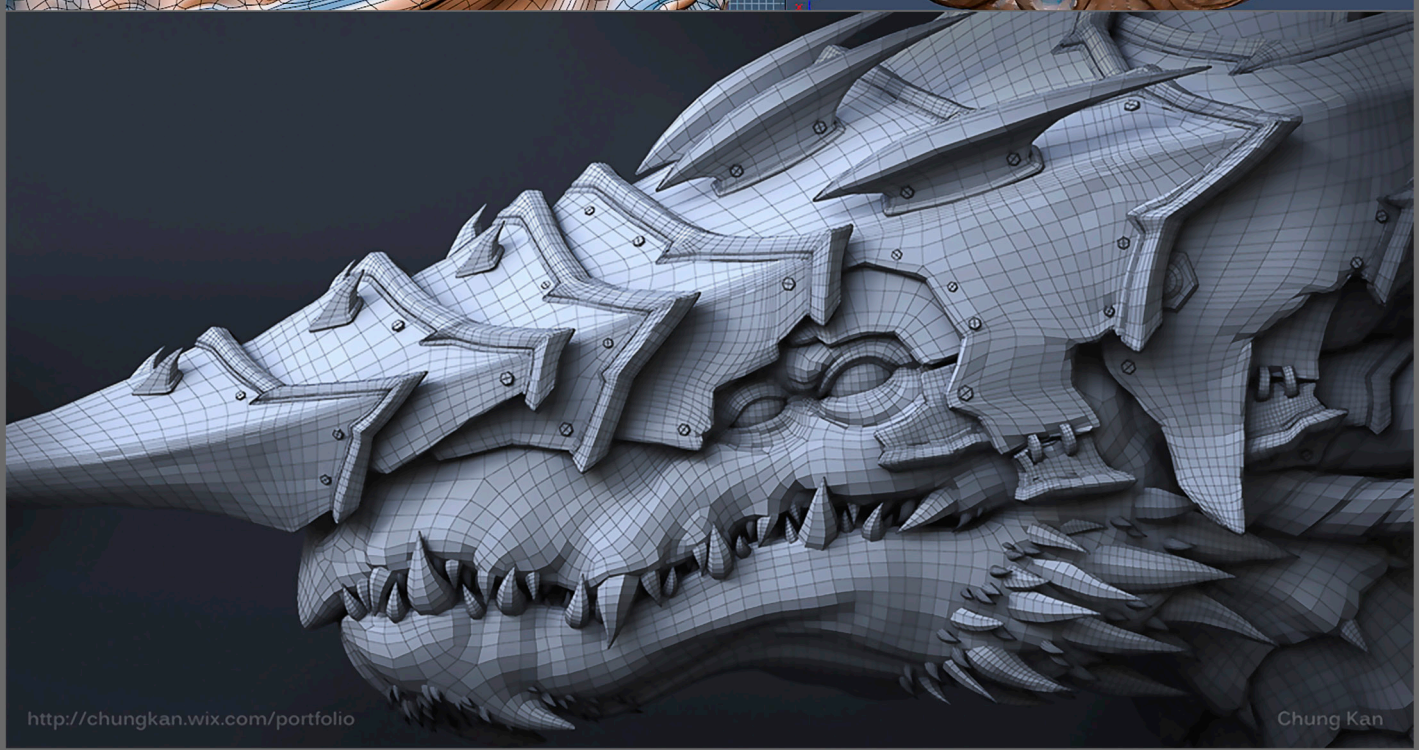

Graphics: ©IvanE.Iliev

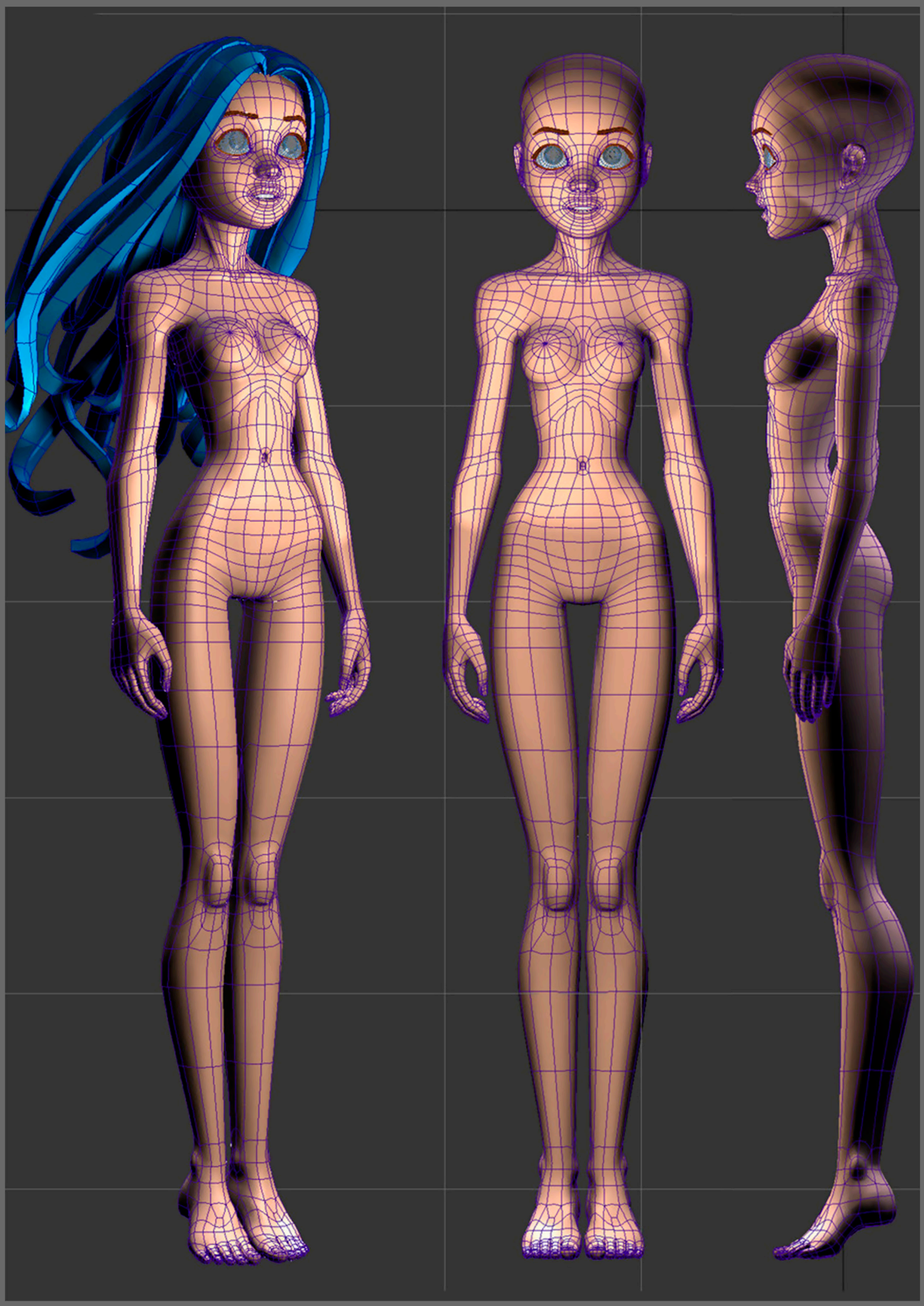

Graphics: ©IvanE.Iliev

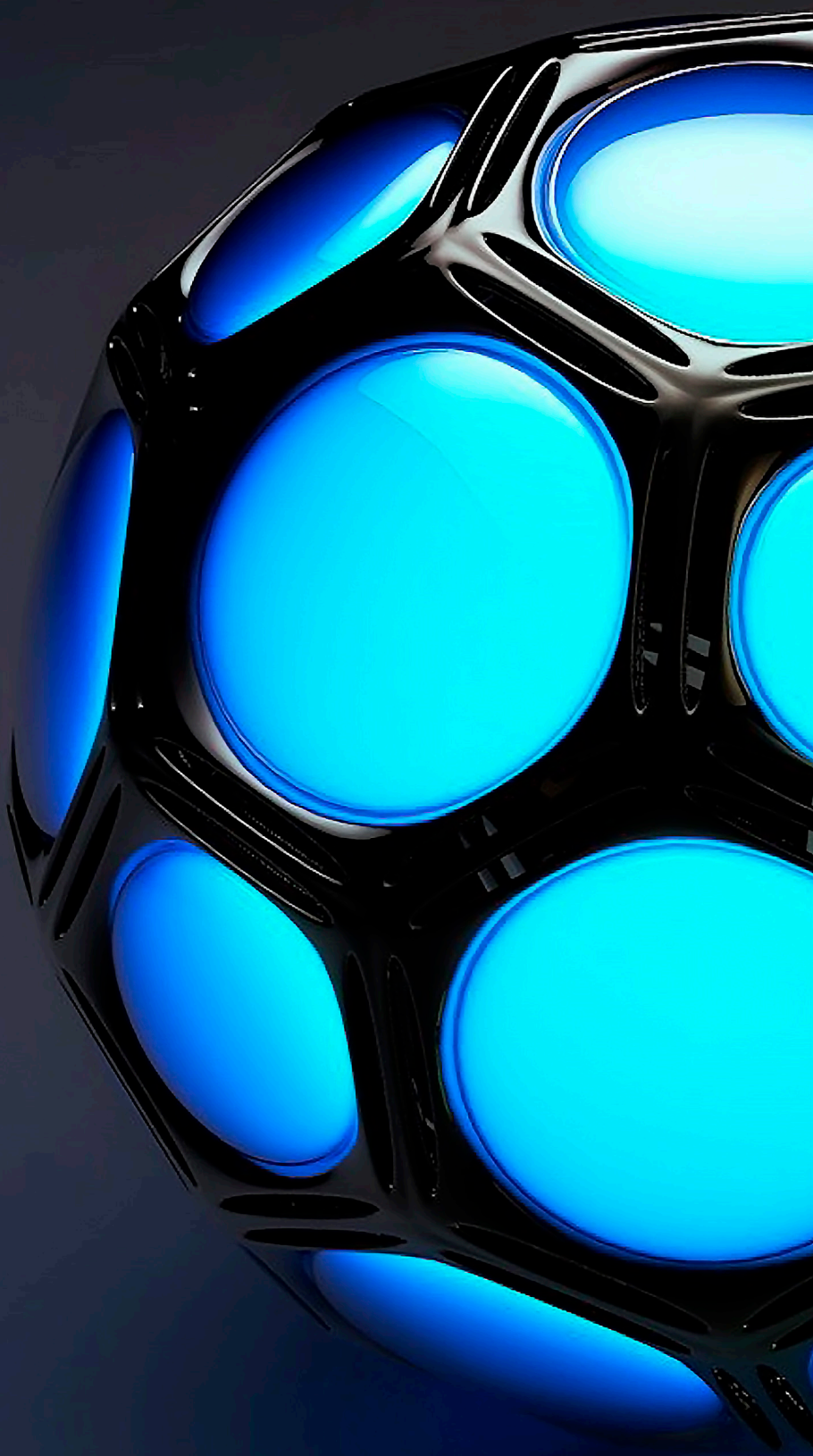

Graphics: ©IvanE.Iliev
Graphics: ©IvanE.Iliev


Front Ortho


User Ortho


http://chungkan.wix.com/portfolio
Chung Kan





MrLuciyIN