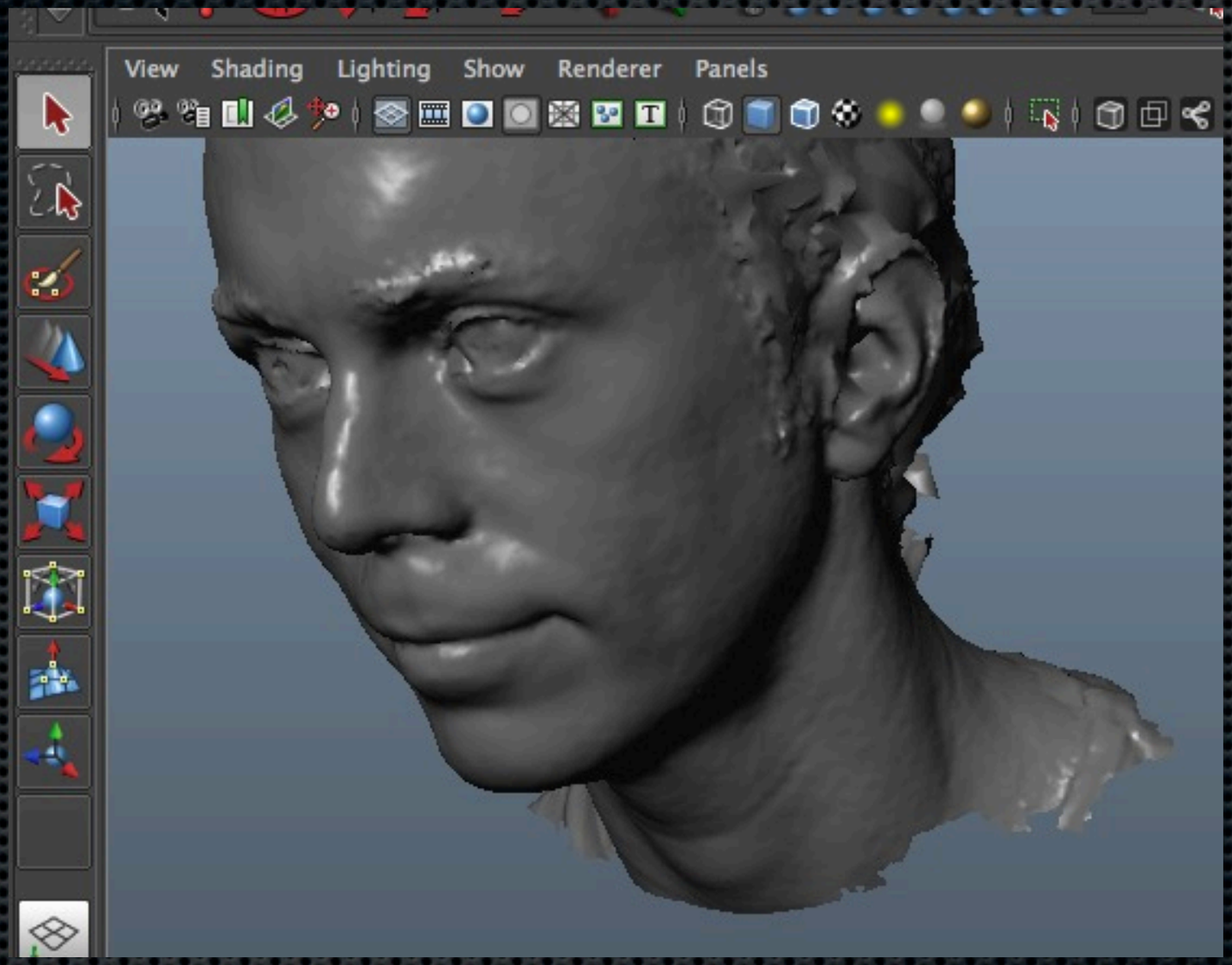
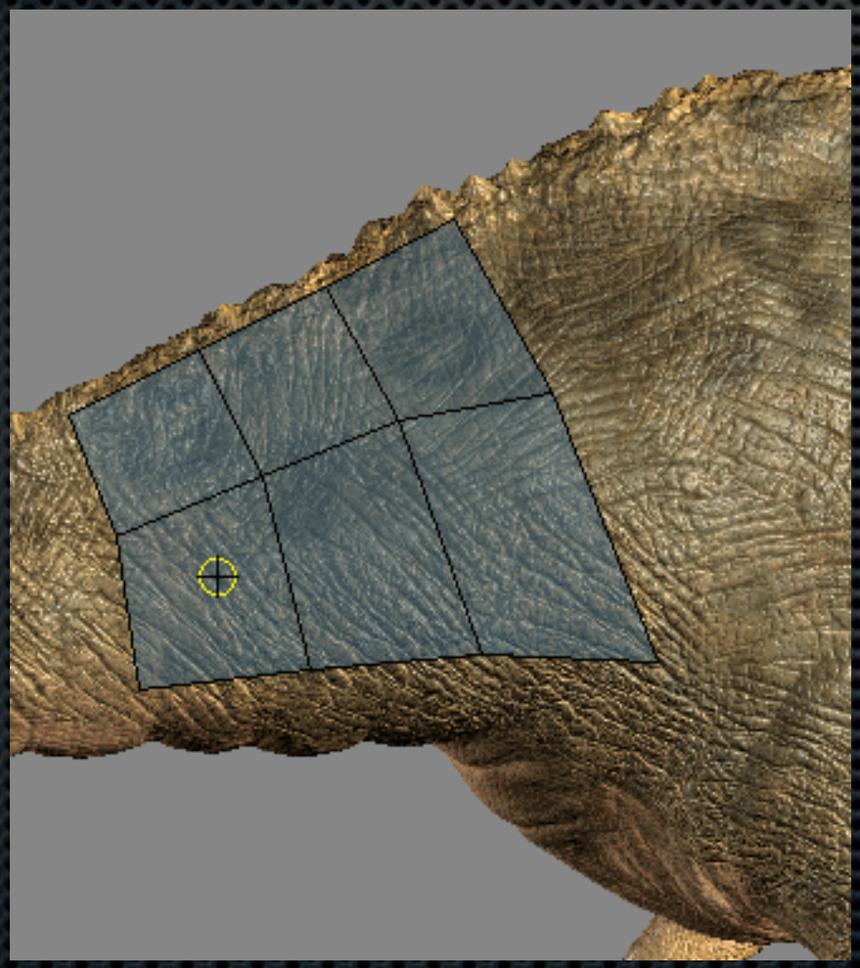
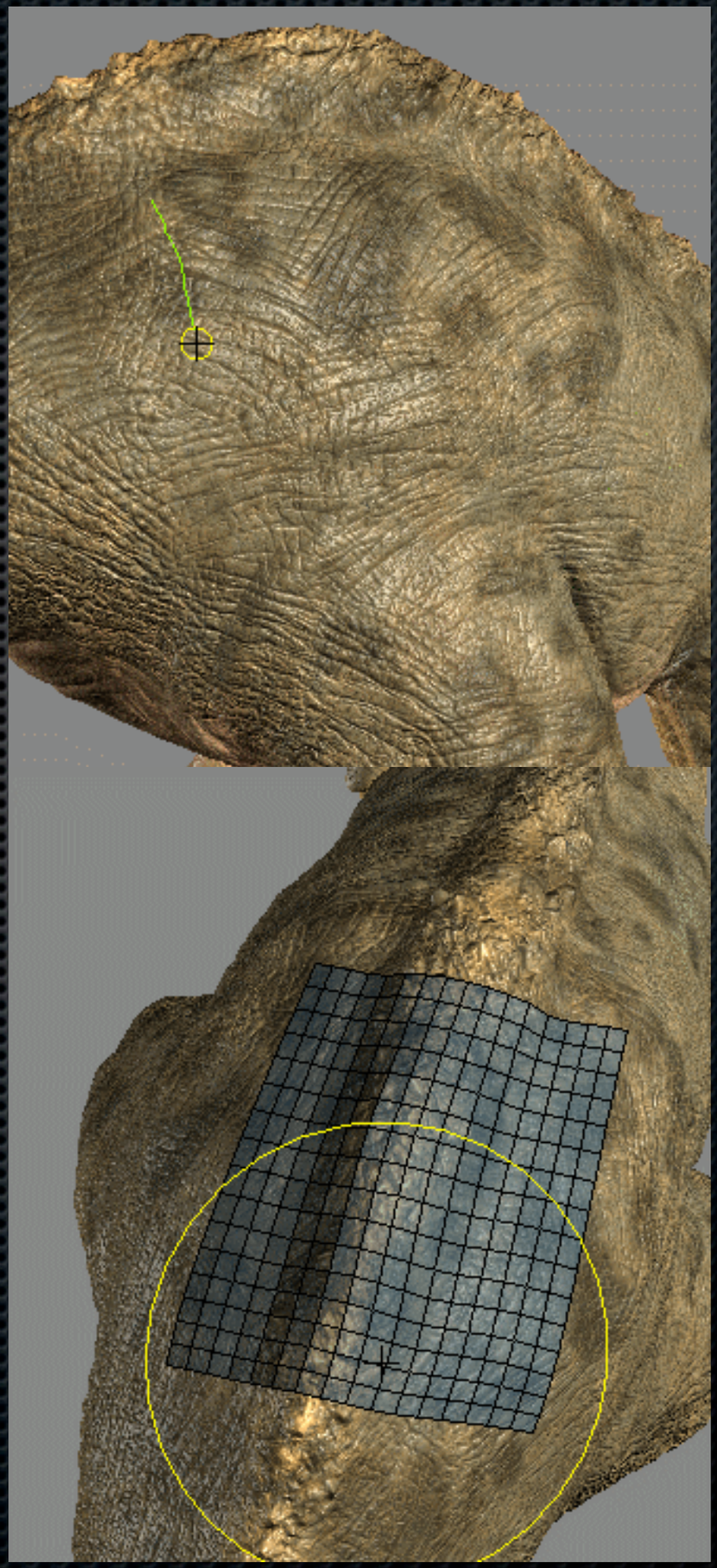
face capture
retopology
rigging
performance

Capture

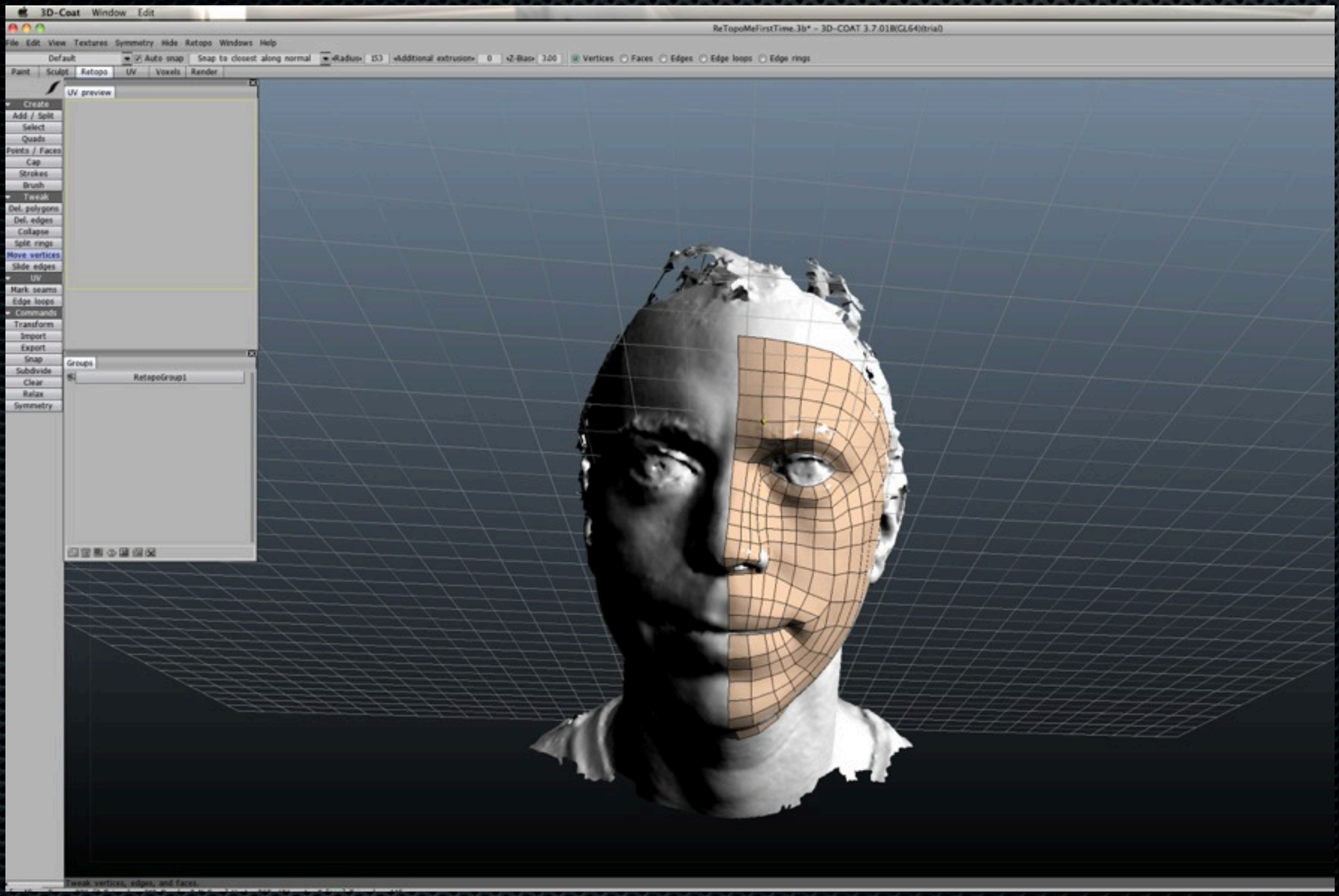


Re-topo

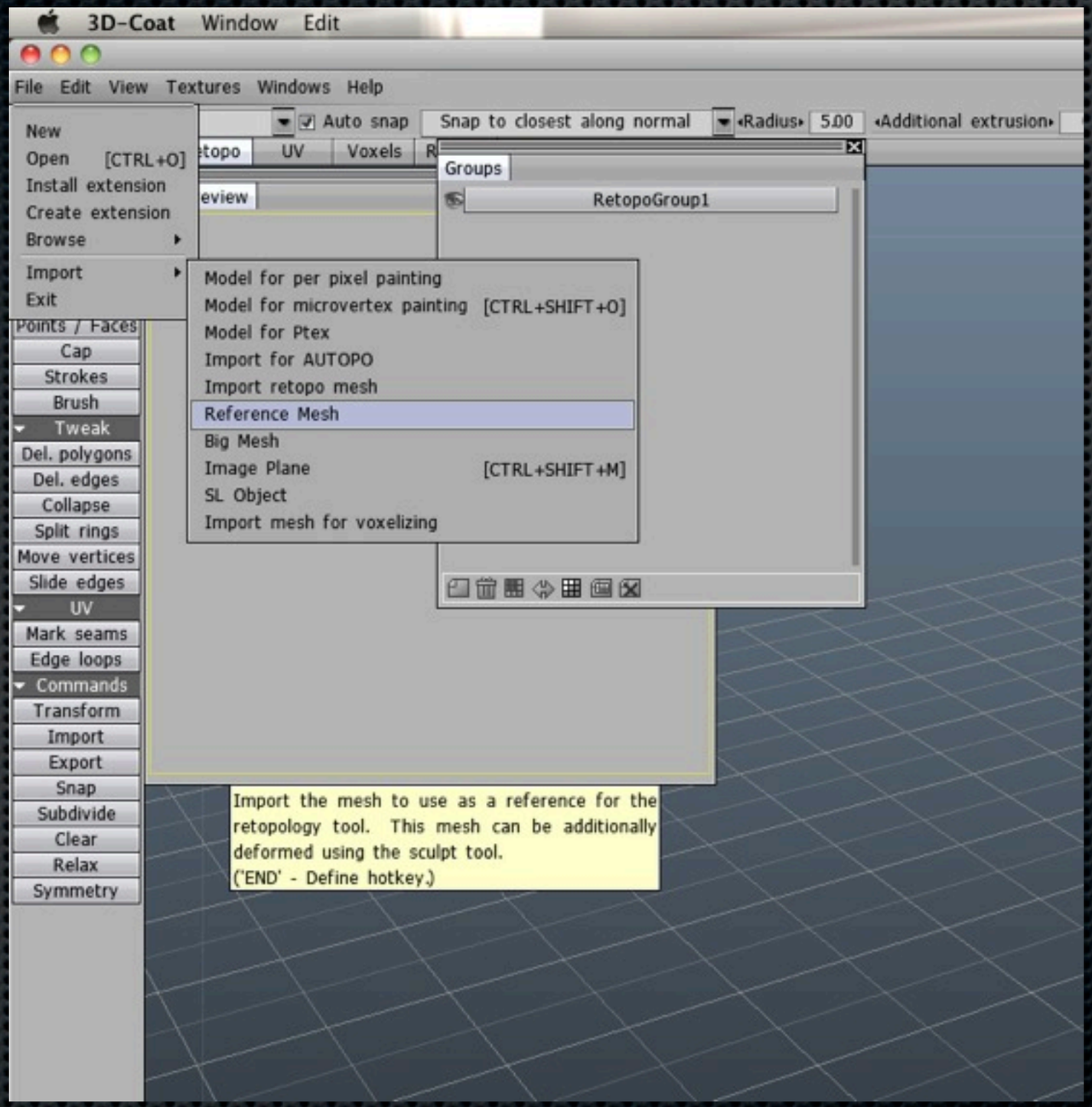




3D Coat

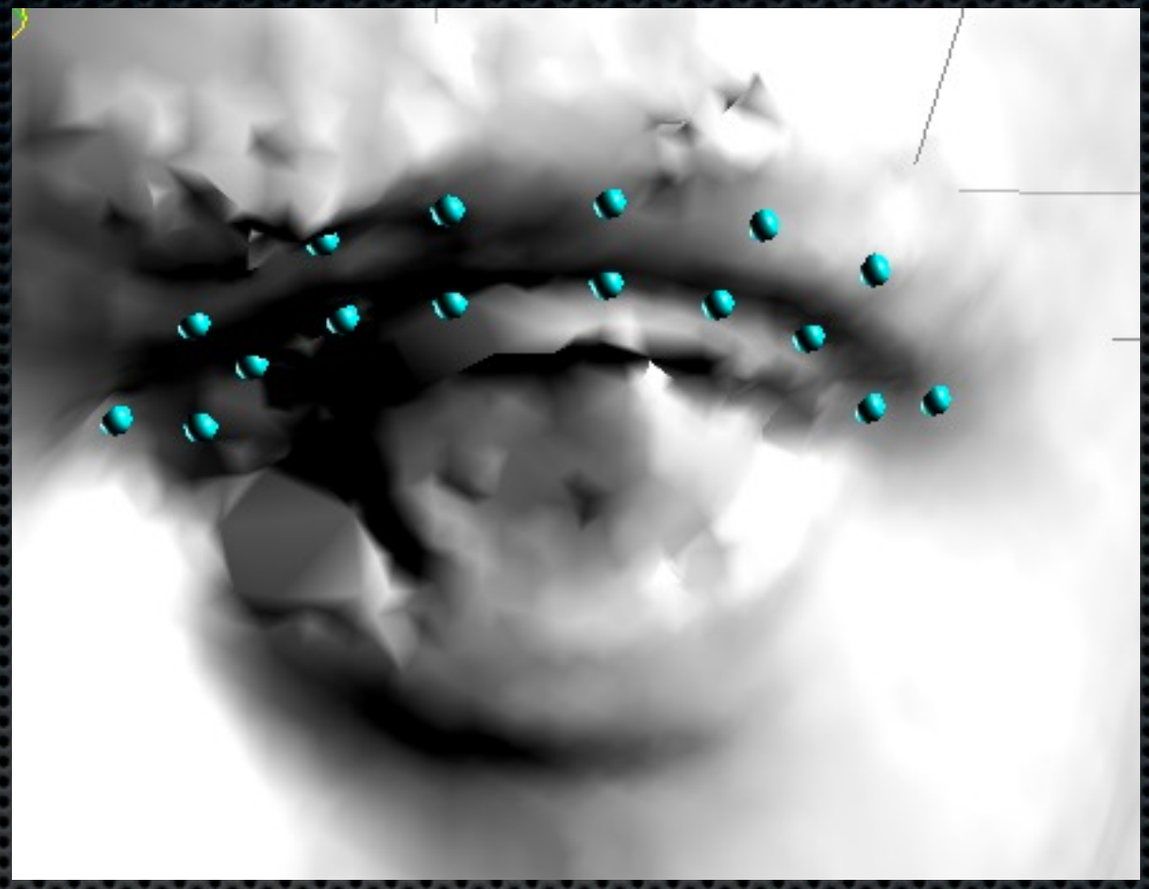

3D-Coat Window Edit
ReTopoMeFirstTime.3b* - 3D-COAT 3.7.018(CL64)(trial)
File Edit View Textures Symmetry Hide Retopo Windows Help
Default
Auto snap
Snap to closest along normal
«Radius» 153
«Additional extrusion» 0
«Z-Bias» 100
Vertices Faces Edges Edge loops Edge rings
Paint Sculpt Retopo UV Voxels Render
UV preview
Create
Add / Split
Select
Quads
Points / Faces
Cap
Strokes
Brush
Tweak
Del. polygons
Del. edges
Collapse
Split rings
Move vertices
Slide edges
UV
Mark seams
Edge loops
Commands
Transform
Import
Export
Snap
Subdivide
Clear
Relax
Symmetry
Groups
RetopoGroup1
Tweak vertices, edges, and faces.

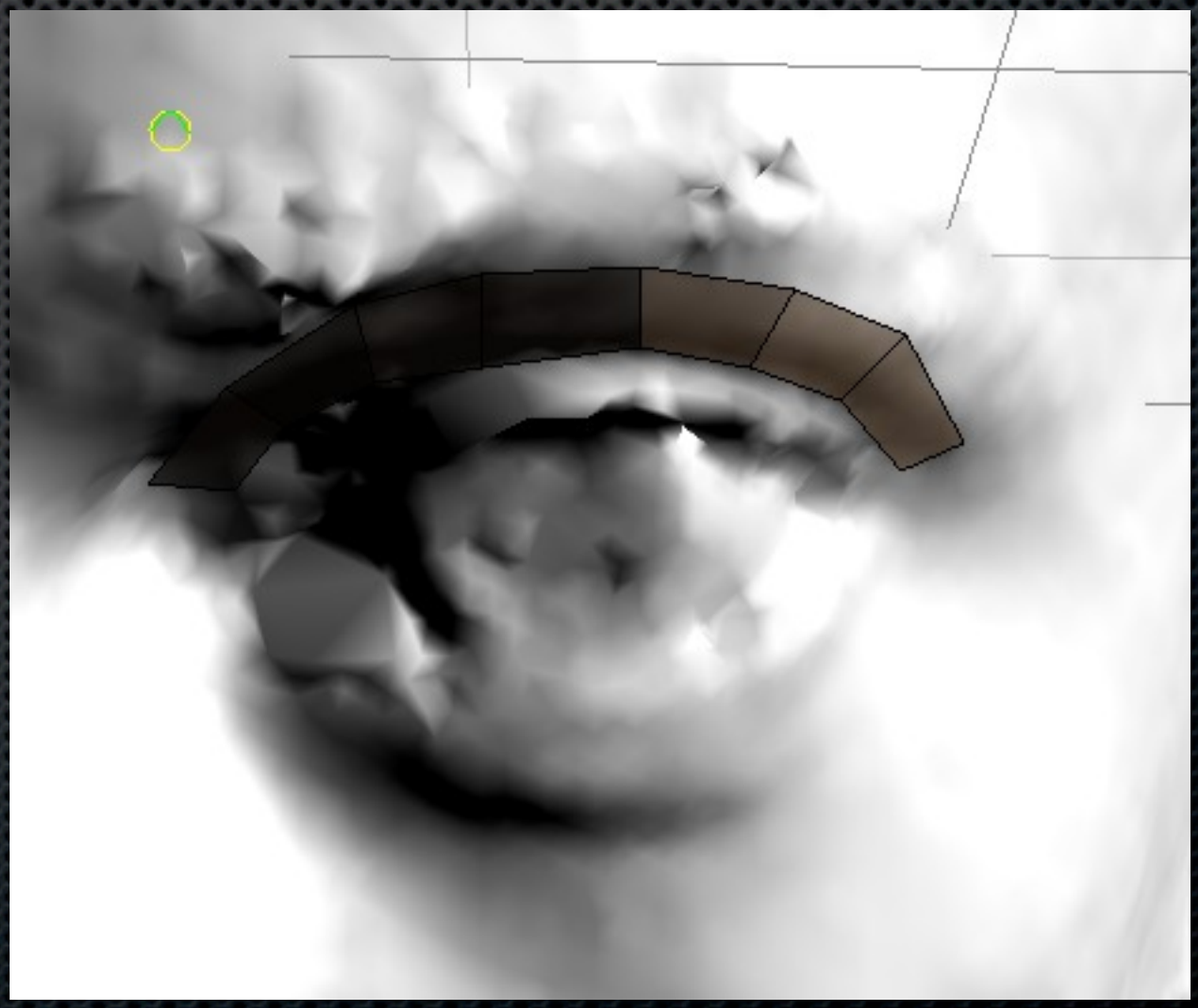
Reference Mesh



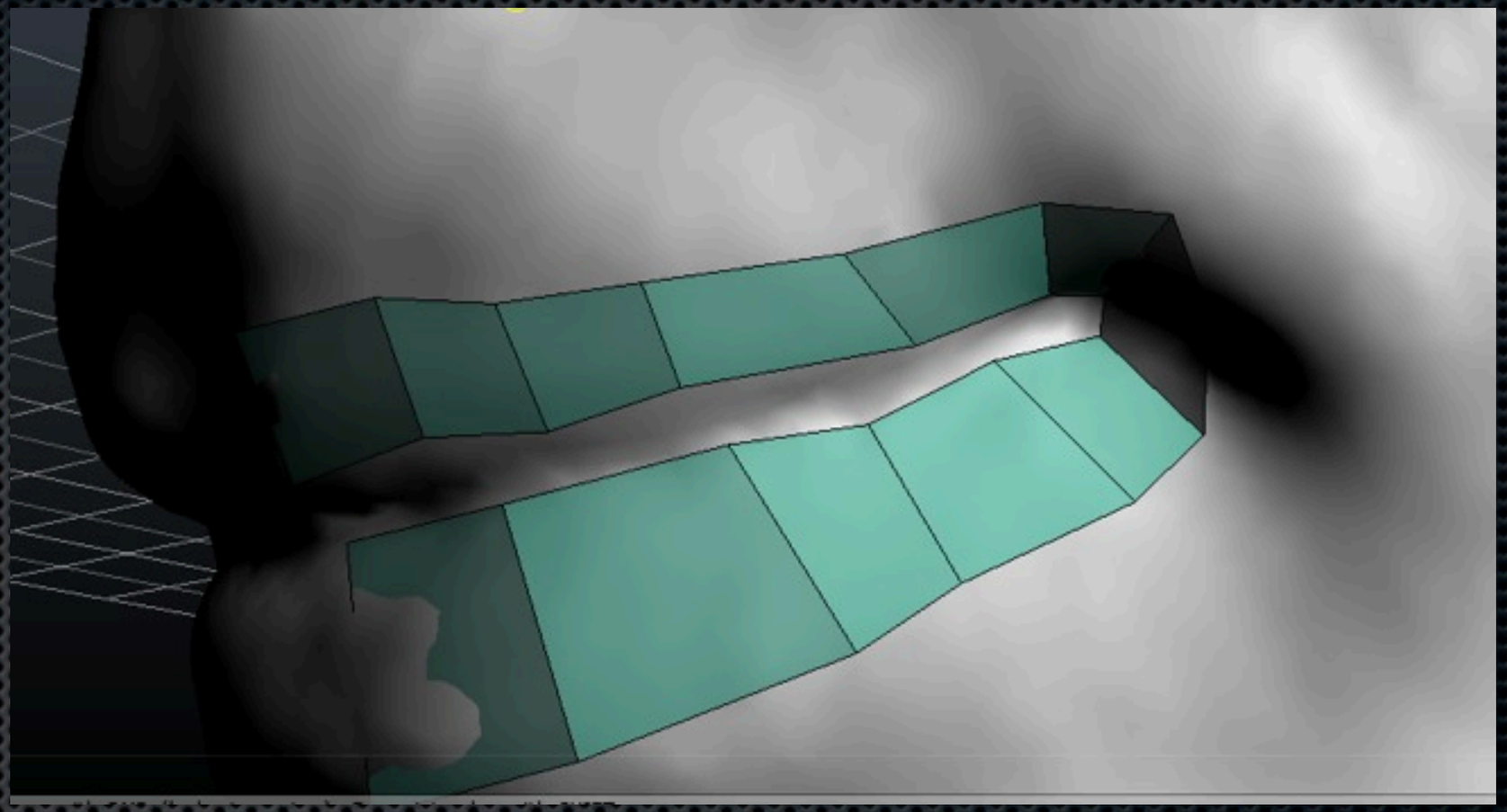
Reference Mesh

Create: Points & Faces

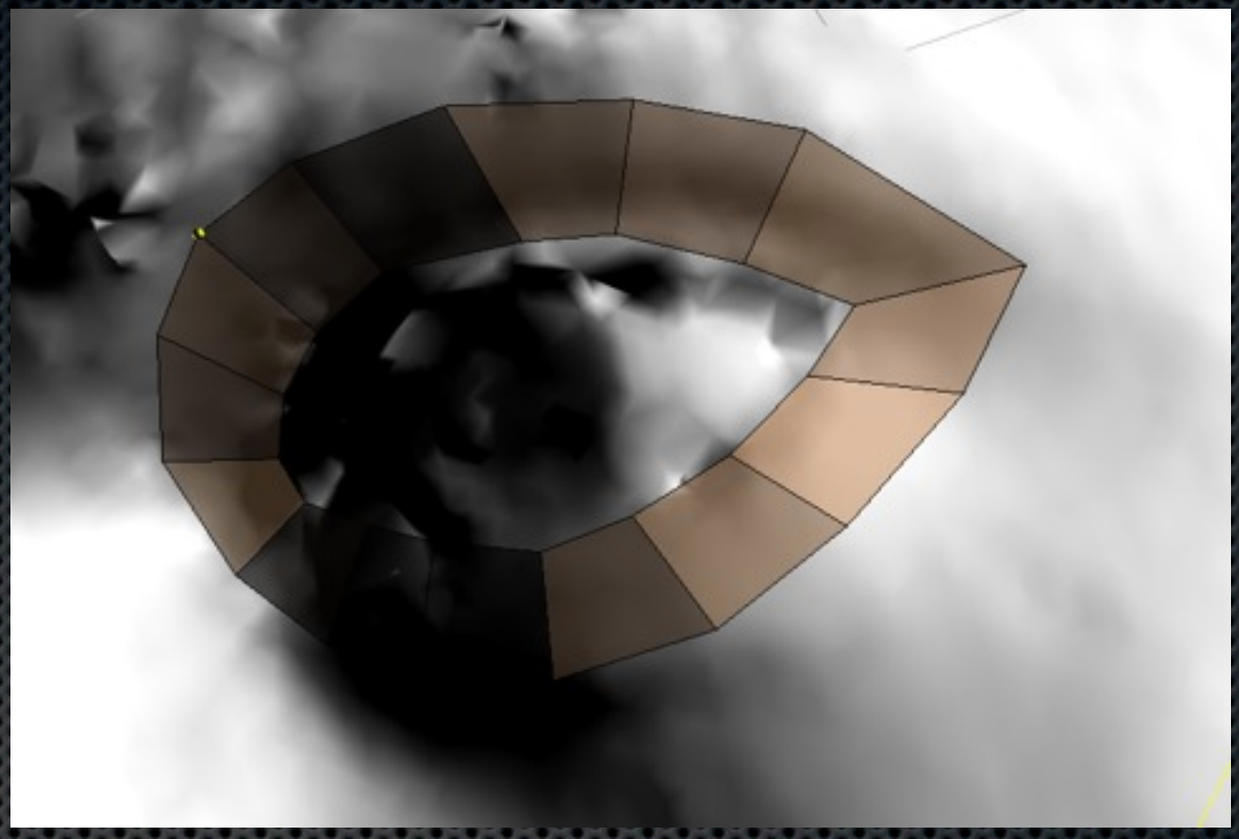


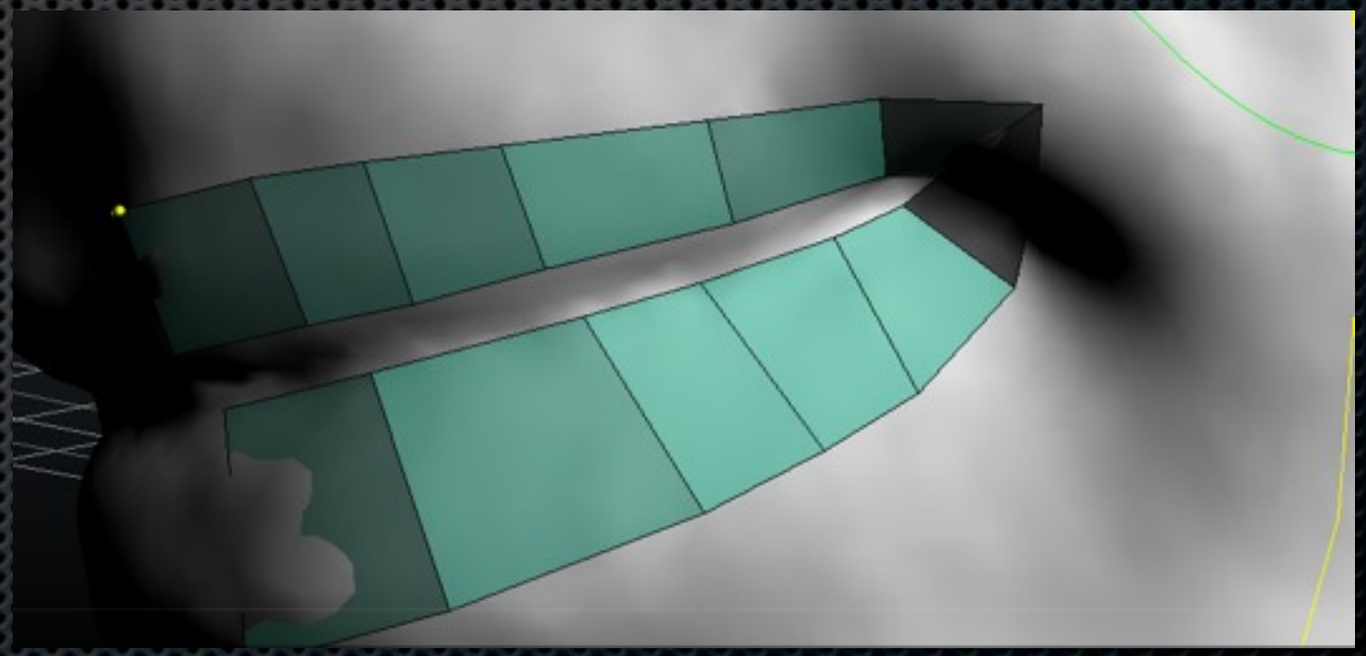


Create: Points & Faces



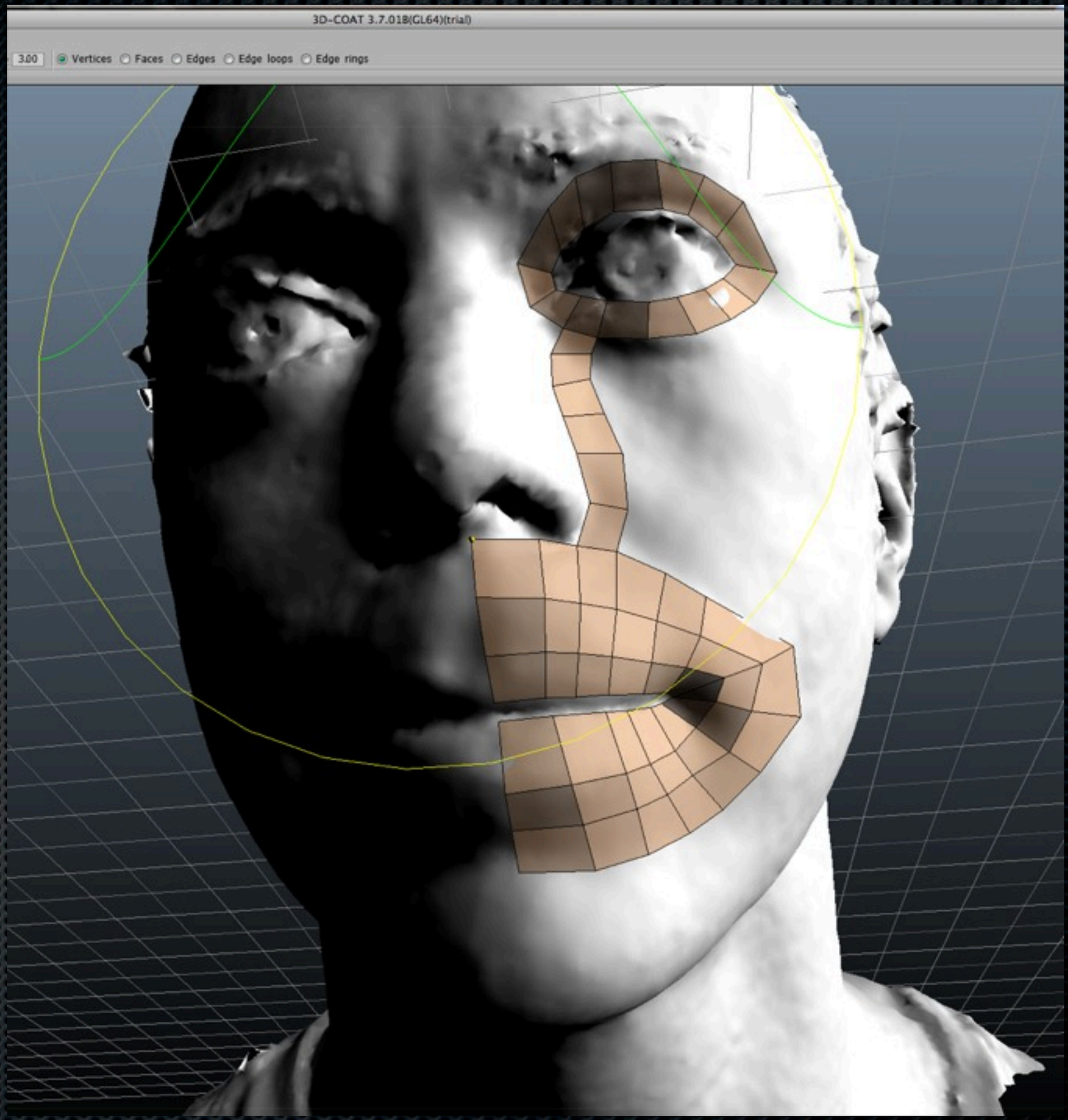
Tweak: Points & Faces



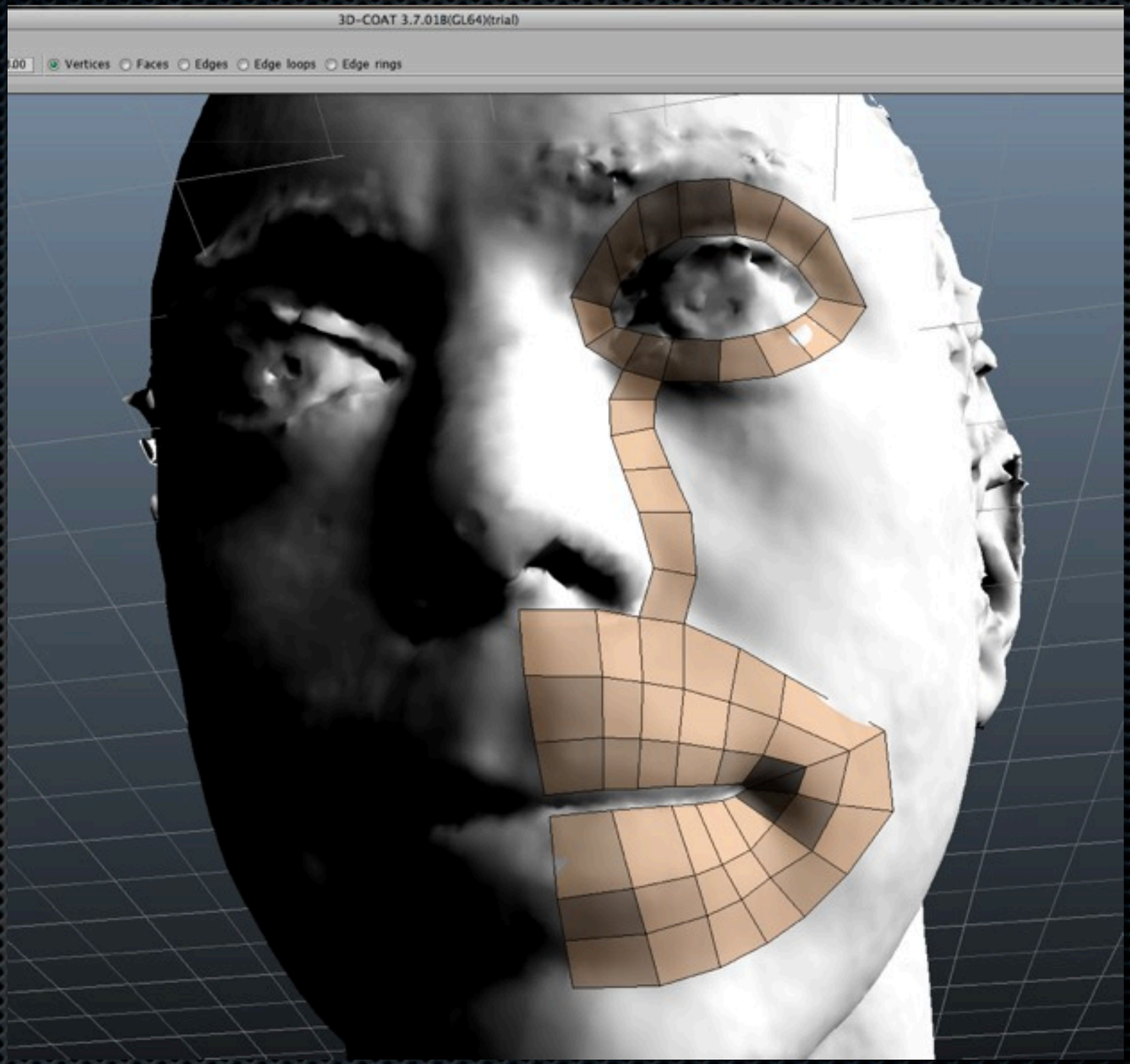


Continue to add and tweak.

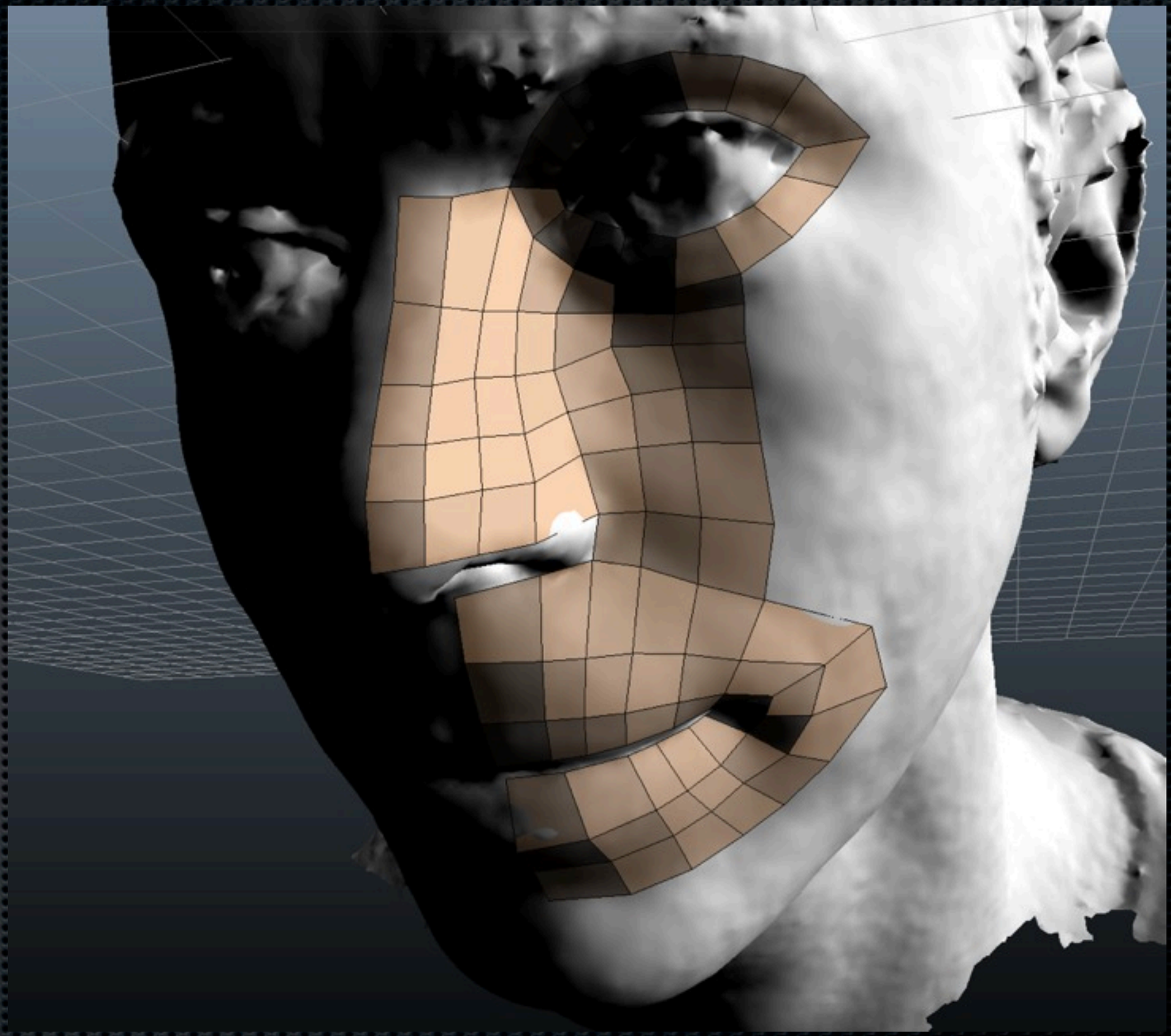
Plan edge layout to follow musculature of face for better deformation.



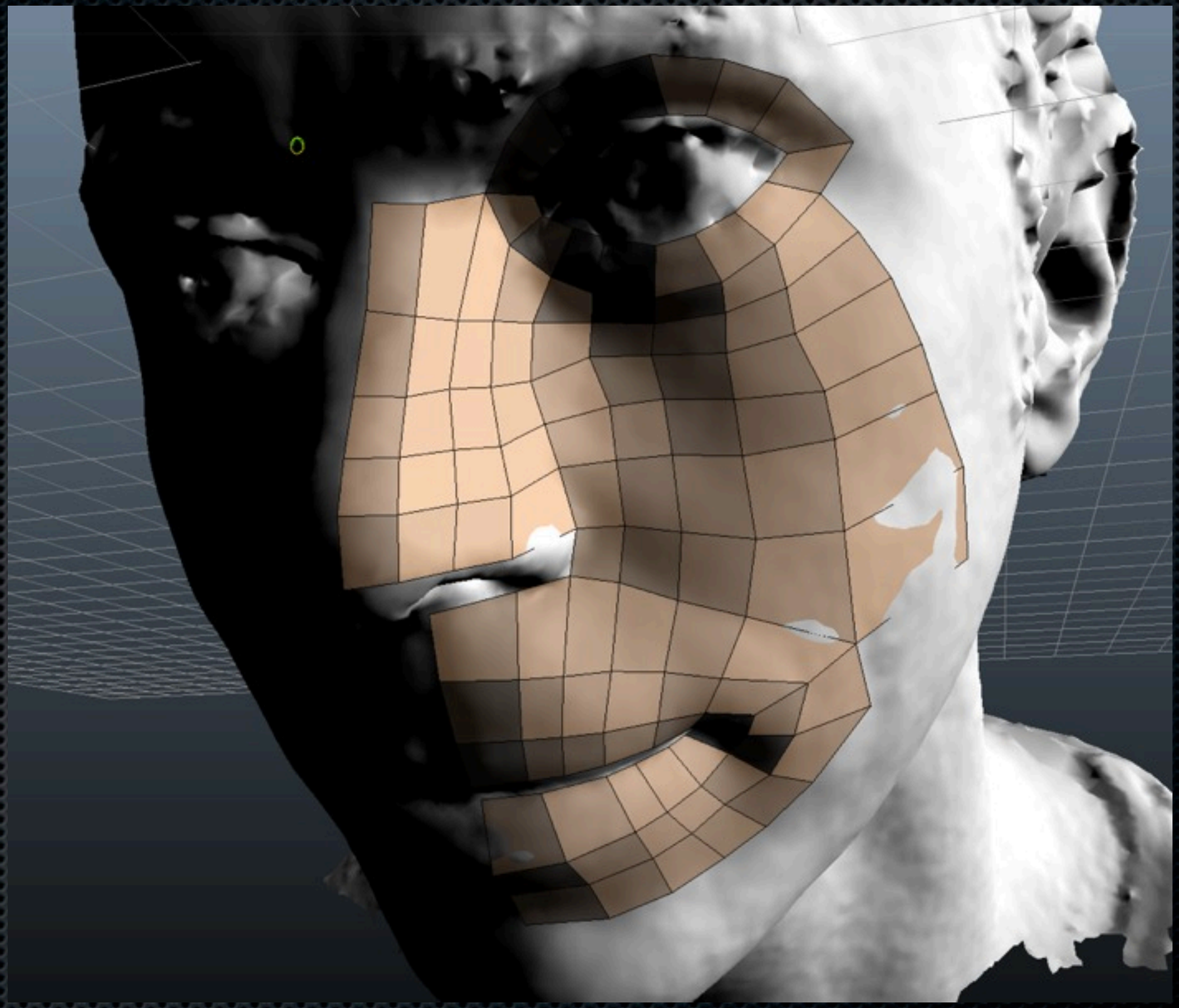
Continue to add and tweak.



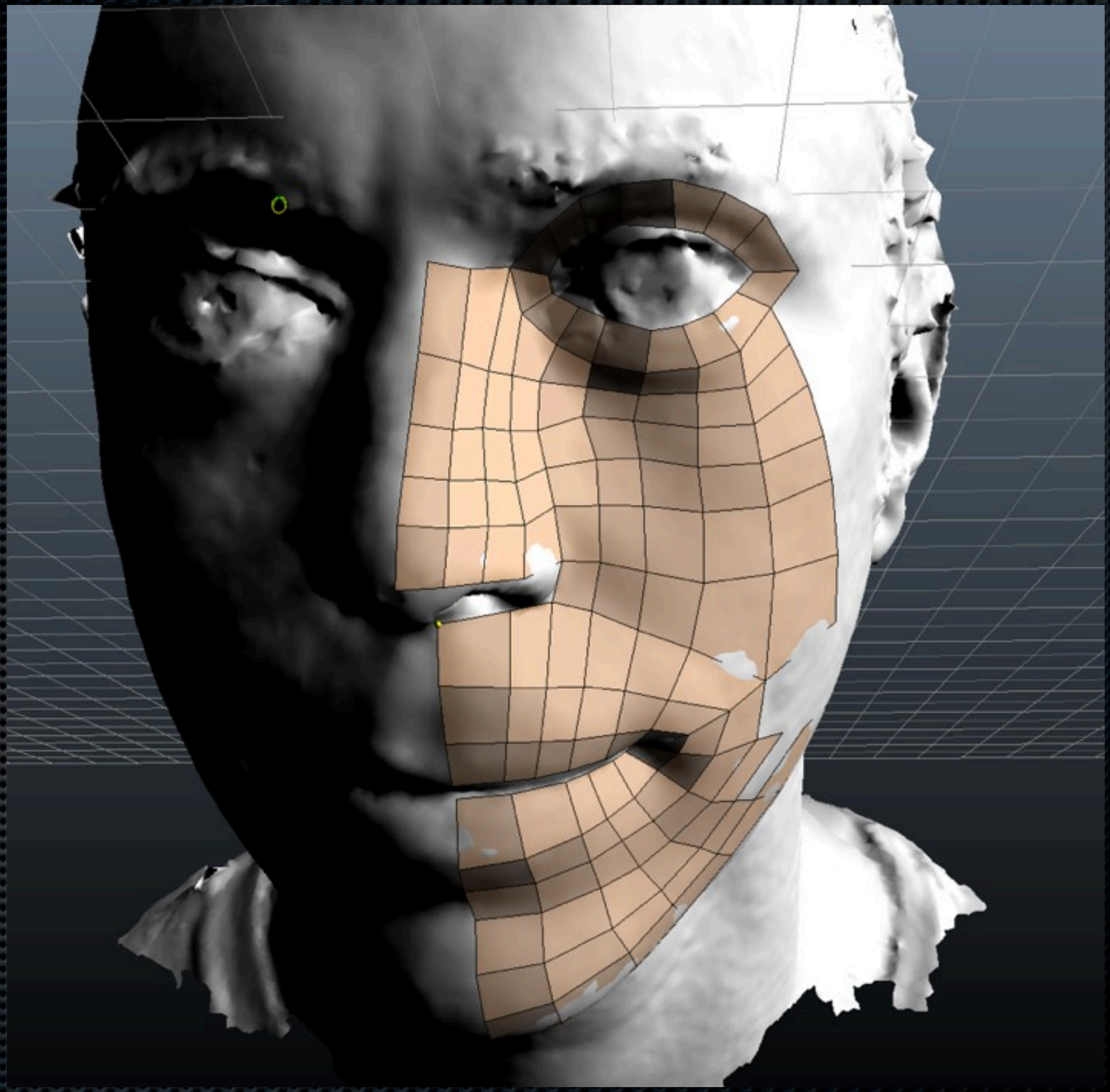
Continue to add and tweak.



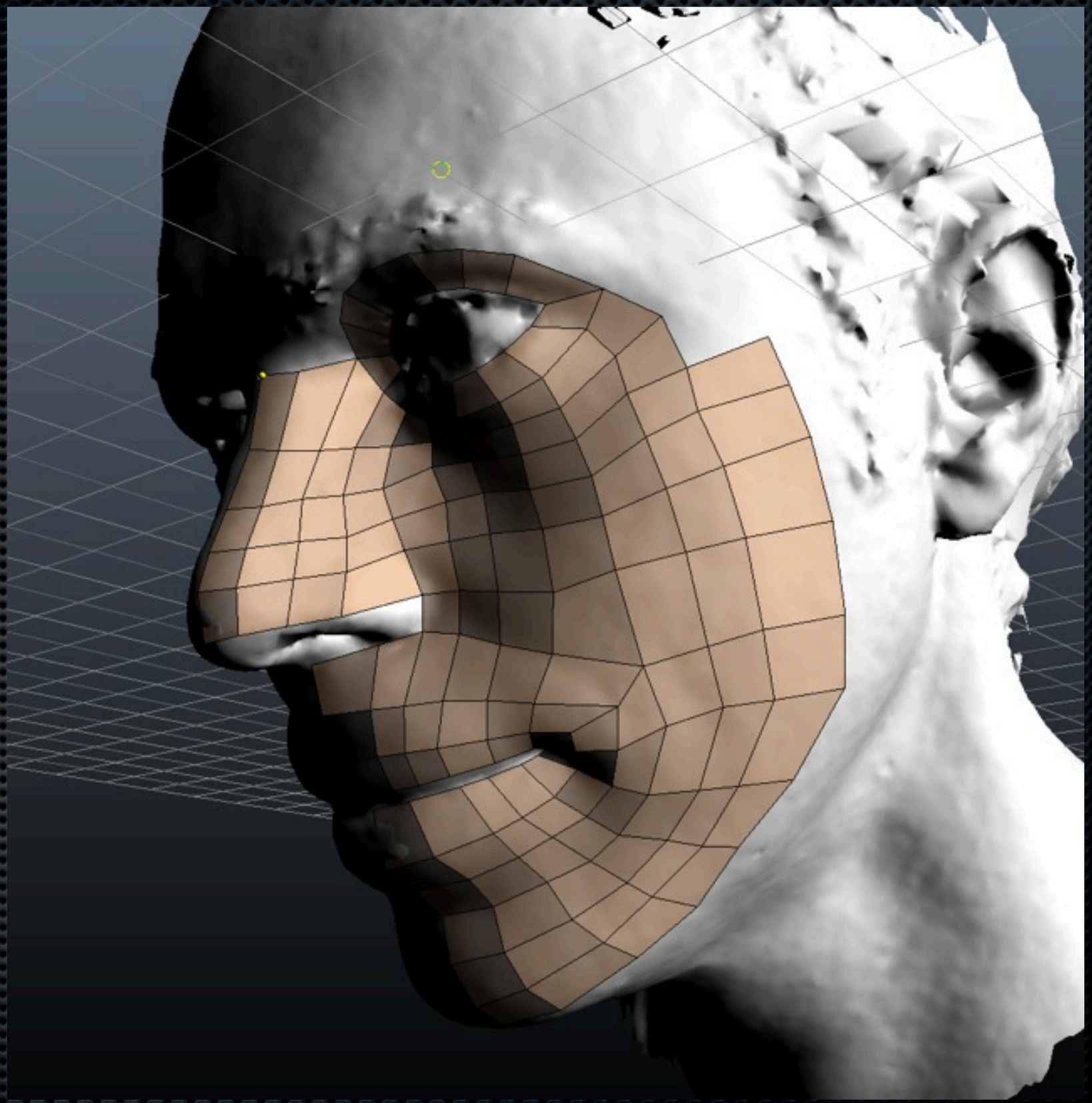
Continue to add and tweak.



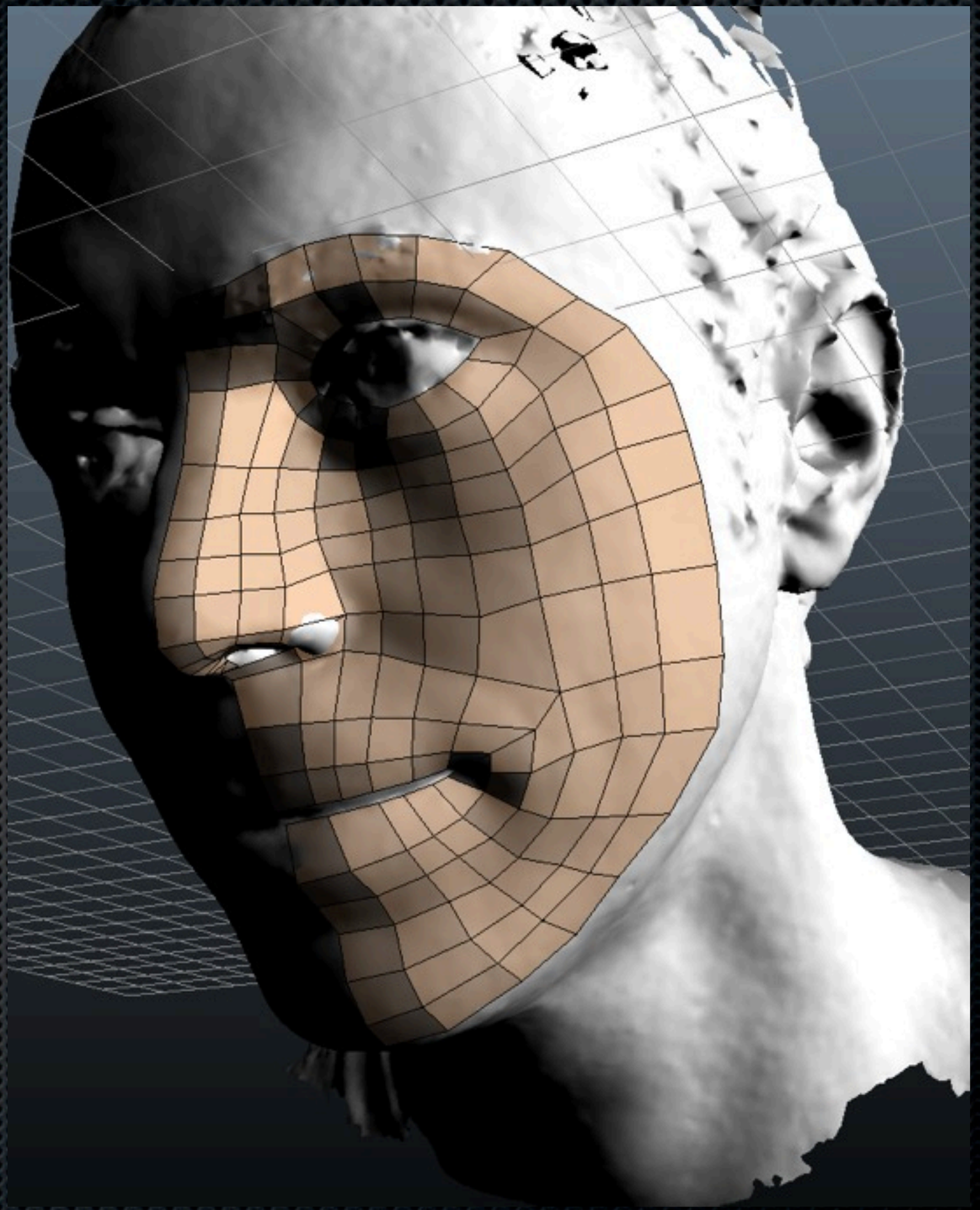
Continue to add and tweak.



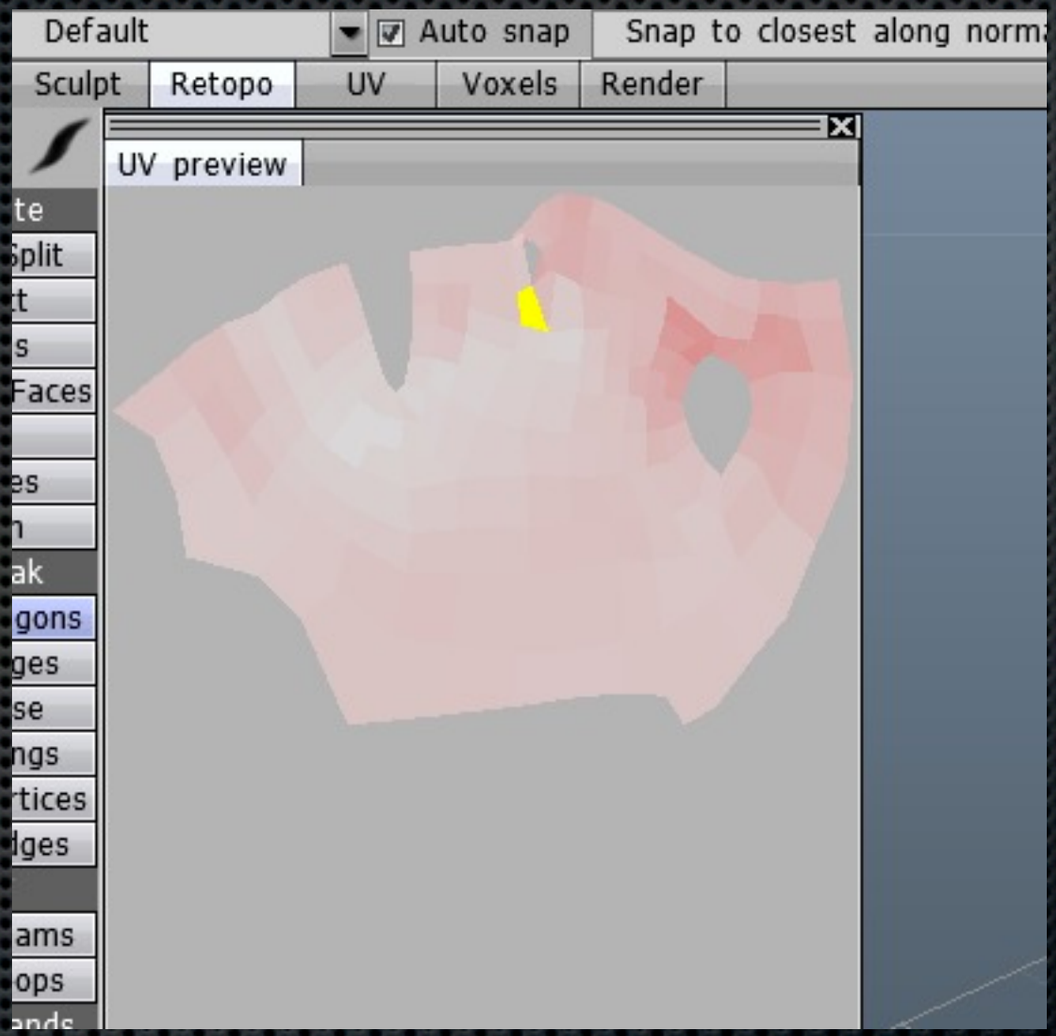
Continue to add and tweak.



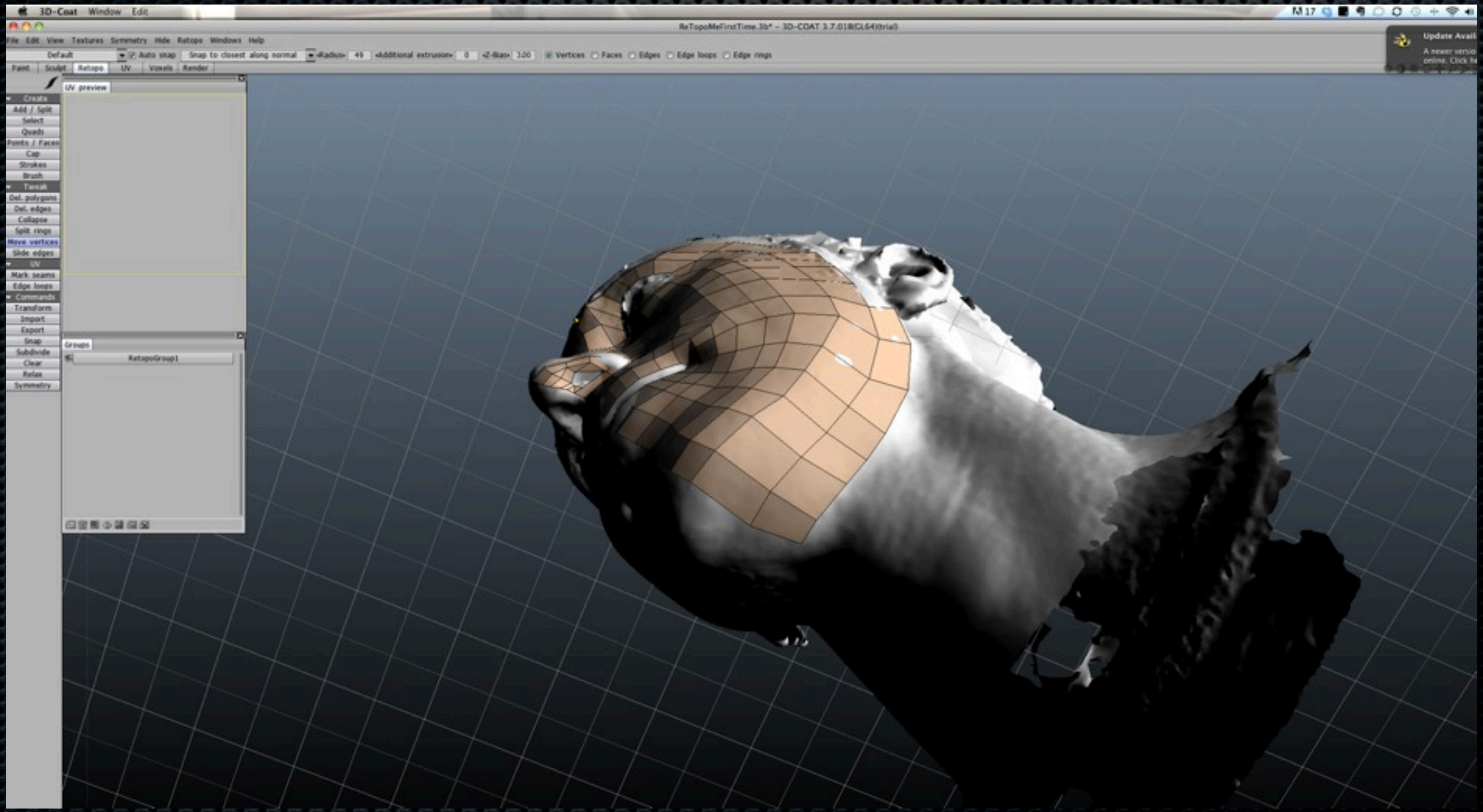
Continue to add and tweak.



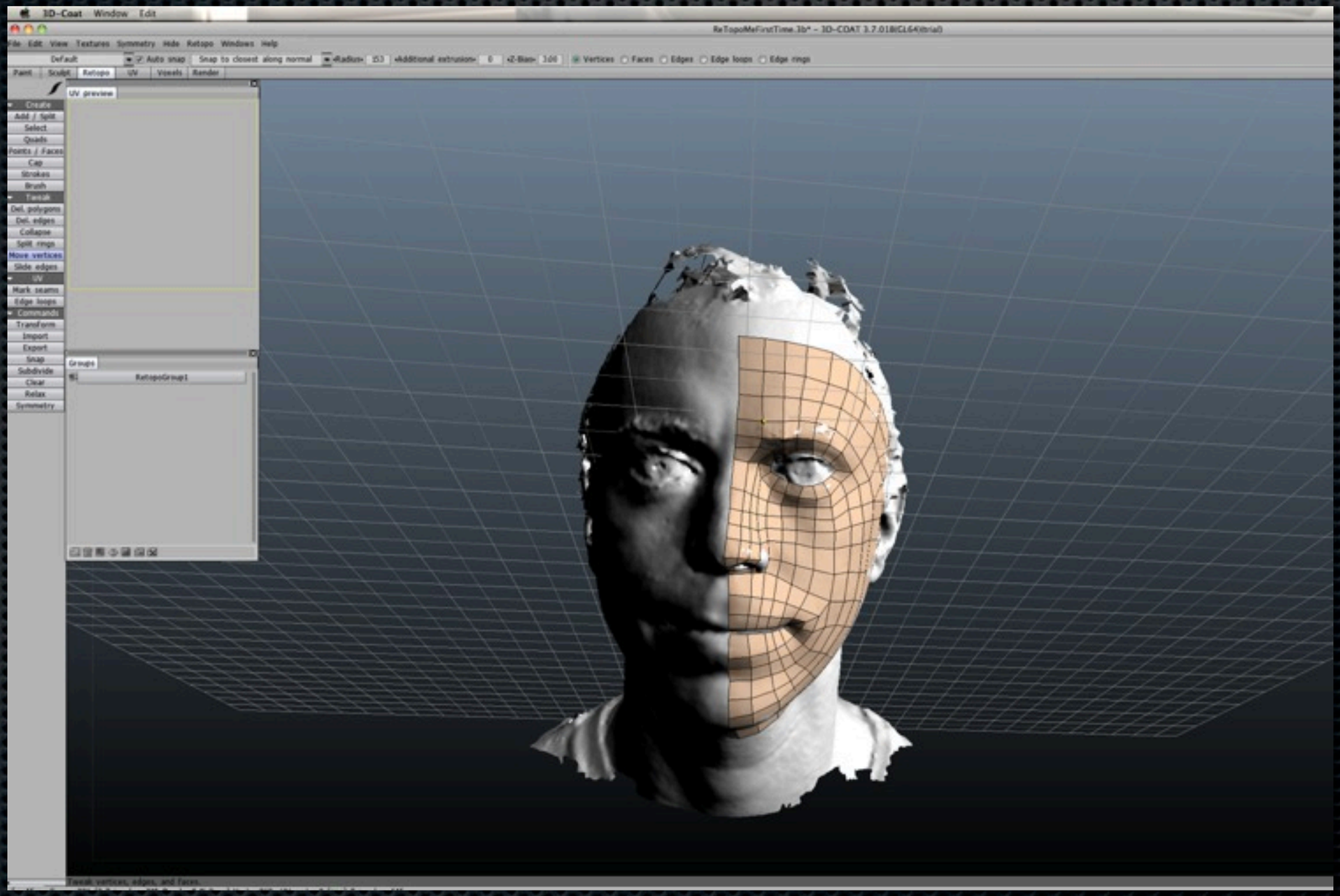
Can do UV layout, painting, sculpting as well.



Continue to add and tweak.

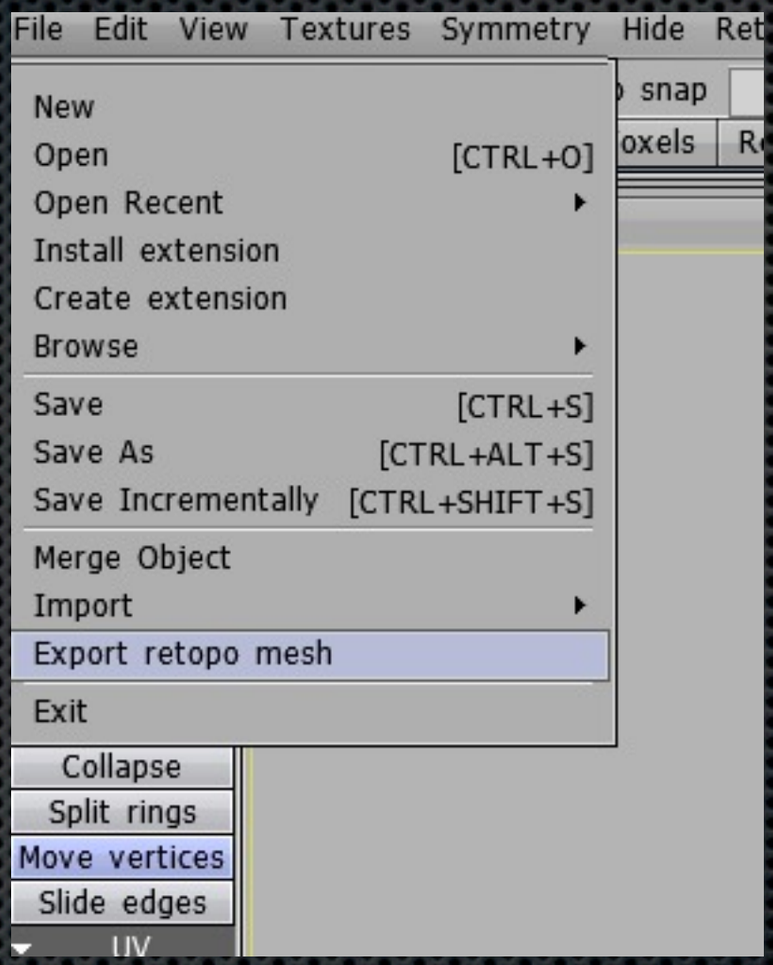


Continue to add and tweak.



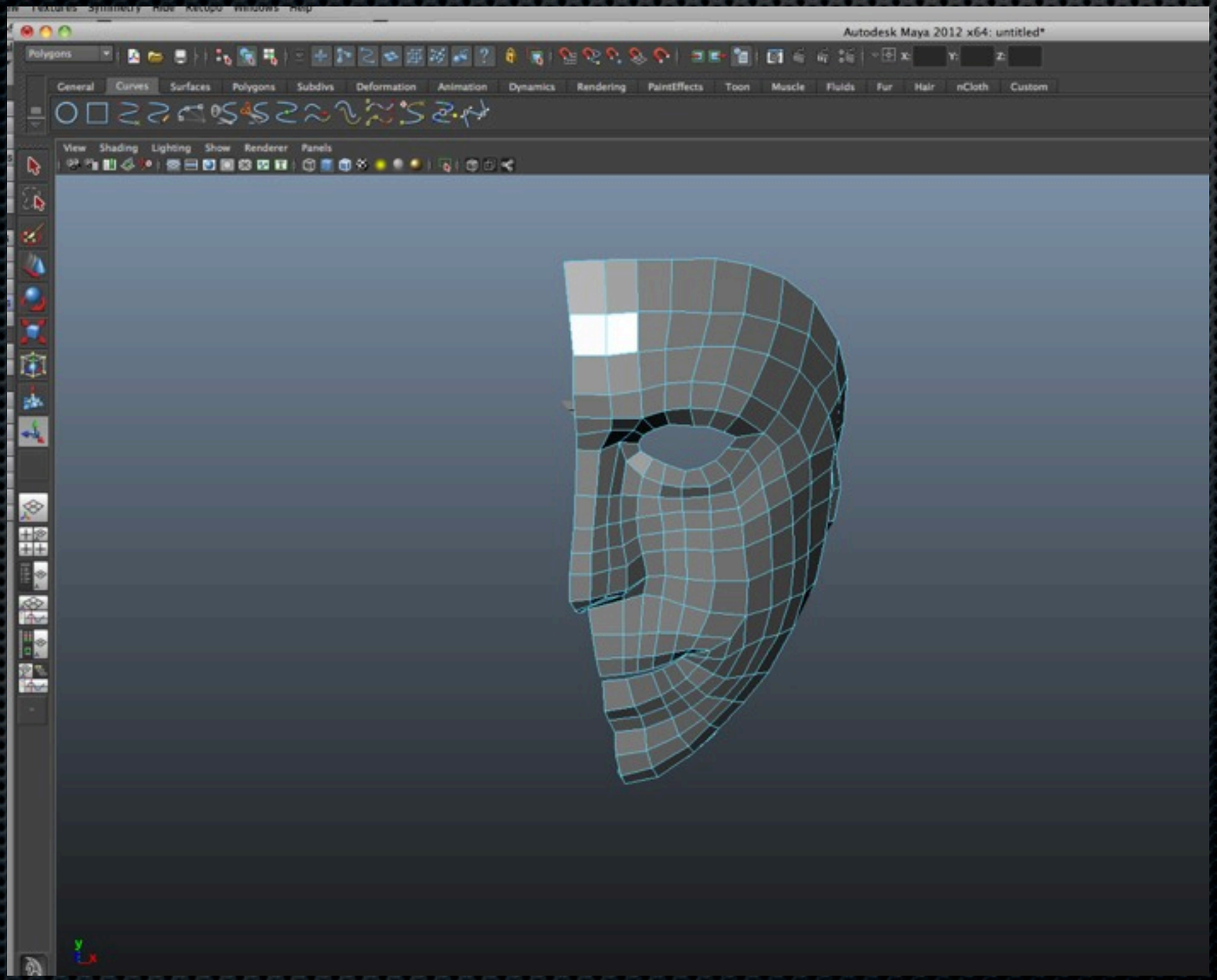
Refine until finished.

Export retopo mesh.

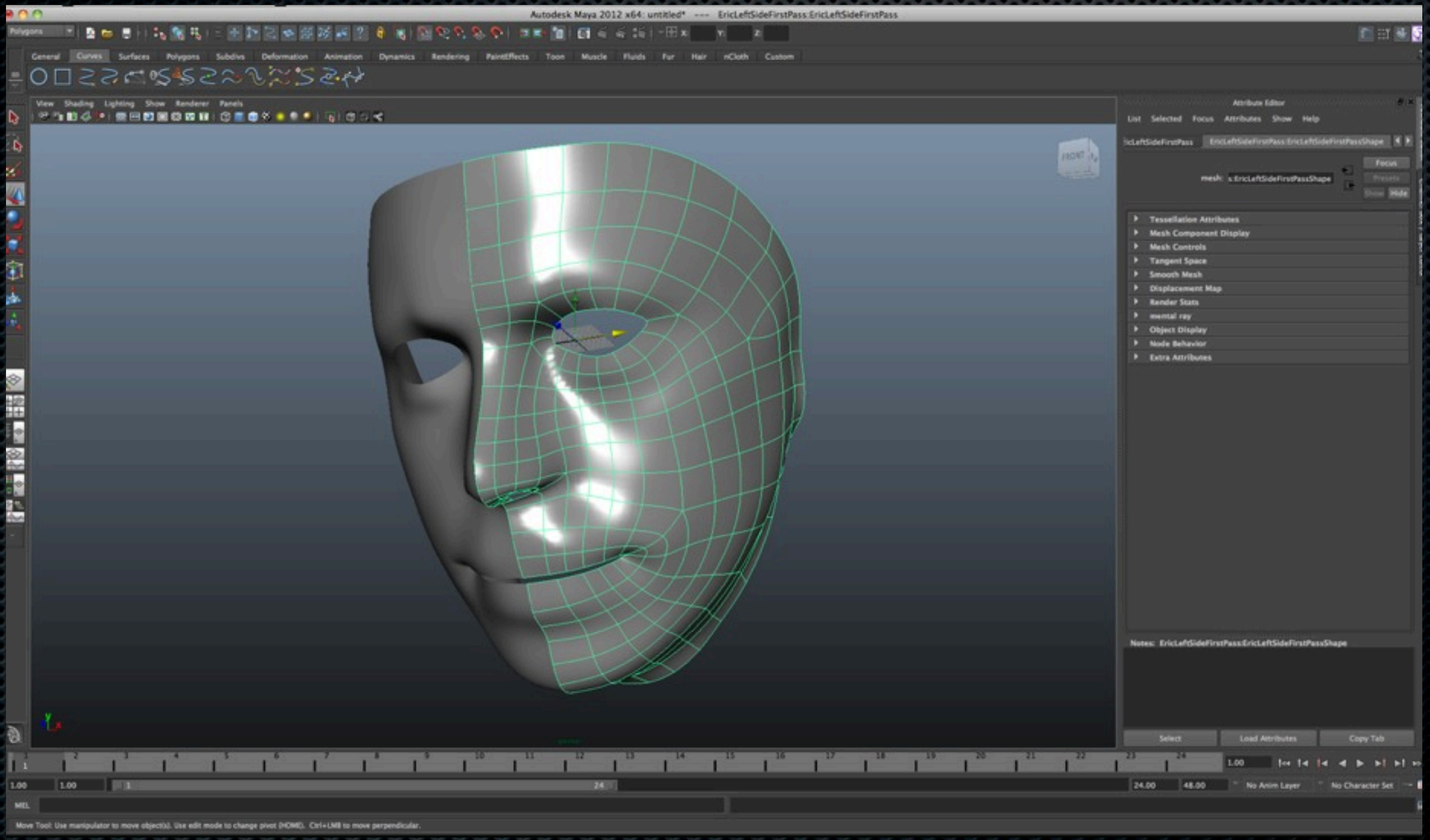


Import .obj into Maya

Could additionally work with texture, displacement, and/or normal maps.



Am I symmetric?



Autodesk Maya 2012 x64: untitled* --- EricLeftSideFirstPass:EricLeftSideFirstPass

Subdivs | Deformation | Animation | Dynamics | Rendering | PaintEffects | Toon | Muscle | Fluids | Fur | Hair

Panels

Render View

File View Render IPR Options Display Render Target Help

Maya Software

IPR: 0MB

size: 640 x 480 zoom: 1.000 (Maya Software)

Frame: 1 Render Time: 0:01 Camera: persp

Attributes

Map

Notes: EricLeftSideFirstPass:EricLeft

Select

persp

5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

1.00

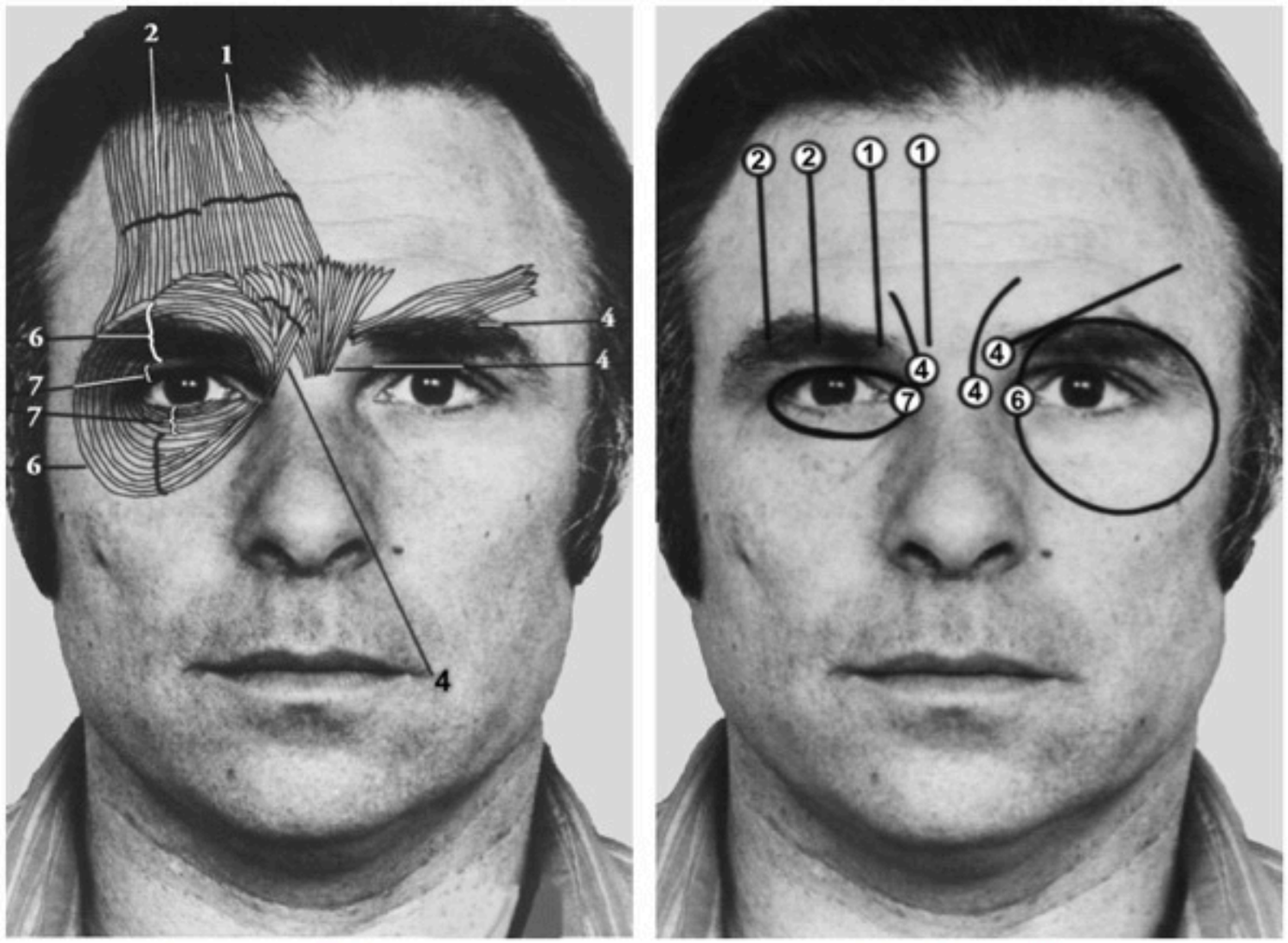
24

24.00 48.00

No Ani

FACs
(to inform rigging and performace tools)

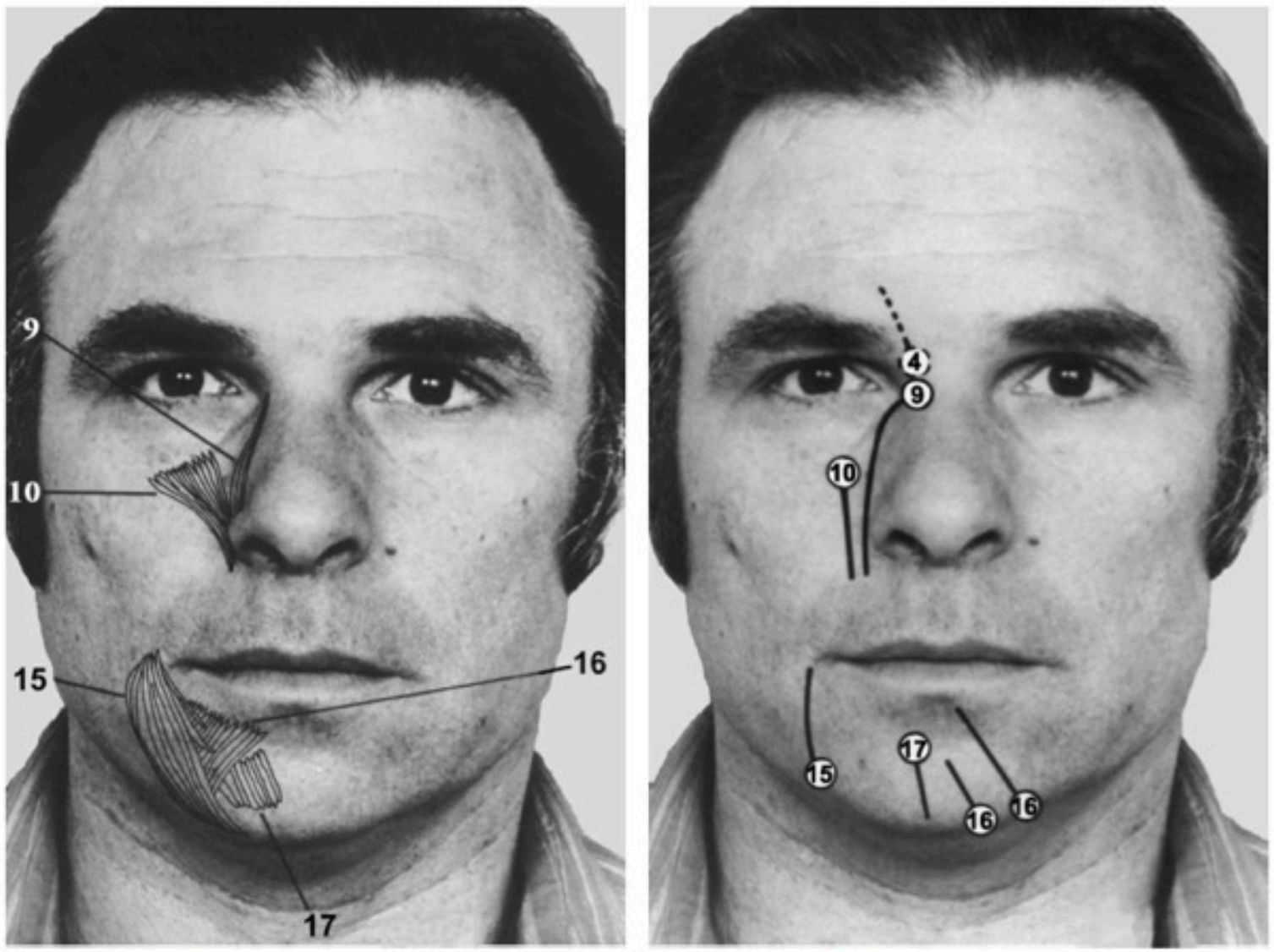
Figure 2-1. Muscles underlying upper face Action Units.



Muscular Anatomy **Muscular Action**

FACs
(to inform rigging and performace tools)

Figure 4-1. Locations of lower face up/down action units



Muscular Anatomy **Muscular Action**

FACs
(to inform rigging and performace tools)

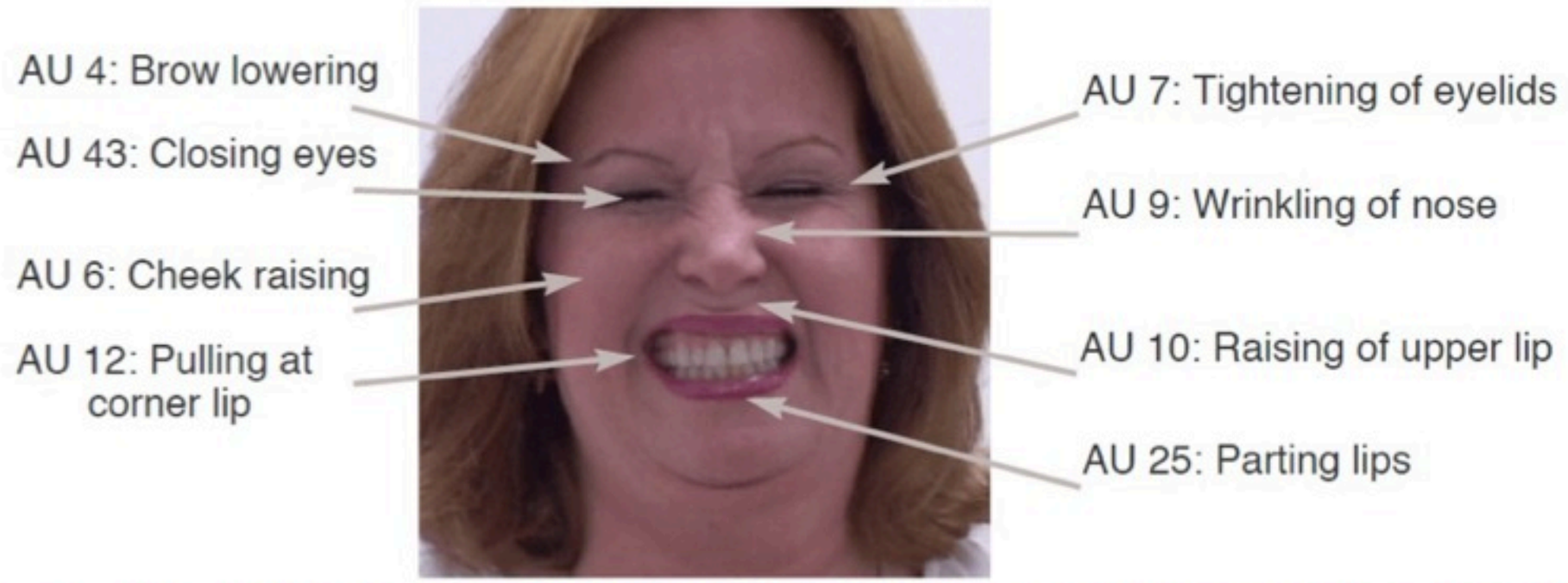


Fig. 2 An example of facial action units associated with a prototypic expression of pain [79].

79. P. Lucey, J.F. Cohn, I. Matthews, S. Lucey, S. Sridharan, J. Howlett, and K.M. Prkachin. Automatically Detecting Pain in Video Through Facial Action Units. *IEEE Transactions on Systems, Man, and Cybernetics, Part B: Cybernetics*, (99):1–11, 2010. 2, 3, 13, 14

FACs
(to inform rigging and performace tools)

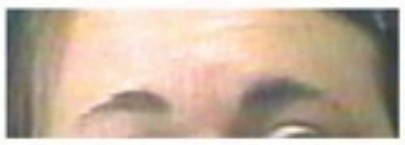
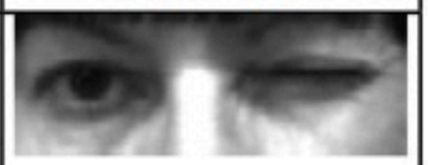
Upper Face Action Units					
AU1	AU2	AU4	AU5	AU6	AU7
					
Inner Brow Raiser	Outer Brow Raiser	Brow Lowerer	Upper Lid Raiser	Cheek Raiser	Lid Tightener
*AU41	*AU42	*AU43	AU44	AU45	AU46
					
Lip Droop	Slit	Eyes Closed	Squint	Blink	Wink

Fig. 3 FACS action units (AU) for the upper face. From [24].

24. J. F. Cohn, Z. Ambadar, and P. Ekman. *Observer-based measurement of facial expression with the Facial Action Coding System*. The handbook of emotion elicitation and assessment. Oxford University Press Series in Affective Science., New York: Oxford., 2007. 4, 5

FACs
(to inform rigging and performace tools)

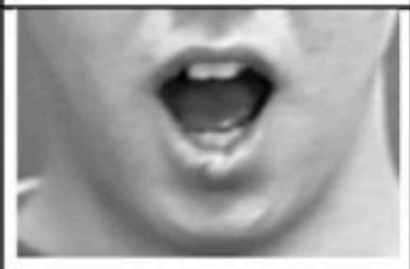
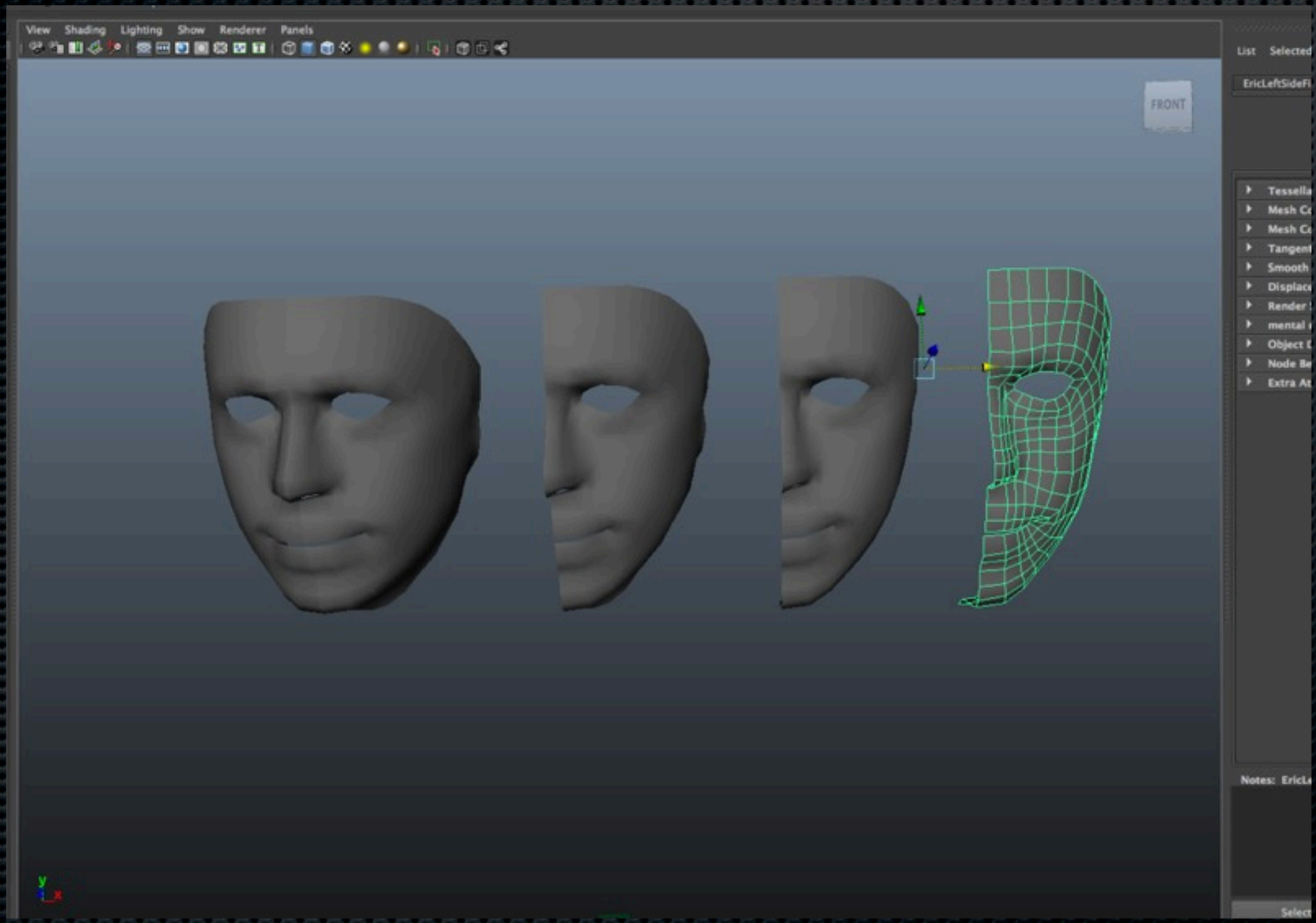
Lower Face Action Units					
AU9	AU10	AU11	AU12	AU13	AU14
Nose Wrinkler	Upper Lip Raiser	Nasolabial Deepener	Lip Corner Puller	Cheek Puffer	Dimpler
AU15	AU16	AU17	AU18	AU20	AU22
Lip Corner Depressor	Lower Lip Depressor	Chin Raiser	Lip Puckerer	Lip Stretcher	Lip Funneler
AU23	AU24	*AU25	*AU26	*AU27	AU28
					
Lip Tightener	Lip Pressor	Lips Parts	Jaw Drop	Mouth Stretch	Lip Suck

Fig. 4 Action units of the lower face. From [24].

Rigging with blendshapes (and possibly joints) to enable movements represented by FACS action units (AUs).



Blend Sh
Edit Options Help
blendShape1
Delete
Add Base
Key All
Reset All
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Select
blendShape2
Delete
Add Base
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FirstPas
Key
Select
blendShape3
Delete
Add Base
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FirstPas
Key

View Shading Lighting Show Renderer Panels

Blend Shape

Edit Options Help

blendShape1

Delete
Add Base
Key All
Reset All

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FirstPass2
Key

Select

blendShape2

Delete
Add Base
Key All
Reset All

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FirstPass3
Key

Select

blendShape3

Delete
Add Base
Key All
Reset All

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FirstPass4
Key

persp

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1

General | Curves | Surfaces | Polygons | Subdivs | Deformation | Animation | Dynamics | Rendering | PaintEffects | Toon | Muscle | Fluids | Fur | Hair | nCloth | Custom

View Shading Lighting Show Renderer Panels

Blend Shape

Edit Options Help

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Key All
Reset All
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FirstPass2
Key
Select

blendShape2
Delete
Add Base
Key All
Reset All
0.000
FirstPass3
Key
Select

blendShape3
Delete
Add Base
Key All
Reset All
1.000
FirstPass4
Key

persp

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21

1 1.00 1 24

MEL

// Result: blendShapePanel1

Blend Shape

Edit Options Help

blendShape1

Delete
Add Base
Key All
Reset All

0.591
FirstPass2
Key

Select

blendShape2

Delete
Add Base
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FirstPass3
Key

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blendShape3

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1.455
FirstPass4
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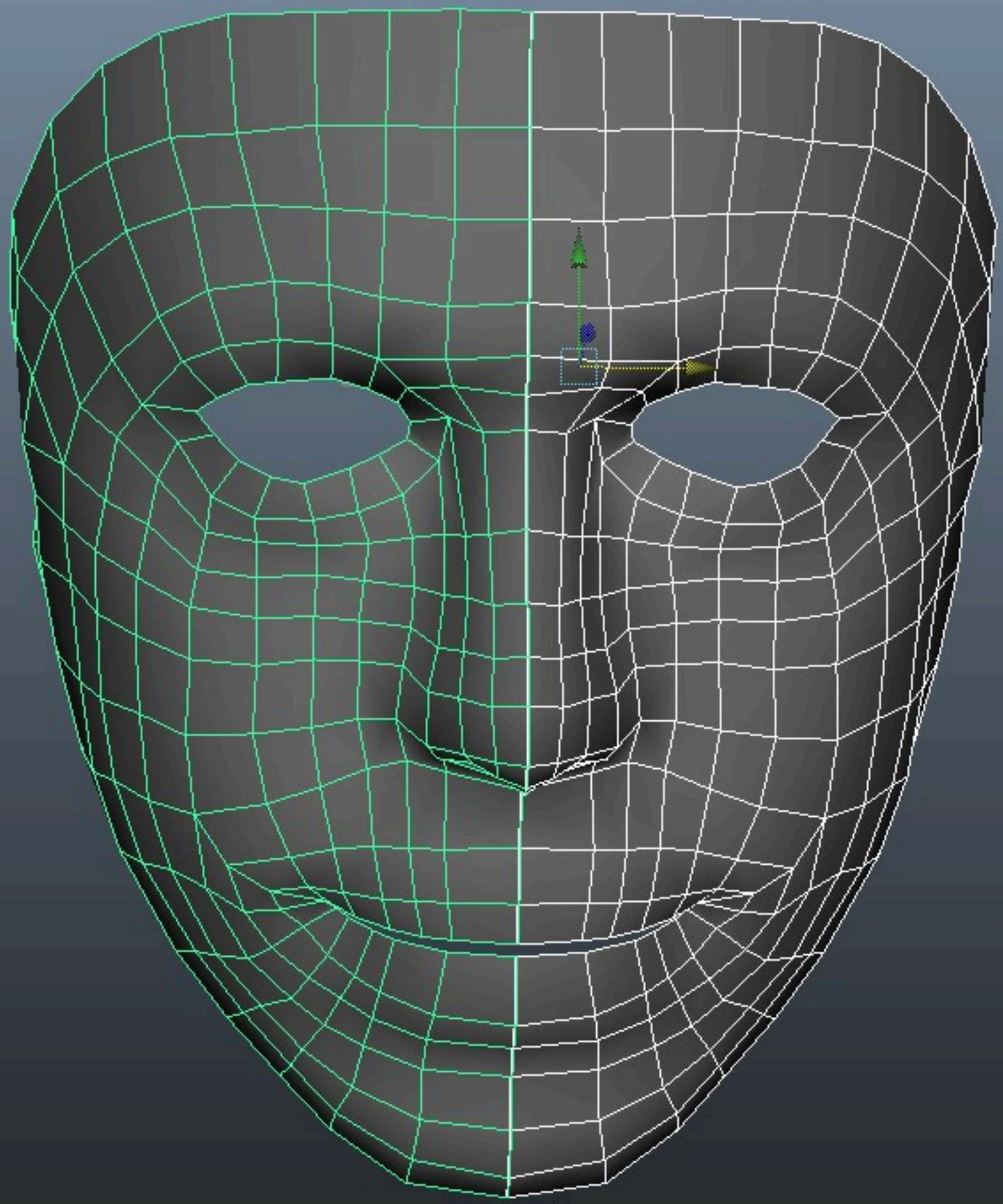
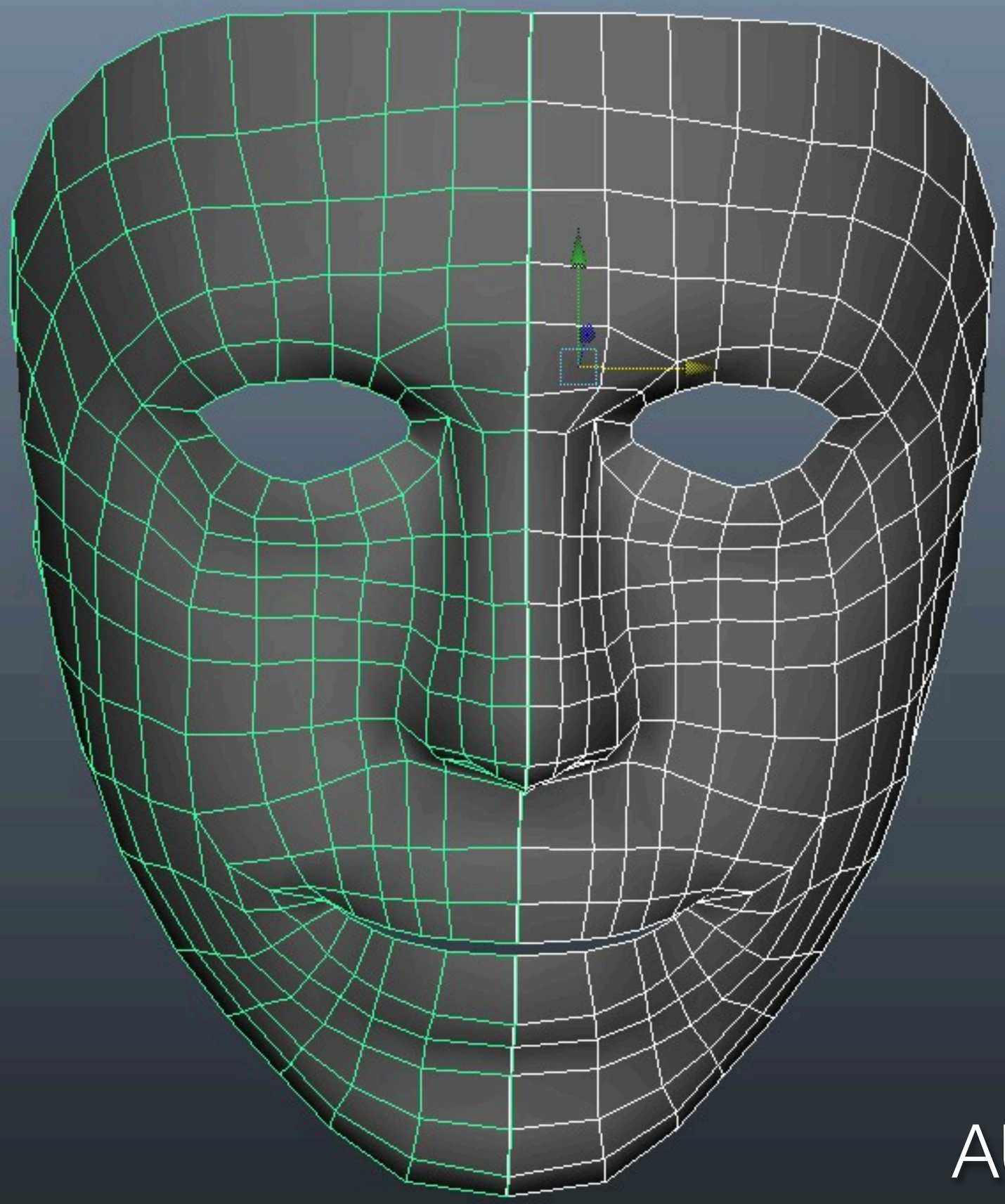
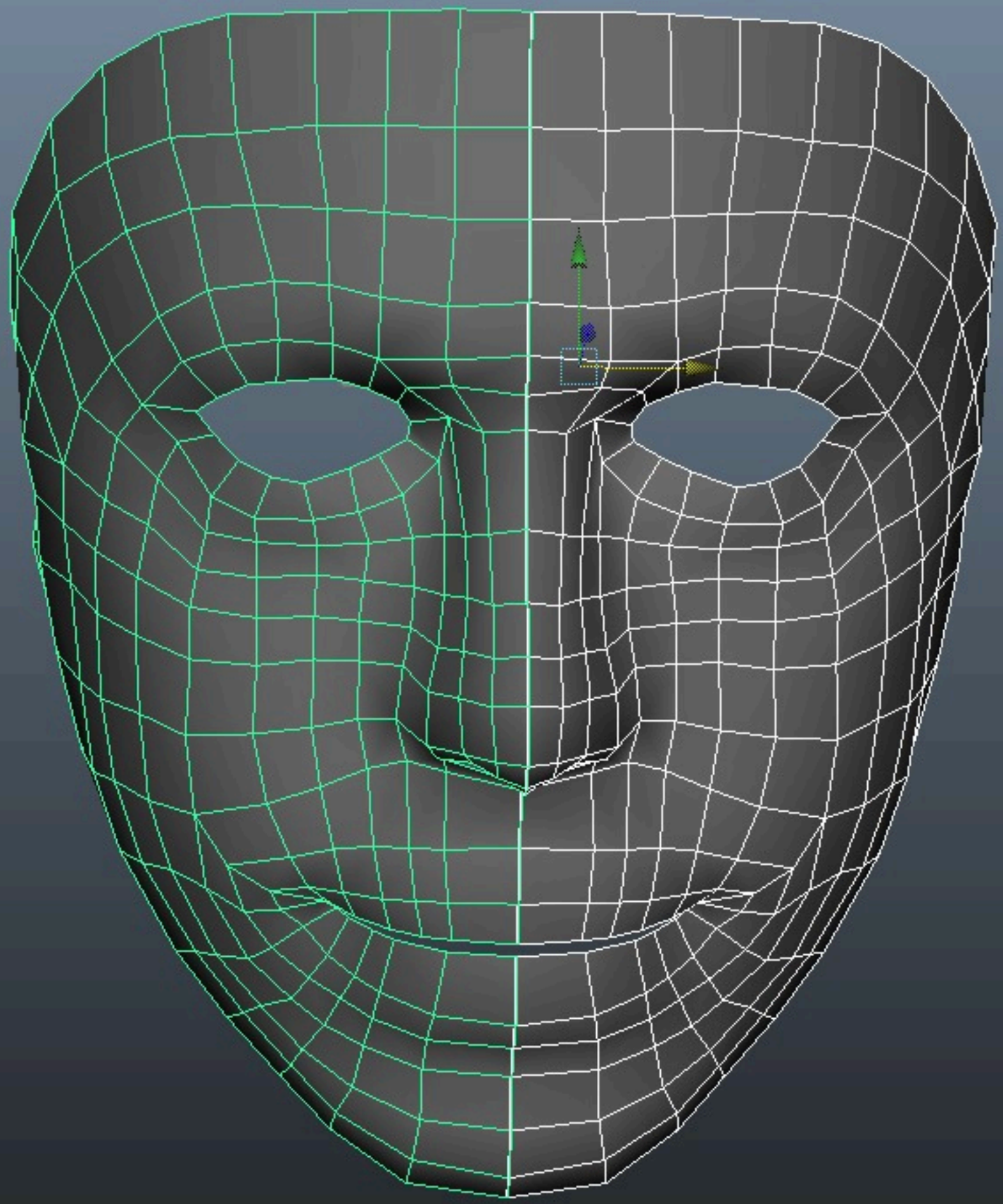
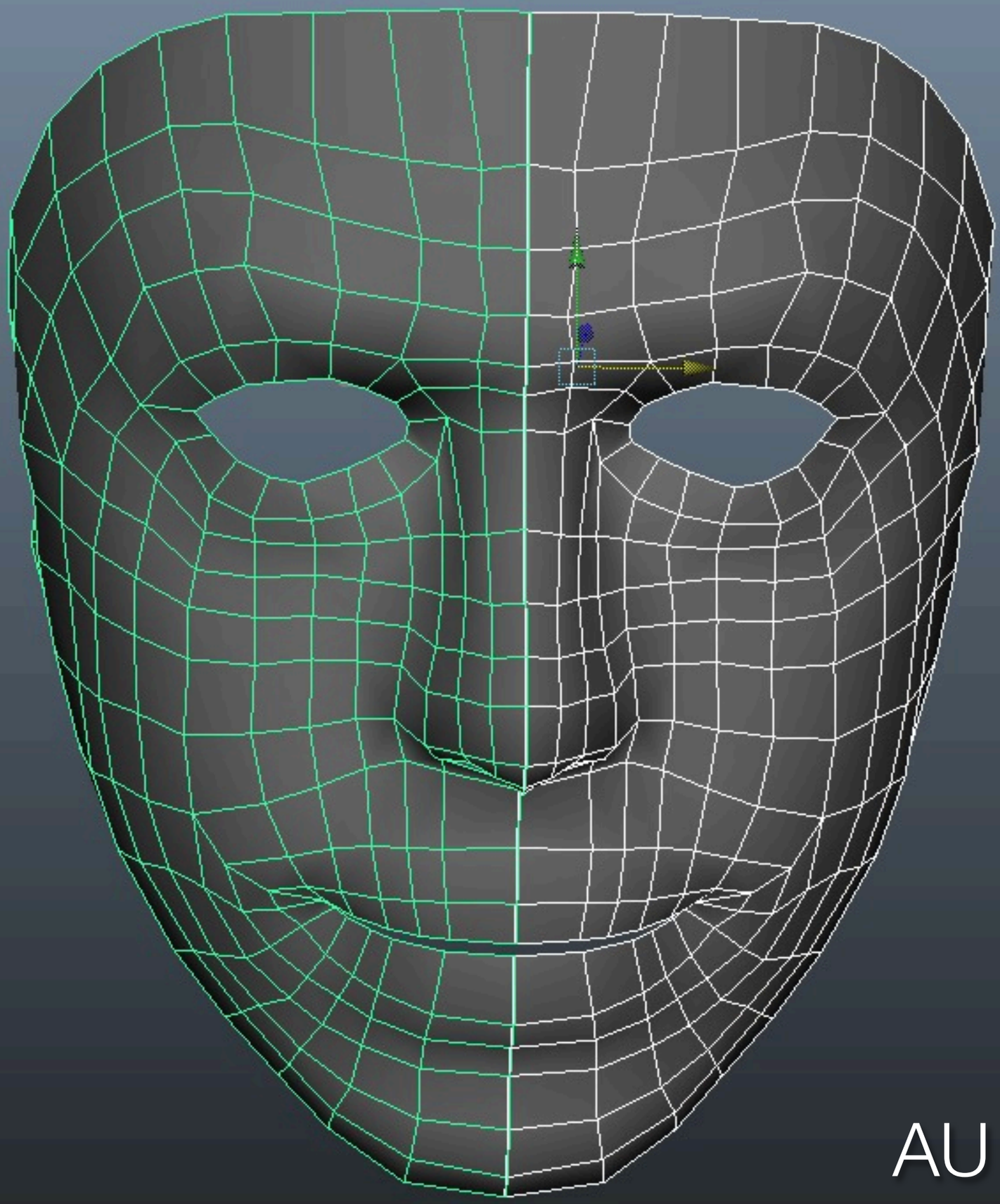




AU 1





AU 2 + 4

Autodesk Maya 2012 x64: /Users/pattersone/Desktop/EricTestFACS2saveToDoMouthEtcLater.mb*

Animation | Dynamics | Rendering | PaintEffects | Toon | Muscle | Fluids | Fur | Hair | nCloth | Custom

Channels

Blend Shape

Edit Options Help

blendShape1

Delete
Add Base
Key All
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FirstPass2

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blendShape2

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Add Base
Key All
Reset All

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FirstPass3

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blendShape3

Delete
Add Base
Key All
Reset All

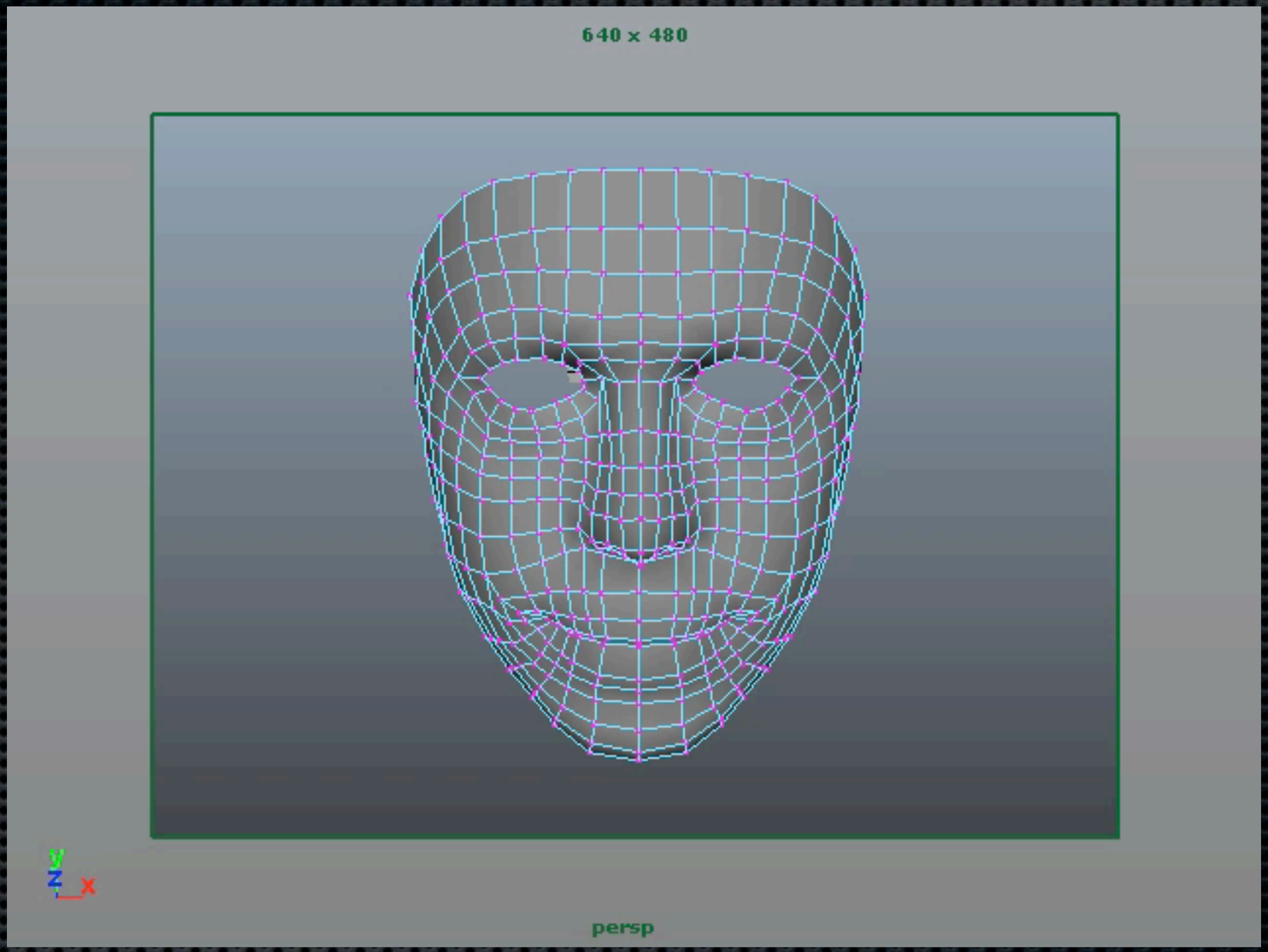
0.000

FirstPass4

Key

Display
Layers

Combined model with Blendshapes for AUs 1, 2, 4.



Quick playblast test of blendshapes.

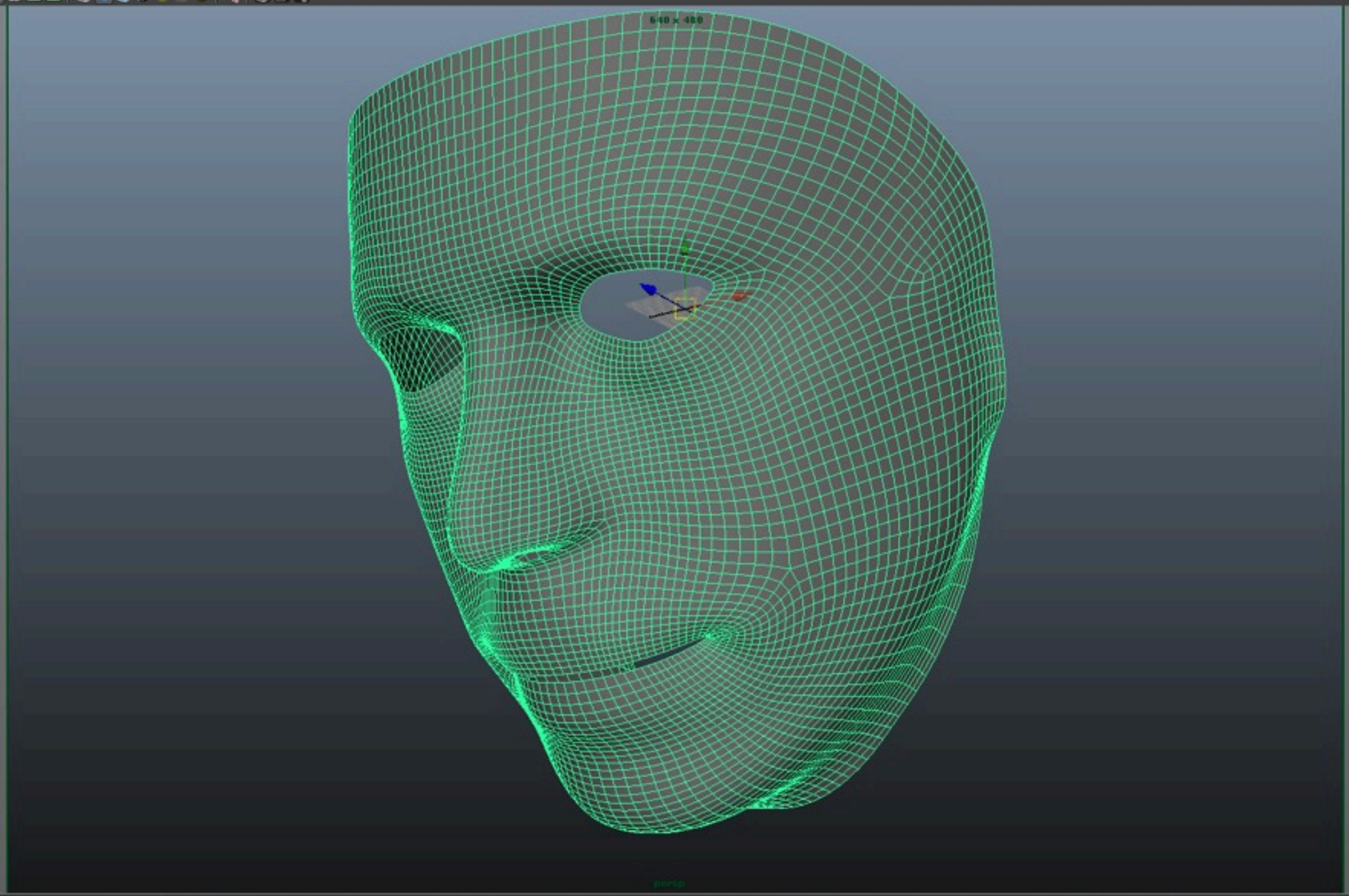
dify Create Display Window Assets Select Mesh Edit Mesh Proxy Normals Color Create UVs Edit UVs 3D Control Muscle Help

Autodesk Maya 2012 x64: /Users/pattersone/Desktop/EricTestFACS2savetoDoMouthEtcLater.mb* --- polySurface1

Surfaces Polygons Subdivs Deformation Animation Dynamics Rendering PaintEffects Toon Muscle Fluids Fur Hair Cloth Custom

ighting Show Renderer Panels

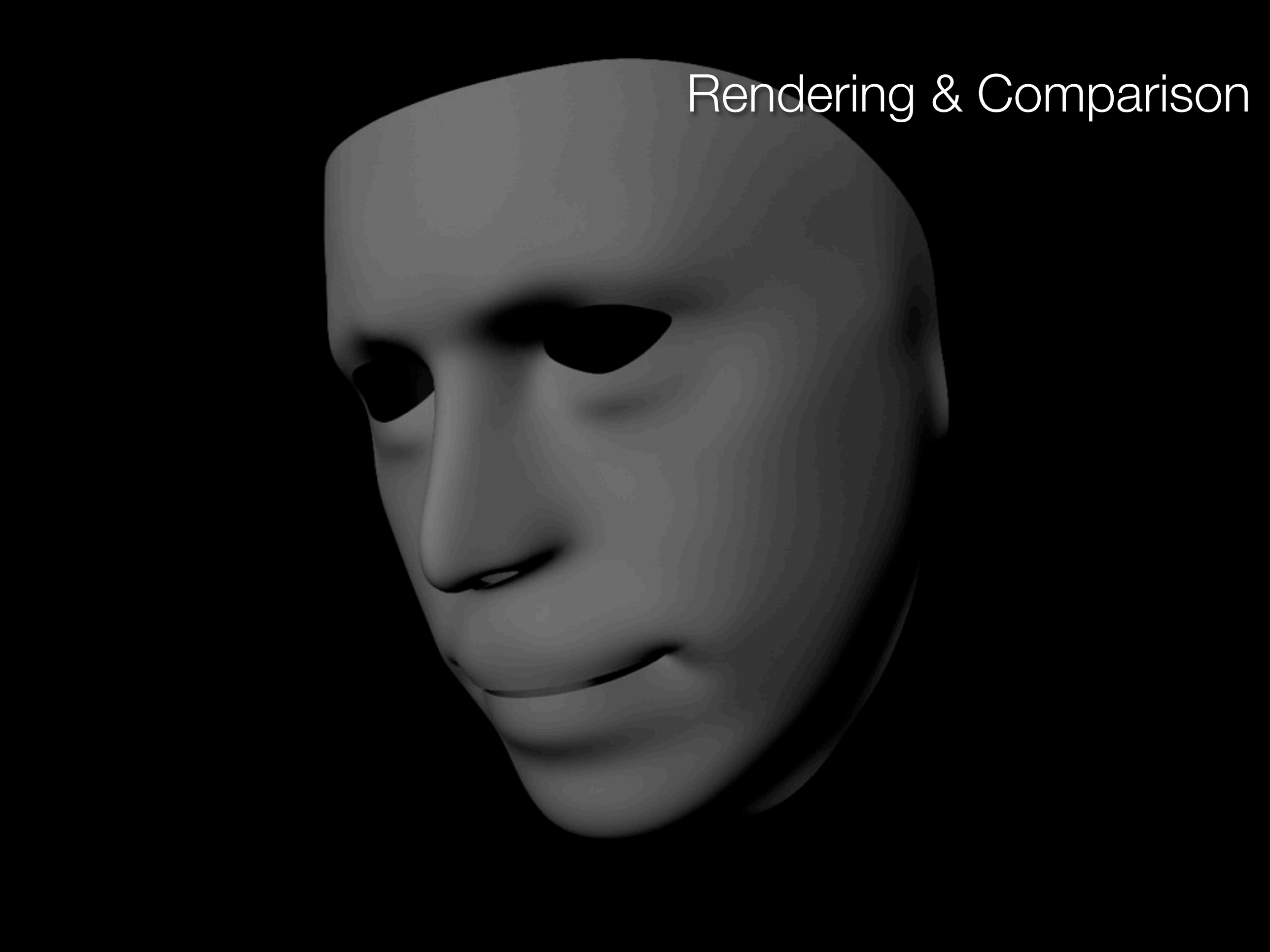
Rendering & Comparison



10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80 82 84 86 88 90 92 94

1 96 96.00 96.00

Rendering & Comparison



Rendering & Comparison

Rendering & Comparison