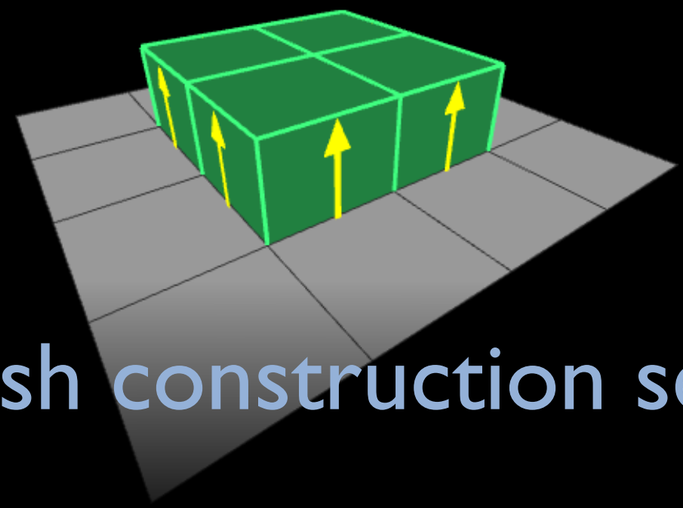
meshflow



interactive visualization of mesh construction sequences

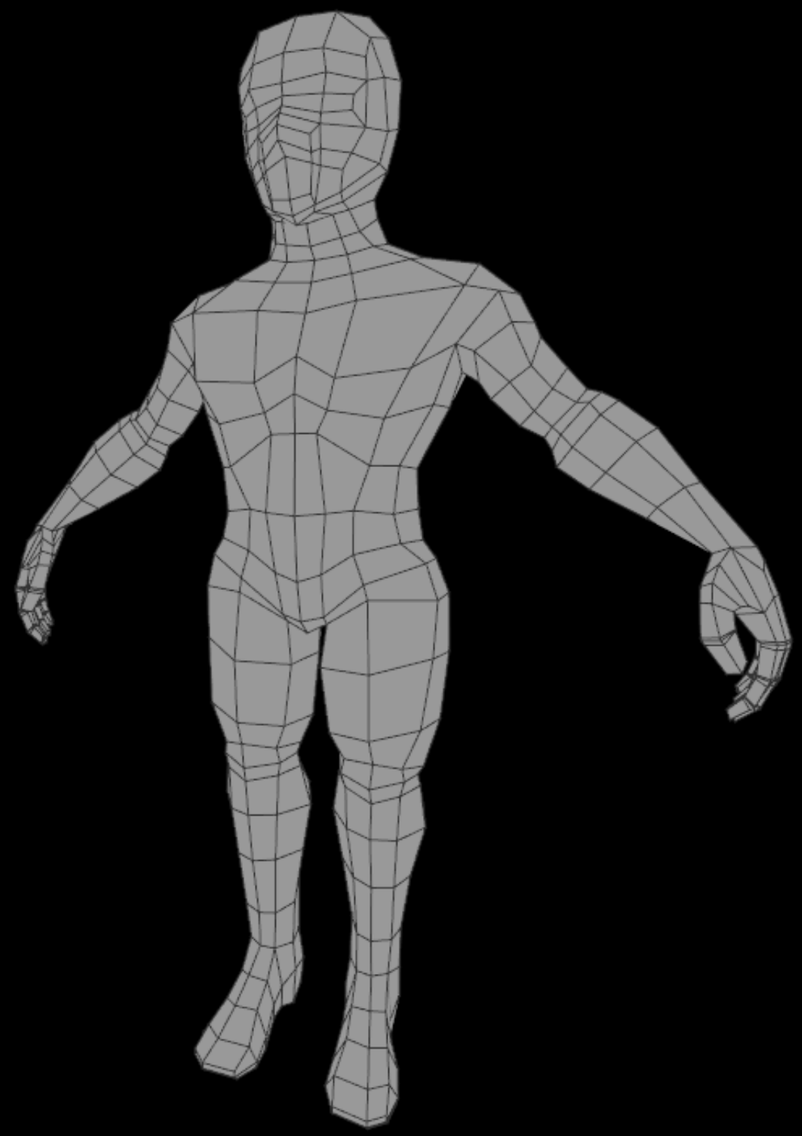
jonathan d. denning[+], william b. kerr[+], fabio pellacini[+*]
[+]dartmouth college, [*]sapienza university of rome

biped

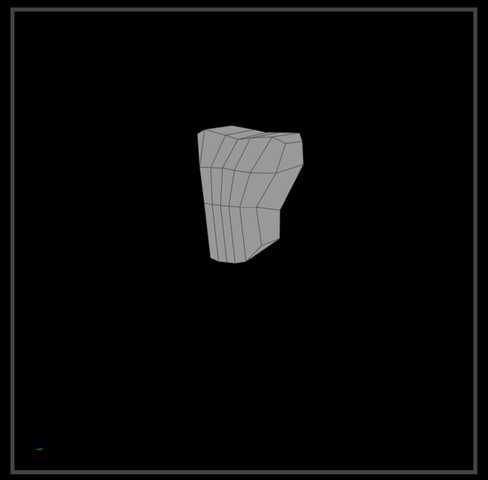
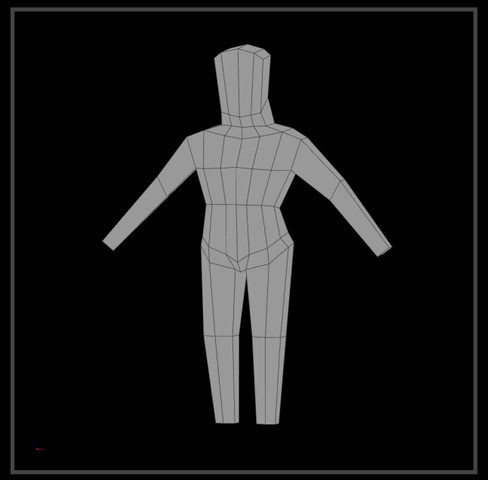
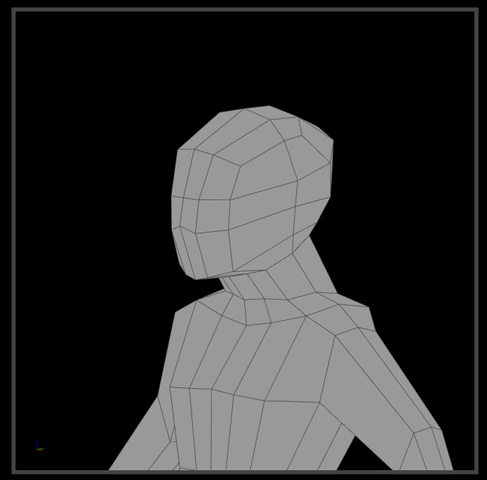
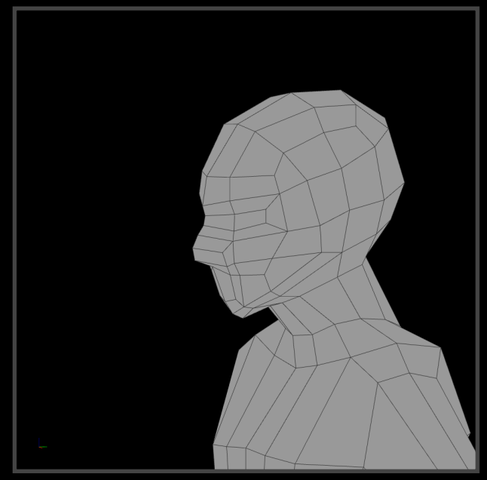
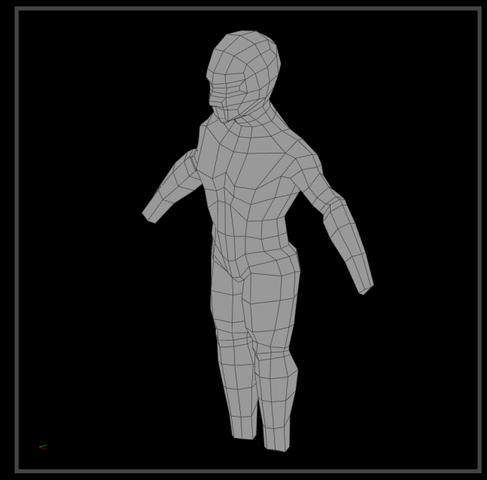
1012 faces

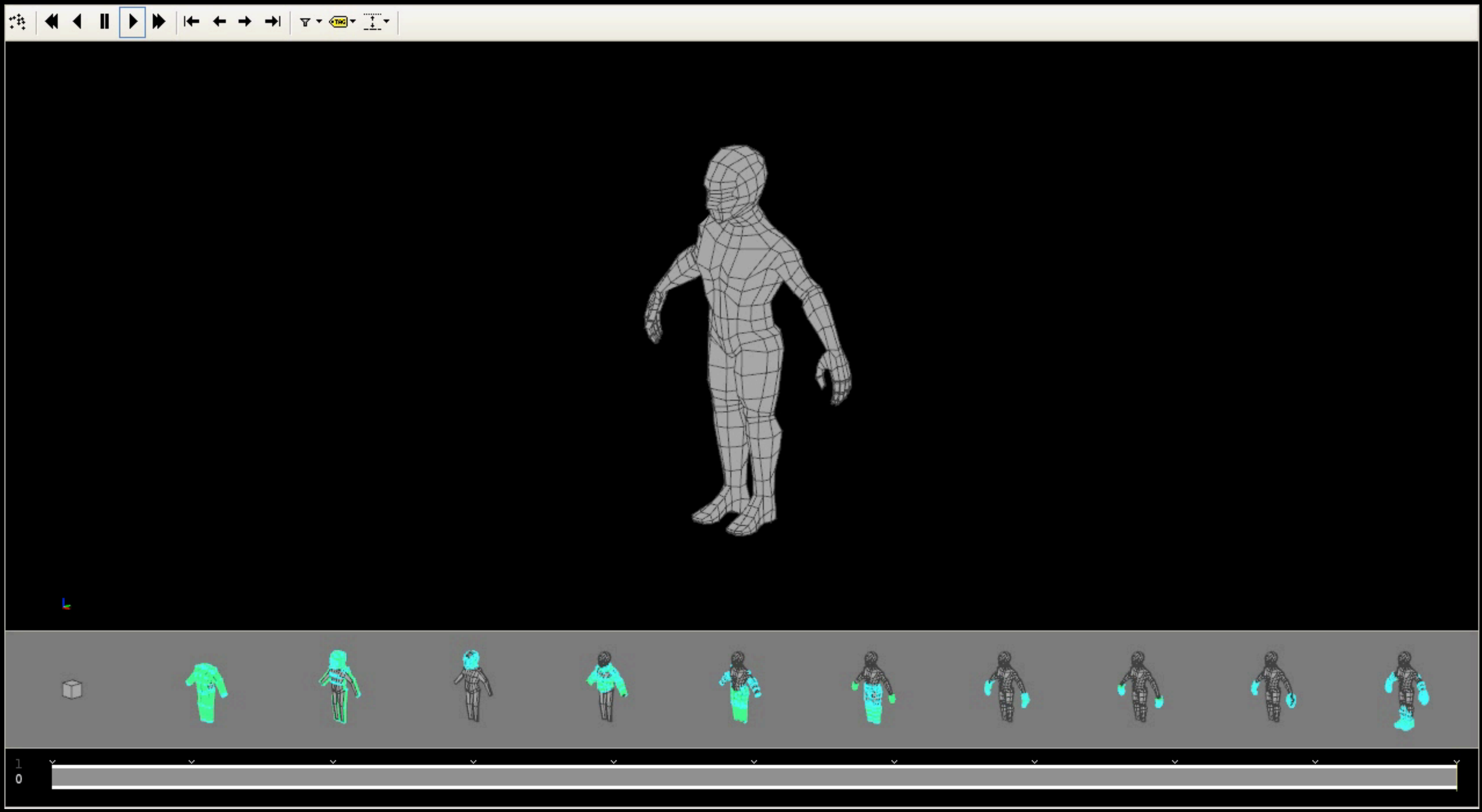
3:10 hrs

5759 ops



60x



File Add Render Help | Modeling | Scene | Blender Render | Ve:1014 | Fa:1012 | Ob:0-1 | La:0 | Mem:6.74M (0.10M) | Model

▼ Object Tools

Transform:
Translate
Rotate
Scale

Origin

Object:
Duplicate Objects
Delete
Join

Shading:
Smooth
Flat

Keyframes:
Insert | Remove

Motion Paths:
Calculate Paths
Clear Paths

Repeat:
Repeat Last

▼ Operator

User Persp

(1) Model

Model

▼ Modifiers

Add Modifier

Copy

Textures:
Merg U
Clippi V
Verte
mit: 0.001000

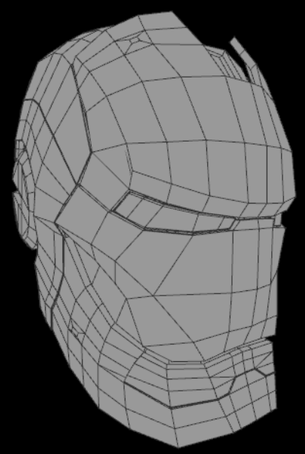
Instrumented Blender 2.5
2.57.1 r36798M

Interaction: Preset

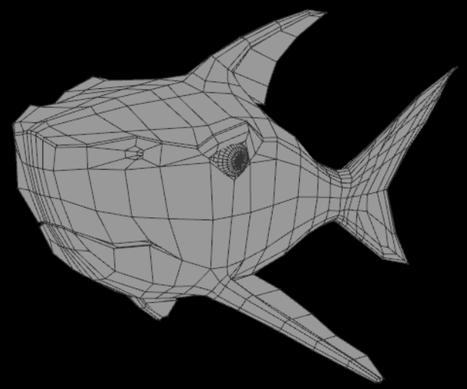
Links
Donations
Release Log
Manual
Blender Website
User Community
Python API Reference

Recent
step000330.blend Cmd O
step004284.blend Cmd O
step004272.blend Cmd O
step004257.blend Cmd O
step004243.blend Cmd O
Recover Last Session

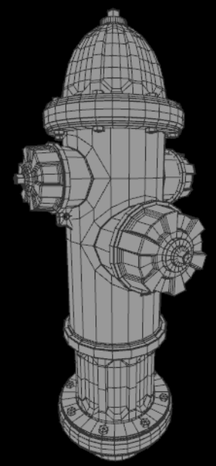
View Select Object | Object Mode | Global



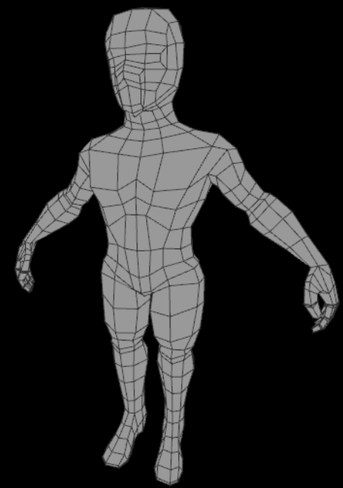
helmet
1867 faces
5:05 hrs
8510 ops



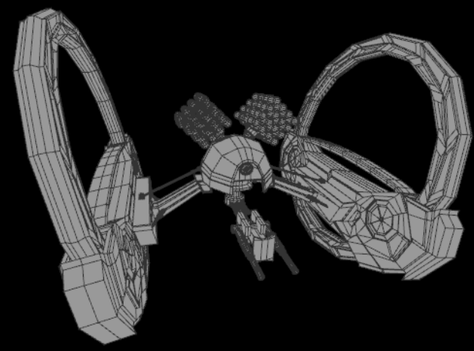
shark
1796 faces
3:30 hrs
8350 ops



hydrant
10808 faces
2:30 hrs
4609 ops



biped
1012 faces
3:10 hrs
5759 ops



robot
15580 faces
9:40 hrs
13478 ops

raw seq

⋮
select
select
view
view
view
view
topo
trans
trans
select
trans
trans
trans
⋮

clustered

⋮
select
view
topo
trans
select
trans
⋮

top 4 bigrams

5759		3781		3118		1843		225	
cam, cam	.33	select, trans	.22	select, trans	.27	trans, trans	.40	trans, cam	.20
select, trans	.15	trans, select	.16	trans, select	.20	trans, cam	.26	cam, $topo_a$	.17
trans, select	.11	cam, select	.13	trans, cam	.15	cam, trans	.25	cam, trans	.16
cam, select	.09	select, select	.13	cam, select	.14	cam, $topo_a$	.02	$topo_a$, trans	.12

clustering by substituting regexs

2 $(\text{cam})+\ (\text{cam})^{\diamond} \mapsto (\text{cam})^{\diamond}$

3 $(\text{view})\ (\text{view})+ \mapsto (\text{view})$

4 $(\text{select})\ (\text{view} \mid \text{select})*\ (\text{select})^{\diamond} \mapsto (\text{select})^{\diamond}$

5 $(\text{select})\ (\text{view})*\ (\text{topo} \mid \text{trans})^{\diamond} \mapsto (\cdot)^{\diamond}$

6 $(\text{trans})\ (\text{view} \mid \text{trans})*\ (\text{trans})^{\diamond} \mapsto (\cdot)^{\diamond}$

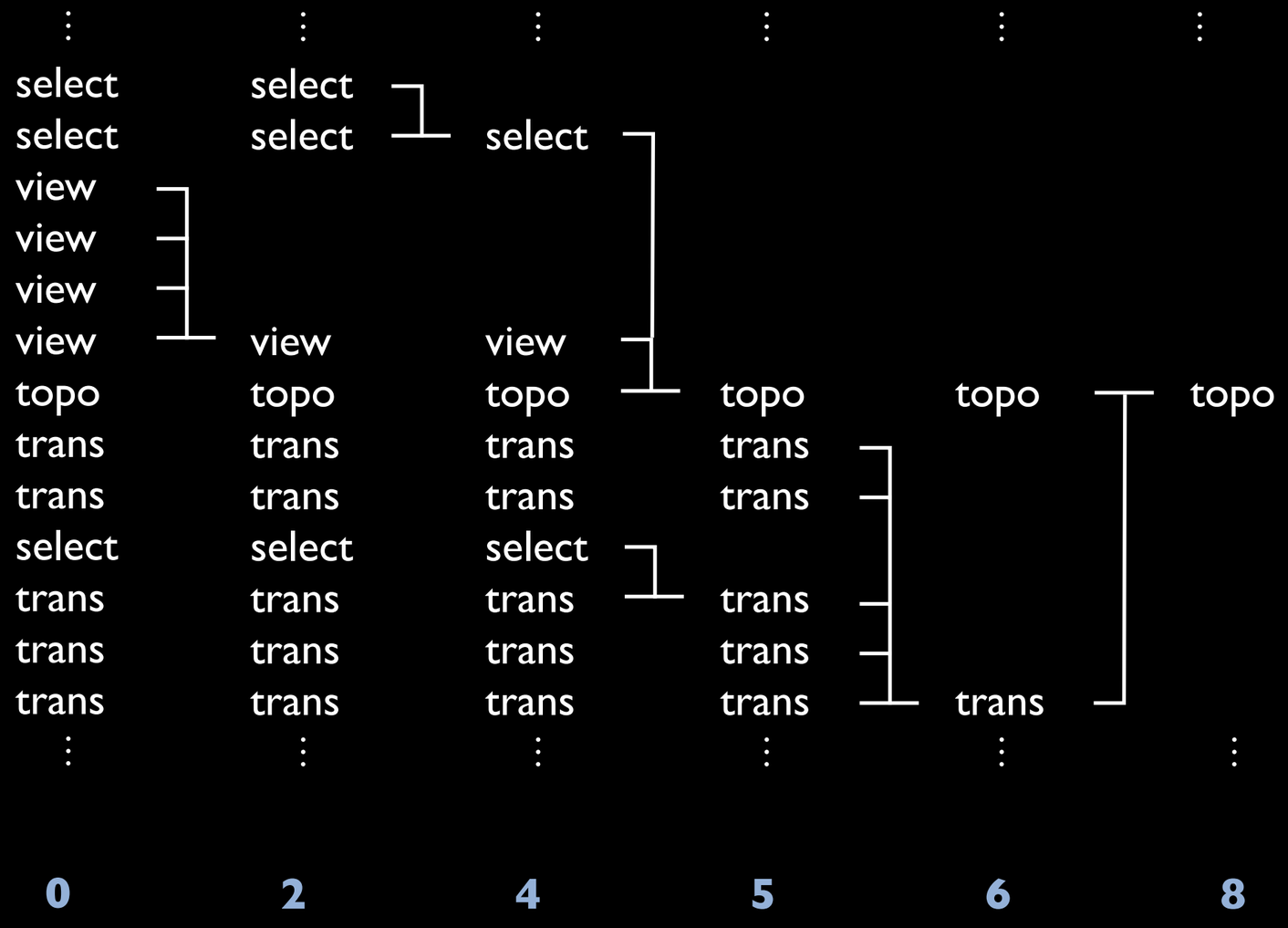
7 $(\cdot)^{\diamond}\ (\text{view} \mid (\cdot)^{\diamond})*\ (\cdot)^{\diamond} \mapsto (\cdot)^{\diamond}$

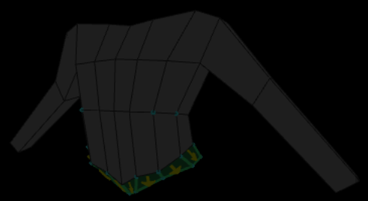
8 $(\text{topo})^{\diamond}\ (\text{view} \mid \text{trans})*\ (\text{trans}) \mapsto (\cdot)^{\diamond}$

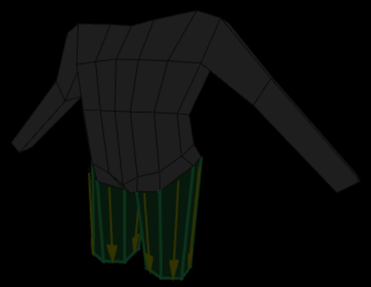
9 $(\text{topo}_a)^{\diamond}\ (\text{view} \mid \text{topo}_b)*\ (\text{topo}_b) \mapsto (\cdot)^{\diamond}$

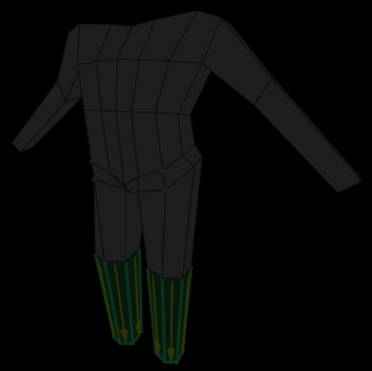
10 $(\cdot)^{\diamond}\ (\text{view} \mid (\cdot)^{\diamond})*\ (\cdot)^{\diamond} \mapsto (\cdot)^{\diamond}$

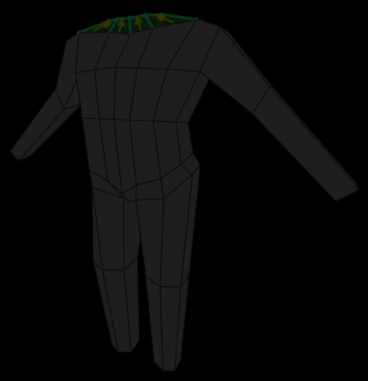
levels of detail

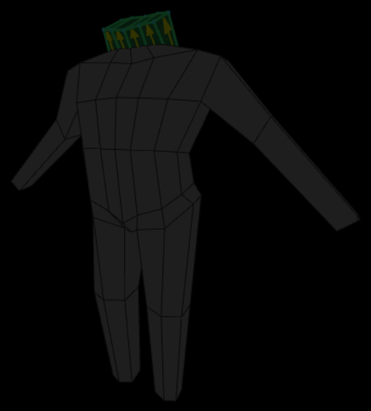


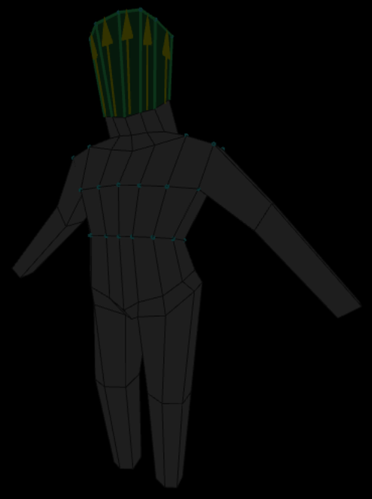




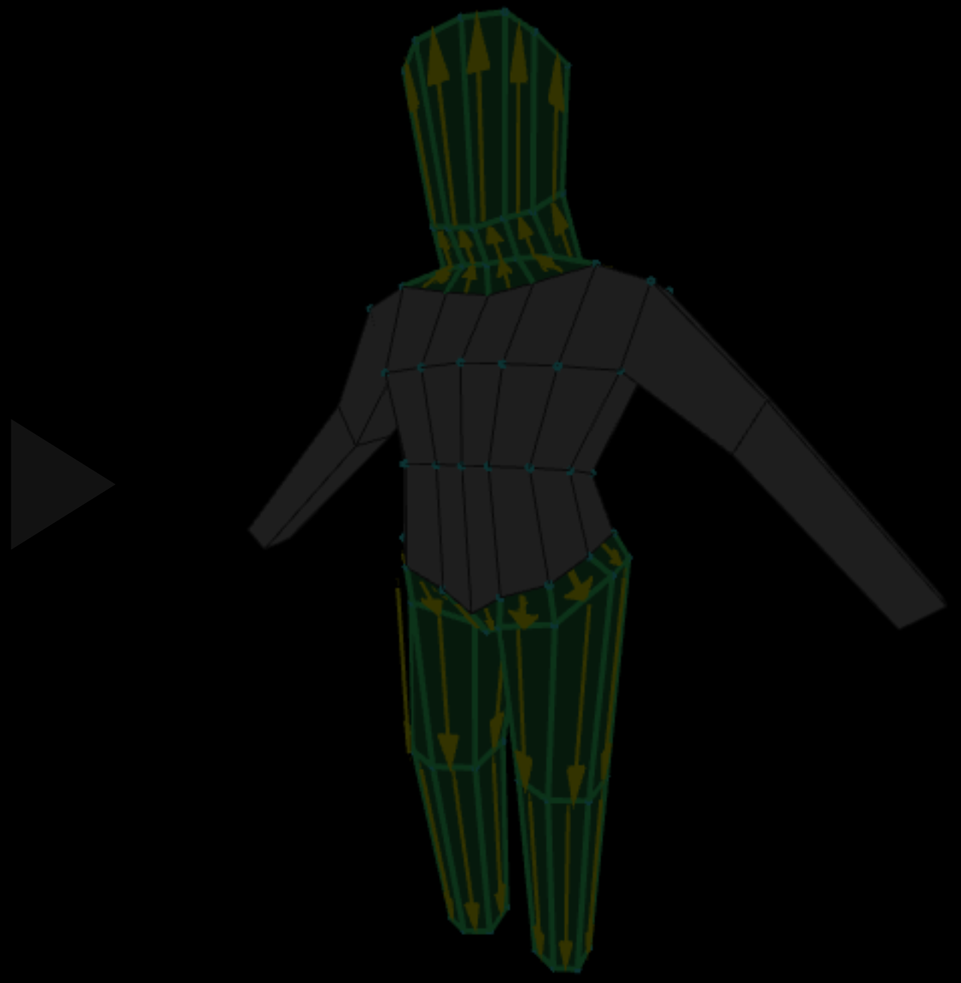




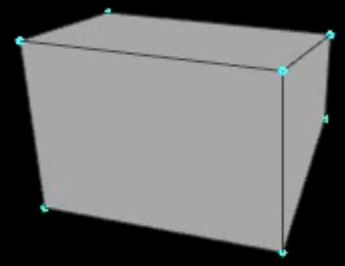




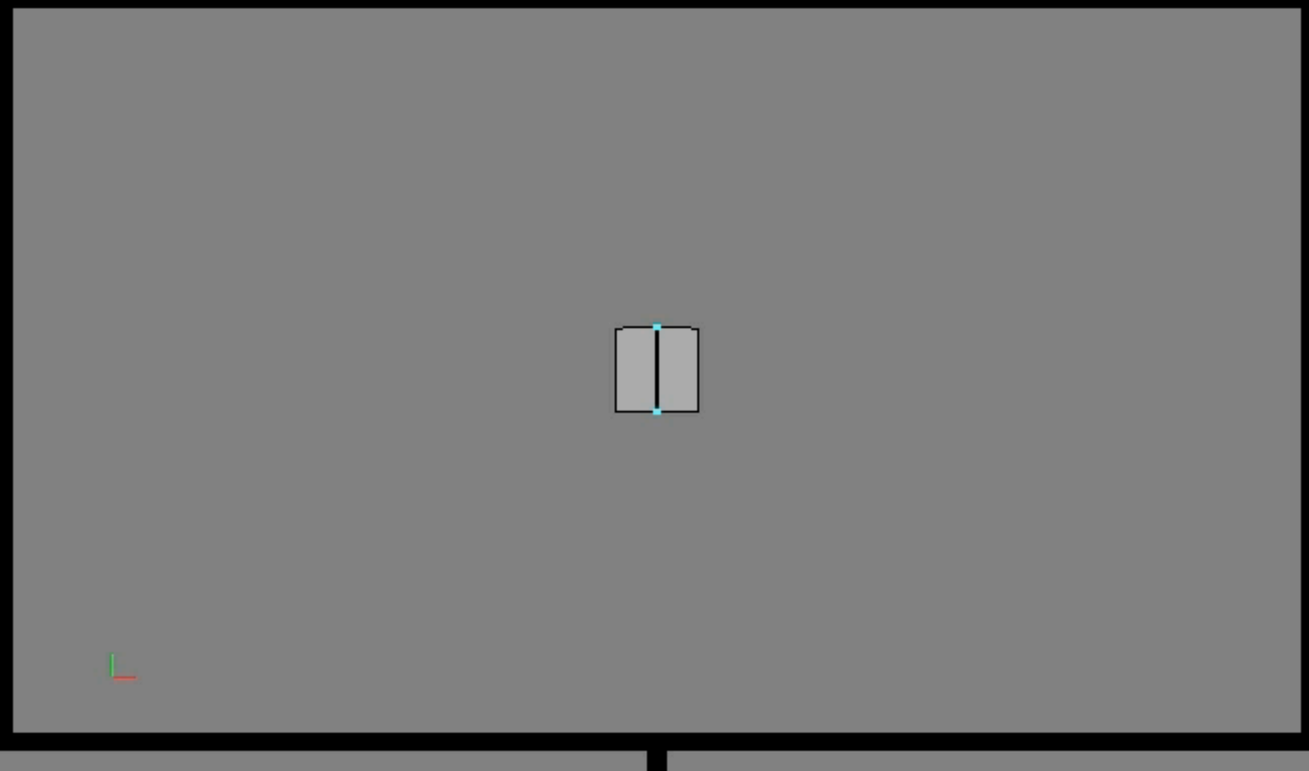
9



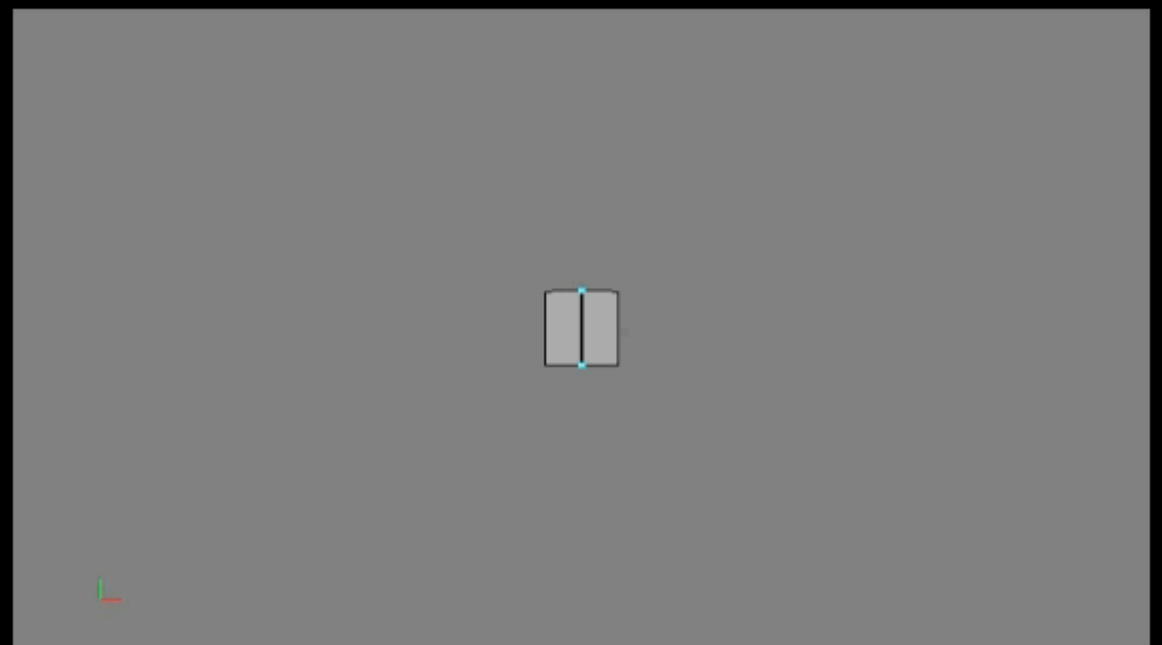
10

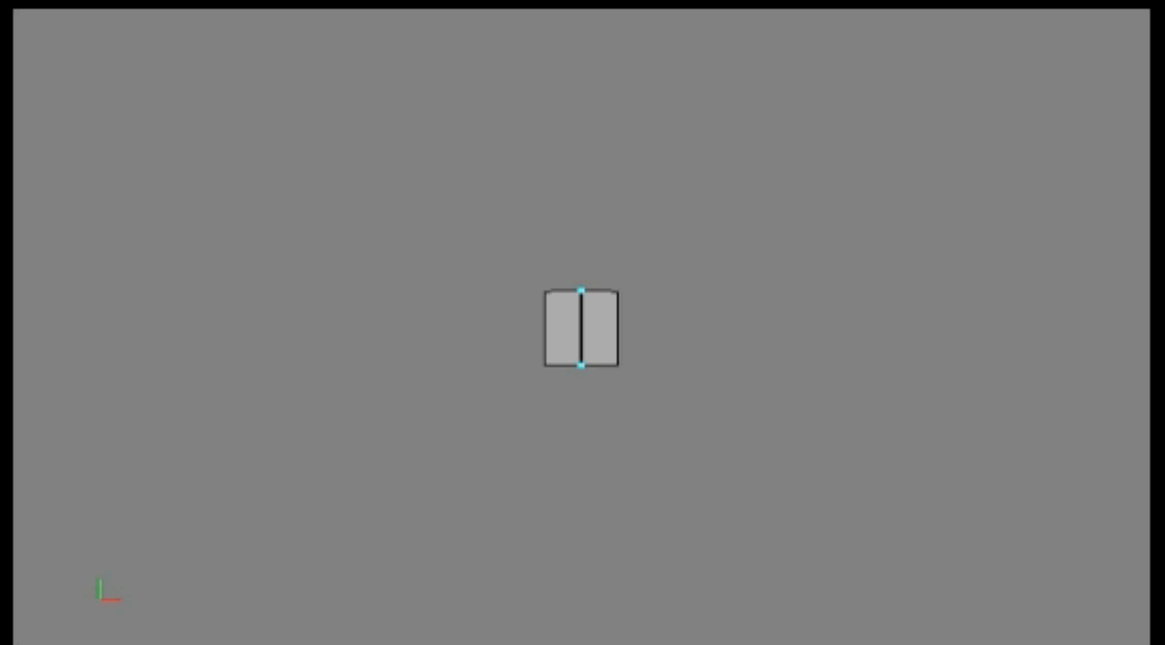


9

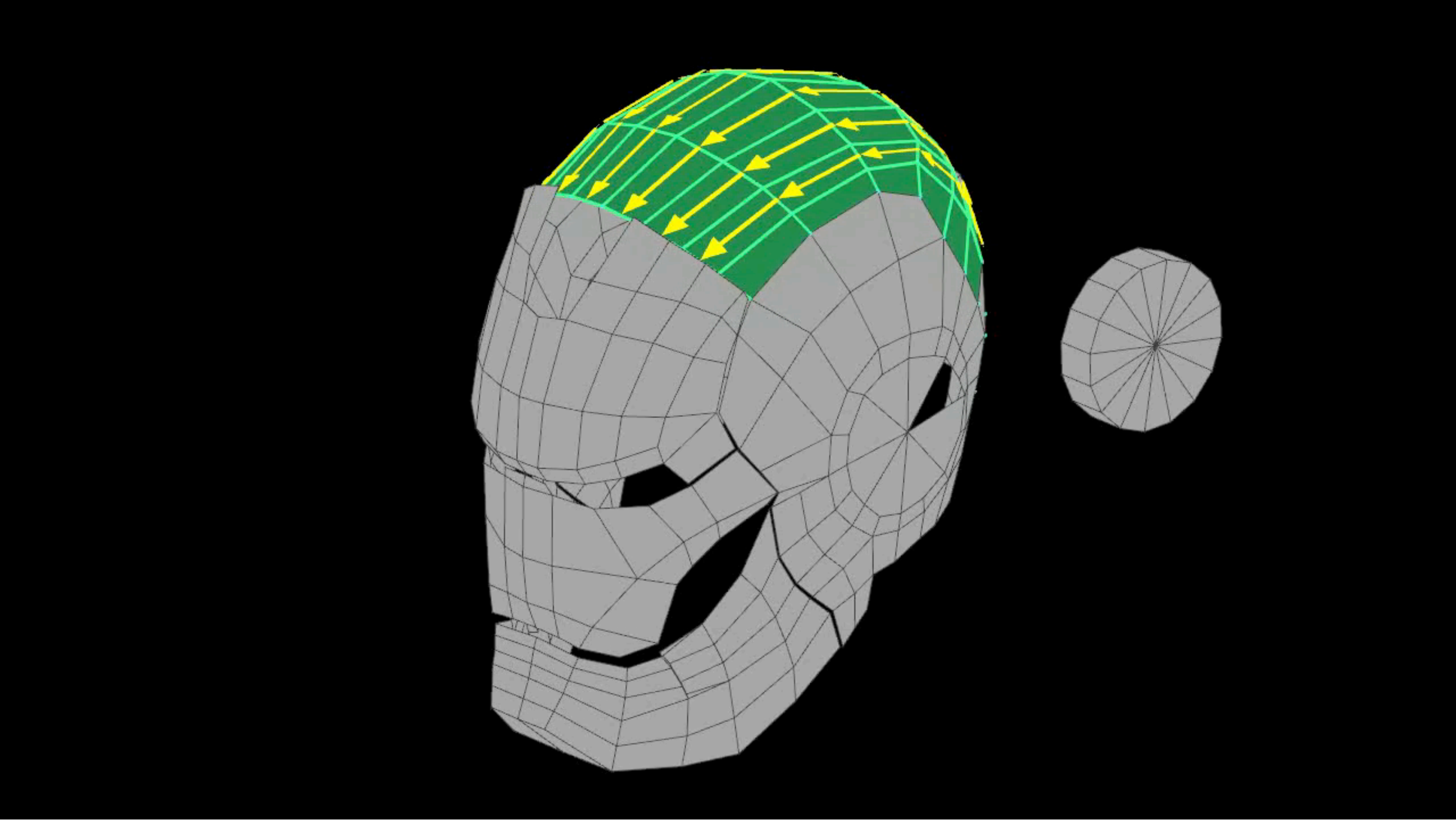


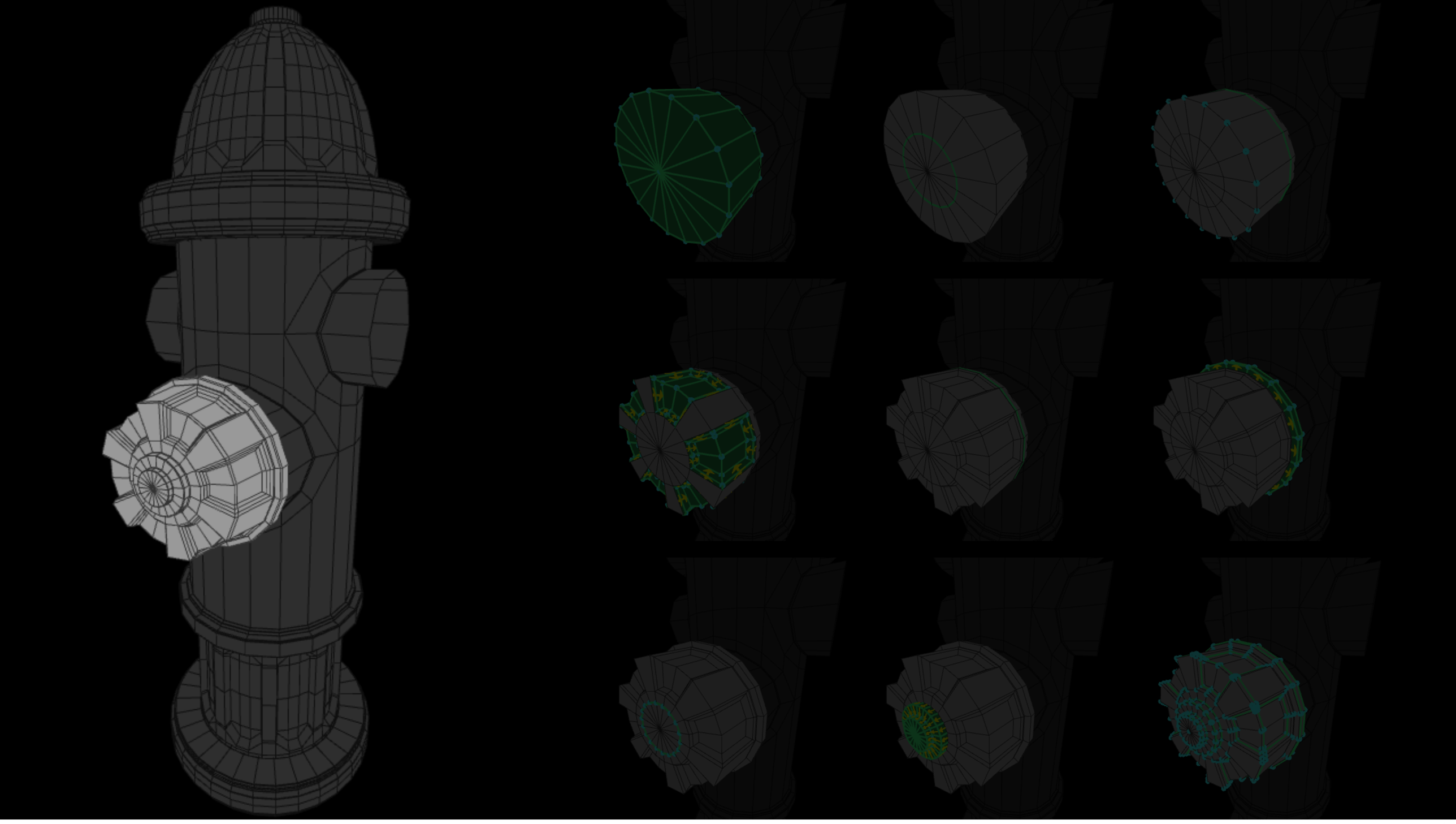
5





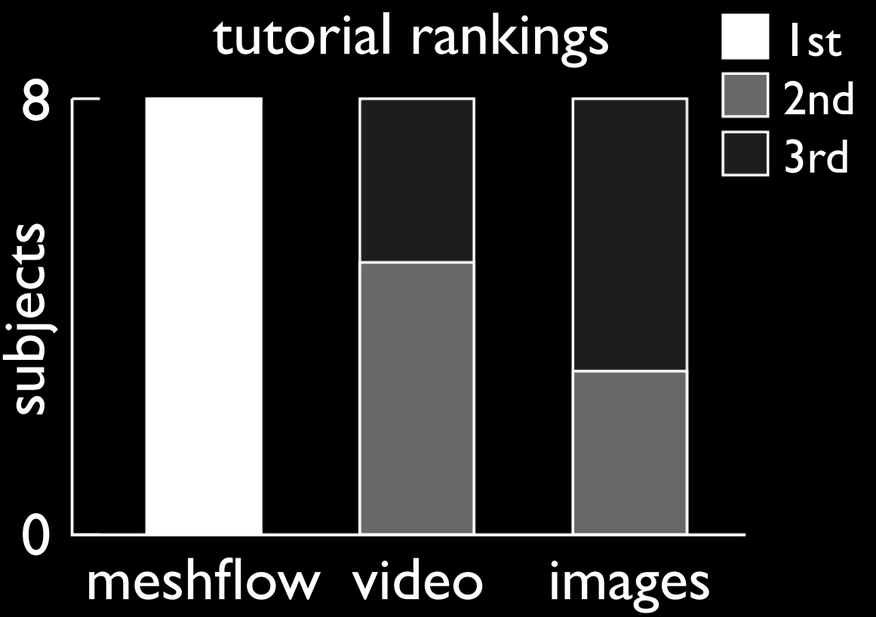
7

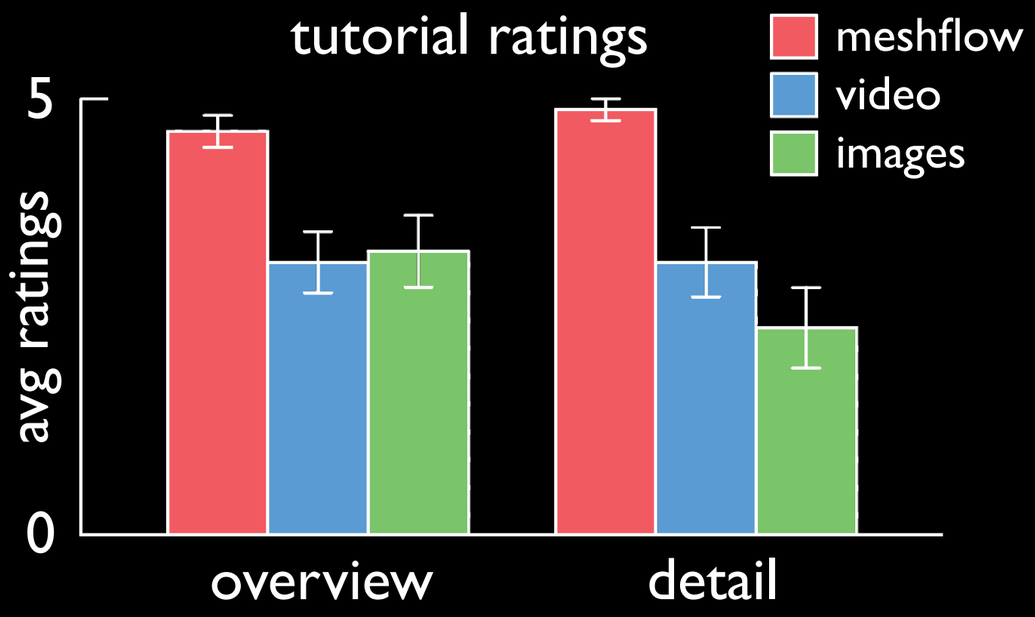




case study

8 college students
modeling class
followed tutorial


tutorial rankings
1st
2nd
3rd
8
0
subjects
meshflow
video
images


tutorial ratings
meshflow
video
images
5
0
avg ratings
overview
detail

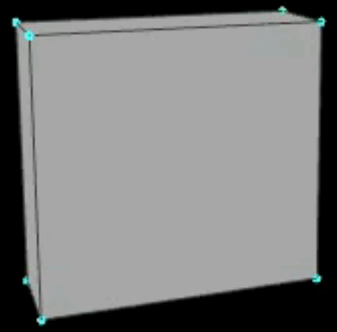
I would have loved to ~~have~~ use this interactive vis tutorial in a digital arts modeling class. Though I suppose with it, the professor would not need to do much.

future work

sequential regexs	/	out-of-order clustering
tag-based	/	geometric analysis
polygonal meshes	/	nurbs, sculpting

summary

hierarchical clustering : details on demand / overview
annotations : illustrate operations
filtering : focus



support: nsf, intel, sloan foundation

tutorials: [culum ‘09; drinic ‘04; jack ‘11; tate ‘09; williamson ‘10]

fin