

ΓΡΑΦΙΚΑ & ΕΙΚΟΝΙΚΗ ΠΡΑΓΜΑΤΙΚΟΤΗΤΑ

Διάλεξη #6

3ds MAX – Sub-Division Modeling

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Sub-division Modeling – Intro (1/4)

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- **What is Sub-division surface modeling ?**
 - ▣ Sub-division surface modeling is an extension of Polygon modeling method
 - ▣ Sub-division surface modeling is giving us the ability to create very soft shapes from a limited number of polygons
 - ▣ The method is to create a shell of polygons in order to have:
 - More polygons to describe the angles of a surface but also
 - Limited number of control points to manipulate the surface
 - ▣ Using this method we don't have to adjusting every single point of the model
 - ▣ Sub-division surfaces modeling is very useful for character modeling

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Sub-division Modeling – Intro (2/4)

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□ Basic concepts

- Hide the Ribbon – Maximize Perspective View – Create a Box
- Modify panel – Set Length=Width=Height=100cm (Cube)
- Convert to Editable Poly (Quad Menu)
- Enable the display of triangles
(Object Properties-disable “Edges Only”)
 - Triangles are the basic (atomic) unit of polygons
- Enable statistics (Press “7”)
- Configure Viewport (“+”) Statistics panel – Enable “Triangle Count”
 - Polys: 6
 - Tris: 12
 - Verts: 8

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Sub-division Modeling – Intro (3/4)

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□ Add Sub-division surface algorithm

- Add a Modifier called “TurboSmooth” (Modifier List)
- Observe that the cube is no longer a Cube – it been rounded out
- Observe at statistics that the No of Triangles and Polygons are increased to 48
- Select Editable Poly from Modifier List – Press “Show and Result” ON and observe the No of Triangles = 12 and Polygons = 6
- 4 times the 12 Triangles = 48 Triangles
- What happened is that each original Triangle split into 4 new Triangles
- Go to “Iterations” (TurboSmooth Properties – Modify Panel) and increase to “2”. We multiply the current No of Triangles by “4”, so we have $48 \times 4 = 192$ Triangles and so on ...
- The new shape approach a Sphere but it will never be an exact Sphere

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Sub-division Modeling – Intro (4/4)

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□ Ready to scalp the Object

- Go back to "Editable Poly" (Modifier List)
- Turn ON "Show and Results"
- Go to "Polygon" Sub-Object Mode from Modify Panel
- Click on top polygon of the Cube
- Observe the top polygons of the Sphere which was selected
- Using the Move and Scale Gismo try to create an "egg" from this Cube!!!
- To clear the display
 - Check ON "Isoline Display" from "TurboSmooth" properties and
 - Check ON the "Edges Only" from Object properties

NOTE: Usually No of Iteration set to 3 (Larger numbers don't effects the objects)

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Sub-division Modeling – Create_Object (1/2)

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□ Start modeling in Sub-division model

- Modeling starts from a Box Object or a Cube
- Create a Box to make a character head (Perspective View)
 - Length=Width=Height=20cm (Modify Panel)
 - Center it to world (Move Tool, x=y=z=0)
 - Set up the level of details (Length=Width=Height Segs=4)
NOTE: Pick low numbers for Segs NOT – use even numbers (We want to use Symmetry)
- Rounded out – Push the Cube to a Sphere (Use “**Spherify**” Modifier)
- Observe the new object – is like a Sphere
- Zoom In (Press “z”) to all Views

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Sub-division Modeling – Create_Object (2/2)

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- ❑ Convert the Object to “Editable Poly”
- ❑ Enter to Polygon Mode (Modify Panel)
- ❑ From Front View Select and Delete the half Object from the left side (negative “x” axis)
- ❑ Observe the Object

Notes for Observations

- ❑ Observe the Object to Front View us the half of the character head
- ❑ Observe the Object to Top View us the character’s nose is facing to bottom of the Top View (the negative “y” axis)
- ❑ That’s corresponds to the default orientation of the Perspective View
- ❑ The character’s face look toward negative “y” axis or facing the camera

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Sub-division Modeling – Symmetry (1/2)

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□ Use “Symmetry” Modifier

- To modeling only half of the Object and save time
- Leave 3ds Max to duplicate the other half to join them together and weld (perfect) the seam

- Add a “Symmetry” modifier (Modify Panel, Modifiers, “Symmetry”)
- Go to “Symmetry” modifier and press the “+” sign
 - Click at the “Mirror” (Sub-object mode of Symmetry Modifier)
 - Perspective View – Press F3 – Orbit around
 - In “Mirror” Gismo appears the mirror plane
 - We can move that plane (“x” axis) to adjust the symmetry
 - Move out to split the object in to two peaches
 - Move back to welding the seam (a mirror line of symmetry is been created as we move)
 - With the move tool selected set x=0 to go back to the default position

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Sub-division Modeling – Symmetry (2/2)

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- **Make adjustments (modelling only the half object)**
 - ▣ Go to “Editable Poly”
 - ▣ Turn ON “Show and Results”
 - ▣ Select a Polygon sub-object
 - ▣ Click to a polygon at right side of the object (Perspective View)
Notice that the corresponding left polygon also selected
 - ▣ Try to move or scale the selected polygon
We are getting a perfectly symmetric object

We got “Symmetry” in place

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Sub-division Modeling – Nurms_or_Turbo (1/3)

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□ Two main techniques to sub-division surface modeling

- Use "Editable Poly" object OR
- Add a modifier (This is the BEST one)

- Select the Object and enable the Ribbon
- We are in Modify Mode (Ribbon)
- Click on Modify Mode button at Ribbon
- We don't see "Editable Poly" – We see "Symmetry", so we have to select it

NOTE: The Ribbon select the modifier from the top of the modifier list by default

- As soon as to select "Editable Poly" from Modify Panel the "Editable Poly" button appears to the Ribbon and all the buttons are active

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Sub-division Modeling – Nurms_or_Turbo (2/3)

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- **One major mistake by accident**
 - If we (accidentally) deselect an object and then select it again and go to a sub-object (e.g. polygon) mode, 3ds MAX adds an “edit poly” modifier at the top of the stack of modifiers list
 - Delete the “edit poly” modifier from the list (Delete button -- Modify Panel)

- Make sure that “Editable Poly” is displayed at the Ribbon (Select it from the Modify Panel) and Turn ON “Show and Results”

- Select the “NURMS” button from Ribbon
 - Observe the wired picks on the model
 - Enter Vertex sub-object mode
 - Pick a vertex and move it
 - Observe that Smoothing applied before Symmetry

NOTE: We want Symmetry to be applied before Smoothing

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Sub-division Modeling – Nurms_or_Turbo (3/3)

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- **We optimally want**
 - ▣ “Editable Poly” at the bottom of the stack to shape the model
 - ▣ A “Symmetry” modifier which will duplicate and weld the seam and
 - ▣ The “TurboSmooth” modifier which will be applied across the mirrored seam

- It’s recommended to use Modifier and not NURMS
 - ▣ Go to Modifier List (exit from any sub-object mode)
 - ▣ Go to top level – Select the “Symmetry” modifier
 - ▣ Pick the “TurboSmooth” modifier to add to the list

NOTE: Make sure to select “Editable Poly” at the bottom of the stack

 - ▣ Enter Vertex sub-object mode
 - ▣ Move the “nose” vertex and observe the result – it’s smoother

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Sub-division Modeling – Rough_shape (1/2)

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□ **Start shaping the cartoon head**

- Change the color (Select the Object, Modify Panel, Name & Color)
 - Pick a light grey
- Enable “Isoline Display” (Select “TurboSmooth” modifier, Main parameters)
- Select “Editable Poly” and enable “Show & Results” (Ribbon)
- Enter “Vertex” sub-object mode
- Shape the model

□ Scale the entire object to make it taller

- Select all the vertices (right ones) – use the Scale tool
 - **Scale** at ‘z’ axis
 - You can also scale at “y” axis.
 - Scaling in “x” axis it might have an issue (choose “reference coordinate center” – third choice)

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Sub-division Modeling – Rough_shape (2/2)

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- Make some **extrusions** – use the “Extrude” button (Vertices Panel)
 - Enter polygon sub-object mode
 - Select the two (right) bottom polygons to make a neck
 - Flat them – scale tool, “z” axis
 - Extrude them (direct – without the caddy)
 - Turn off “Show & Results” (you see half the object)
 - Select the bottom and inside polygons and delete them
 - Enter vertex sub-object mode
 - Select the vertices that don’t have a x=0 to align them (if there any)
 - Enter polygon sub-object mode
 - Select the a (right) top polygon to make ears (Scale, Extrude, adjust...)
 - Select the a (right) middle polygon to make eyes (Scale, Extrude, adjust...)
 - Create the mouth
 - first add details with the cut tool – edit panel),
 - Select the two “detailed” polygons (Scale, Extrude, adjust...)

Ερωτήσεις

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