ΓΡΑΦΙΚΑ & ΕΙΚΟΝΙΚΗ ΠΡΑΓΜΑΤΙΚΟΤΗΤΑ

Διάλεξη #9

3ds MAX – Spline modeling

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Create a line – Command Panel tools

- Bazier spline (default type of curve in most 3D programs)
 - Front View Maximize (Alt + w)
 - Create panel Shapes sub-panel
 - Primitives (Line, Circle, Rectangle, ...)
 - Click and pick "Line" (editable spline)
 - At "Creation method" (Initial Type Drag Type)
 - Initial Type Corner <click two times to create two (corner) points which creates straight line segments >
 - Drag Type Bezier <click and hold the mouse to create a Bezier point>
 - Right click to exit

Move Pivot point

- The Pivot point of an object is the center of its transforms (move, rotate or scale)
 - Select the line and the pivot point appears by the two axis displayed
 - Lets move the pivot point to x axis at zero (0) to add later a "Lathe" modifier
 - To move the Pivot Point:
 - Activate the "Select and Move" tool (main toolbar)
 - At "Command Panel" select the "Hierarchy" panel
 - Click at button <Affect Pivot Only >
 - Set x=0 at the word coordinates (the pivot point moving and align the x axis)

"Lathe" modifier (Revolve the Spline))

- The Pivot point of the line is set to x=0 and now we can apply the "Lathe" modifier
 - Select the line
 - At "Command Panel" select the "Modify" panel
 - In Modifier List select to add the "Lathe" modifier
 - Set Segment=36
 - Makes transformations only at "Front View"
 - Go to Line mode Vertex mode, select a vertex and move it

Vertex types

- The Line Object or Editable Line has four (4) different types of vertices
 - Select the bell At the "Modify" panel Select Line Turn "Show & Results" OFF
 - Go in sub-Object mode "Vertex"
 - Select a vertex and convert from QuadMenu to:
 - Bezier Corner
 - Bezier
 - Corner
 - Smooth
 - Convert to Bezier Observe the green handles which help us to shape the curve
 - Convert to Bezier corner Observe that only one green handle appears

Axis constrains

When we transform a object we have to choose an axis constrain

- That takes place usually with the transform "Gismo"
- Transforming an object using "Bazier line" with the "Gismo" might creates some issues...
 - Select the "Bell" go to modify panel in vertex mode turn OFF "Show & Results" grub the "move" tool – select a vertex
 - Depending how much zoom in/out we are, lets select a Bezier handle and try to transform the line....
 - The vertex only moves up and down. Not side to side
 - The transform Gismo stay stack to the vertex that's a problematic state
 - We can turn off (disable temporally) the transform Gismo by:
 - A. Views Show Transform Gismo ON/OFF (not the better way. <u>We can't see the constrain axis</u>) Leave it ON
 - B. Customize Preferences Gismos tab <u>Uncheck ON (that's ok)</u>
 - Two more steps (tips):
 - 1. Use the shortcut (**ctrl + shift + x**) to hide the transform gismo but not the axis
 - 2. <u>Open the "Axis Constrains" toolbar (right click at any empty space on the main toolbar)</u> (Shortcuts F5-F8)
 - Chose the constrain axis (make some tests in perspective view)

- □ Select the "Bell" and go to **vertex** sub-object mode to the line
 - A segment is the connected curve between two vertices
 - A spline is a series of connected segments --- Press F3 to observe better

Extend the command Panel to appear all tools !!!

<u>Remove / Add details in a spline</u>

- To remove a vertex go to vertex sub-object mode select a vertex and press DEL
- To add a vertex user "Refine" button from "Geometry" tab (Modify Panel)
 - Click on the "Refine" button and then click on the Spline anywhere
 - A new vertex will be created due to the surrounded vertices type

Extend a spline

- First create a new spline using the "Create Line" button from "Geometry" tab (Modify Panel)
 - Click several times to create a new spline. Right click to exit....
- Enter to "Spline" sub object mode Enable the "Automatic Wedding" button use the "Create Line" button and approach the vertex we want to extend (the cursor shape will change) – click to create a point (vertex) near the spline we want to weld.
- Enter to "Vertex" sub-object mode Move the vertex on the vertex we want to join

Arc creation

- We can create a sphere and glue it to the top of the Bell but is more easier to create the Sphere with an Arc
- First, open the 3D Snaps menu (right click on the Snaps tool at Main Toolbar) Check only "Grid Lines (we want to have a point exactly on z axis)
- Select the "Arc" primitive from Create panel
 - Click and hold to create the first point while holding the mouse, enable the Snaps (press "s"), get the position and release the mouse button. Disable the Snaps (press "s"). Adjust the radius of the Arc. Right click to exit.

--- Press F3 to see the Arc creation

□ <u>Attach</u>

- We have two objects in the scene. The Lathe and the Arc.
- We need to attach the Arc to the Lathe line.
- Select the "Bell" and go to the Line level of the modifier stuck click the "Attach" button from "Geometry" and click to another shape or primitive or line or editable spline. The Arc imported in the existing line. Right click to exit.
- Weld the gab by moving one vertex on to the other.
 - Enter vertex sub-object mode and with "Automatic Welding" enable, select one vertex and drop it on to the other.

--- Go to the top level of the Modifier List (Lathe) and observe

□ <u>Fillet</u>

- The term "Fillet" refers to the corners (rounded them).
- Enter Vertex sub-object mode enable "Fillet" button from "Geometry" (downwards) – pick a vertex and drag to round it. Right click to exit.

Outline

- Lets use the "Outline" tool to create a inner surface in the Bell.
- Enter Spline sub-object mode enable "Outline" button from "Geometry" (downwards) – pick the spline and drag it to create another one at equal distance to the first. Release the mouse and right click to exit.
- Delete some segments by enter Segments sub-object mode selects the desirables and press delete.
- Delete a vertex by enter Vertex sub-object mode selects the desirable one and press delete.
- Finally select the Lathe Object and enable the "Weld Core" to correct the weld point

Interpolation

- Level of detail vertically Select Lathe from modifier list set Segments: 36 or higher.
- Level of detail horizontally Enter Vertex sub-object mode Set Steps: 4 or higher.
 - Optimize ON/OFF (recommended ON) Optimize with Bazier "Corner" vertices
 - Adaptive ON/OFF (recommended OFF)

--- Press "7" to see the statistics

Ερωτήσεις

