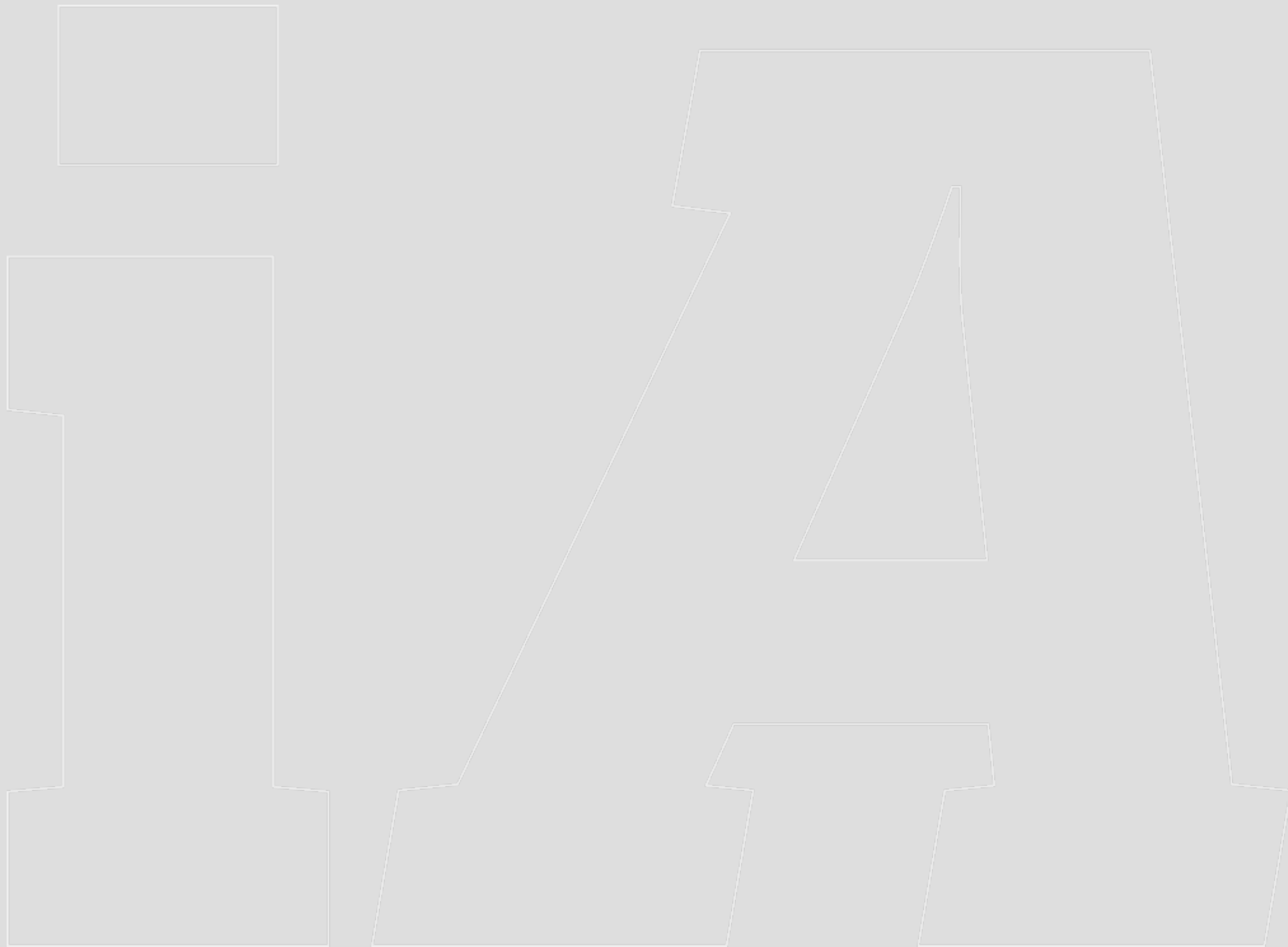




Visualize ComplexCity
3D Animation Software

21.02.14

treuer@arch.ethz.ch

- 3D Animation Software in your Architecture Workflow
 - 3D Animation Pipelines
 - Architectural Visualization Workflows in the Past Decade
 - NURBS vs Meshes
 - Overview on 3D Animation Software Packages
- Blender: the open source project
- Coding (in) Blender

3D Animation for Architects

What you can learn from it

Storyboard /
Concept Art

Modeling

Animation /
Rigging

Rendering

Post



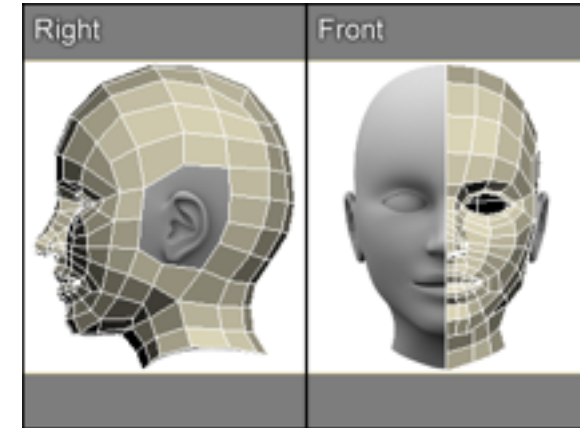
wikipedia.org



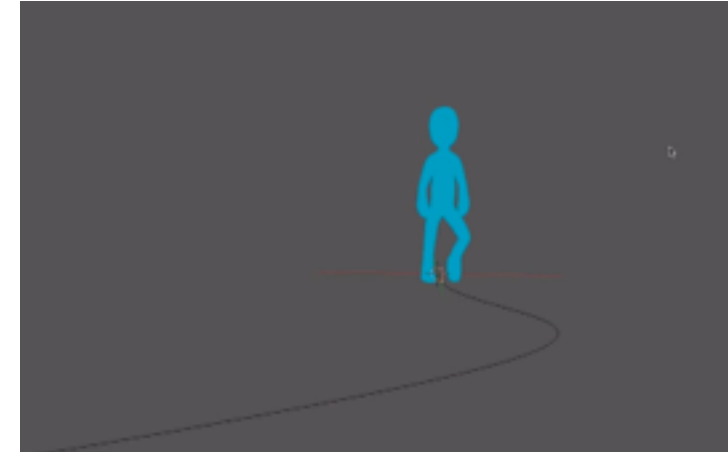
mango.blender.org



crushdigital.co.uk/



secondpicture.com



youtube.com



followed by many others



Sculpting



cghub.com/

3D Animation Pipeline
Example

Storyboard /
Concept Art

Modeling

Animation /
Rigging

Rendering

Post



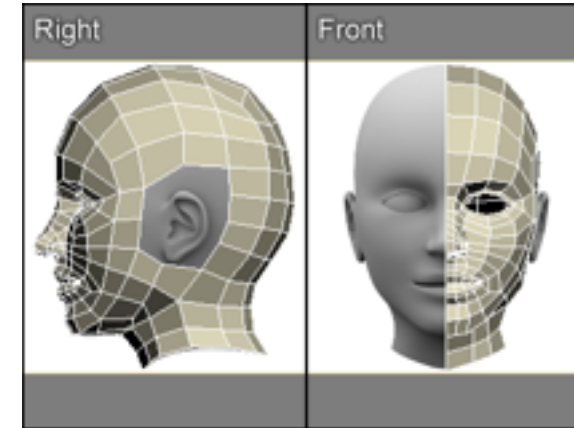
wikipedia.org



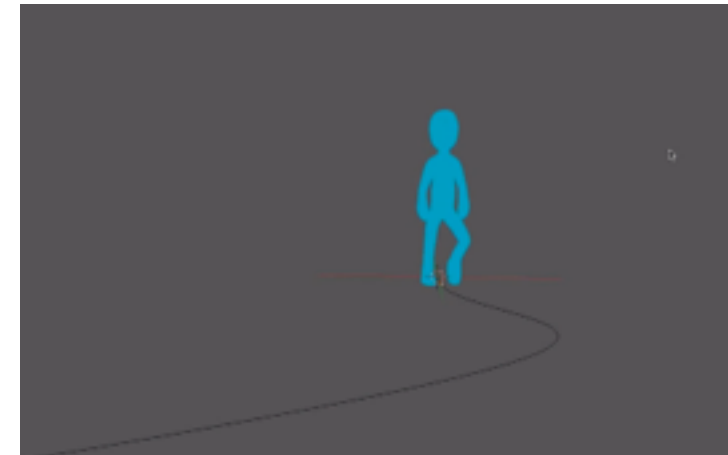
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youtube.com



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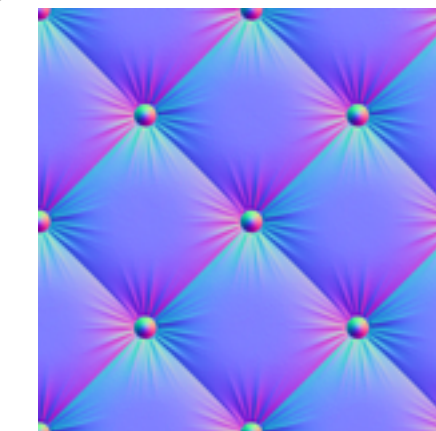
Sculpting



Concept Art by Vinicius Menezes

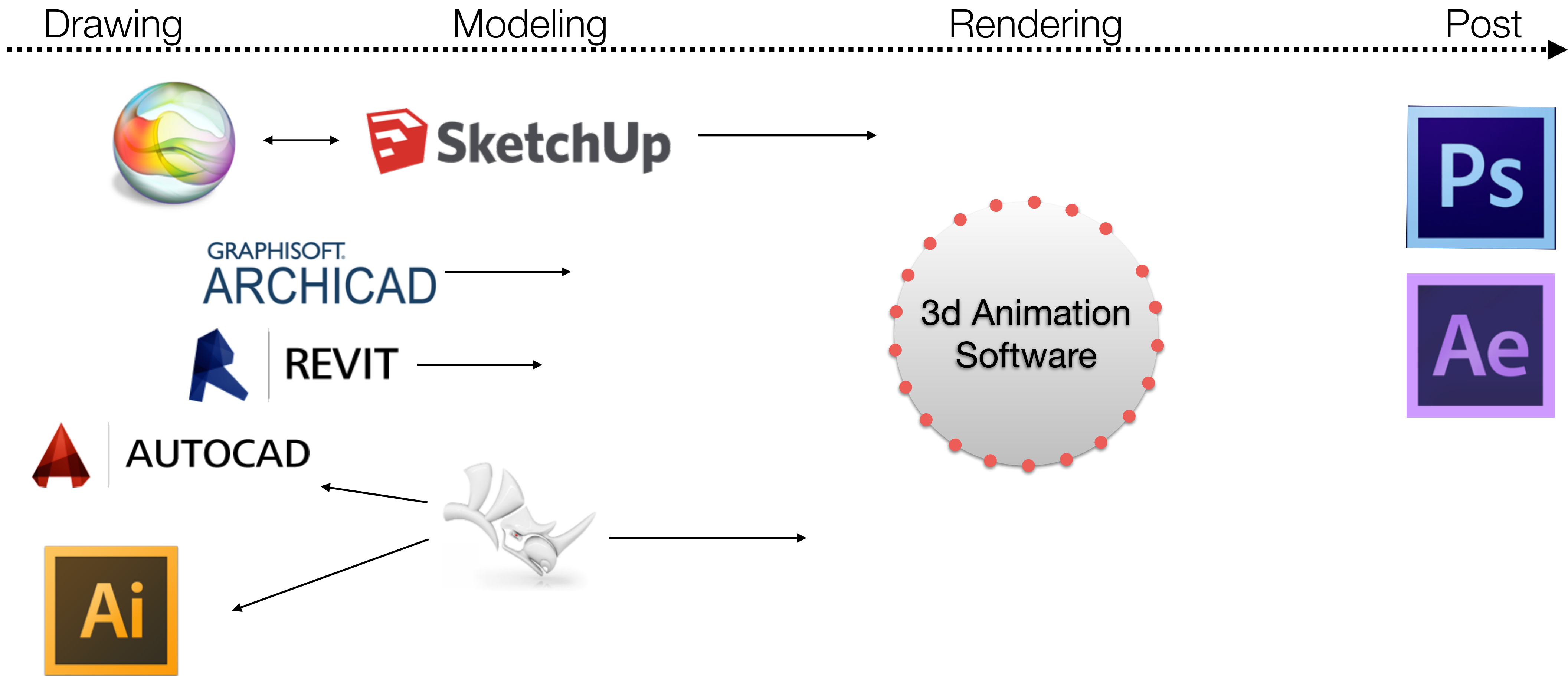
youtube.com

Baking Geometry to
Normalmaps: reducing
the number of polygons



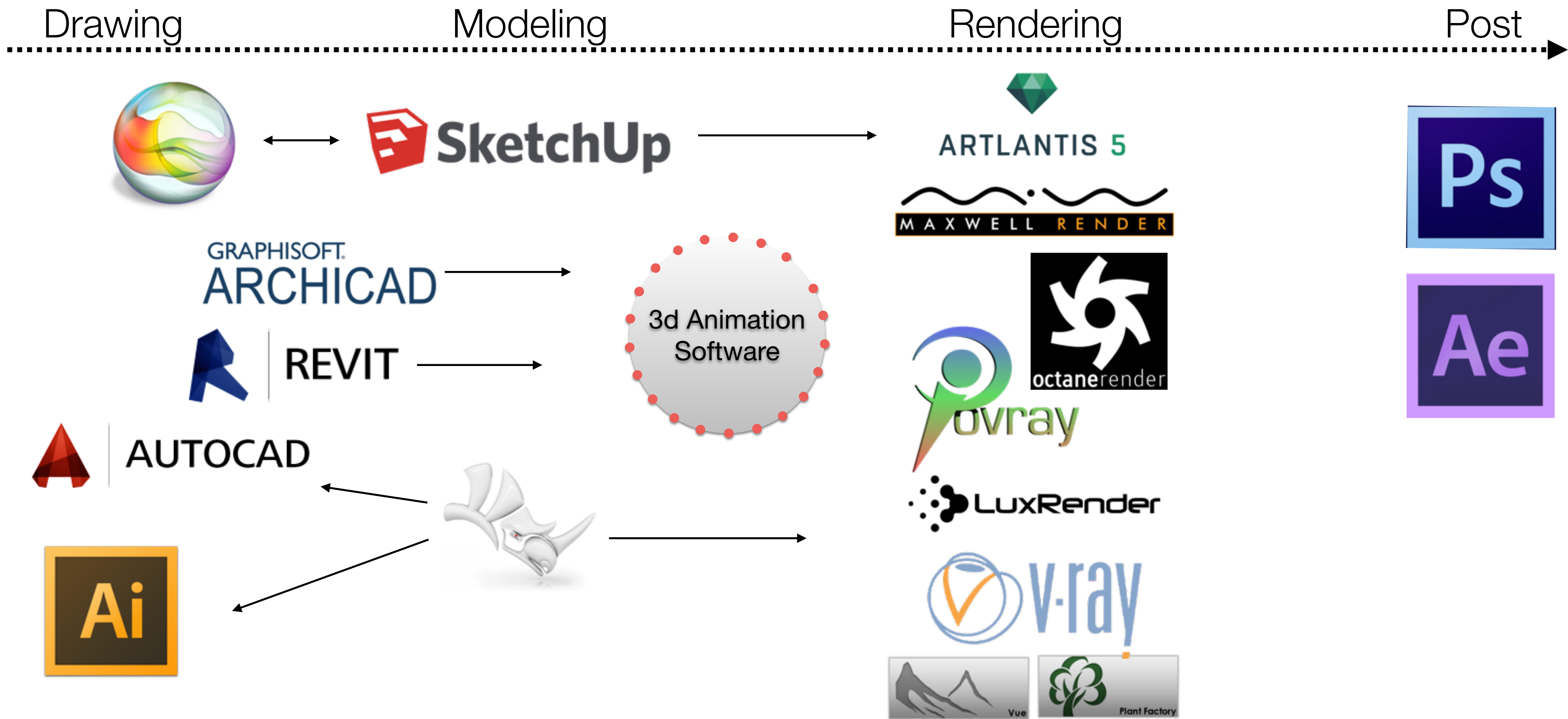
[Normal Map](#)

3D Animation Pipeline
Example



3D Animation Software in Architectural Workflows

Development in the past decade



3D Animation Software in Architectural Workflows

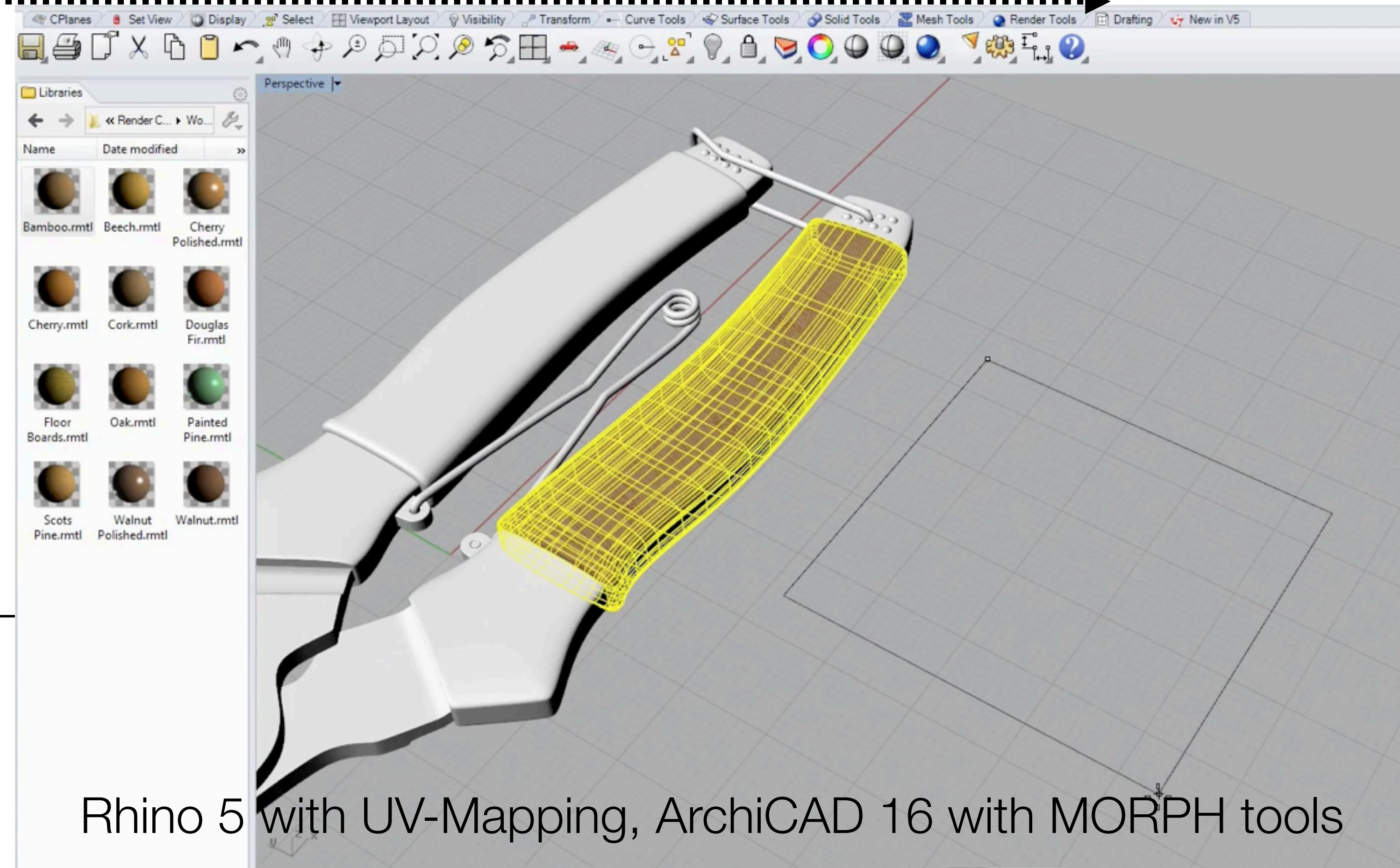
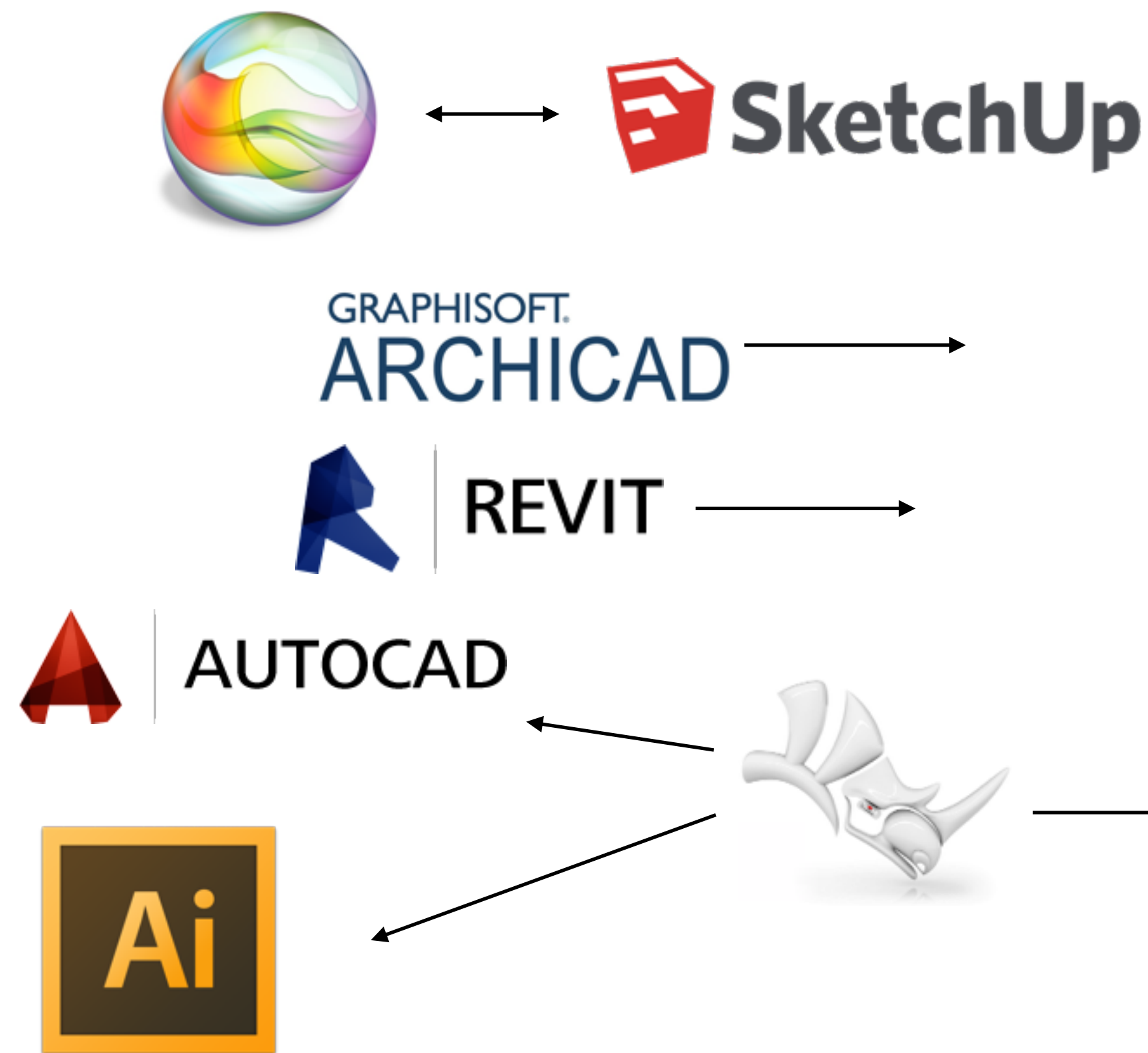
Development in the past decade

Drawing

Modeling

Rendering

Post



3D Animation Software in Architectural Workflows

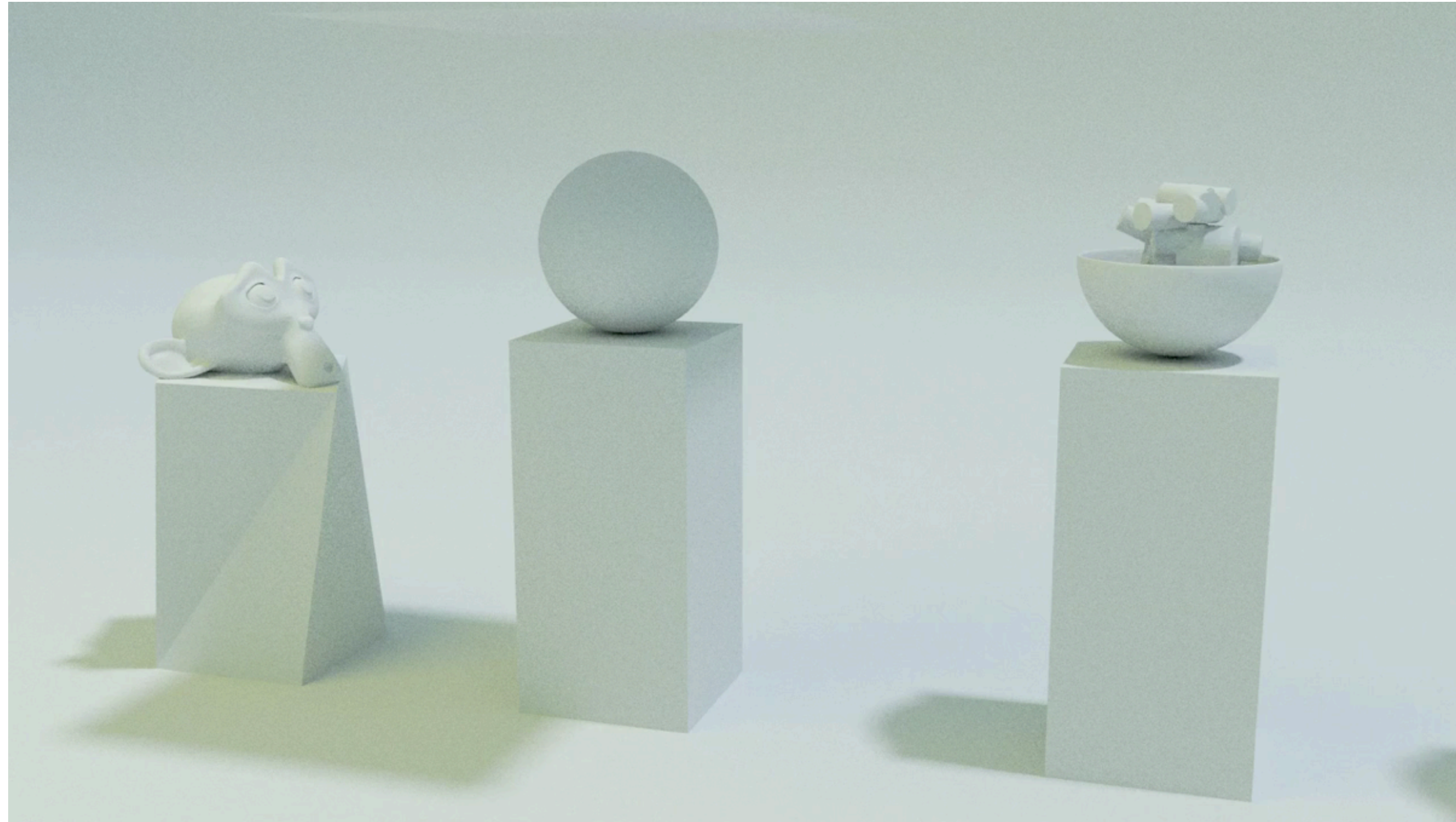
Development in the past decade

Drawing

Modeling

Rendering

Post



3D Animation Software in Architectural Workflows

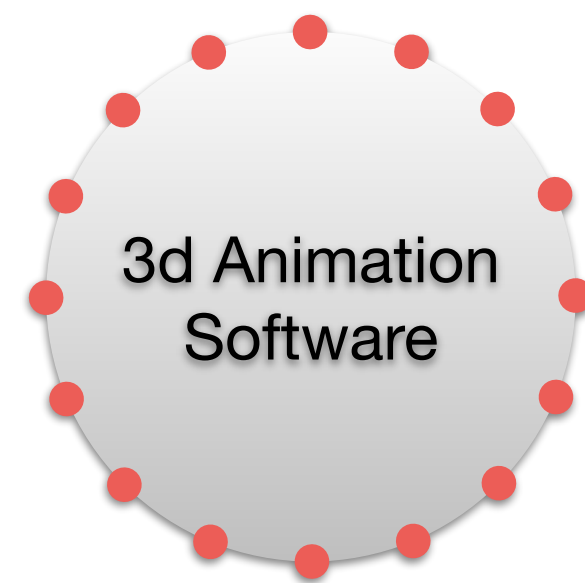
Reasons why architects still use it

Drawing

Modeling

Rendering

Post



for freeform modeling



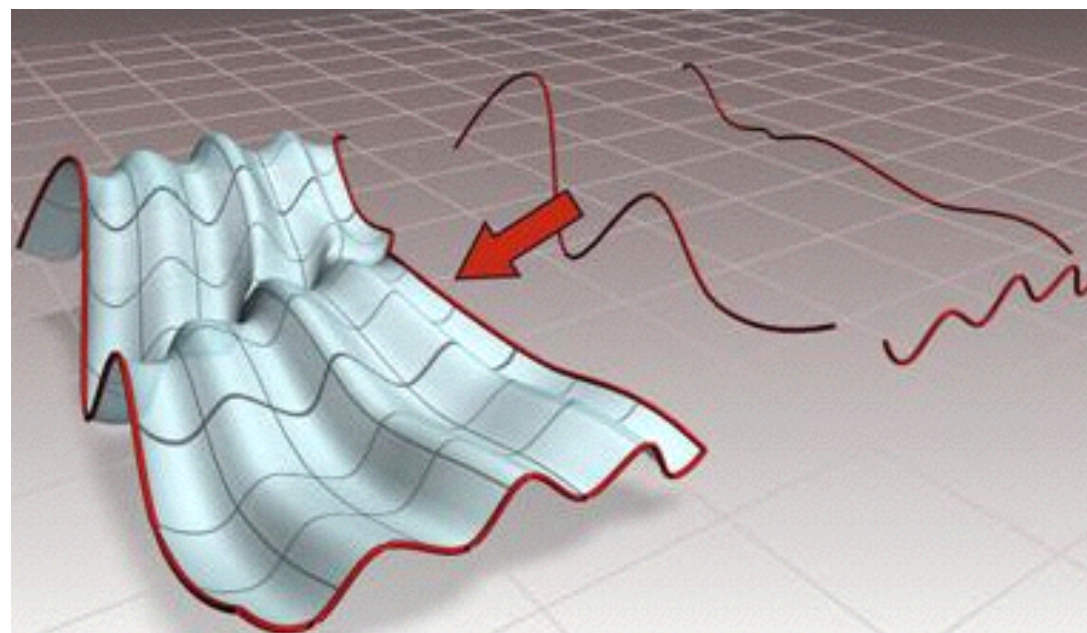
—> Nurbs vs. Mesh Modelling

3D Animation Software in Architectural Workflows

Reasons why architects still use it

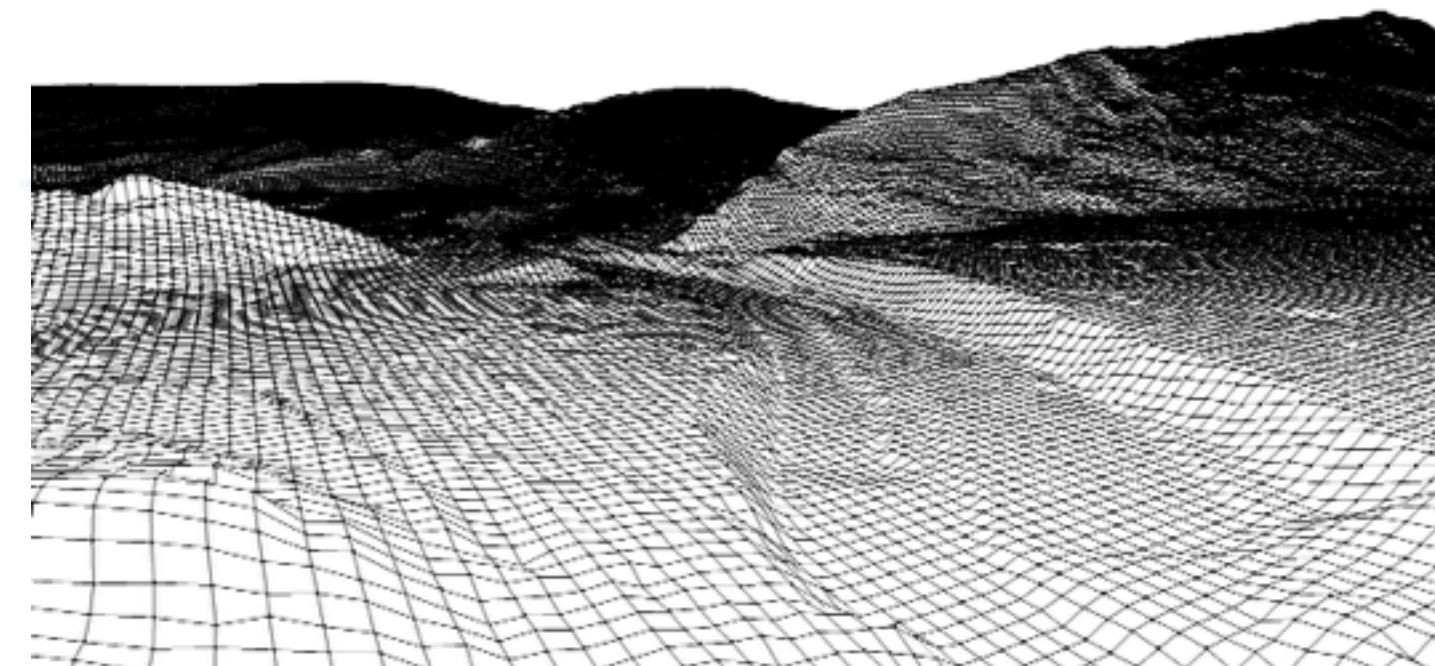
NURBS

- overarching category for Bezier, B-Splines in one or two dimensions
- a surfaces defined by control points
 - a section results in a curve
 - math. equation to generate meshes
 - flexible resolution: low res on screen, high res in 3D print



Meshes (also Polygon / Polymeshes)

- Points (called Vertex, Vertices)
- Edges (straight, no curves at all)
- Faces made up by edges
- smooth surfaces with Subdivided Surfaces (CatmullClark 1978)



Nurbs & Mesh

Two different approaches to 3D modeling

- Don't mix it up with smooth shading !!
- Smooth Shading happens on the screen
- NURBS / Subdivision Surfaces: Dynamic generation of high-res meshes

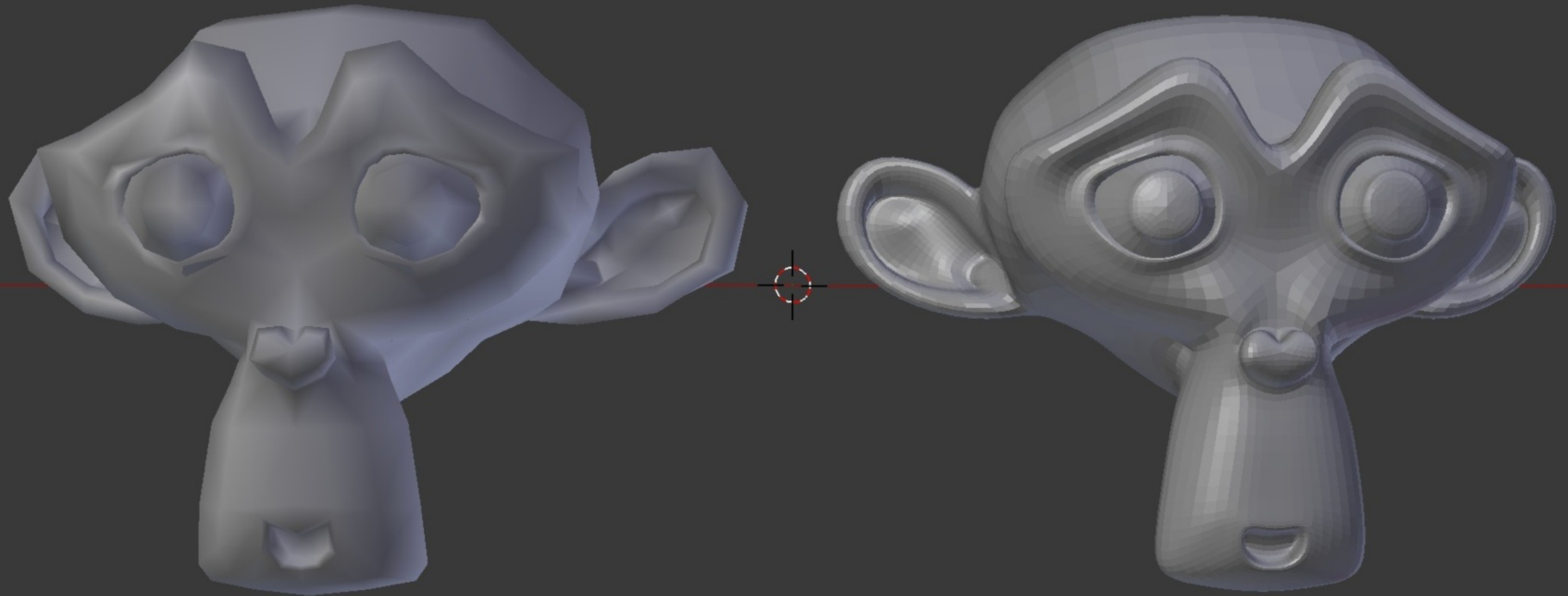
Smooth Surfaces

NURBS vs. Subdivision



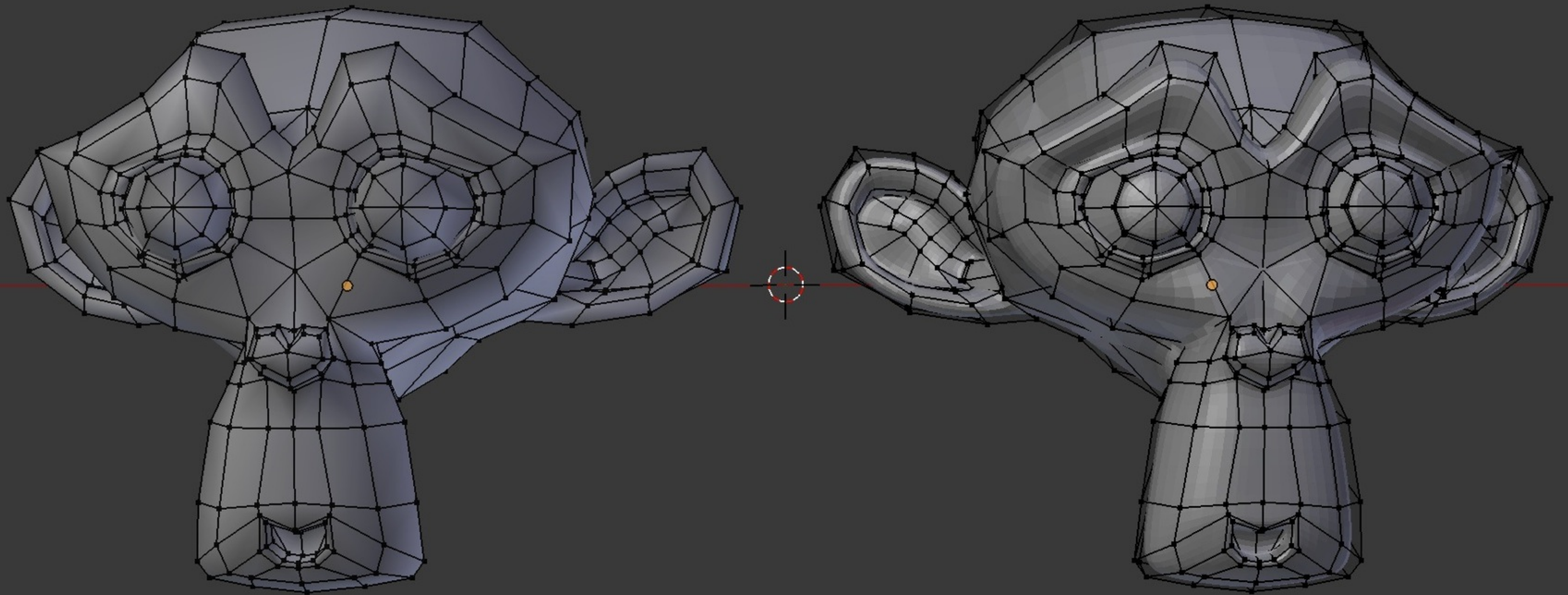
Smooth Shading

<http://www.youtube.com/watch?v=PMgjVJoglbc>



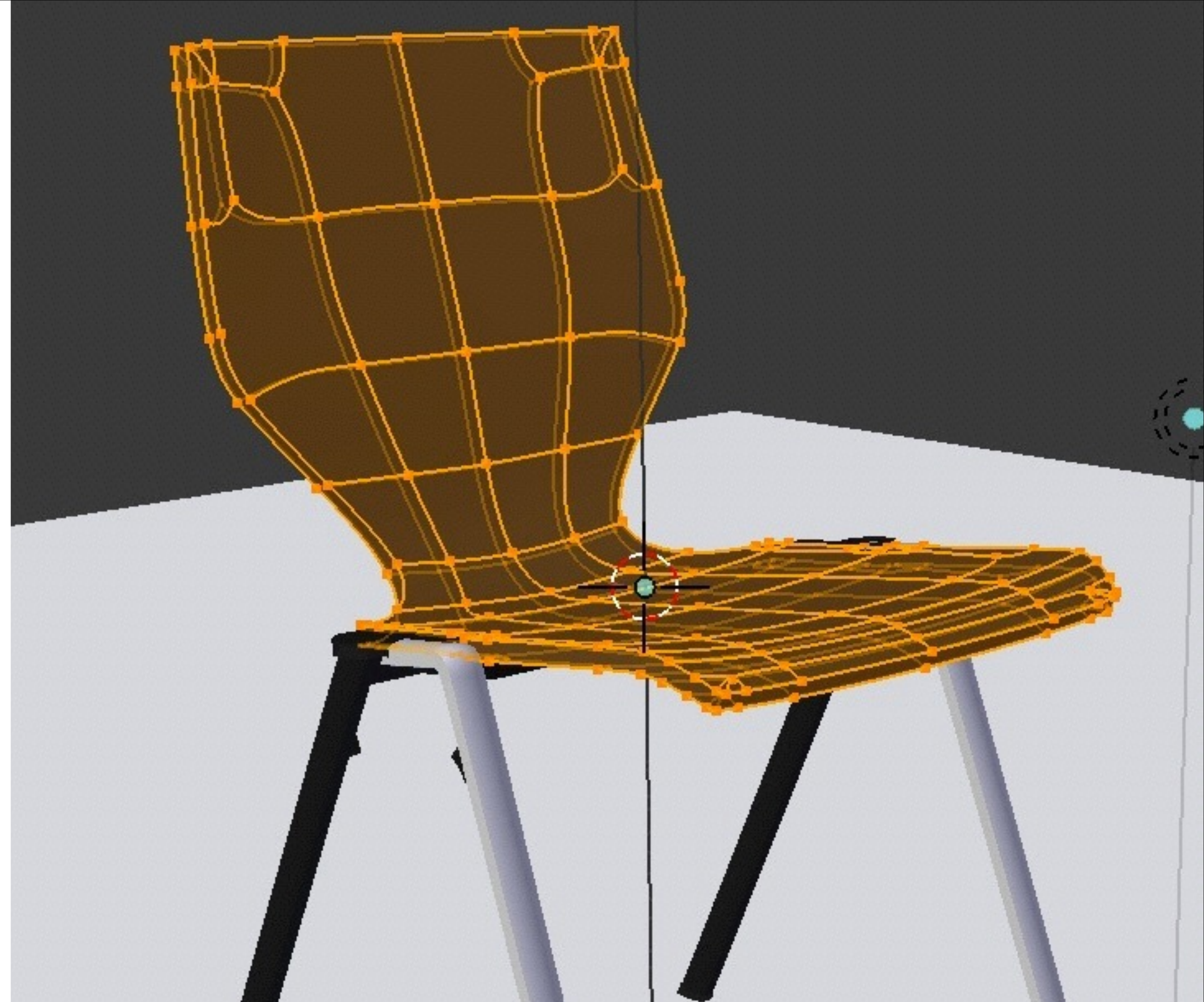
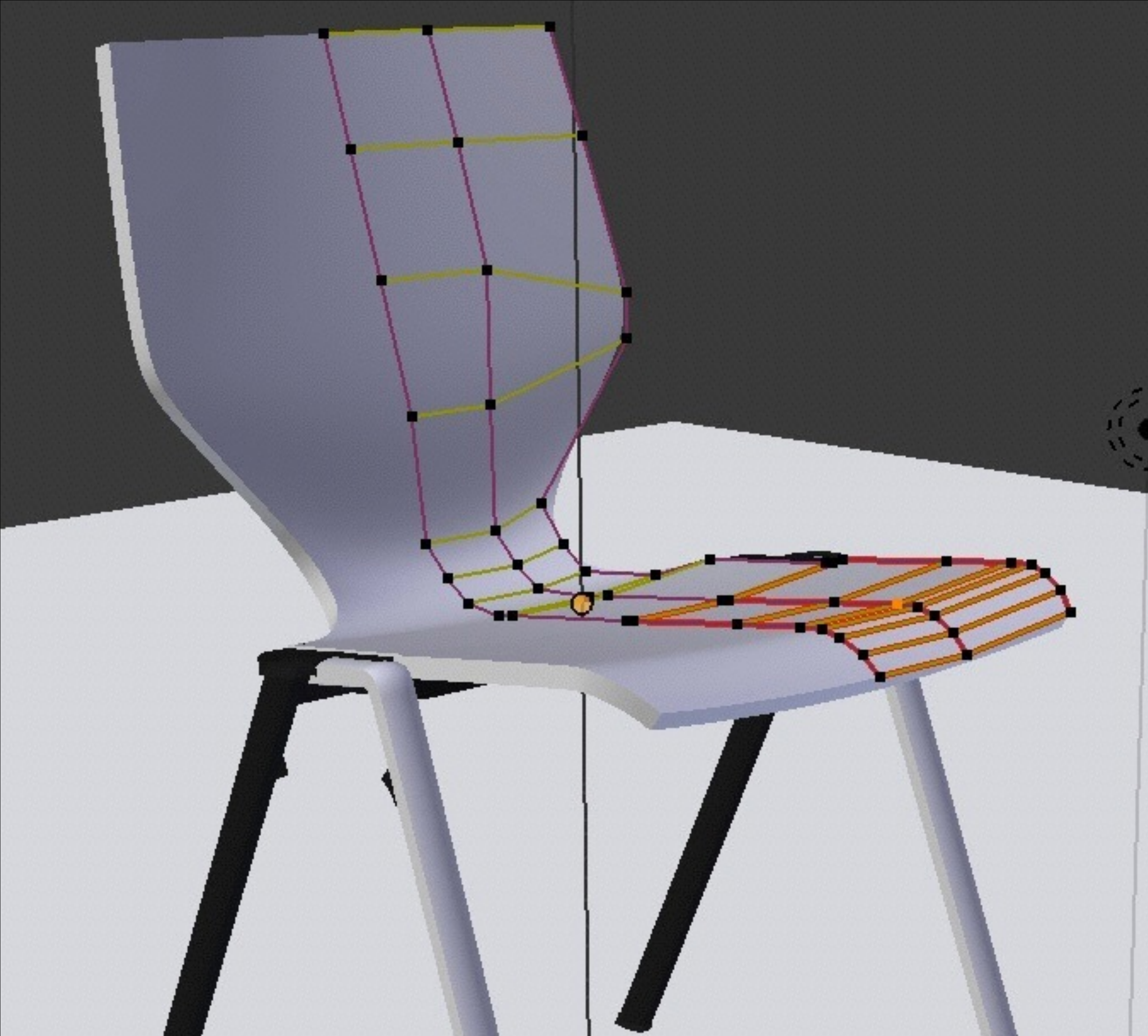
Mesh Modeling: Smooth Shading vs. Surface Subdivision

Example using Blender's „Suzanne“



Mesh Modeling: Smooth Shading vs. Surface Subdivision

Example using Blender's „Suzanne“



Nurbs vs Mesh Modeling
Example: - chair

Softimage
Softimage XSI



2000

NewTek
Vista 3D



1990

Crash Pad



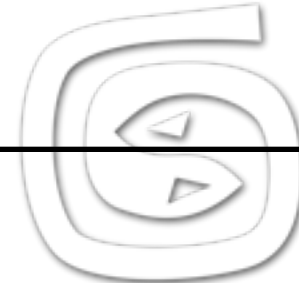
1993

Open Source
Blender3D



2002

Autodesk
3DS MAX



1990

Alias
Maya



2008

Luxology
modo



2004

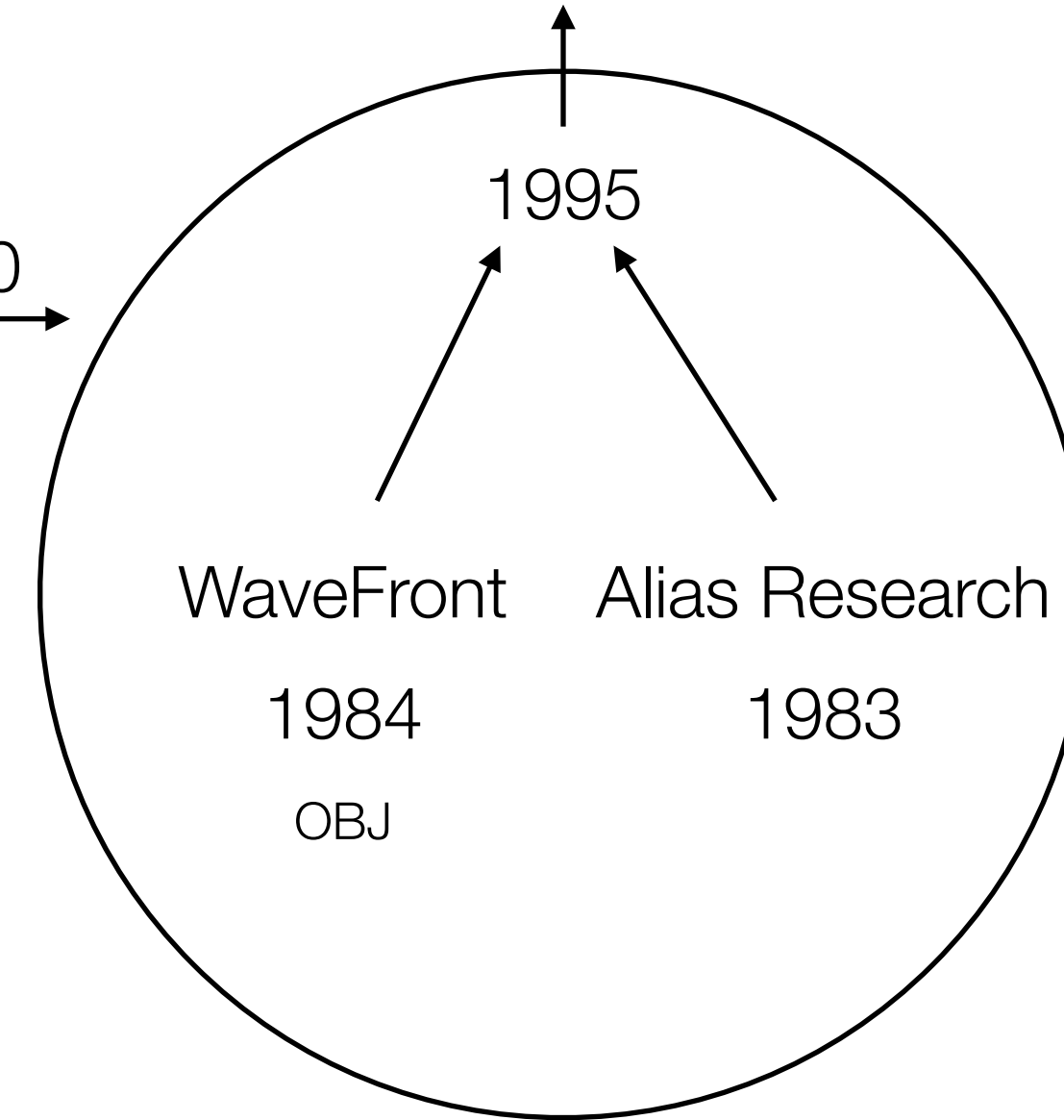
Side Effects
Houdini



1996

Silicon Graphics
1982 - 2009

\$Mio500



3D Animation Software

Comparison of Selected Packages - wikipedia.org

Autodesk
SoftImage 3D



NewTek
LightWave3D



Cinema4D



Blender3D



Autodesk
3DS MAX



Autodesk
Maya



Luxology
modo



Side Effects
Houdini



student price: free

\$195

free

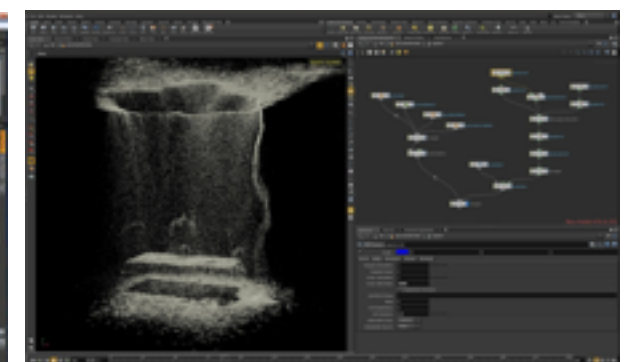
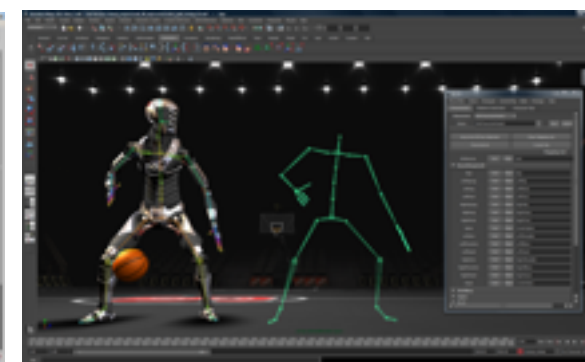
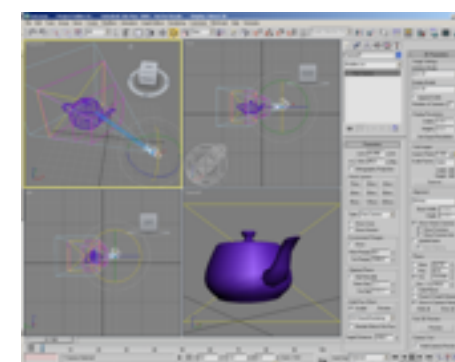
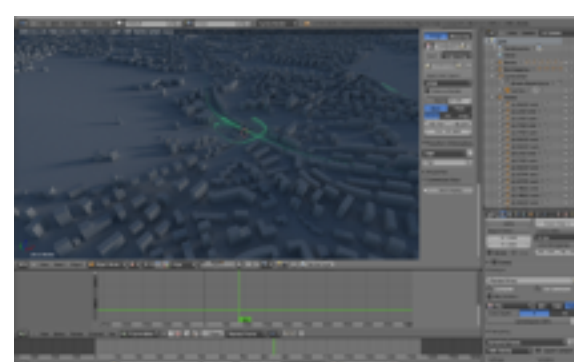
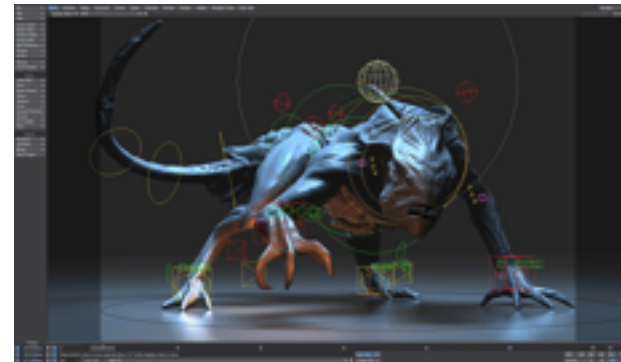
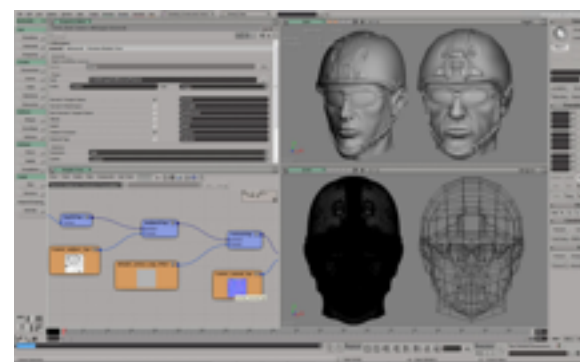
free

free

free

€180

Personal Learning
Edition



Python, C#,
C++

Python, C

Python,
C.O.F.F.E.E, C++

Python, C

Python,
MaxScript, C++

Python, C++,
C#

Python, Perl,
Lua, C++

Python, VEX

3D Animation Software

Comparison of Selected Packages - wikipedia.org