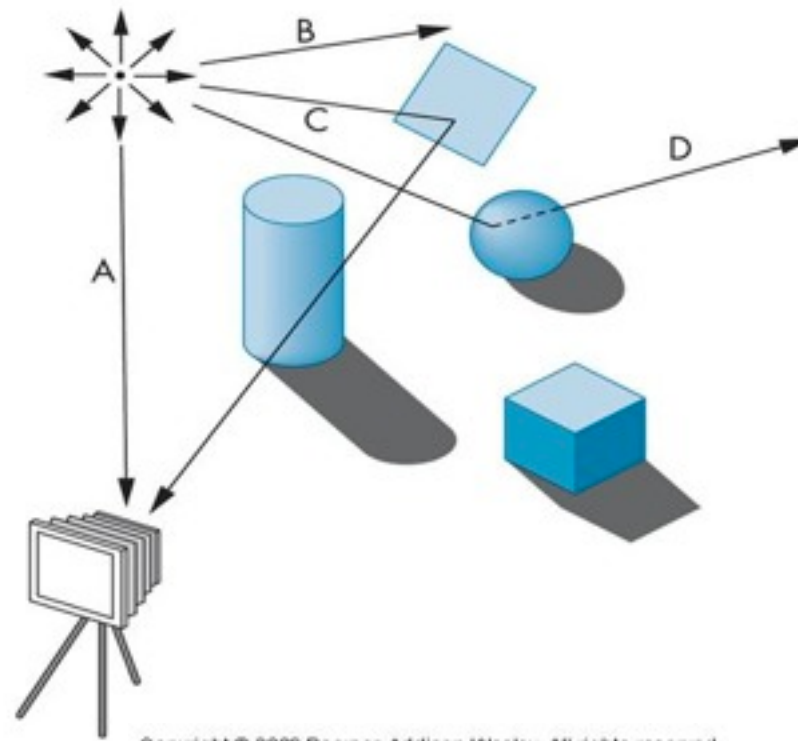


Modeling

Prof. Vladlen Koltun
Computer Science Department
Stanford University

The synthetic camera model



- Two components of viewing
 - Set of geometric objects that form the content of the scene
 - Viewer through which the scene is imaged

How do we represent the world?



image from Wojciech Matusik

Meshes



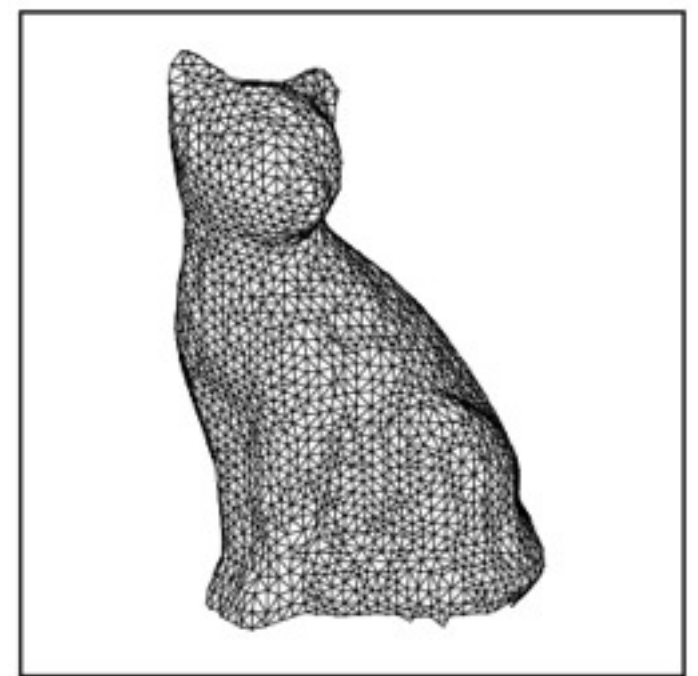
15,000 triangles



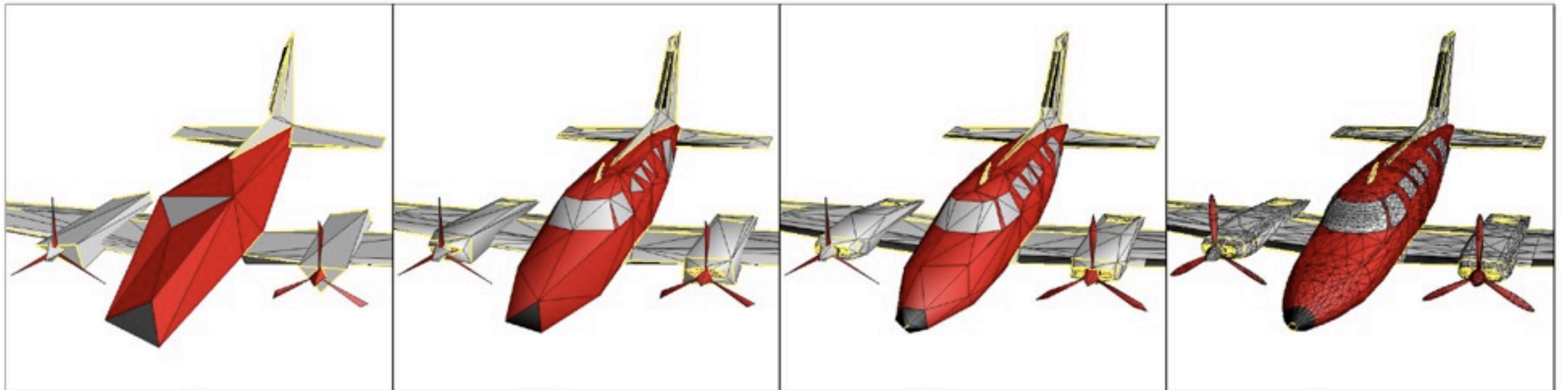
15,000 triangles



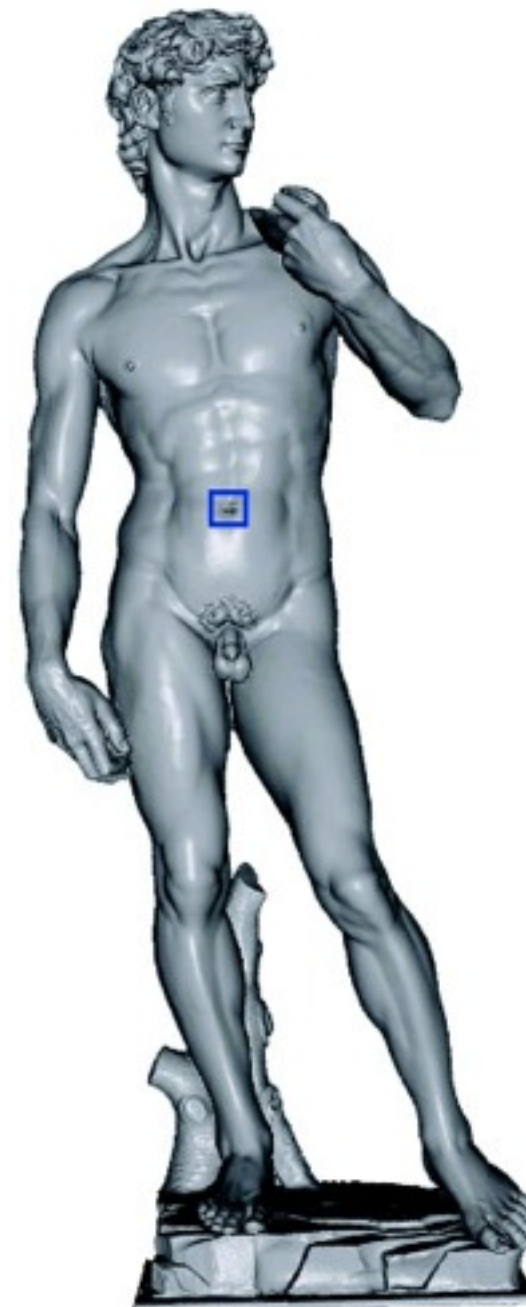
1 million triangles



images from Hoppe et al., SIGGRAPH 1993 and 1994, TOG 2004



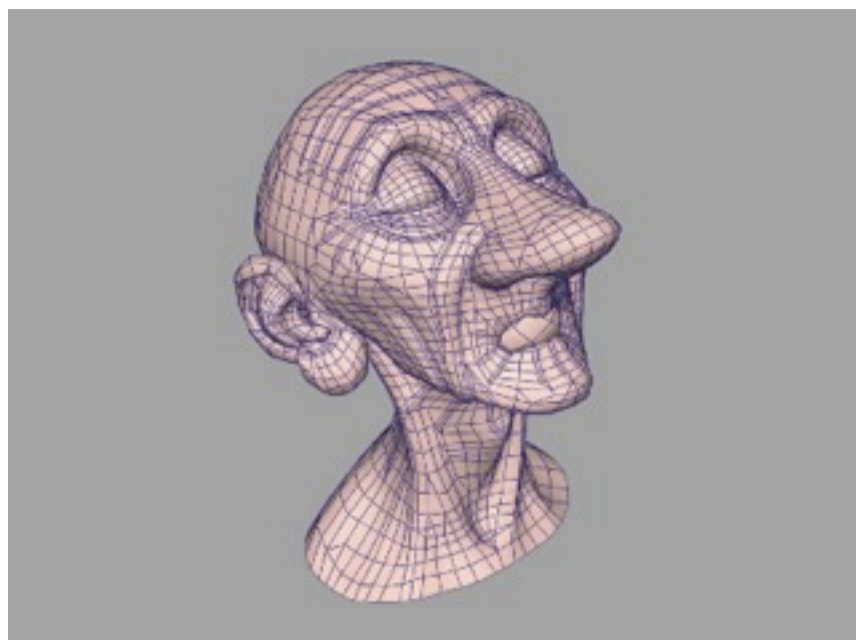
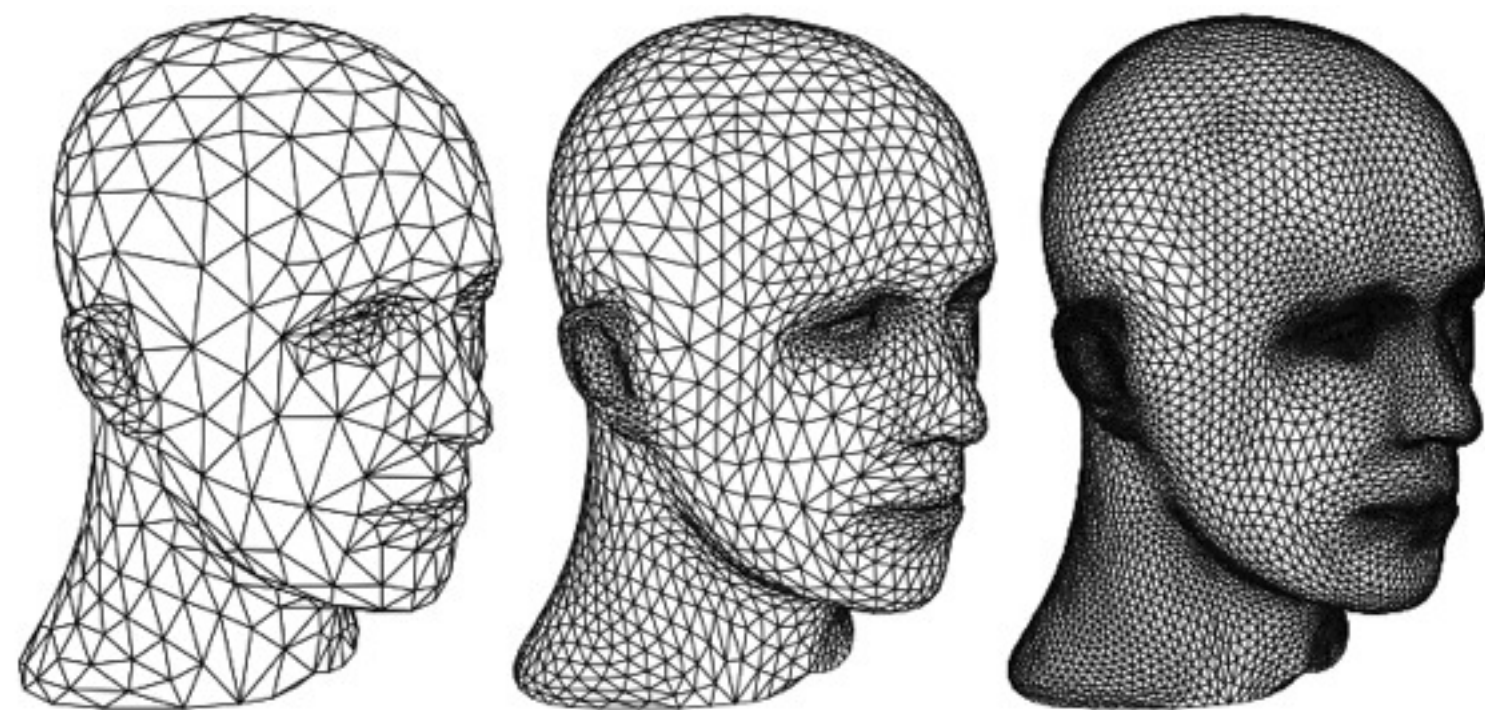
Points



images from Zwicker et al. and Pauly and Gross,
SIGGRAPH 2001



Subdivision surfaces

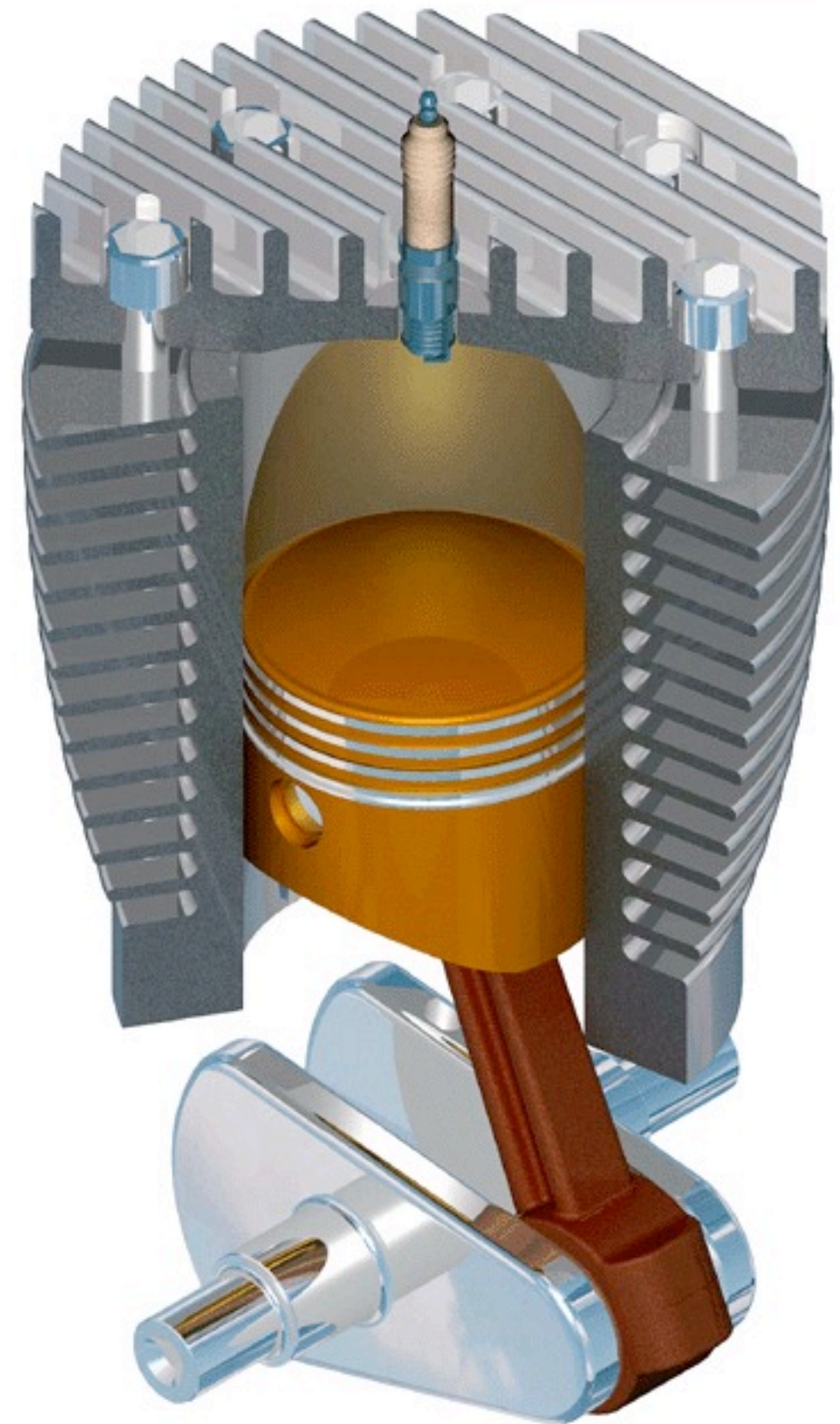
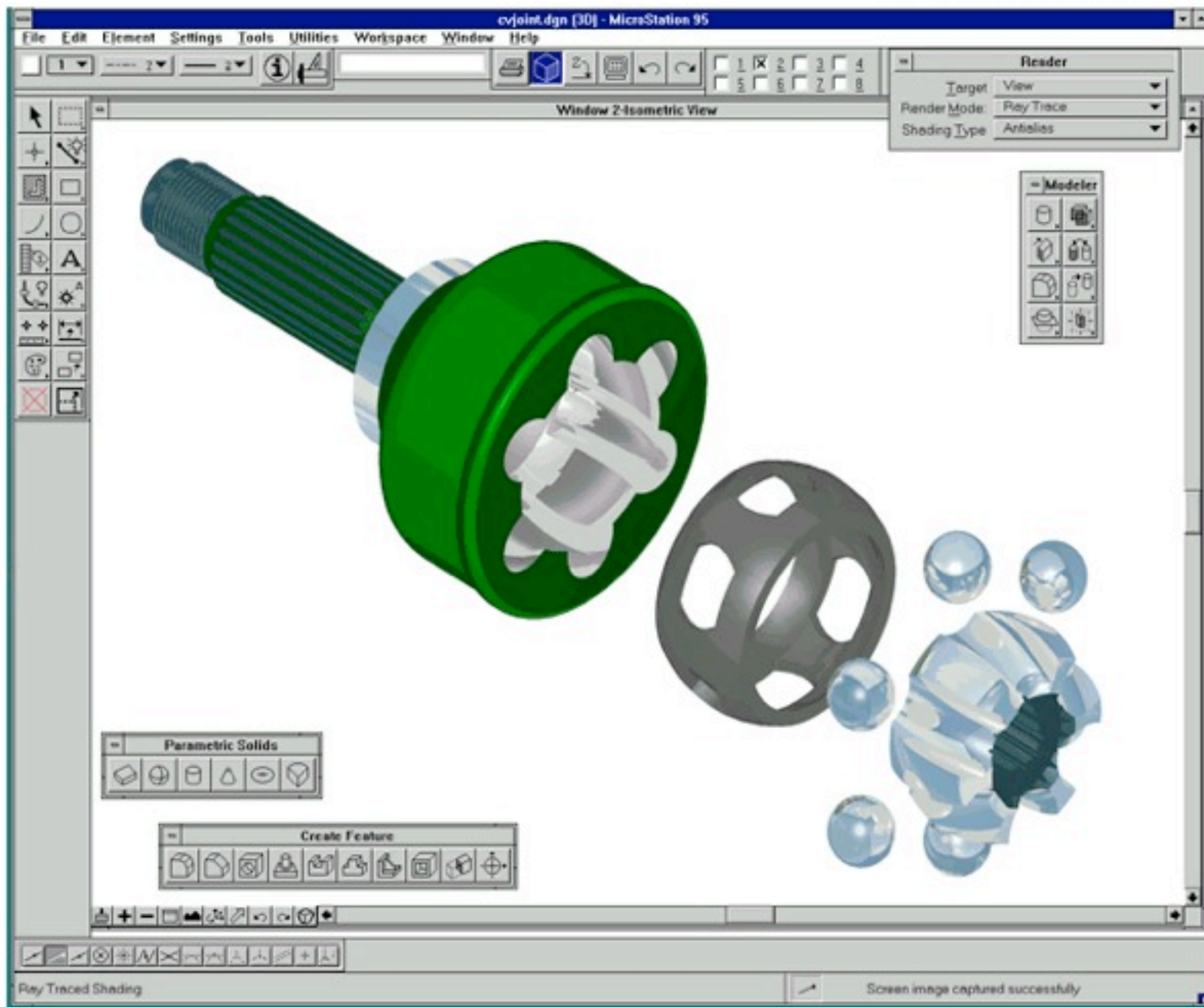


images from Subdivision for Modeling and Animation,
SIGGRAPH 2000 course

Solid geometry

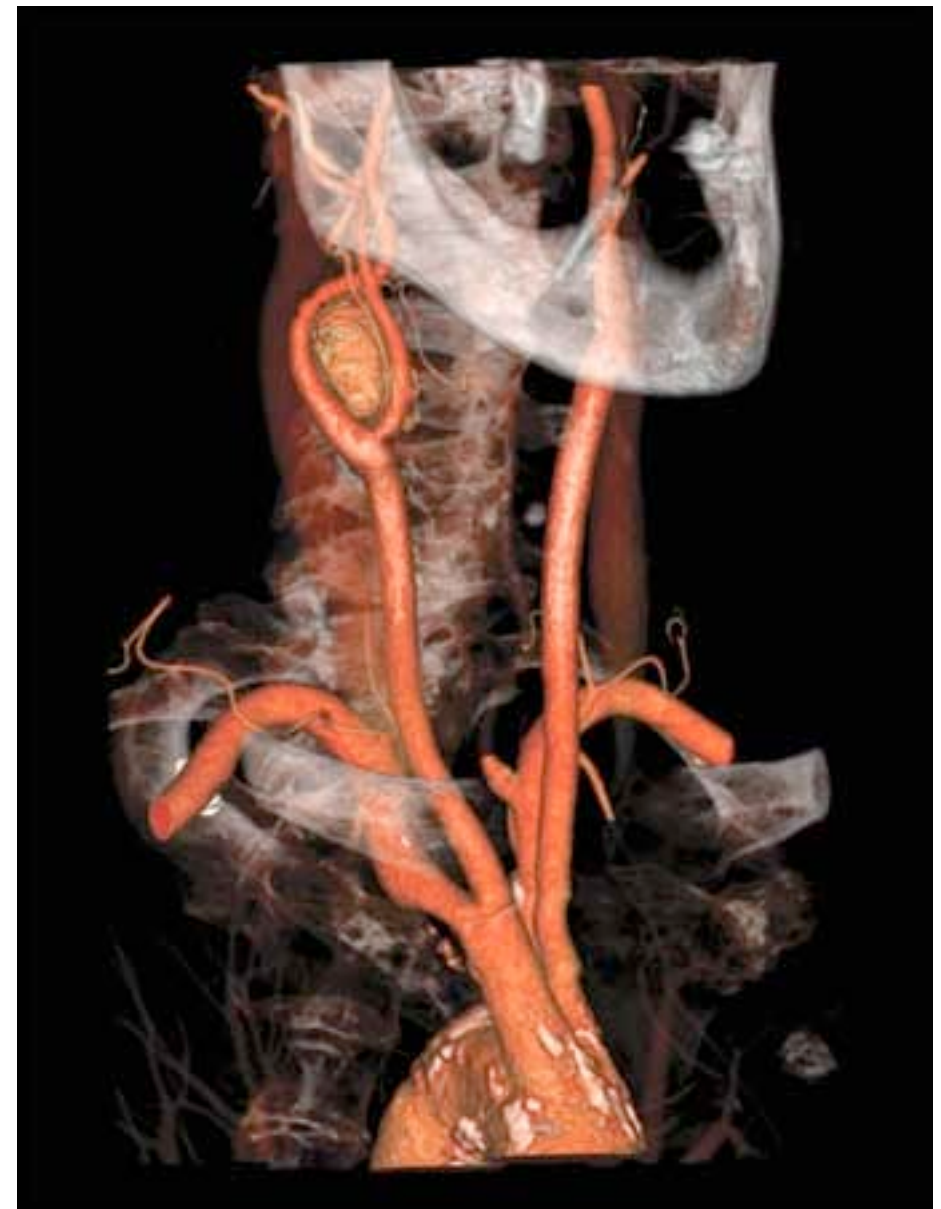
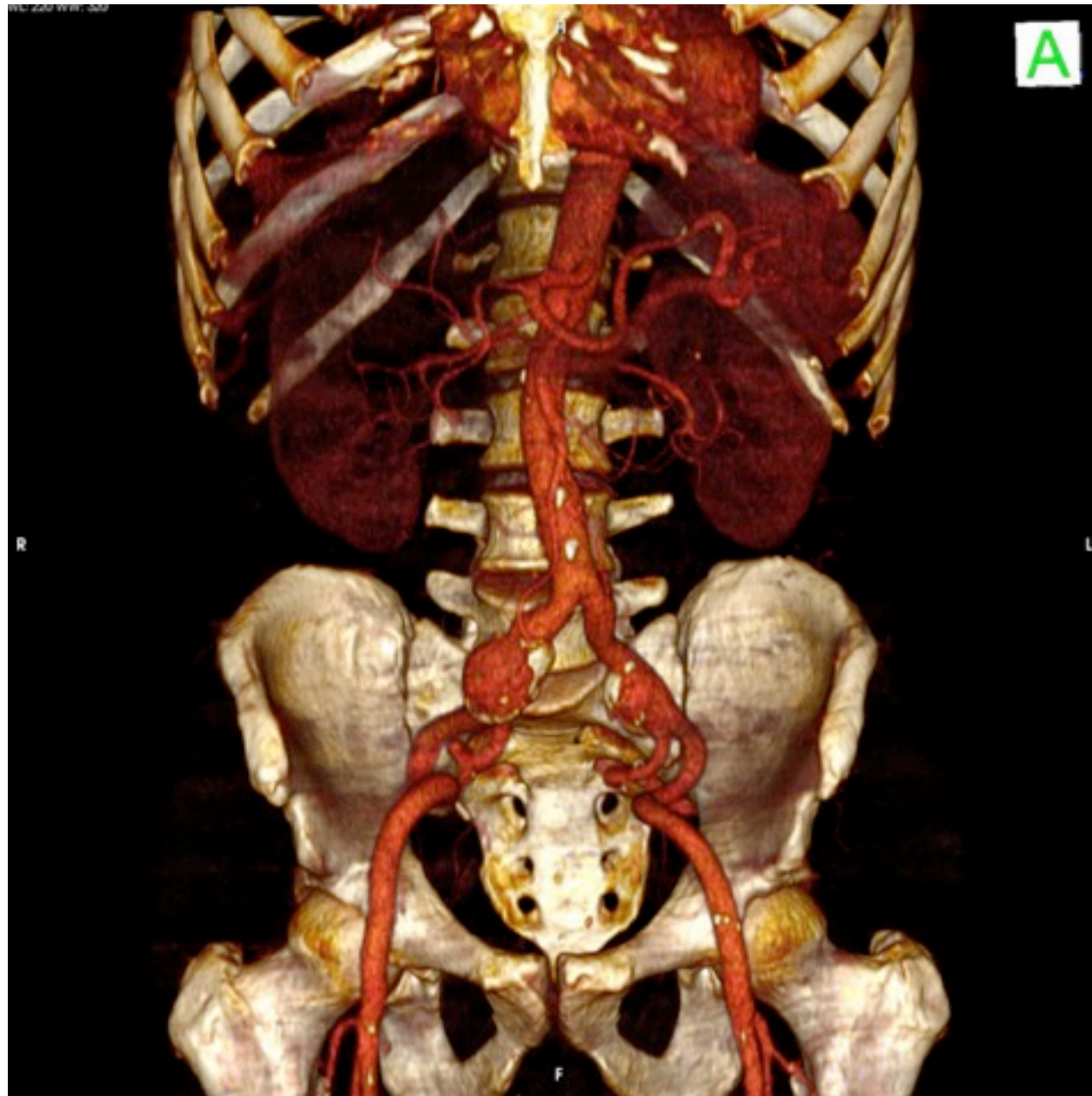
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images from Computer Desktop Encyclopedia

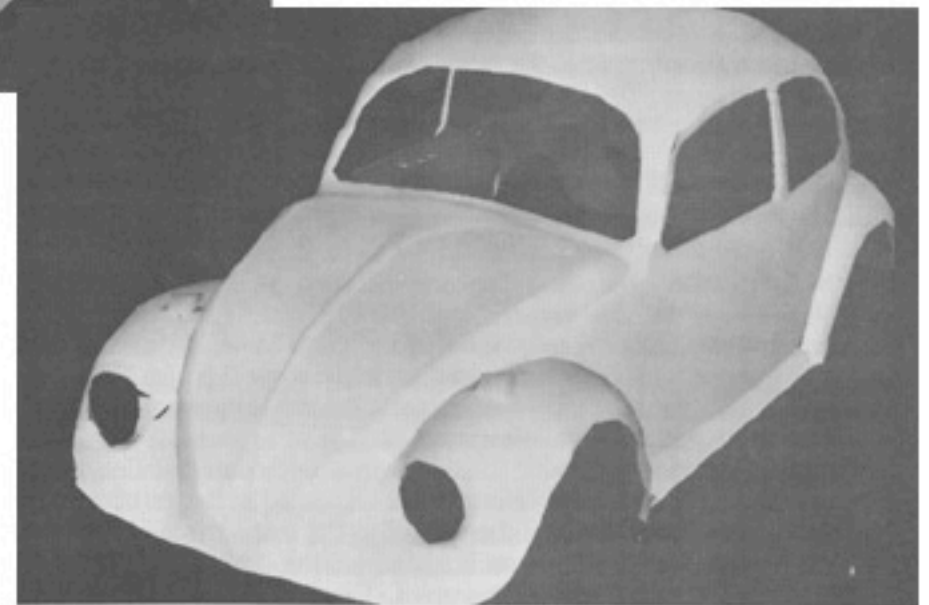
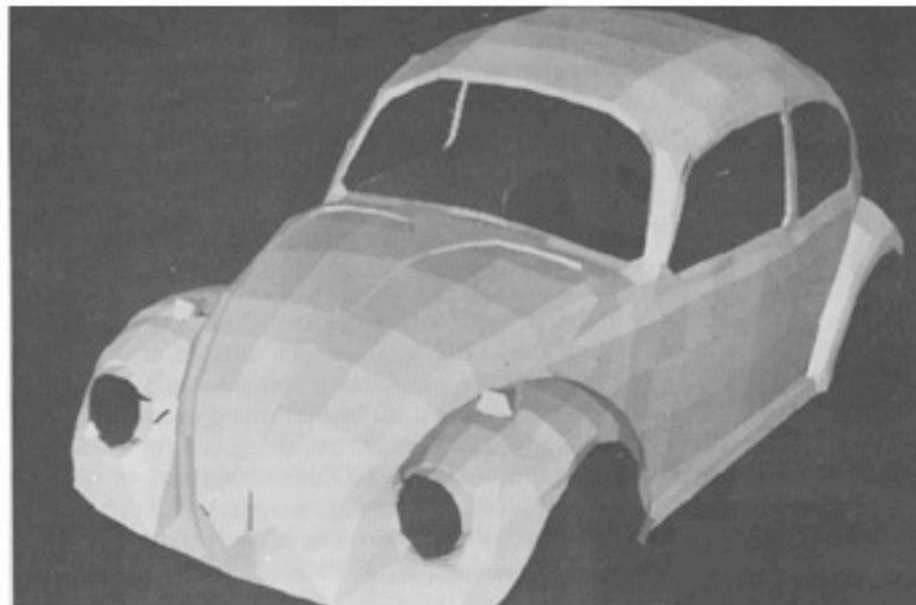
Volume data



images from OsiriX Imaging Software and Imaging Economics

Advantages and disadvantages of polygons

How do we create 3D content?



3D scanning

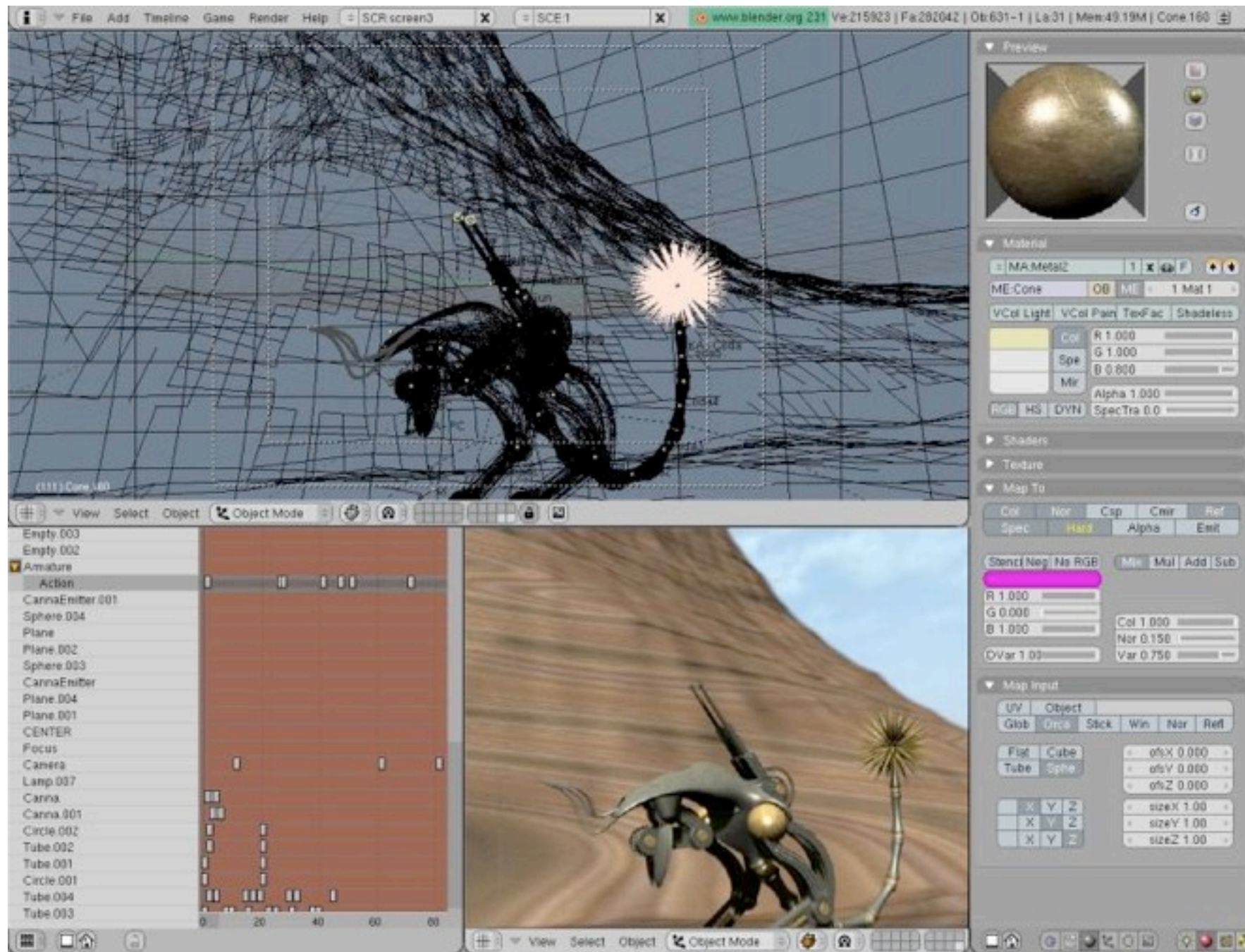


Cyberware Model Shop 3D Scanner



3D video capture with Kinect
<http://www.youtube.com/watch?v=7QrnwoOI-8A>

Geometric modeling

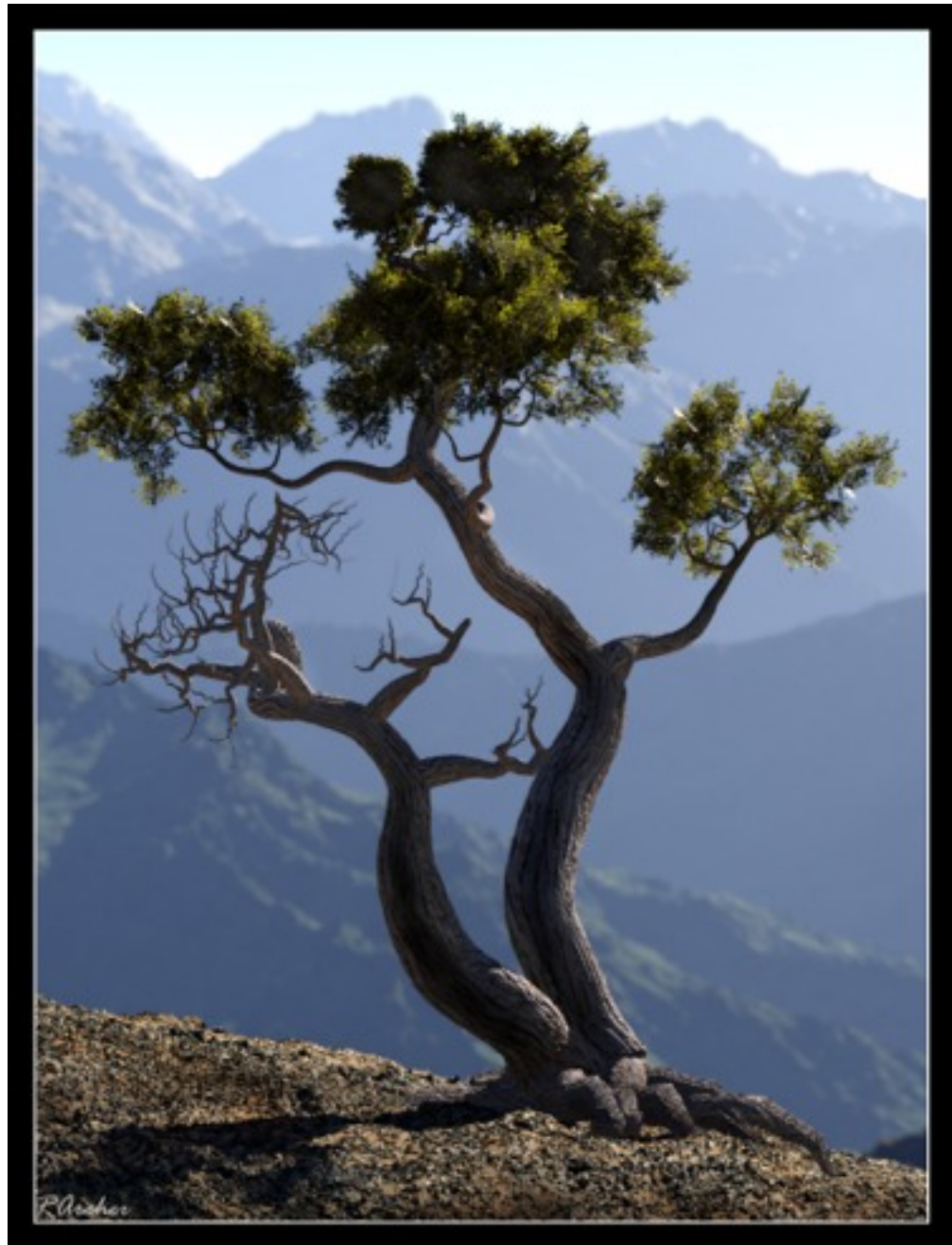


Free: Blender, Wings 3D, SketchUp

Commercial: 3DS Max, Maya

image from <http://www.freesmug.org/review/blender>

Procedural modeling



images from the Terragen 2 gallery

Basic data structure

- List of vertices (position, normal direction, material and texture information)
- List of faces (pointers to vertices)

Questions on modeling?