Computer Graphics

https://www.cise.ufl.edu/research/SurfLab/gfxNotes/cap5705idx

This syllabus page will evolve!

https://www.cise.ufl.edu/research/SurfLab/gfxNotes/cap5705/CGsyllabus.html

Structure:
- ➢ Curves (1 variable)
- ➢ Polyhedra (2 variables, linear)
- ➢ Surfaces (2 variables, curved)

Cool tools (not covered)

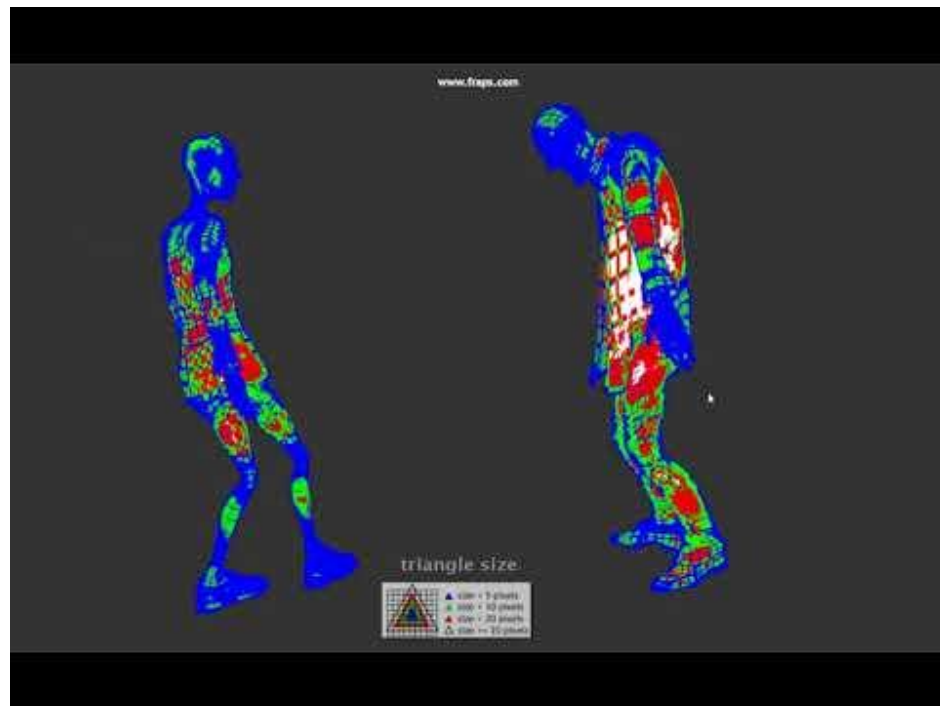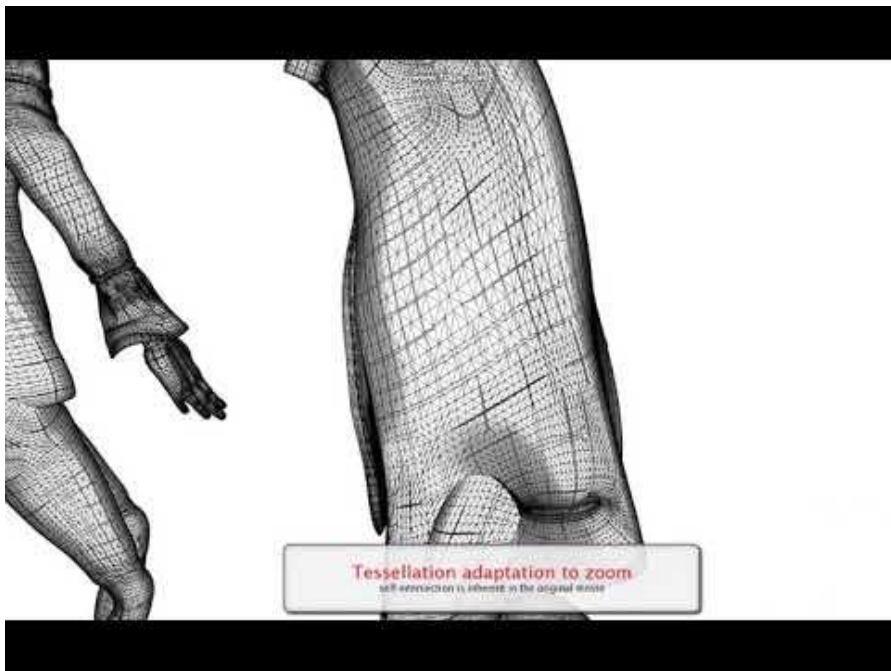Blender
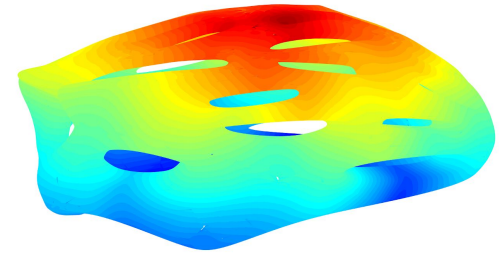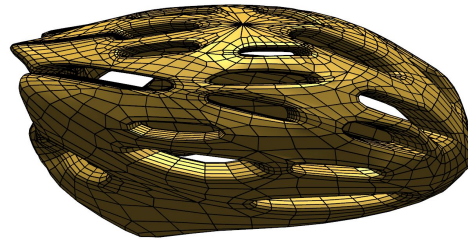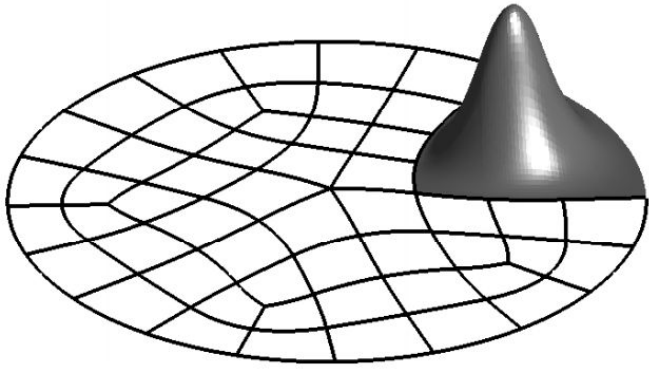
Surgical simulation

Animation (not covered)

Efficient Pixel-accurate Rendering of Animated Curved Surfaces [YBP12]

Elephant's Dream Blender

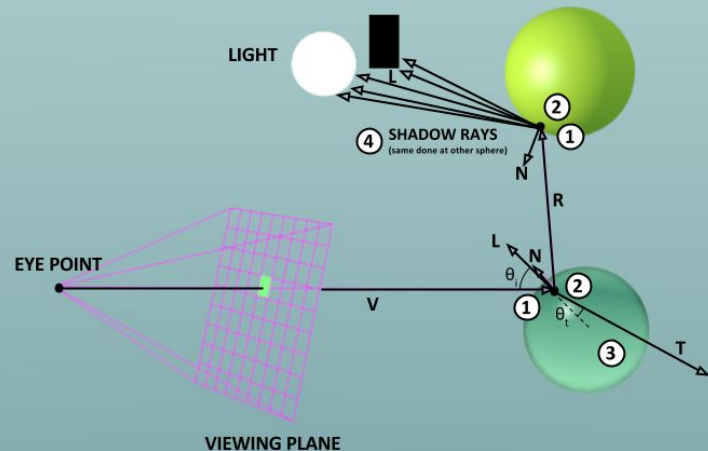# Design & analysis (not covered)

Ray Tracing (not a focus)

RAY TRACING
(for one pixel up to first bounce)

LIGHT

④ SHADOW RAYS (same done at other sphere)

EYE POINT

VIEWING PLANE

① Sphere equation: $(\vec{p} - \vec{c}) \cdot (\vec{p} - \vec{c}) = r^2$

Ray equation: $\vec{r}(t) = \vec{o} + t\vec{d}$

Intersection:

$$\left(\vec{o} + t\vec{d} - \vec{c}\right) \cdot \left(\vec{o} + t\vec{d} - \vec{c}\right) = r^2$$

$$t^2 \left(\vec{d} \cdot \vec{d}\right) + 2\left(\vec{o} - \vec{c}\right) t\vec{d} + \left(\vec{o} - \vec{c}\right) \cdot \left(\vec{o} - \vec{c}\right) - r^2 = 0$$