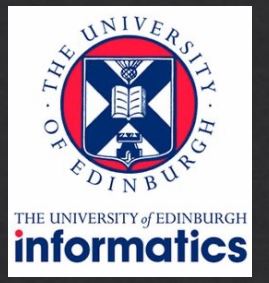


Computer Graphics

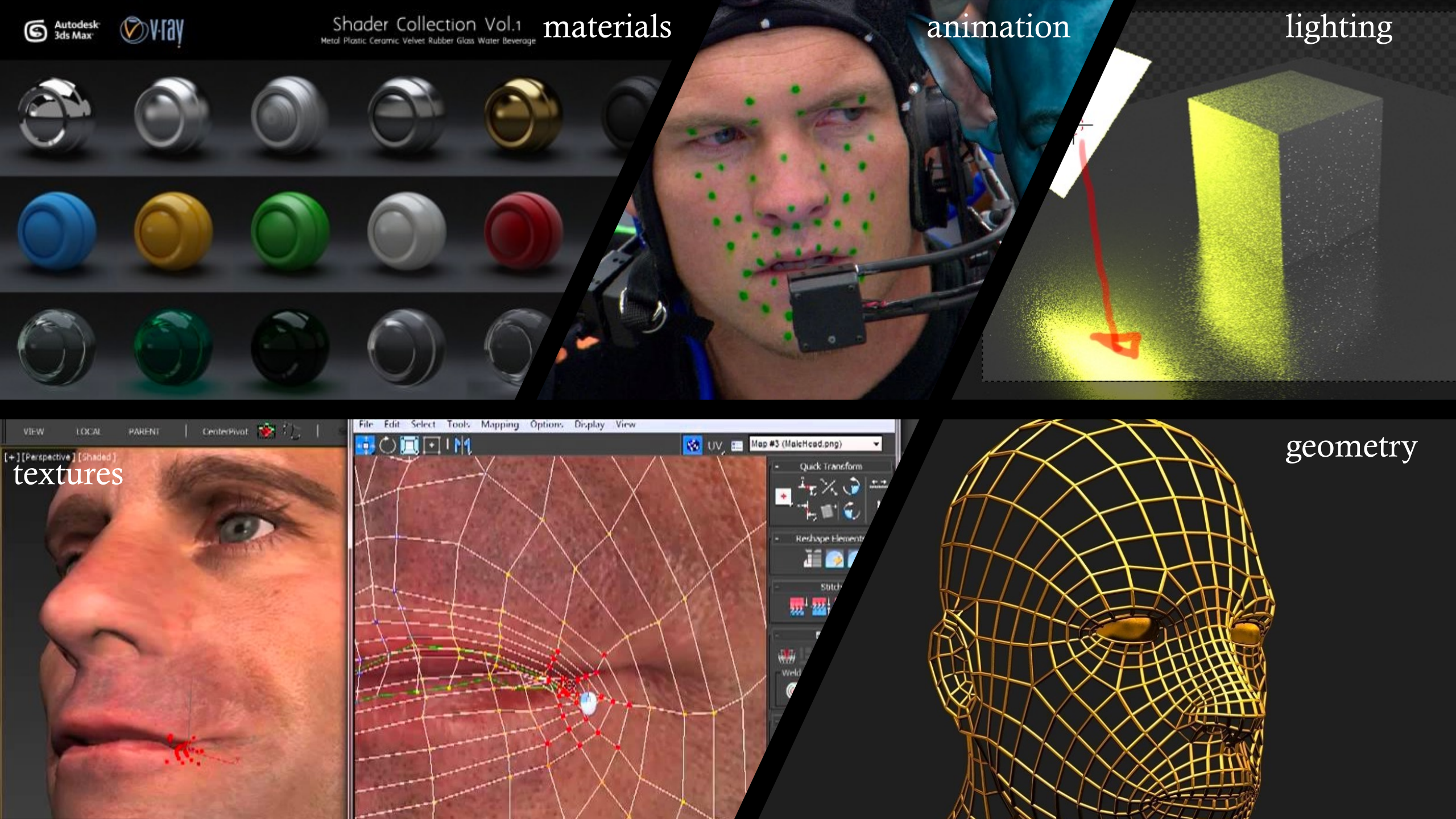
Lecture 5: Modelling

Kartic Subr

What is a model?

What is a model?

use (a system, procedure, etc.) as an example to follow or imitate.


Autodesk 3ds Max
V-Ray
Shader Collection Vol.1
Metal Plastic Ceramic Velvet Rubber Glass Water Beverage
materials
animation
lighting
textures
geometry

Search videos showing ‘effects breakdown’

https://www.youtube.com/watch?v=DVlroZ3Lbg0

https://www.youtube.com/watch?v=CRl3Rn_ud9g

https://www.youtube.com/watch?v=pTffQIFFYR8

Approaches to modelling

Artistic creation

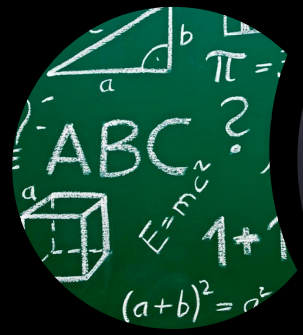
maths

measurement

Approaches to modelling

Artistic creation

maths

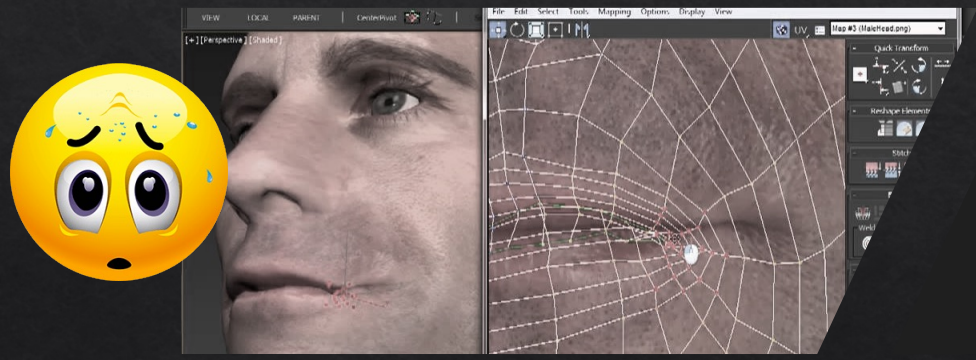


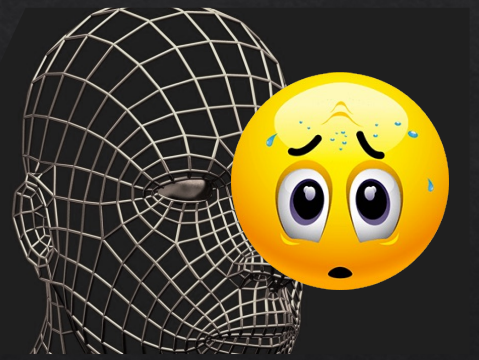
measurement

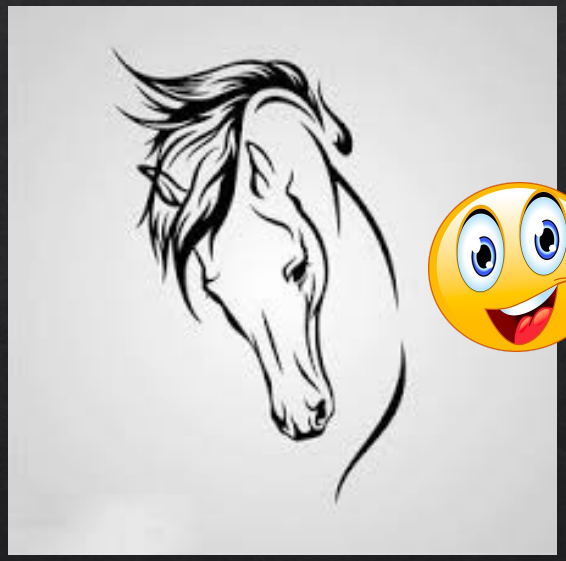
- Use physics
- Repeated procedure
- Analytical shapes (sphere)

- 3D scan
- Photograph
- Motion capture

manually created models



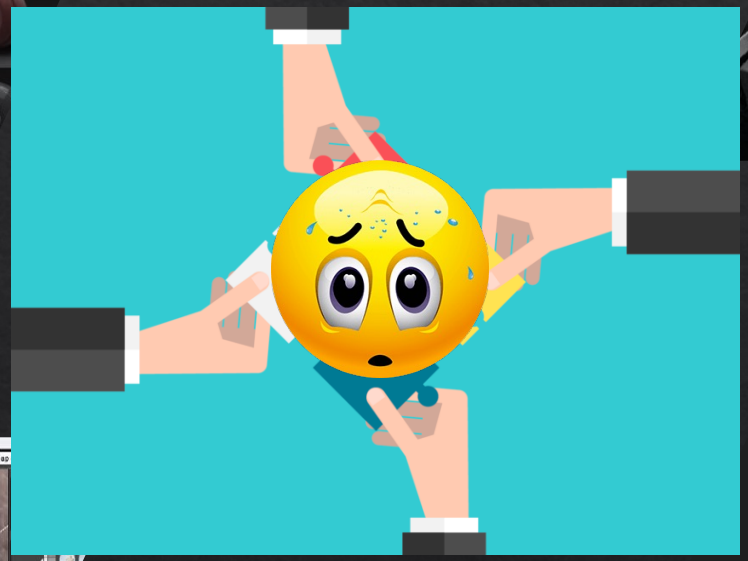


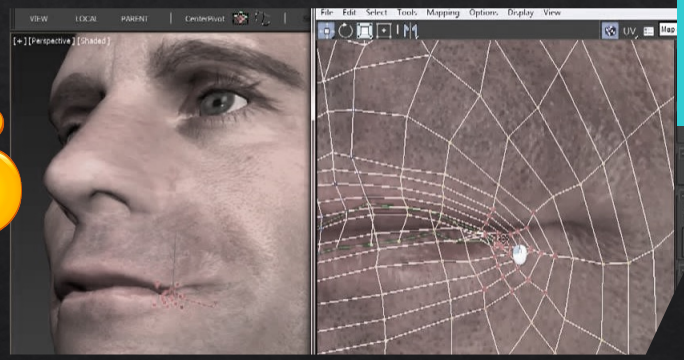


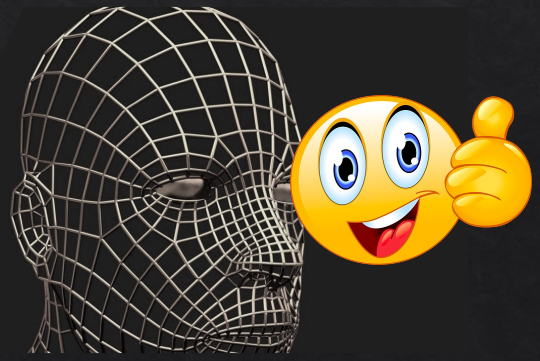
artistic expression

ABC
$E=mc^2$
$(a+b)^2$

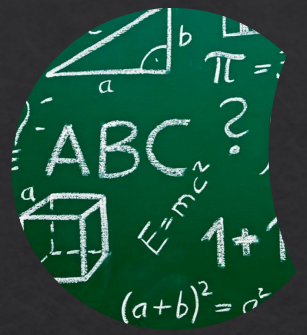
measurement



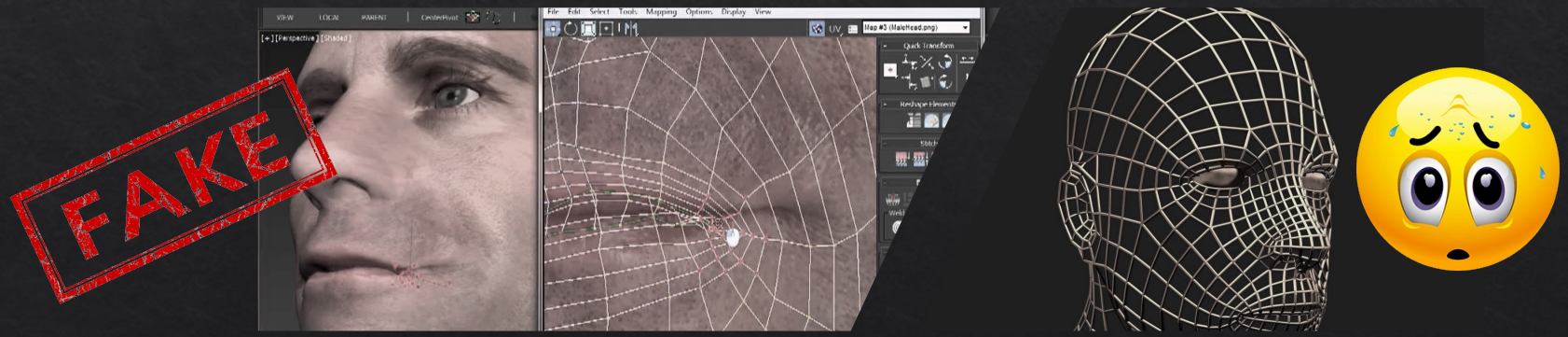




ABC
$E=mc^2$
$(a+b)^2$



mathematical models



3D shape representations

- Implicit representation

- Explicit representations
  - primitives
  - parametric

3D modelling – common approaches

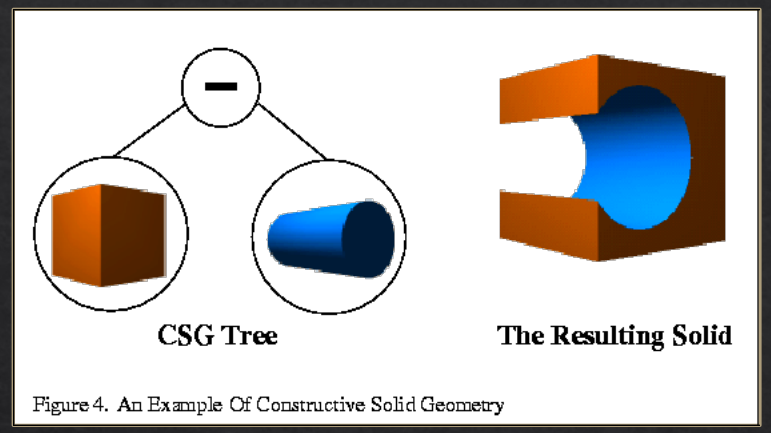
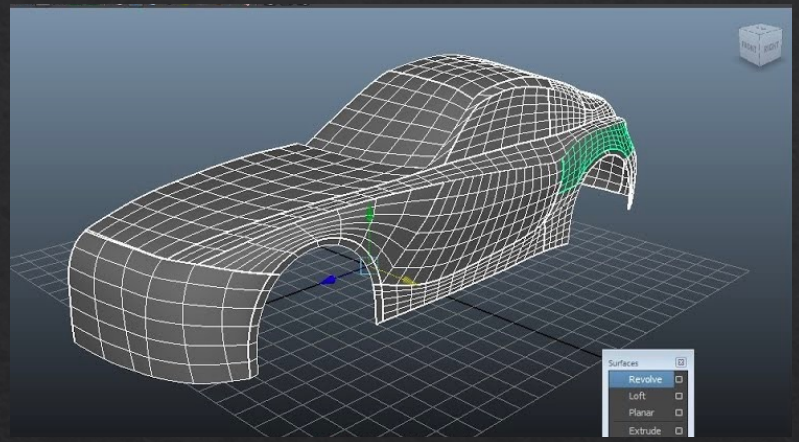


Figure 4. An Example Of Constructive Solid Geometry

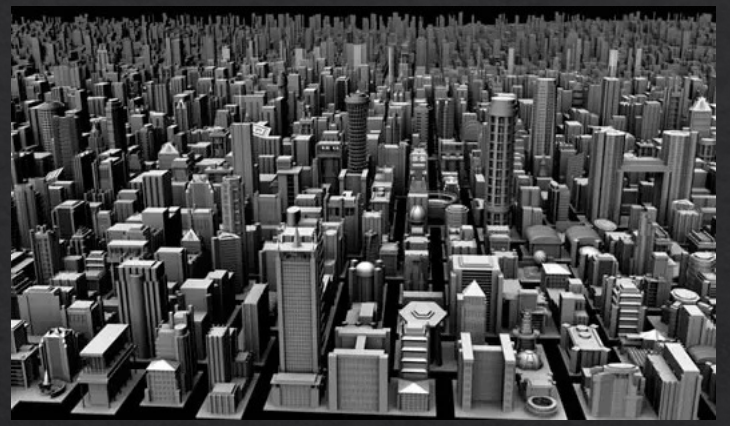
constructive solid geometry

https://www.cs.cmu.edu/~scoros/cs15869-s15/lectures/05-CSG_Procedural.pdf



parametric surfaces

http://www.inf.ed.ac.uk/teaching/courses/cg/lectures/slides16.pdf

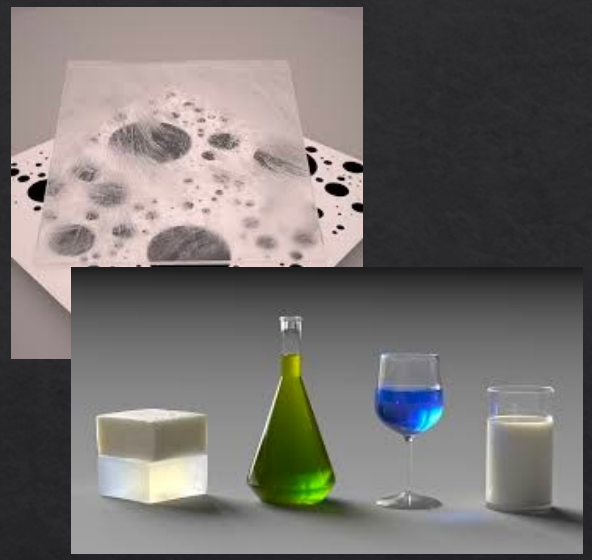


procedural modelling

https://www.cs.princeton.edu/courses/archive/spring03/cs426/lectures/16-procedural.pdf

Materials – common approaches

measured

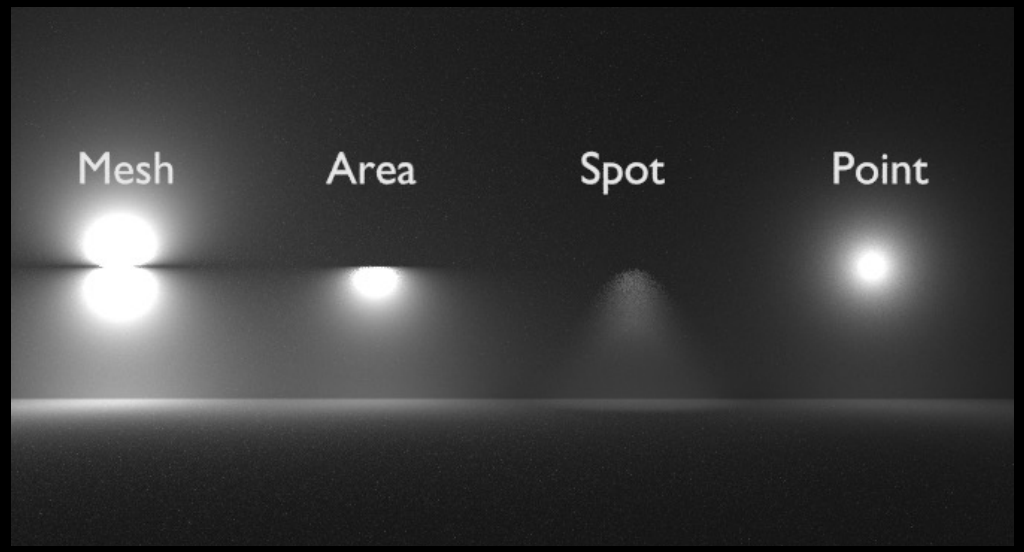


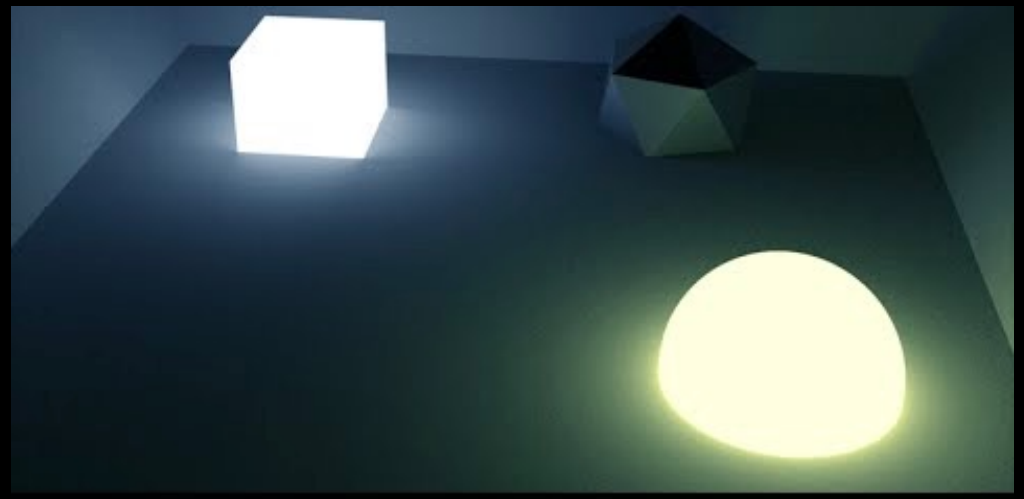
parametric e.g. ggx, bssrdf

procedural modelling

more about this, later in the course …

Lighting



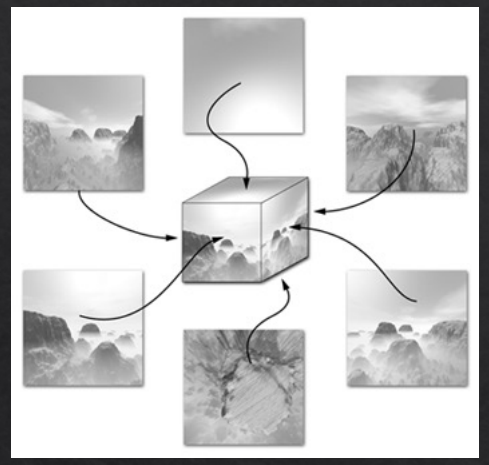


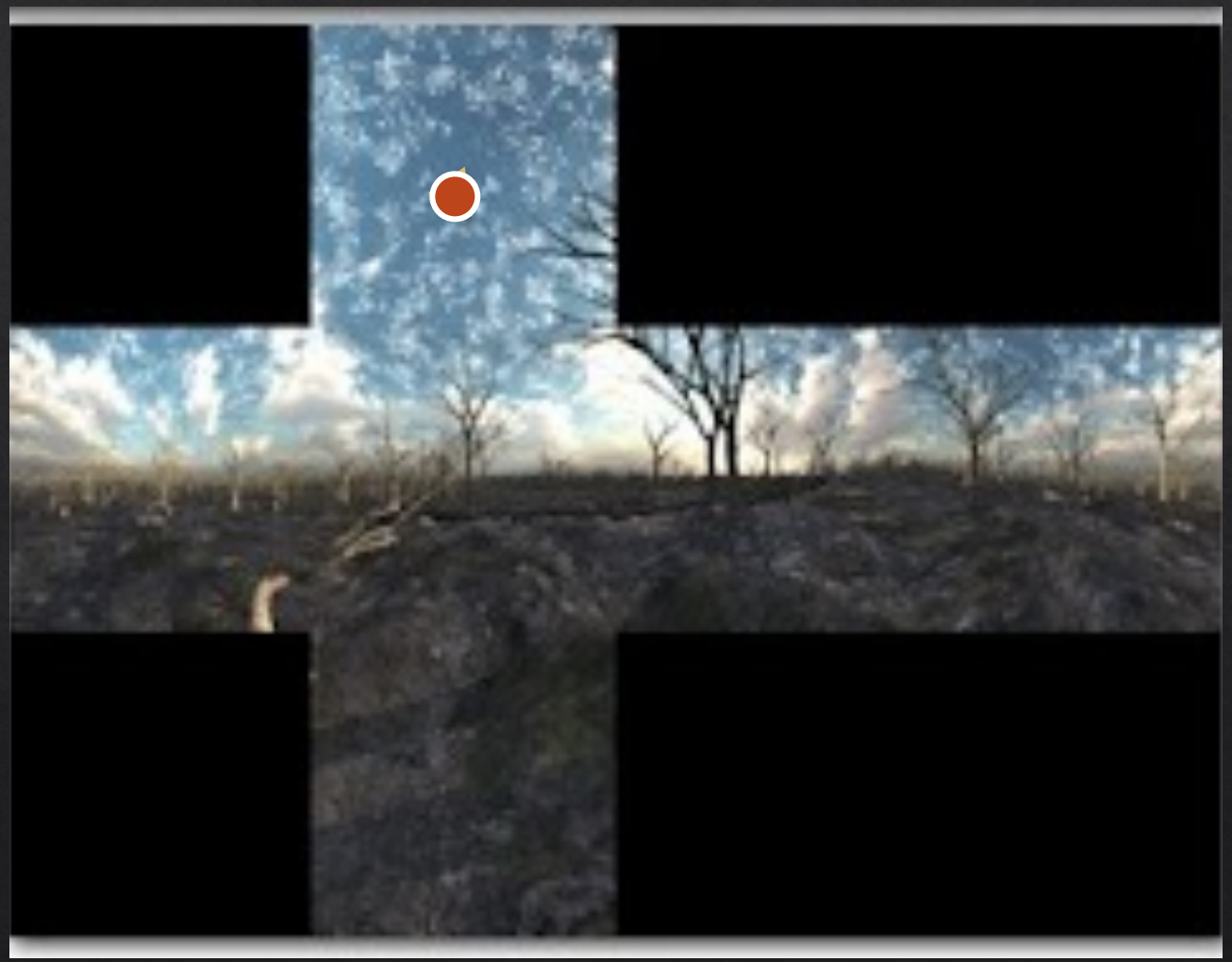
Environment Maps

Environment Maps

Environment Maps

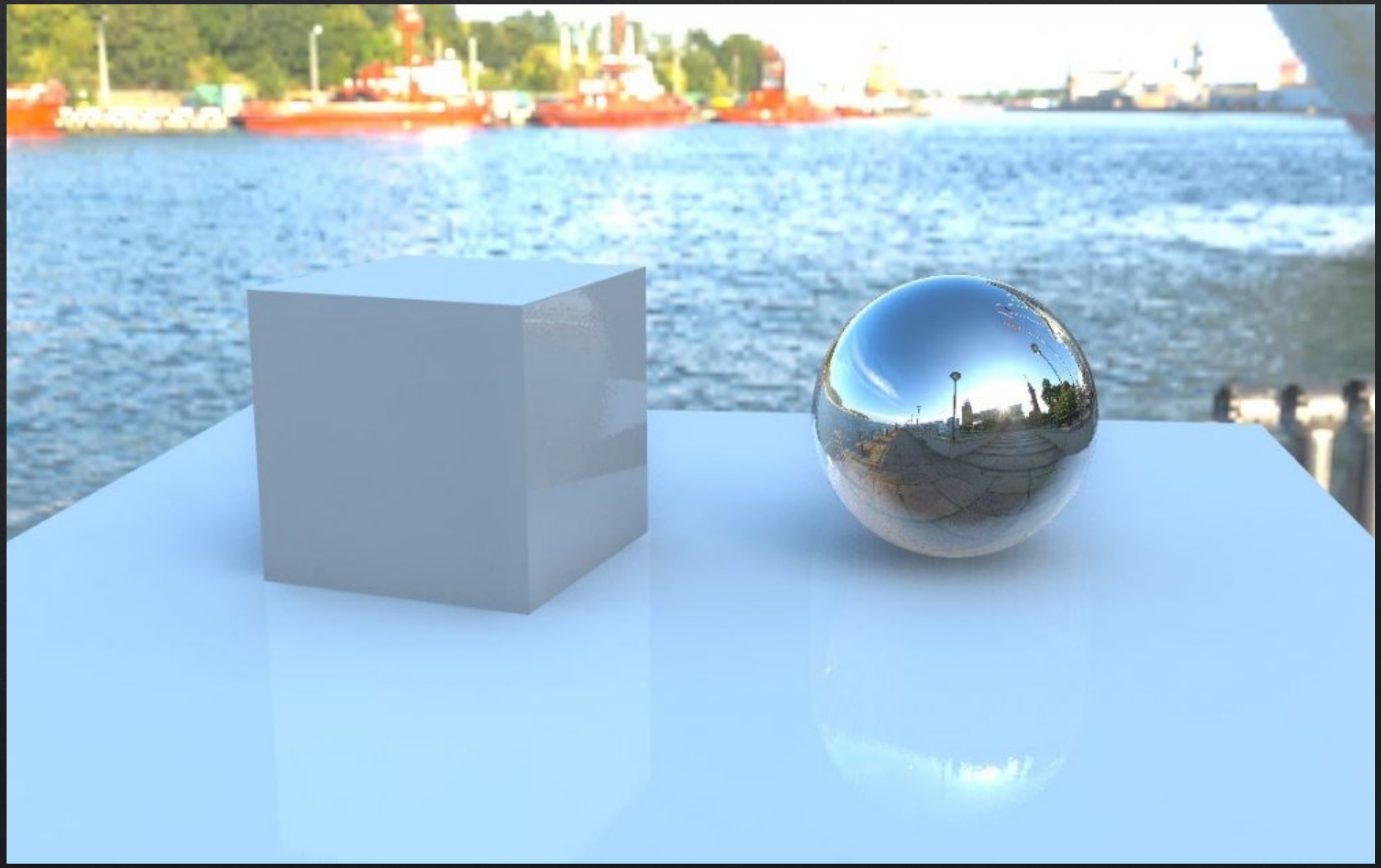
Environment Maps – cube map





Environment Maps – other parameterisations

Environment Maps – directional lighting



ABC
$E=mc^2$
$(a+b)^2$

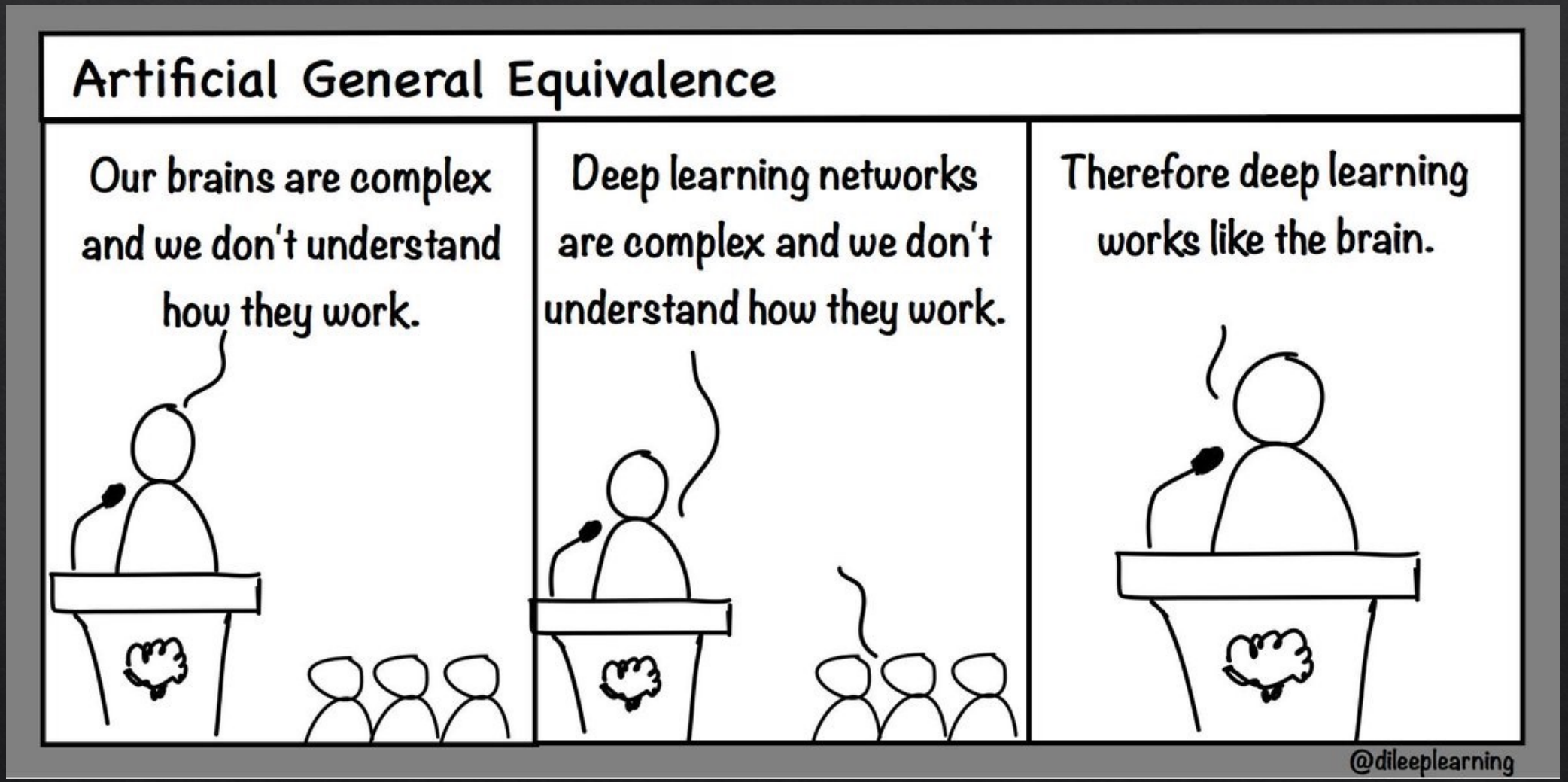
Deep Learning for Content Creation

Taming the Beast, Courtney Chaney

Sanja Fidler

https://www.cs.utoronto.ca/~fidler/

https://www.youtube.com/watch?v=lkkFcg9k9ho


Artificial General Equivalence
Our brains are complex and we don't understand how they work.
Deep learning networks are complex and we don't understand how they work.
Therefore deep learning works like the brain.
@dileeplearning