From 3D to 4D
A quantum leap for design

Matthias RAUTERBERG
Thinker versus Tinker

“There is nothing so practical as a good theory.”

"Don't worry about what anybody else is going to do… The best way to predict the future is to invent it. Really smart people with reasonable funding can do just about anything that doesn't violate too many of Newton's Laws!"

(1971)

Ludwig Boltzmann (1884-1906)

Alan C. Kay (1940-)

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What is design?

“A plan or drawing produced to show the look and function or workings of a building, garment, or other object before it is built or made.”

“Design is that area of human experience, skill and knowledge which is concerned with man’s ability to mould his environment to suit his material and spiritual needs.”

Merriam Webster (2011)  
Archer, B (1973)
Discipline: ENGINEERING SCIENCE
Teaching: LECTURING
Principle: TALKING

Left Brain
Verbal
Analytic
Parts, detail
Logical, rational
Sequential, successive
Systematic, directed
Cautious
Linear
Factual, words
Abstract, symbolic
Digital
Rational
Convergent
Propositional
Objective

Right Brain
Non-verbal
Synthetic, relational
Wholes, big picture
Intuitive, creative
Random, simultaneous
Casual, free
Adventuresome
Holistic
Visual, colors
Sensory, concrete
Spatial, analogue
Emotional
Divergent
Imaginative
Subjective

Discipline: DESIGN ART
Teaching: APPRENTICESHIP
Principle: DOING
Most influential German engineer

Konrad ZUSE
(1910-1995)
Most influential German designer

Dieter RAMS
(1932--)

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From 3D to 4D Design
Science and Design

Science in 3rd person view

Design in 1st person view
Design forms

- **mechanical style**
  - dedicated forms (e.g. typewriter, etc)

- **electronic style**
  - channel forms (e.g. Radio, TV, PC, etc)

- **mechatronic style**
  - active forms (e.g. smart memory alloys)
  - connected forms (e.g. ambient intelligence)
  - given forms (e.g. augmented reality)

From discrete to continuous interaction
FONCKEL
an interactive luminaire

Philip ROSS
Video 2:45
www.fonckel.com
The primacy of …

1600

R. Descartes

1900

M. Merleau-Ponty

2000

action

cognition emotion

perception

The primacy of …
Designing the Intangible

4D: Interaction Flow in Time

user

interaction

system

PACE visualizer

Figure 6. An agent opening a door in three different manners. (a) An agent pulling to open a door, (b) An agent pushing to open a door, (c) An agent sliding to open a door.

REF: M. Badawi and S. Donikian (2007). COMPUTER ANIMATION AND VIRTUAL WORLDS
How to visualize the ‘interaction’?
How to teach interaction design?
Finally...

The following conclusions can be drawn:

(1) Most products are to be used by humans, hence interactive

(2) We have to combine left-brain and right-brain expertise

(3) The upcoming challenge of design are the four dimensions
Thank you for your kind attention.