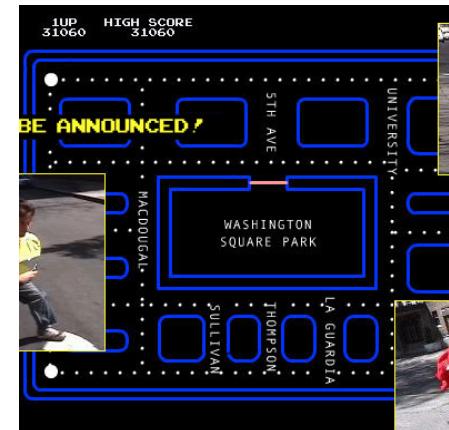




Interaktionsdesign 1

*“Networking robots,
pigeons and people”*



Kolding School of Design, 2014

Teachers: Jacob Sikker Remin & Thomas Markussen

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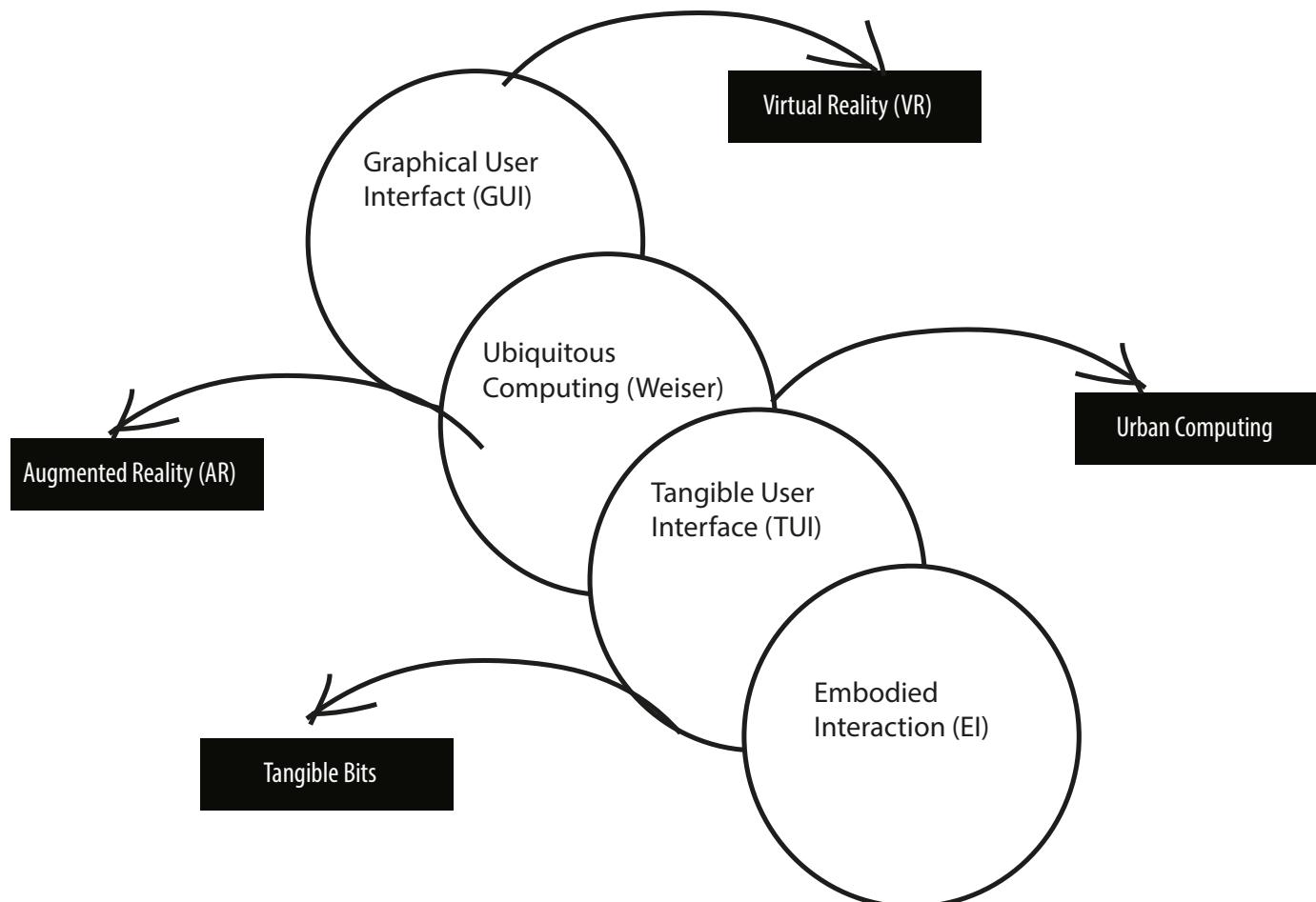
Programmet for i dag

- ① Hvad er Interaktionsdesign?
- ② Cybernetics – vi bladrer lidt i familie albummet
- ③ Robotter og dyr som designmateriale?
- ④ Skitseringsmetoder (skal I bruge til udvikling og formidling af jeres spilkoncepter)
- ⑤ Deliverables: fokus på software, programmering og interaktive prototyper



HVAD ER INTERAKTIONSDESIGN?

Hvad er interaktionsdesign?



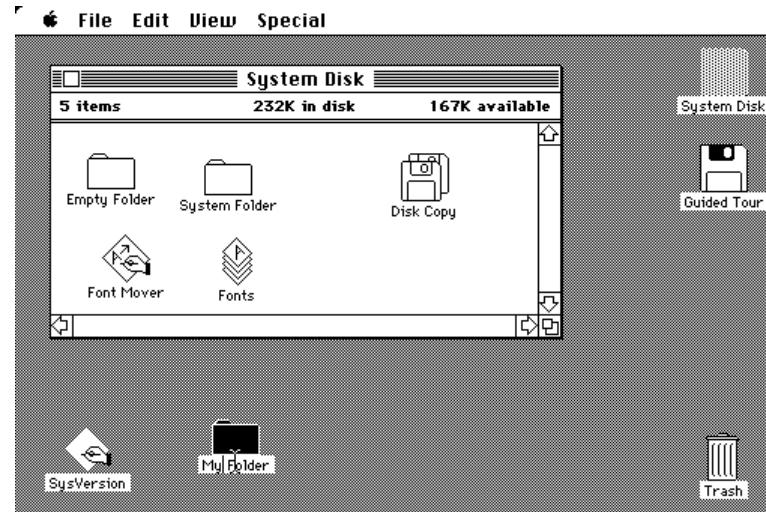
+

Graphical User Interface (GUI)

Xerox Parc

baggrundshistorien

- AIM: to make direct manipulation interfaces
- Instead of having the write operations to the computer, the computer could be operated by pointing on graphical icons
- Bit mapping display technological



+

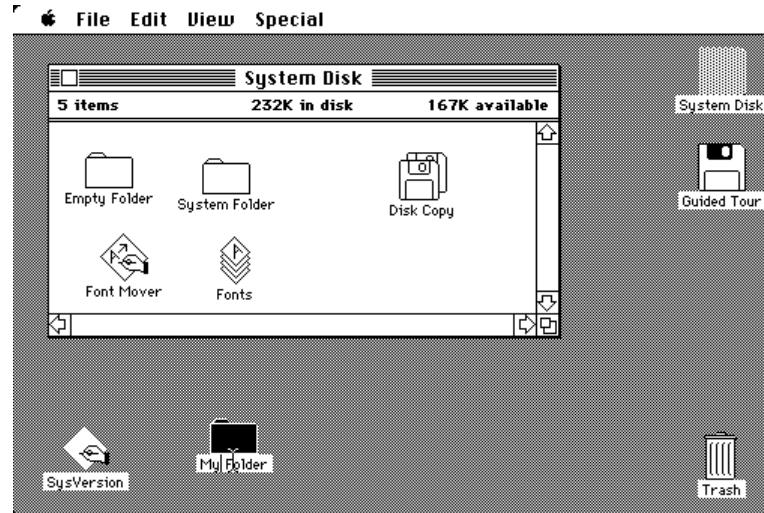
Tangible User Interface (TUI)

Tangible bits

baggrundshistorien

- AIM: to move beyond the current dominant model of GUI bound to computers with a flat rectangular display, windows, a mouse, and a keyboard.
- Tangible bits allows for users to "grasp & manipulate bits" in the center of users' attention by coupling the bits with everyday physical objects and architectural surfaces.

Ishii & Ullmer (1997): Tangible Bits, p. 1-2



+

Graphical User Interface (GUI)

Tangible computing

Graphical User Interfaces (GUI)

"We all have four senses: how sad that our connection to computers is 'sensory deprived and physically limited'.

Nicholas Negroponte



Figure 5 The GUI's mental model of a user [30].

+

Graphical User Interface (GUI)

Cyberspace

Virtual Reality

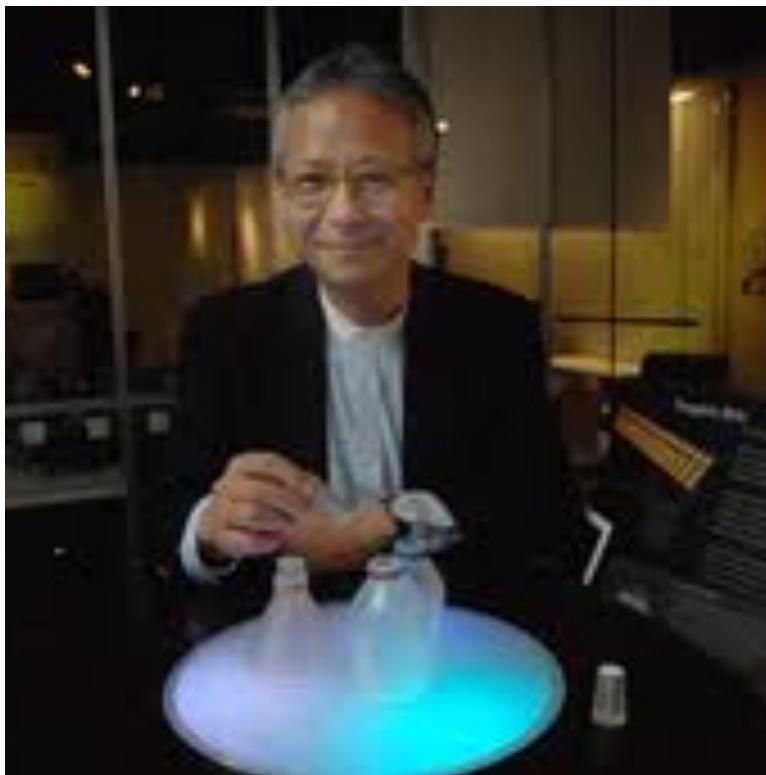
- Immersive in virtual space
- Data gloves and VR glasses
- 1993 Internet (www)
- William Gibson's neuromancer



+

Tangible Bits / tangible computing

Hiroshi Ishii



Bryg Ullmer



+

Tangible Bits / tangible computing

Mogens Jacobsen



Hørbar



http://www.youtube.com/watch?v=_3k-RdUIxC8

+

Tangible Bits / tangible computing

Tangible bits

Baggrundshistorien / Ubiquitous computing

- Tangible bits is inspired by the vision of Ubiquitous Computing and the new stream of Augmented Reality.

Ishii & Ullmer (1997): Tangible Bits, p. 1-2



Mark Weiser, 1952-1999

+

Tangible computing



' tangible computing might attempt to take familiar objects and invest them with computation, or it might present us with entirely new artefacts that disclose something of the hidden world inside the software system'

Paul Dourish *Where the Action is:
the foundation of embodied interaction* (2001)

+

Tangible Bits / tangible computing

3 key concepts

Tangible User Interfaces

Coupling of bits with graspable physical objects:

- ◆ This physical embodiment of incoming phone messages as marbles demonstrated the great potential of making digital information graspable by coupling bits and atoms.

Ishii & Ullmer (1997): Tangible Bits, p. 3

Durrell Bishop's Marble Answering Machine

Durrell Bishop invented the Marble Answering Machine [MAM] for RCA while attending the Royal College of Art in London for his MA in Interaction Design (1992). The MAM interface is one of the first examples of interfaces that interlinks the *physical* and *DIGITAL* worlds. The conceptual prototype telephone answering machine explores ways in which computing can be taken off the desk and integrated into everyday objects of the current time.



<http://vimeo.com/19930744>

+

Tangible Bits / tangible computing

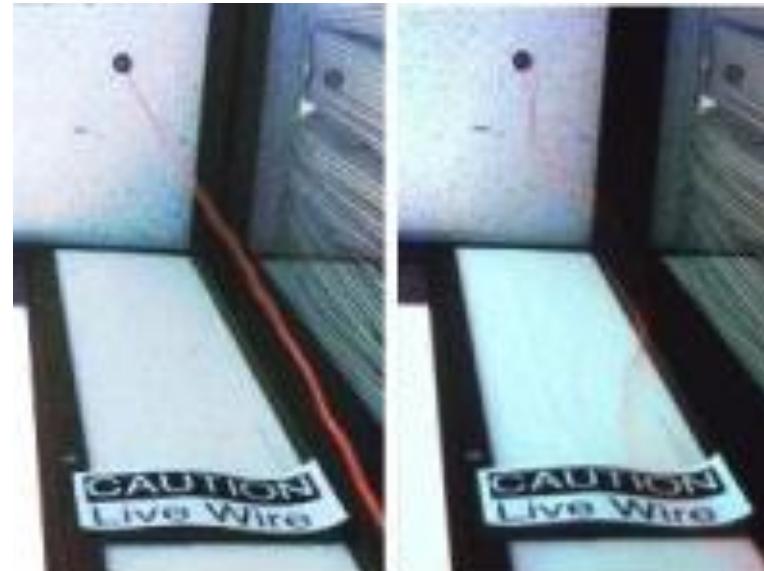
3 key concepts

Natalie Jeremijenko Livewire, 1995

Ambient Media for background awareness:

Use of ambient media such as sound, light, airflow, and water movement for background interfaces with cyberspace at the periphery of human perception.

- ❖ Bits flowing through the wires of a computer network become tangible through motion, sound, and even touch.



Ishii & Ullmer (1997): Tangible Bits, p. 3-4

[http://www.todayandtomorrow.net/2008/07/23/
volume-of-emptiness/](http://www.todayandtomorrow.net/2008/07/23/volume-of-emptiness/)

+

Tangible Bits / tangible computing

3 key concepts

NOX D-Tower, 2003

Interactive surfaces

- ❖ Transformation of each surface within architectural space (e.g., walls, urban sculptures, windows, etc.) into an active interface between the physical and virtual worlds.

Ishii & Ullmer (1997): Tangible Bits, p. 2



+

Tangible & Embodied Interaction



Diller + Scofidio *Blur Building* (2002)



Ben Rubin/EAR Studio - *Braincoat* (2002)

HVAD ER CYBERNETICS?

+

Cybernetics I

- AI intelligens er opbygget som information – sekvenser af nuller og ettaler - binære tal = bits (binary digits).
- Hjernen er som en computer der behandler data ved hjælp af algoritmer.
- Norbert Wiener, Alan Turing, Shannon & Weaver

Deep Blue vs Kasparov (1997)



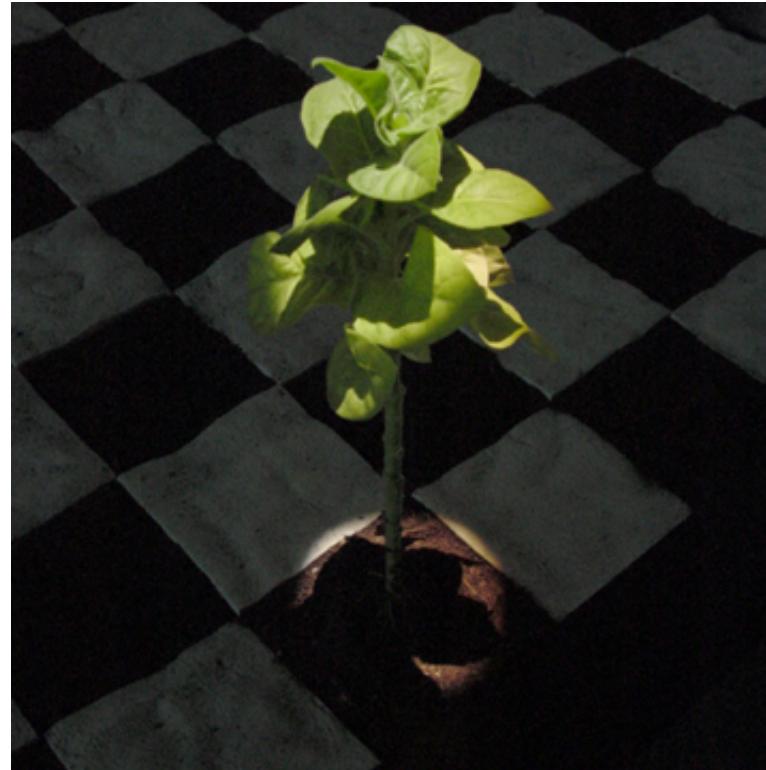
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Cybernetics I

Norbert Wiener

- AI intelligens er opbygget som information – sekvenser af nuller og ettaler - binære tal = bits (binary digits).
- The gene uses ASCII (the universal computer code for representing binary numbers as Roman characters, on- and off-line) to translate Descartes's statement: "Cogito ergo sum" (I think therefore I am) into the four bases of genetics.
- This installation gives continuity to my ongoing interventions at the boundaries between the living (human, non-human animals) and the nonliving (machines, networks).

Eduardo Kac: Move 36



+

Cybernetics II

Norbert Wiener

- Alt liv er en suppe af information og DNA er livets kode (artificial life)
- Ligesom vi kan om-programmere softwaren i en computere kan vi programmere livets kode: DNA'et og RNA'et
- Kloning er når vi kopierer og gentager et DNA så vi skaber identiske individer = replicants?
- Francesco Varela,

Fåret Dolly, 1996



+

Cybernetics II

- Alt liv er en suppe af information og DNA er livets kode
- Ligesom vi kan om-programmere softwaren i en computere kan vi programmere livets kode: DNA'et og RNA'et
- Kloning er når vi kopierer og gentager et DNA så vi skaber identiske individer = replicants?

Moon



+

Cybernetics II

- Alt liv er en suppe af information og DNA er livets kode
- Ligesom vi kan om-programmere softwaren i en computere kan vi programmere livets kode: DNA'et og RNA'et
- Re-programmere DNA'et så kroppen ændrer sig

Marta de Meneze: Butterflies, 1999

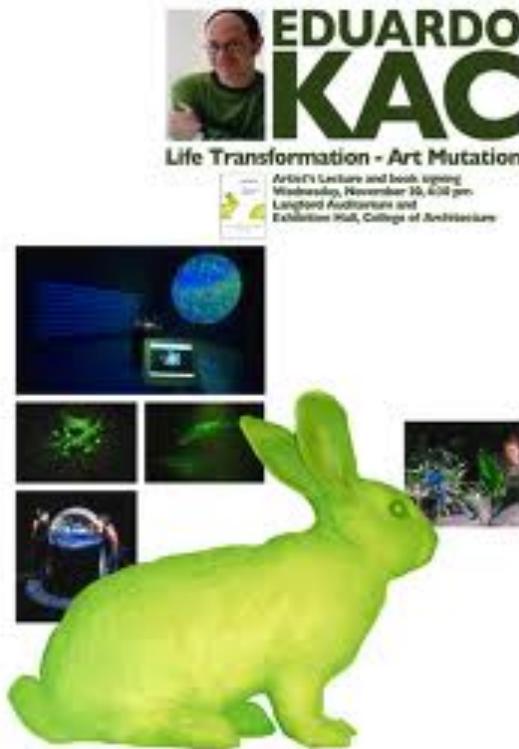


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Cybernetics II

Edourca Kac: Alba, 2000

- Alt liv er en suppe af information og DNA er livets kode
- Ligesom vi kan om-programmere softwaren i en computere kan vi programmere livets kode: DNA'et og RNA'et
- Gensplejsning er når vi forbinder DNA fra 2 forskellige organismer



+

Cybernetics II

The Vacant Mouse, 1997

- Alt liv er en suppe af information og DNA er livets kode
- Ligesom vi kan om-programmere softwaren i en computere kan vi programmere livets kode: DNA'et og RNA'et
- Gensplejsning er når vi forbinder DNA fra 2 forskellige organismer

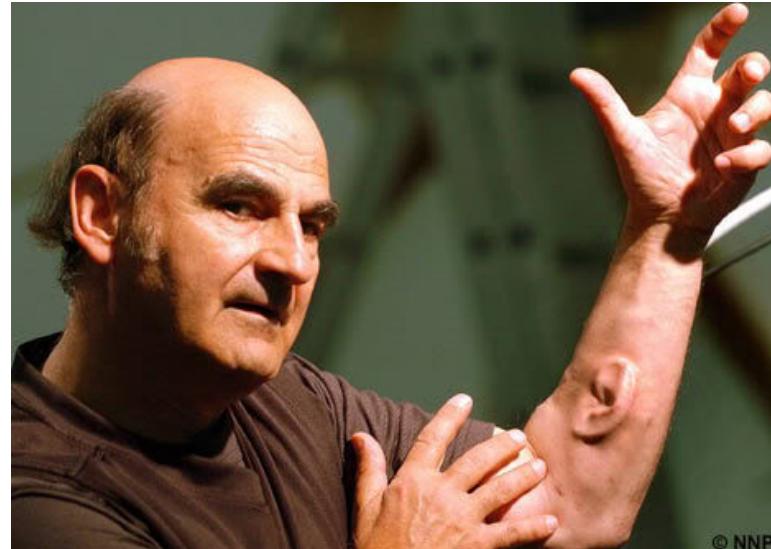


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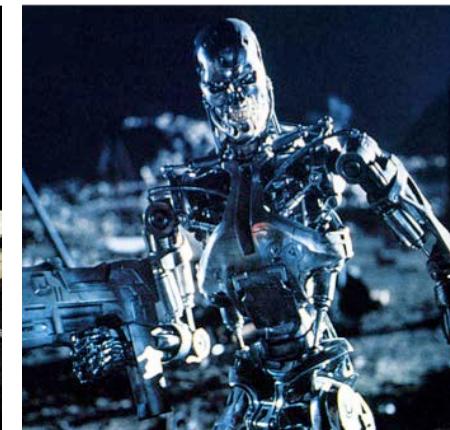
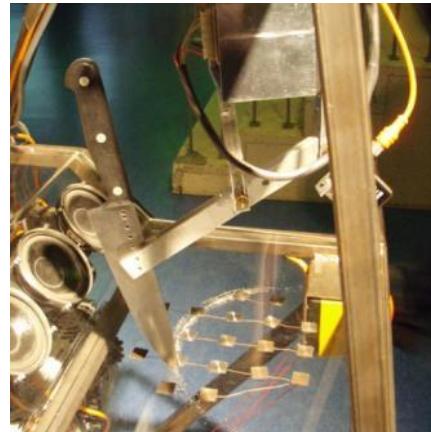
Cybernetics II

Stellarc The internet ear, 2011

- Alt liv er en suppe af information og DNA er livets kode
- Ligesom vi kan om-programmere softwaren i en computere kan vi programmere livets kode: DNA'et og RNA'et
- Gensplejsning er når vi forbinder DNA fra 2 forskellige organismer

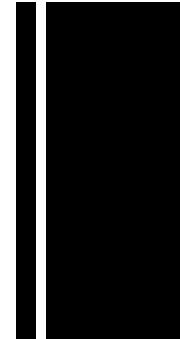


© NNP



Robotter som designmateriale

Robotter som designmateriale

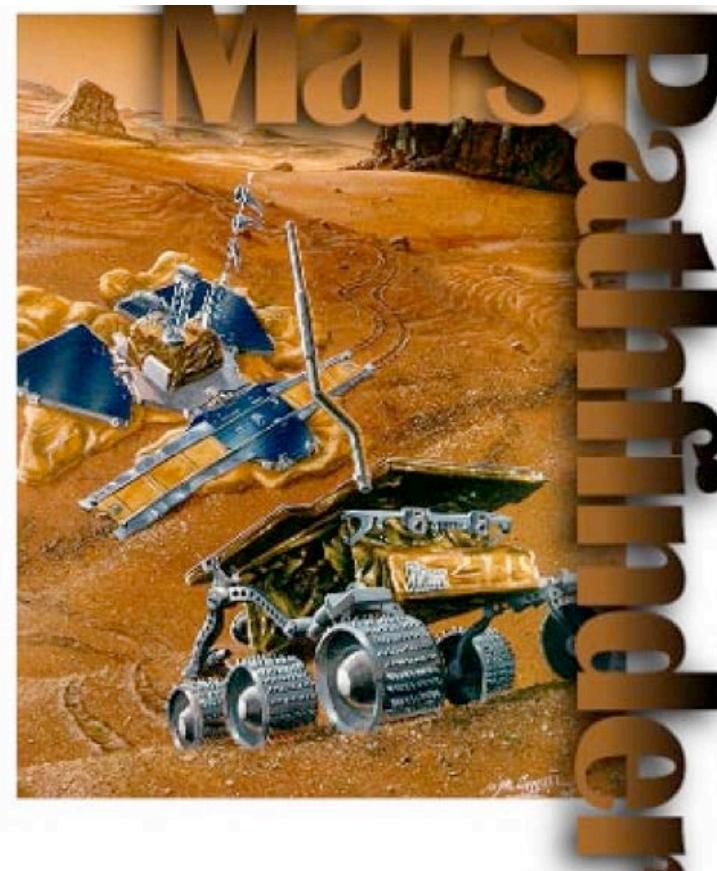


- Human-Robot Interaction I
(Robotter som vi kender dem)
- Human-Robot Interaction II
(Robotter som vi kommer til at
se dem)
- Eksperimenter med robotter
inden for design og kunst



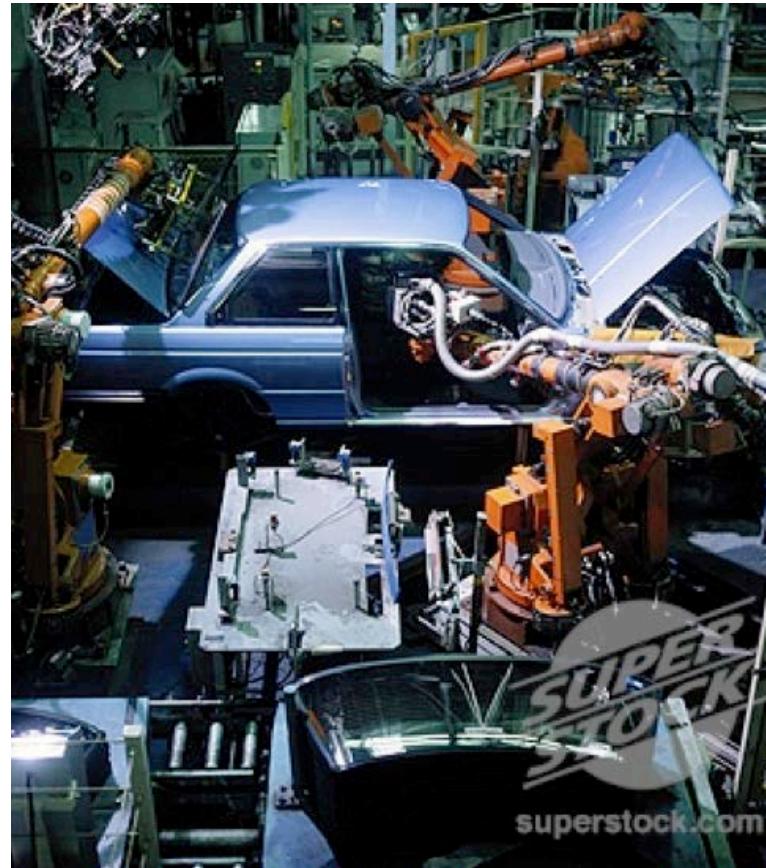
Human-Robot Interaction I

- Primary areas of use:
 - Dangerous expeditions in outer space, at the bottom of the sea or highly polluted environments (Chernobyl)
- Interaction:
 - remotely controlled by people at a safe and comfortable distance (telerobotics)
- The presence of robots = the absence of man
- Challenge: to develop artificial intelligence that makes the robot able to learn from its immediate surroundings

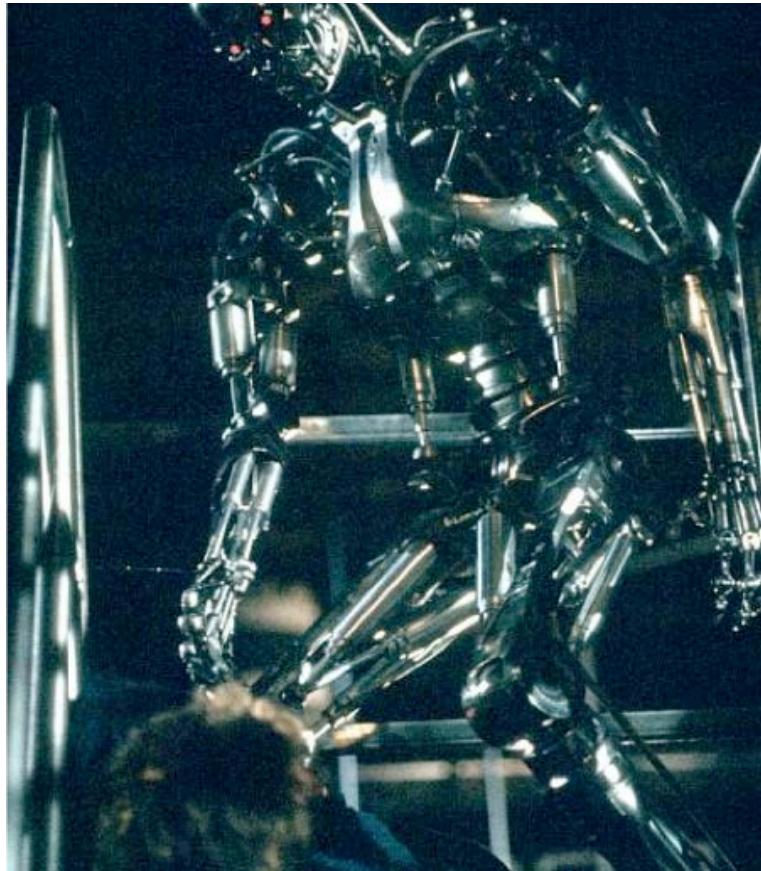


Human-Robot Interaction I

- Primary areas of use:
 - Automation of human labor as a means to make production more efficient and competitive
- Interaction:
 - Repetitive tasks at the assembly lines within the industry
- The presence of robots = the absence of man -- unemployment
- Challenge: to translate physical working tasks into the programming and construction of the robots

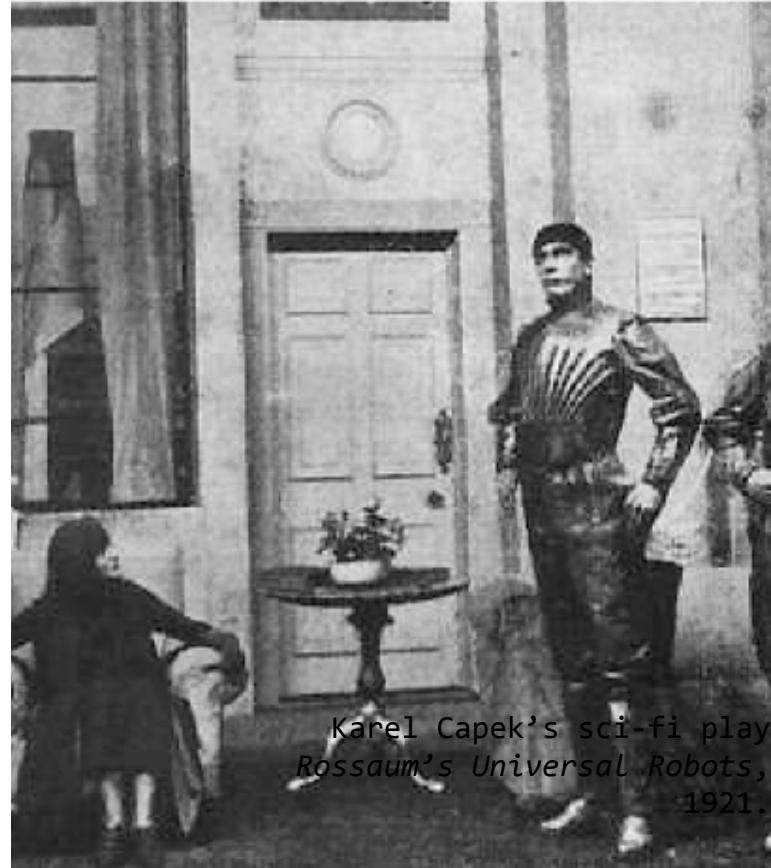


Human-Robot Interaction I



Human-Robot Interaction I

- Robota = forced labour (Czech.)
- What if ...
 - Robots became more intelligent than we are?
 - Robots rebelled against their master and enslaved humans?



Karel Čapek's sci-fi play
Rosaum's Universal Robots,
1921.

+ Human-Robot Interaction II

- Robots in the age of post-industrialization

- Demographic challenges
- Shortage of human labor:
 - Ex: In hospitals and healthcare centers; schools and educational environments
- The presence of robots = the presence of man
- Challenge: to design robots that people feel safe about, wants to play with and are able to learn from.



+

Human-Robot Interaction II

The role of art and design

Ken Goldberg *Telegarden* (1995-2004)

- Exploring novel uses of robotic technology
- Rich emotional and interpersonal forms of interaction.
- Change and challenge the cultural idea of what a robot is and what it can be used for



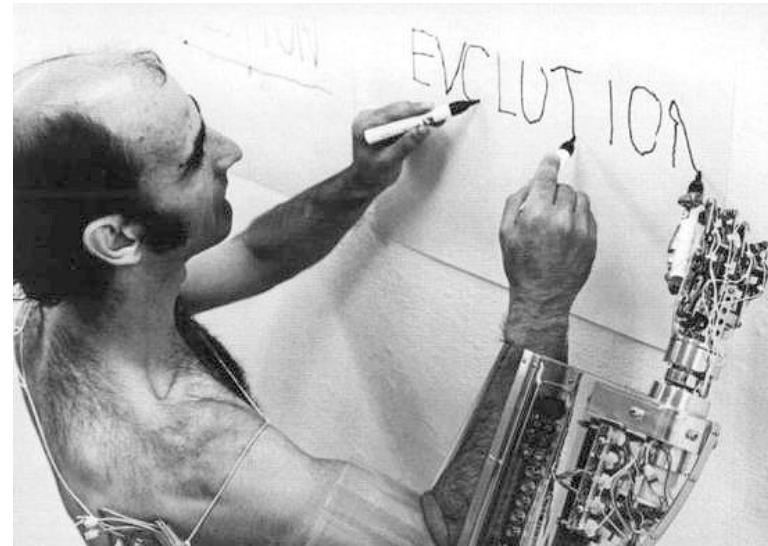
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Human-Robot Interaction II

The role of art and design

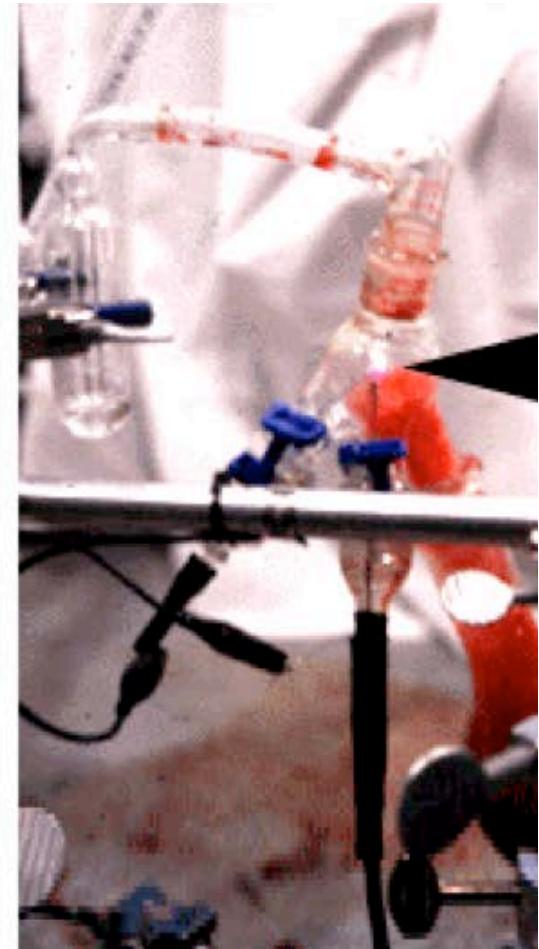
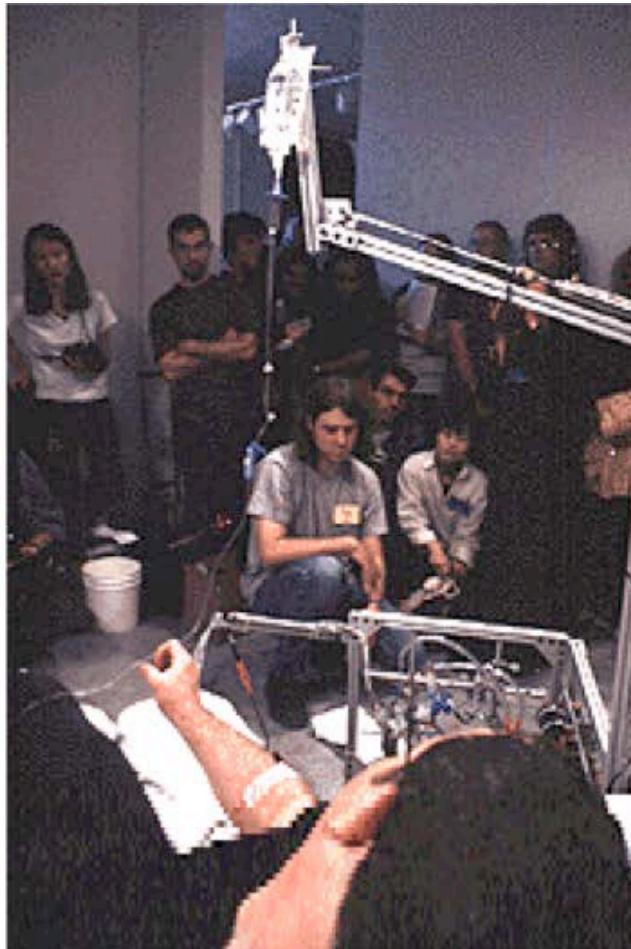
Stellarc: The Third Arm

- Exploring novel uses of robotic technology
- Rich emotional and interpersonal forms of interaction.
- Change and challenge the cultural idea of what a robot is and what it can be used for



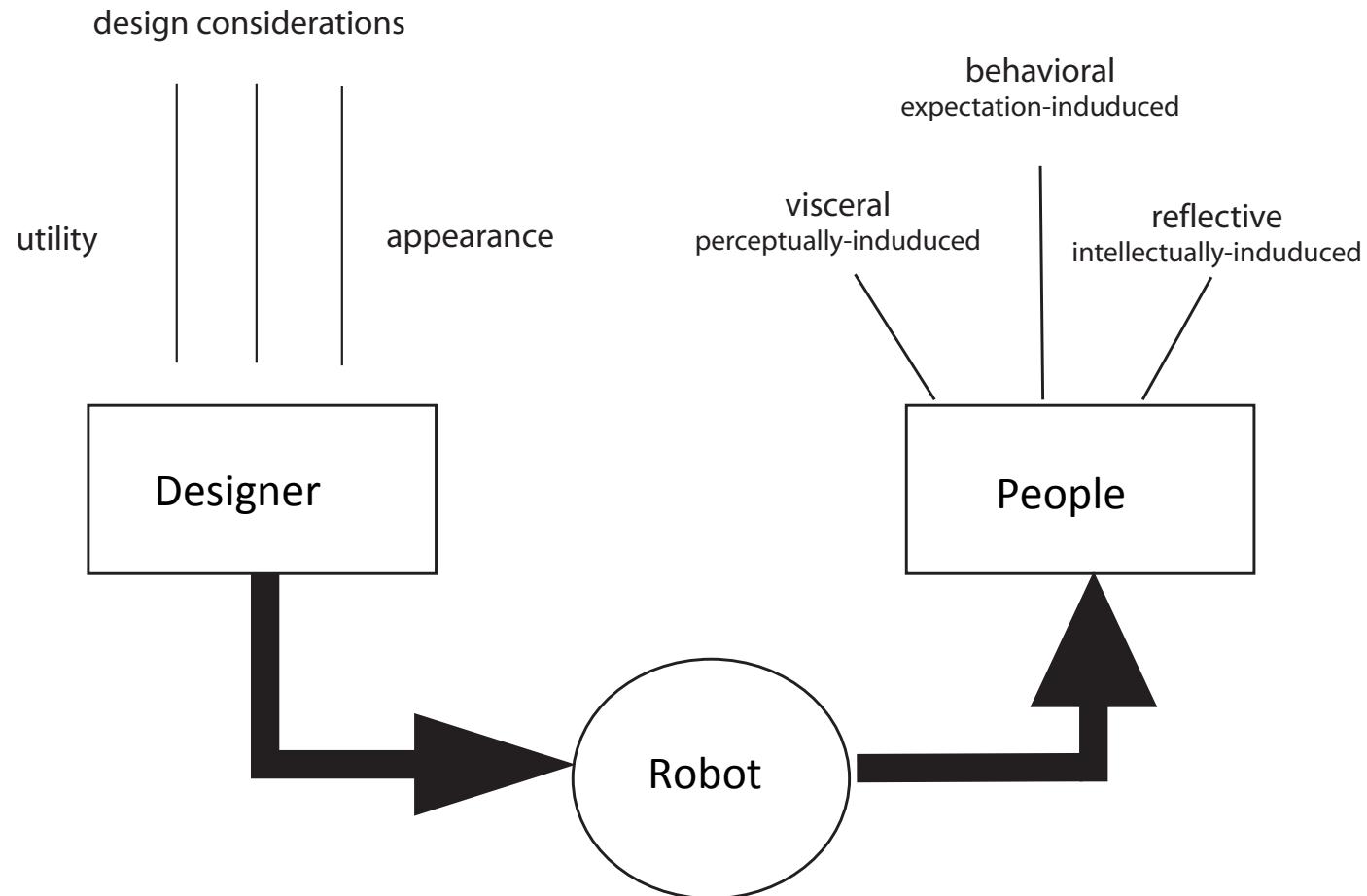
The Cyborg

Human-Robot Interaction II



Eduardo Kac "A-positive", 1997

+ Hvordan kan vi forstå interaktion med robotter?



D. Norman & A. Ortony
Designers and Users: Two Perspectives on Emotion and Design

+

3 former for interaktion

The visceral level

Example: Paro (1993)

- Perceptually induced emotions
- Involve automatic evaluation of the perceptual properties of objects (surface features, material, the immediate appearance of products, etc.)
- Negative/positive assessments signal harmful/beneficial experiences
- Perceptually induced reactions are not based on past experience
- Determined by biology – high degree of invariance in response patterns across cultures



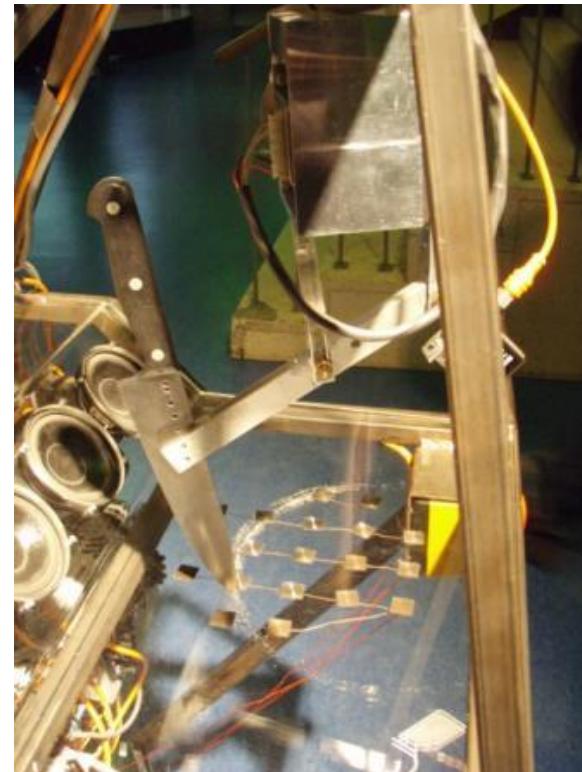
+

3 former for interaktion

The visceral level

Ex: Knife Hand Chop Bot

- Perceptually induced reactions
- Involve automatic evaluation of the perceptual properties of objects (surface features, material, the immediate appearance of products, etc.)
- Negative/positive assessments signal harmful/beneficial experiences
- Perceptually induced reactions are not based on past experience
- Determined by biology – high degree of invariance in response patterns across cultures



+

3 former for interaktion

The behavioral level

Dunne & Raby

- Expectation induced emotions aimed at the function and use of a product
- Depend on the user's individual and social learning, past experience
- Intimately connected to predictions of and expectations about the near future
- Vary from person to person, from culture to culture



Technological Dream Series: No. 1 Robots, 2007

<http://www.moma.org/explore/multimedia/audios/37/838>

+

3 former for interaktion

The behavioral level

- Expectation induced emotions aimed at the function and use of a product
- Depend on the user's individual and social learning, past experience
- Intimately connected to predictions of and expectations about the near future
- Vary from person to person, from culture to culture

Robot aben på Psykiatrisk afd.



+

3 former for interaktion

The reflective level

Dirk the homeless robot

- Intellectually induced reactions triggered by people's self-examination of their own actions and understanding of the situation at hand
- Influenced by experience and culture as well as by one's social group
- Vary greatly from culture to culture, age group to age group



+ Robotter som eksperiment The role of art and design

- Using art and design to explore and express possible futures and alternative presents.
- Design as a critique, raising question about cultural beliefs and habits
- Never starts with technology, starts with exploring human needs, fears and imagination
- Experience-driven approaches
- Designing robots for
 - social interaction
 - street art and political activism
 - social critique

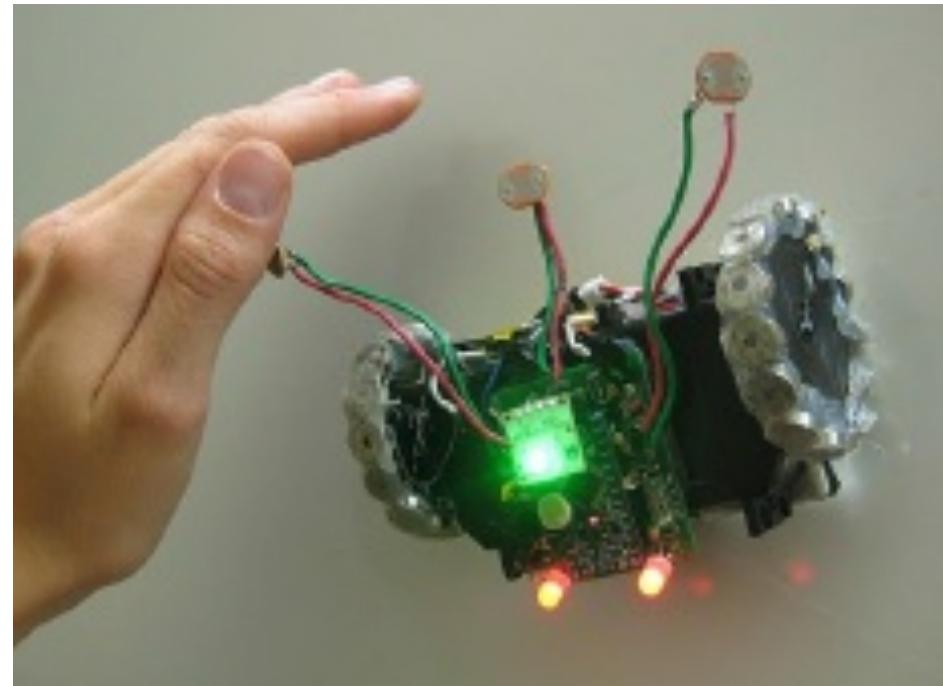
Example: Wallbots



+ Robotter som eksperiment The role of art and design

Example: Wallbots

- Using art and design to explore and express possible futures and alternative presents.
- Design as a critique, raising question about cultural beliefs and habits
- Never starts with technology, starts with exploring human needs, fears and imagination
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- Designing robots for
 - social interaction
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+

The role of art and design

James Auger

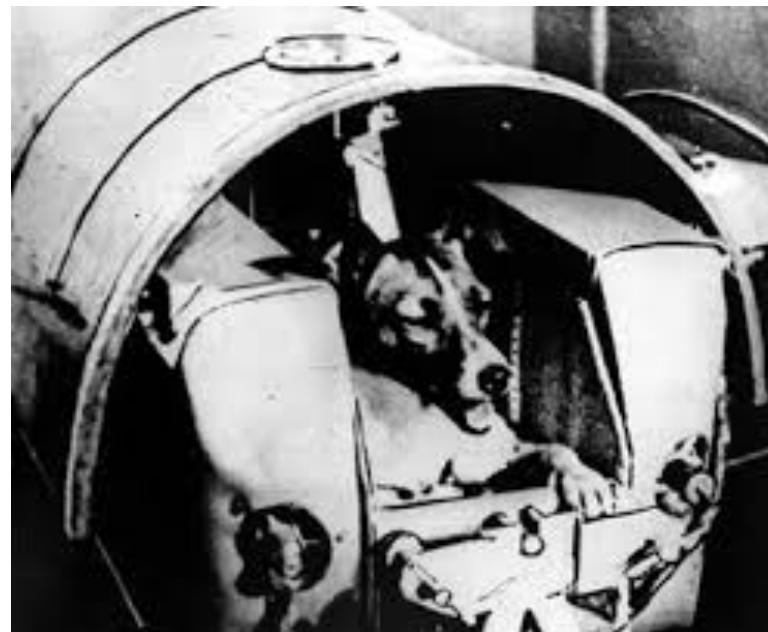
Domestic Carnivorous Robots



DYR SOM DESIGNMATERIALE

+

Dyr som designmateriale



+

Dyr som designmateriale

Marta de Meneze

- Alt liv er en suppe af information og DNA er livets kode
- Ligesom vi kan om-programmere softwaren i en computere kan vi programmere livets kode: DNA'et og RNA'et
- Re-programmere DNA'et så kroppen ændrer sig



+

Dyr som designmateriale

Caligula's Horse



Michael Jackson & Bubbles



+

Dyr som designmateriale

Joseph Beuys, 1974



Bjørn Nørgaard



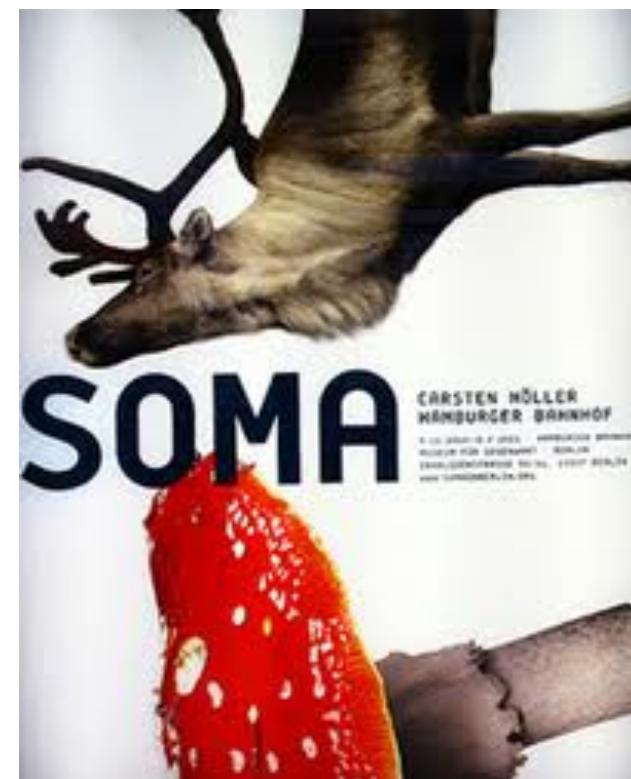
"I Like America and America Likes me"

<http://vimeo.com/5904032>

+

Dyr som designmateriale

Carsten Höller:



+

Dyr som designmateriale

What if the energy grid ...

broke down? Animal Energy

- What if the energy grid broke down because of a civil war in Denmark in 2018
- Pets would be a luxury, animals would be producers of household devices: computers, toasters, coffee machines, etc.



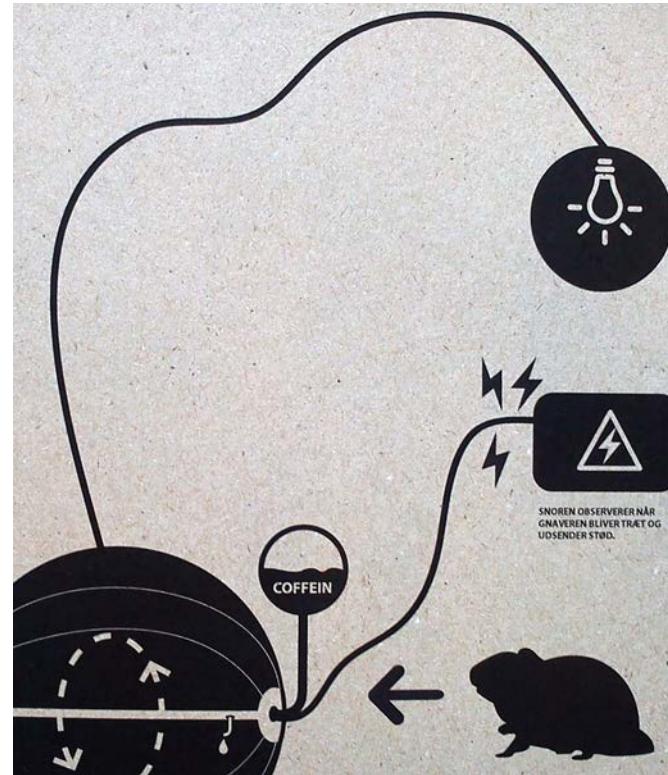
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Dyr som designmateriale

Hamster battery,

Rabbit Jaw Machine

- What if the energy grid broke down because of a civil war in Denmark in 2018
- Pets would be a luxury, animals would be producers of household devices: computers, toasters, coffee machines, etc.

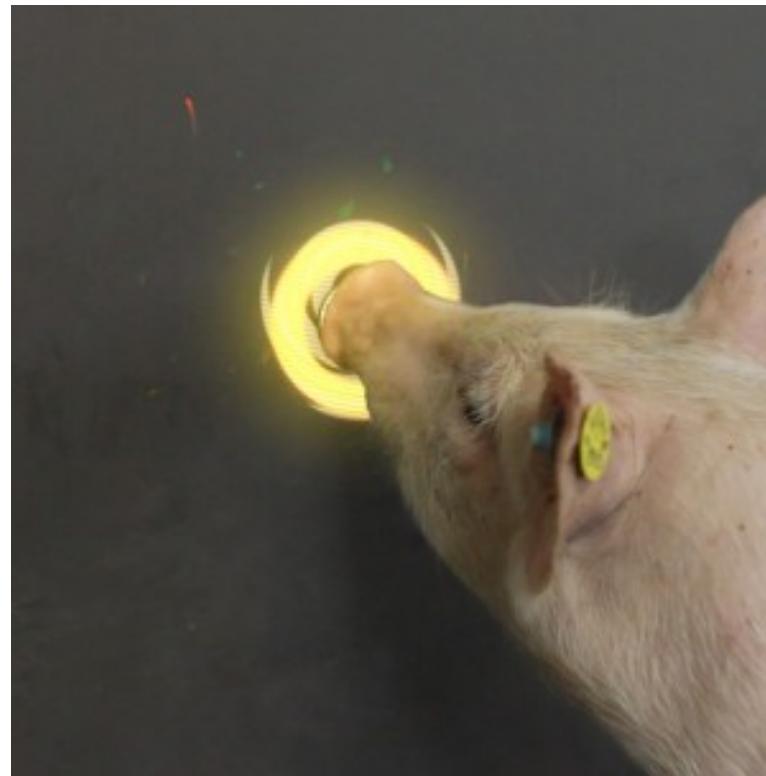


+

Dyr som designmateriale

Play with Pigs

- The *Playing with Pigs* project is researching the complex relationship we have with domesticated pigs by designing a game.



<http://www.playingwithpigs.nl>

+

Dyr som designmateriale

Police bees



[http://blogs.computerworld.com/17828/
police bees for surveillance tracking and buzzzsting biohackers](http://blogs.computerworld.com/17828/police_bees_for_surveillance_tracking_and_buzzzsting_biohackers)

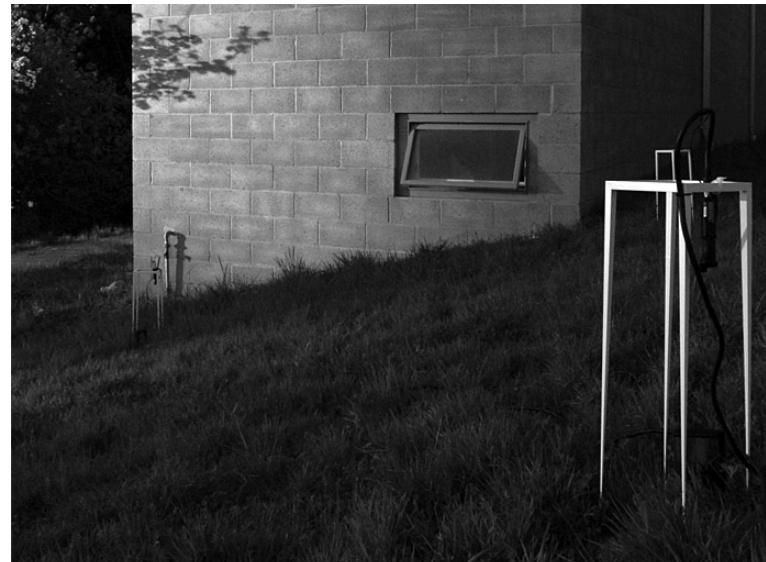
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Dyr som designmateriale

Shona Kitchen



Domestic Wilderness Channel, 2006

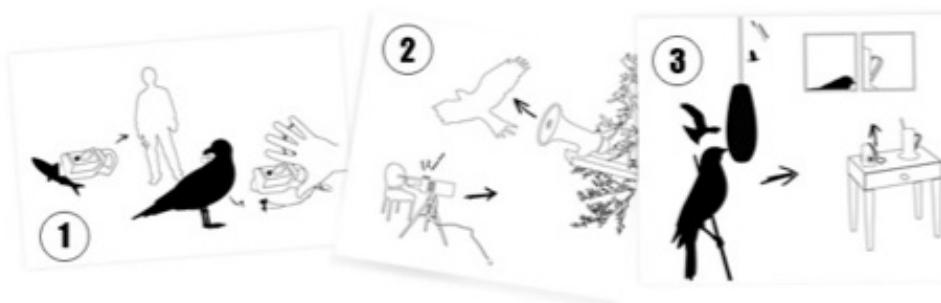


+

Dyr som designmateriale

Tau Lenskjold & Li Jönson

NOT-QUITE COMPANION SPECIES





Opgaven

- I skal vælge om I vil arbejde med
 - Robotter i byrummet
 - Dyr i byrummet

I begge tilfælde handler det om at skabe nye former for interaktion mellem mennesker, robotter og/eller dyr ved hjælp af digital teknologi

Processen

Uge 1

Tirsdag

- Eksperimenter med robotter, deres fysisk udtryk og materialer

Onsdag

- Research i byen – hvilke dyr lever her, hvorhenne hvilket forhold har vi til dem?

Torsdag

- Introduktion til træværkstedet

Freddag

- Introduktion til opgaven

+

Opgaven

Jeppe Hein, 360 Presence



Tau & Li



interaktionsdesign 1

uge 8		Undervisere
mandag	Opstart med Thomas: Introduktion til Interaktionsdesign - networking humans, robots and animals	Thomas
tirsdag	antropomorphism: robots and rubber (arduino 101)	Jacob
onsdag	Kl 10-12: naturvejleder giver en guidet tur rundt i kolding midtby og fortæller om byens dyr	Jacob
torsdag	introduktion til træværksted v. carl emil Jacobsen	Jacob + Carl Emil
fredag	OPGAVEN præsenteres	Jacob
uge 9		
mandag	Selvstudie	Jacob
tirsdag	A Foray into Not-Quite Companion Species v. Tau Lenskjold og Li Jönsson, Danmarks Designskole	Jacob
onsdag	tech upgrade: 3D printer + laser cutter	Jacob
torsdag	arbejde med OPGAVEN / video skitsering v. Jonas	Jacob + Jonas Drotner
fredag	arbejde med OPGAVEN / video skitsering v. Jonas	Jonas Drotner
uge 10		
mandag		Jacob og Thomas
tirsdag	Midtvejspræsentation - deliverables: hver gruppe præsenterer videosketches	Jacob
onsdag	tech upgrade: processing	Jacob
torsdag	konceptudvikling	Jacob
fredag		
uge 11		
mandag	Selvstudie	Jacob
tirsdag	Selvstudie	Jacob
onsdag	finalizing	Jacob + Thomas
torsdag	finalizing	
fredag	præsentation, gennemgang + kritik	

+

2 typer deliverables i dette forløb

videosketch

- Deliverable 1 deadline til midtvejspræsentationen i uge 10
- Videosketch – skal vi bruge til præsentation af koncept og til at træffe endelige designvalg før I laver den funktionelle prototype
- Videosketchen er jeres måde at kommunikere i gruppen, til os og til softwareudviklere

prototype

- Deliverable 2 deadline uge 11 – den endelige præsentation
- Her vil vi udover videoskitsen se en funktionel prototype (eller dele af en)
- Det har betydning for hvordan I danner grupper