Research through and for Design

Design knowledge

- Analysis
- Synthesis

User test

Intelligent systems
Designed Intelligence (DI)

Our research methodology is a particular form of research through & for design. In our opinion, industrial design research should be problem-oriented and design-oriented, based on respect for people and society in general. It should also be scientific and current. Our idea of problem orientation has to do with the strong feeling that systems, products and related services should address society’s problems through technology. Compared to more traditional disciplines like mechanical engineering, electrical engineering and computer science, this means we try to pay more attention to peoples’ actual needs. Industrial design research is not focused on one specific technology. We favor a creative approach to integrate technology in useful interactive systems and products.

Main research questions:

How can we design useful and meaningful dynamic forms of the behavior of intelligent systems, products and related services?
Three Main Research Topics

- **Adaptive Systems** (i.e. bio-signal processing and modelling, learning algorithms, smart material, smart sensors)

- **Autonomous Systems** (i.e. autonomous robots, embodied intelligence, human-robot interaction, mental modelling)

- **Aware Environments** (i.e. cultural computing, dynamic processes, medical applications, sensing behaviour)
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Department Industrial Design

Assistant Professors of the DI Group

- Rene AHN
  Master in Physics
  PhD in Computer Science
  Interests in Embodied Intelligence
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- Frank DELBRESSINE
  Master in Mechanical Engineering
  PhD in Mechanical Engineering
  Interests in Design and Manufacturing
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  PhD in Mathematics and Physics
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  Interests in Multimodal Systems
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- Christoph BARTNECK
  Master in Technological Design
  PhD in Industrial Design
  Interests in Human-Robot Interaction
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- Wei CHEN
  Master in Electronics
  PhD in Electrical Engineering
  Interests in Sensor Technology
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- Ben SALEM
  Bachelor in Architecture
  PhD in Electrical Engineering
  Interests in Gaming & Entertainment
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- Karl TUULS
  Master in Computer Science
  PhD in Computer Science
  Interests in Adaptive Agents

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Master in Museum Studies
System Designer
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Sam NEMETH
Film Producer
Lecturer/Coach

Othmar SCHIMMEL
Master in Musicology & Sonology
PhD in Acoustic
Interests in Sound Design
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Peter PETERS
Researcher, Lecturer
Office HG 2.59

Laboratories:
- Bio-Feedback Lab
  HG 3.46
- CoSy Lab
  HG 2.29
- ALICE Lab
  W-Hal
- VISION Studio
  HG 10.84
- /d-search lab's
  e.g. HG 3.44
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Department Industrial Design

PhD Students of the DI Group

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Martin SAERBECK
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PhD candidate
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Office HG 3.58

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Project ALICE

- **Goal**: design of a new type of user experience
- **Strategy**: design and construction of an augmented reality environment
- **Partners**: Microsoft Research Cambridge (UK)
- **Researchers**: Matthias Rauterberg, Jun Hu, Ben Salem, Christoph Bartneck
- **Potential applications**: experimental platform for cultural computing

ALICE in Cultural Computing Lab in W-Hal

Stage 1: in the park
Project Birth-Simulator

- **Goal**: design of a new type of mannequins
- **Strategy**: design and construction of an augmented reality simulator
- **Partners**: Medisch Maxima Centrum, Eindhoven
- **Researchers**: Loe Feijs, Sidarto Bambang-Oetomo, Jun Hu, Frank Delbressine
- **Potential applications**: training tool of nurses and physicians

Project Brain Interface

- **Goal**: design feedback systems based on bio-signals such as EEG
- **Strategy**: use control theory and techniques from gaming
- **Partners**: SPS group (TU/e Dept. E), The Mindconnection (Maastricht)
- **Researchers**: Loe Feijs, Emilia Barakova, Christoph Bartneck, Peter Peters
- **Potential applications**: ADHD feedback, relaxation, in future also autism, epilepsy, meditation
Project **Games for Autistic Kids**

- **Goal:** Design games that provoke explorative and social behavior in autistic children and embed them in an multiagent interactive platform
- **Strategy:** Use findings from developmental psychology, sociology
- **Researchers:** Dr. van Leeuwen, St. Marie Hospital, US
- **Potential applications:** Training of autistic patients, Multiagent and complex system research.

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Project **MARS-500**

- **Goal:** design a diagnostic tool for emotional crew status
- **Context:** European Space Agency / NWO / SRON
- **Industrial Partners:** Russian Space Agency
- **Researchers:** Matthias Rauterberg, Karl Tuyls, Daniel Hennes
- **Potential applications:** new concepts for analysing communication
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Project Neonatal Monitoring

- **Goal**: design of a new generation of neonatal monitoring systems
- **Strategy**: design and implement non-invasive neonatal monitoring
- **Partners**: Medisch Maxima Centrum, Eindhoven
- **Researchers**: Loe Feijs, Sidarto Bambang-Oetomo, Wei Chen
- **Potential applications**: Health monitoring in NICU and at home

Project SEAT

- **Goal**: design the next generation of seats to enhance passengers comfort
- **Context**: European Project Consortium
- **Industrial Partners**: Thales (F), StarLab (SP), AIX (SP)
- **Researchers**: Matthias Rauterberg, Ben Salem, Hao Liu, Chee Fai Tan
- **Potential applications**: new concepts for user adaptation, bio signals and feedback, automotive
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Thank’s for your attention