

MASTER'S STUDIES INDUSTRIAL DESIGN

MEDICAL DESIGN M.A.

*DESIGNING THE
FUTURE REQUIRES
PROFESSIONALISM*

DESIGNING THE FUTURE REQUIRES PROFESSIONALISM

The ability to actively and effectively design perspectives of our future world, ways to sustainability and above all, effectively concretise them, is becoming increasingly important for designers. In the context of transformation processes the design disciplines can play out a great strength and concretise designs, concepts and images that can be used as references for desirable technological, social and cultural change.

This requires a high degree of critical attitude, sensitivity and precision, in short: a professional basic set-up in which conceptual strength, detailing and substance interact at a high level. In the master's program in Industrial Design at the Muthesius University of Fine Arts and Design we teach ways to achieve such a competence profile.

DESIGNING FUTURE PERSPECTIVES:

COMPETENCES FOR THE DESIGN OF VISIONARY PROCESSES AND PRODUCT SYSTEMS

We understand the thematic foundation of medical design as a principle of design beyond the limitations of medical technology and with a special interest in the realization of sustainable living conditions in the sense of "One Health" (human, environment, animal). For this, you develop an expanded understanding of the human being and social constellations. Within the framework of project work, you deepen comprehensively into the thinking, designing and communicating innovative processes, systems and interfaces. And also taking the structure, details and quality of products into consideration, required for circular economy and resource conservation.

The connection with the "Interface Design" master's degree course also has a unique position and is, in our view particularly trend-setting, since products are increasingly being seen as multi-layered, networked information carriers and interaction mediators.

DESIGN AND RESEARCH

The supervision of project work with us is individual and far-reaching. Students move in a distinctly networked context both inside and outside the university. In Kiel we are surrounded by outstanding research activities in which we participate, e.g. in the CAPTN Initiative or in the Cluster of Excellence "Precision Medicine in Chronic Inflammation".

We continuously address the connections and interactions between research and design in varying interdisciplinary project formats. In the research project "Sustainable Mobility Transformation" we were funded by the EKSH for a longer period of time.

We establish research assistants, as recently in the area of "Materials and Sustainability". Cooperations and exchange programmes exist with TU Delft, NCKU Tainan and Kobe Design University, among others.

UNDERSTAND NEW. DESIGN WITH COURAGE.

We offer profound access to knowledge and questions of the "Health and Life Sciences" within the framework of our studies. On the other hand, students work on many related topics of the future human living environment and social change.

The focus here is on issues of the environment and sustainability, public and private space, mobility and logistics, questions of future human images and new technologies. We are very interested in critically questioning established patterns of thought and breaking new ground. Courage for experimental openness, willingness to take risks and radicality are concerns, to which we would like to motivate you as designers.

Courage pays off: works of students have not only won a large number of important national and international prizes and awards in recent years. Our graduates have also been able to successfully establish themselves professionally in a wide variety of contexts.

*UNDERSTAND NEW.
DESIGN
WITH COURAGE.*

CEVEC

— Gabriel Müller

PROJECTS

● INSERTION OF A CENTRAL VENOUS CATHETER IN EMERGENCIES

“Cevec” enables paramedics to quickly and safely administer medication by inserting a central venous catheter in emergency situations. Its minimal steps and tools ensure a fast application, and the distinguishable equipment makes it easy to use. It considers the specific conditions of emergency situations such as unsteady surroundings, untrained users and time pressure.

● AWARDS

- _ IF Design Student Award
- _ Core 77 Design Awards Student Notable
- _ James Dyson Award Winner [Germany and International Top 20]
- _ Shown at German Design Award Exhibition
- _ Selection Dubai Global Grad Show





PILUM

— Konstantin Wolf

● FOREST MONITORING

“Pilum” is a rod sensor which is used in forestry to refine and monitor forest protection measurement. By analysing pheromones and resin particles of bark beetles in the air it provides precise data on the pest’s location and behavior during its reproductive cycle. This data is available on a publicly accessible app, enabling informed forest treatment.

● AWARDS

- _ iF Design Student Award
- _ National Winner of the James Dyson Award (1st Place)
- _ Mia Seeger Prize — Grand Prize





PAPER PREGNANCY TEST

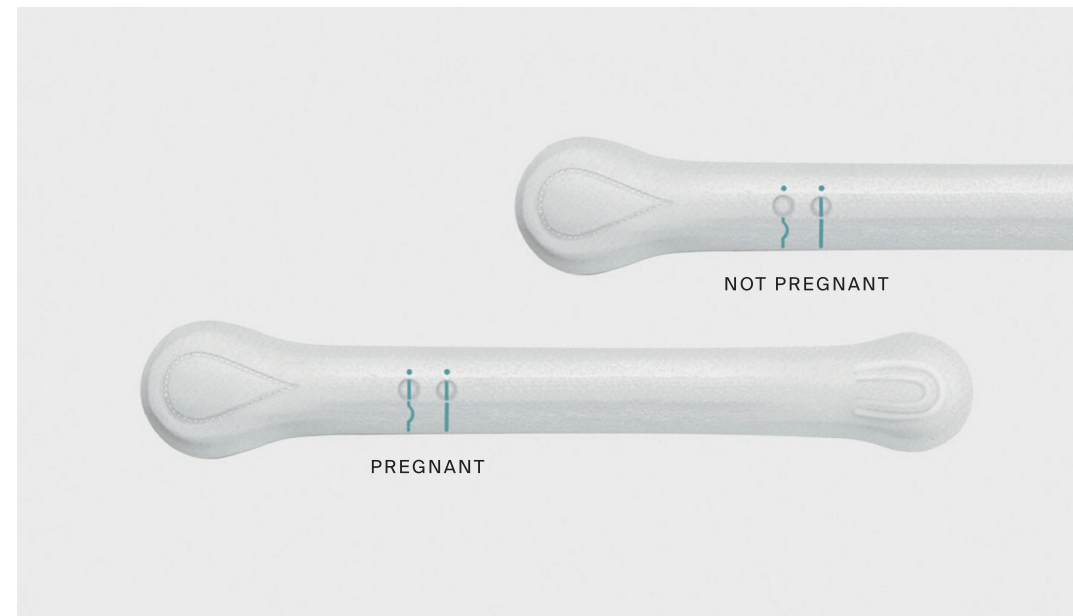
— Yue Zhao

ZERO WASTE PREGNANCY TEST

Million tons of plastic waste through pregnancy tests are the last thing people want to think of when using them. The “Paper Pregnancy Test” is a disposable, plastic-free product made of recycled paper. The test function is as simple as conventional ones: hold the test strip in the urine stream and wait for the result to appear as stripes.

AWARDS

- _ Winner of the Federal Ecodesign Award
- _ Mia Seeger Prize — Recognition





WATERePUBLIC

— Jadwiga Slezak

PROJECTS

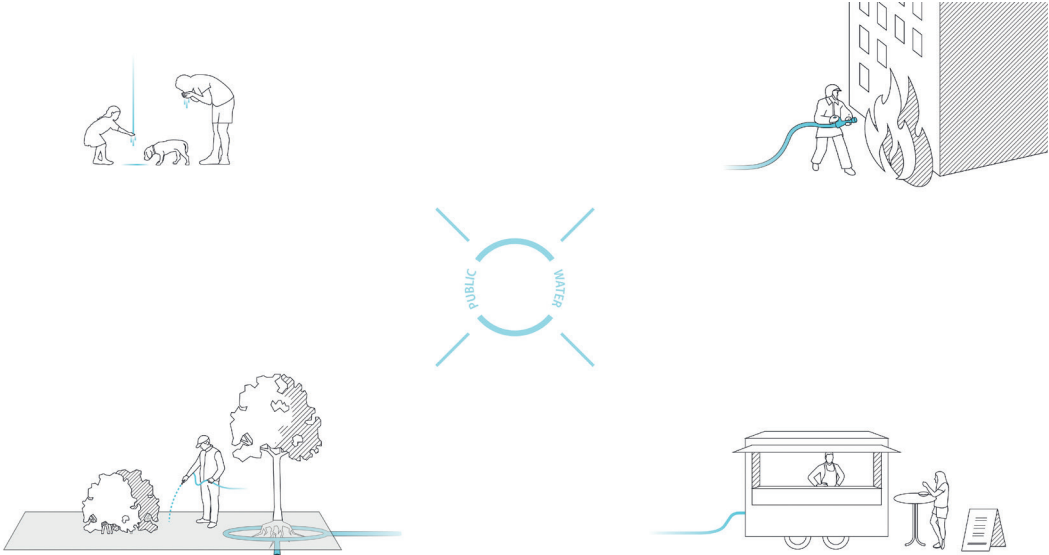
● PUBLIC WATER

“WATERePUBLIC” repurposes fire hydrants as universal water sources for people and animals, promoting community participation, sustainability, and enhancing quality of life. Setting a sign that public spaces have to be rethought in times of climate change, it provides constant access to water for green spaces, offices and citizens, without the need for standpipes or transport.

● AWARDS

- _ Main prize at the BraunPrize
- _ Mia Seeger Prize — Recognition
- _ Lucky Strike Junior Designer Award



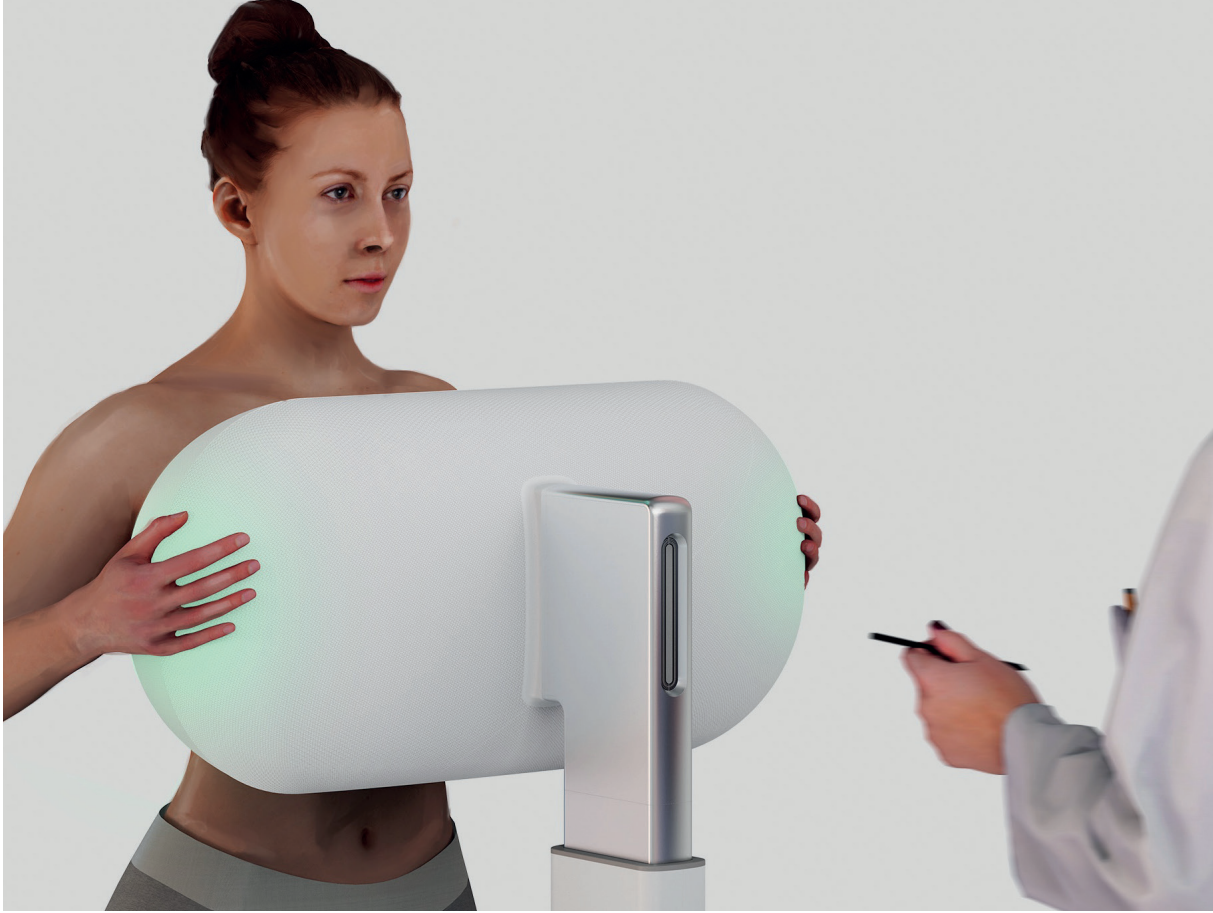
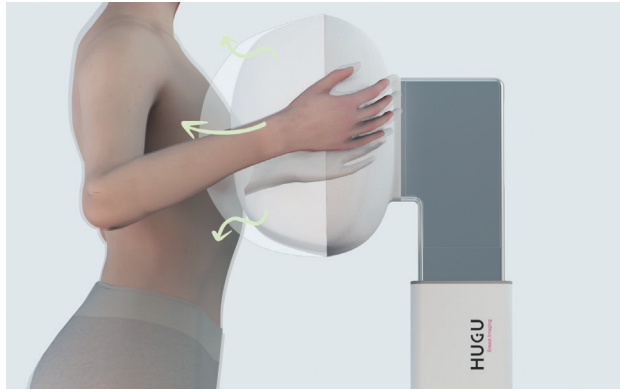


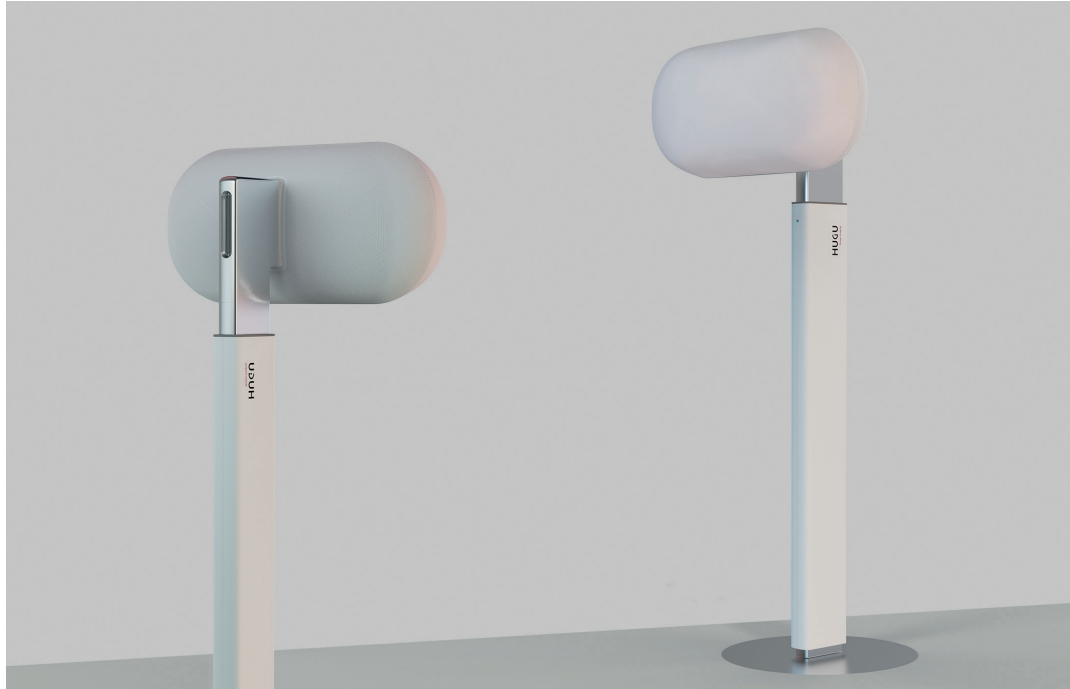
HUGU

— Qianhui Zhou

● HIGH-PRECISION, PAINLESS BREAST CANCER SCREENING

Late detection and misdiagnosis burden women in breast cancer diagnosis. “HUGU” applies soft robotics and embedded photoacoustic imaging to create a more comfortable experience. It is pressed against the upper body like a cushion and has AI support for diagnosis and monitoring.





ORMO

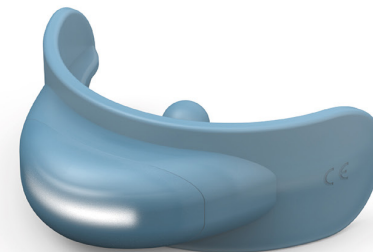
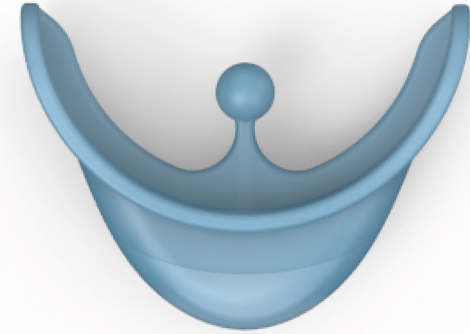
— Meret Oppermann

● ORAL MOTOR SKILLS

ORMO supports children and adults with speech impairments in compensating for their speech and swallowing deficits as part of a speech therapy program. The tongue joystick is used as an adjunct to speech therapy aimed at strengthening the oral musculature — specifically the muscles of the lips and tongue. ORMO offers a gamified training experience featuring a digital interface designed to be both enjoyable and easy to use.

● AWARDS

- _ Arthur-Petersen-Prize, Muthesius Academy of Fine Arts
- _ Mia Seeger Prize — 1st place
- _ New Talents Award, Verband Deutscher Industriedesigner (VDID) — 1st place





IMPULSE

— Bashar Zapen

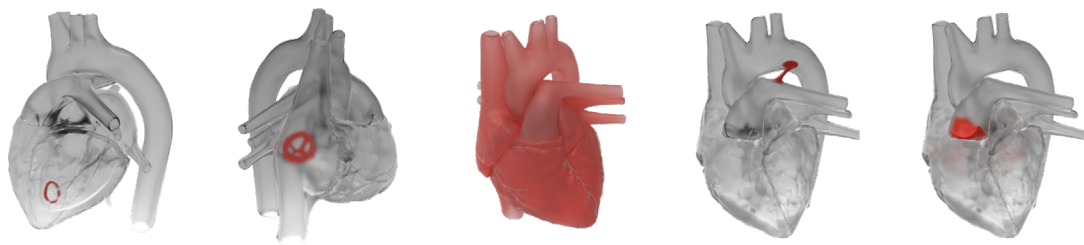
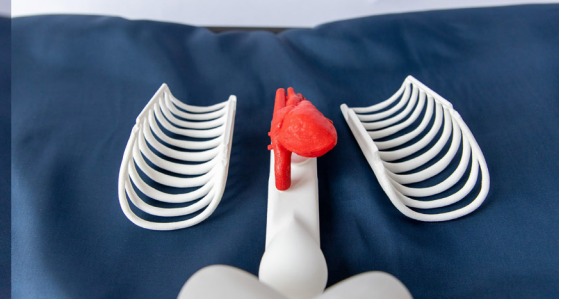
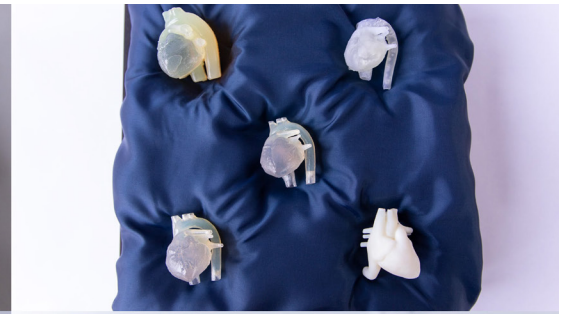
PROJECTS

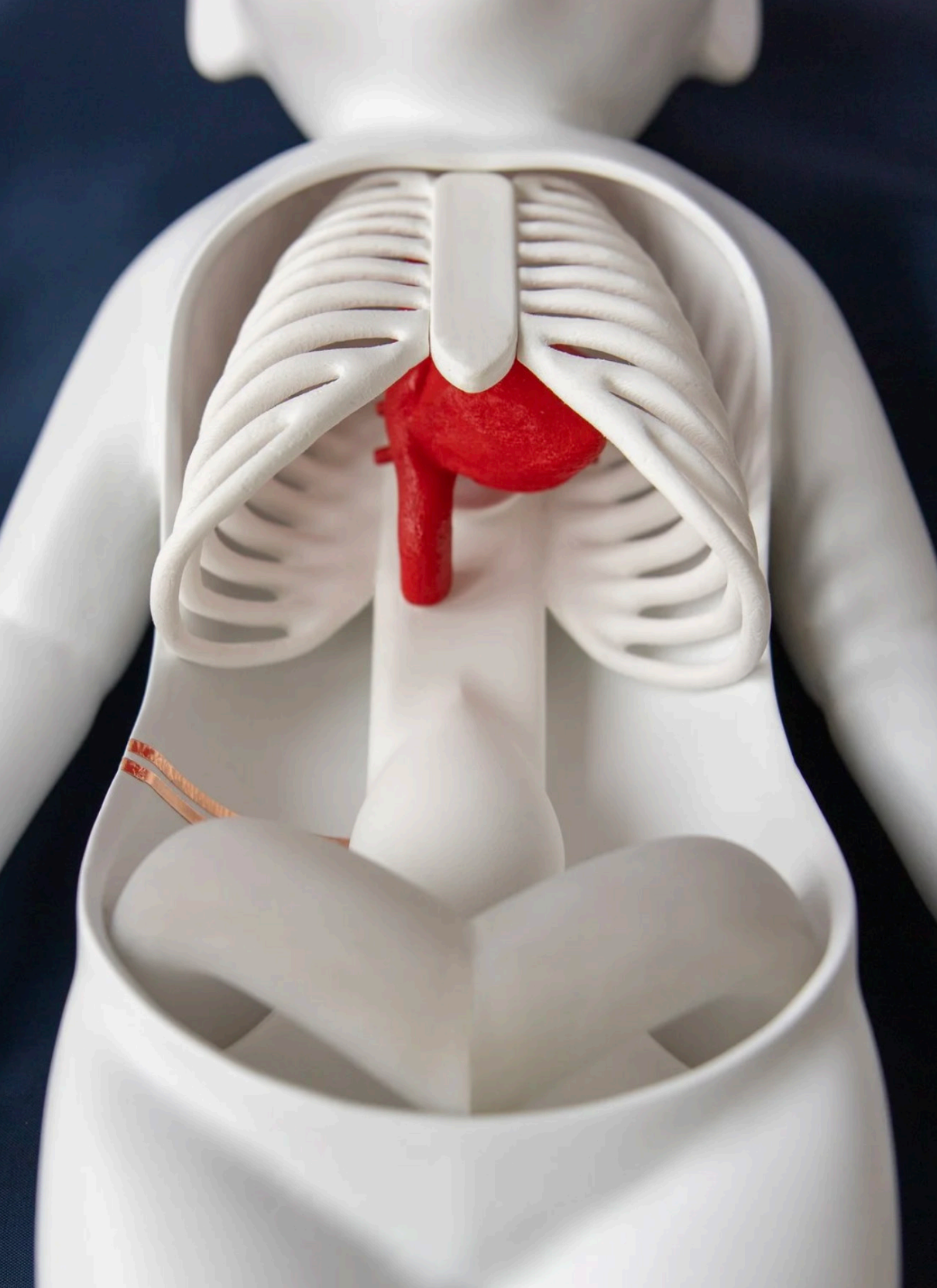
● SIMULATION TRAINING MODEL FOR PEDIATRIC HEART SURGERY TRAINING

- ImPulse aims to establish a new paradigm for pediatric cardiac surgery training. Currently, the only way for trainee surgeons to practice pediatric surgery is to operate on actual patients. Unfortunately, this exposes patients to unnecessary risk; thus, senior surgeons hesitate to let trainees participate. Hence the need for simulation training modules that pose no threat to patients.
- ImPulse offers trainees a high-fidelity simulation training module called Janān, simulating the various steps of pediatric cardiac surgery from start to finish in a safe environment that is consistent, repeatable, and uses the same tools and equipment as actual surgery.
- Janān and its internal modules are 3D printable, with heart modules representing common congenital heart deformities that all pediatric cardiac surgeons should be able to treat. This is especially beneficial for economically and politically constrained areas where it is otherwise difficult to access medical training devices.

● AWARDS

- _IF Design Student Award
- _Selection Prototypes for Humanity (Dubai)



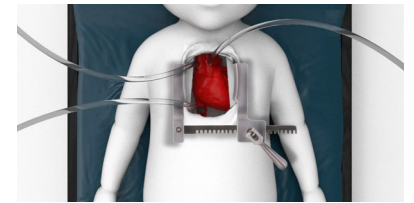


01.



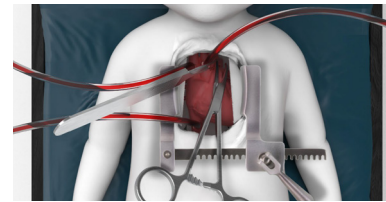
Trainees start practising by incising the skin and cutting the breastbone.

02.



They later connect the heart to a heart-lung machine to make it safe to handle.

03.



Once the heart is still, trainees can practice correcting the simulated congenital heart deformity.

04.



After treating the heart, the tubes are removed, and the breastbone is sewn shut.

05.



Finally, trainees stitch the wound to finish the operation.

NEXTSTEP

— Katrine Struve and Fynn Stolt

● AN INTEGRATED MOBILIZATION SYSTEM FOR INTENSIVE CARE MEDICINE

NextStep is a smart mobilisation system designed to enable early, safe mobilisation of intensive care patients.

By integrating AI-assisted monitoring with physiologically adaptive support, it identifies clinically appropriate times for movement and temporarily takes over medical care during mobilisation. Floor projections and stabiliser sensors guide and monitor the patient, while personal audio options enhance comfort.

NextStep reduces workload for clinical staff, encourages autonomy, and improves outcomes by embedding movement into routine ICU care.

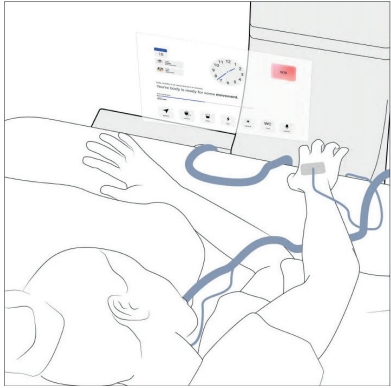
- Supervising lecturers:
- Prof. Detlef Rhein
 - Dr. Peter Nydahl (UKSH Kiel)

● AWARDS

- _ Selection Prototypes for Humanity (Dubai)



● MOBILIZATION PROCESS



01. Resting

The patient receives information via a bedside holographic display as soon as her vital signs indicate readiness for mobilization. With her consent, the nursing staff is notified to initiate the process.



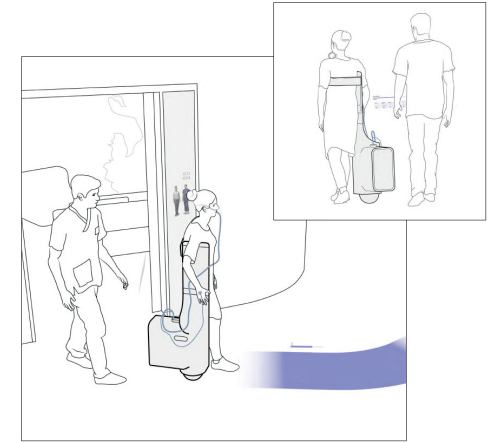
02. Sitting

The staff assists the patient in sitting up at the edge of the bed. NextStep disconnects from the ICU main unit, moves into position at her side, and activates the assistance arm. Mobilization can be started and stopped via voice control.



03. Getting Up

Once the patient feels safe and ready, the supported standing-up process begins. At this point, NextStep takes over medical care, and real-time vital signs are displayed as a hologram for intensive care staff.



04. Walking

A floor projection provides visual guidance and real-time activity recommendations. A stylized door interface informs potential Visitors that the patient is currently undergoing mobilization.

A HOLISTIC HUMAN-CENTERED APPROACH TO COLONOSCOPY

— Group Project

PROJECTS

INDUSTRIAL DESIGN — MEDICAL DESIGN (M.A.)

FUTURE COLONOSCOPY

The Japanese company Olympus is a global leader in the field of endoscopy technology. The collaboration between the M.A. Medical Design program and the User Experience Center at Olympus's European headquarters in Hamburg marks the company's first partnership with a design university in Germany.

As a "Future Vision" initiative, the project focused on gastroenterology, specifically addressing colorectal cancer screening (colonoscopy). The objective of this collaborative project was to develop design strategies capable of establishing endoscopy as a positive symbol of the societal importance of colorectal cancer screening.

Still, too few people — particularly those in the over-50 age group — undergo this examination. What potential exists across the realms of communication, process design, interaction, and technology to transform the colonoscopy into a pleasant, clear, and appealing experience?

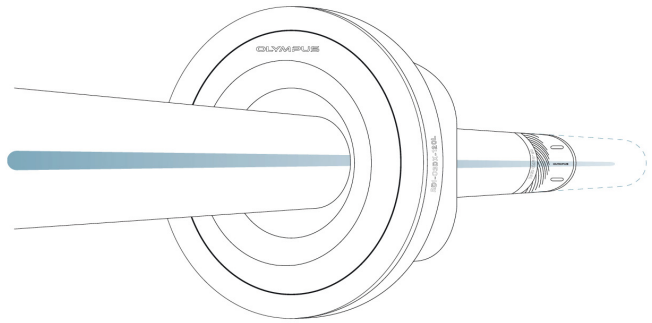
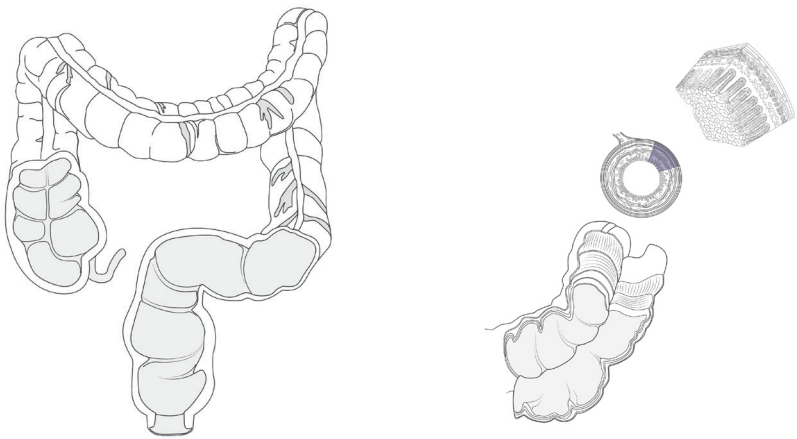
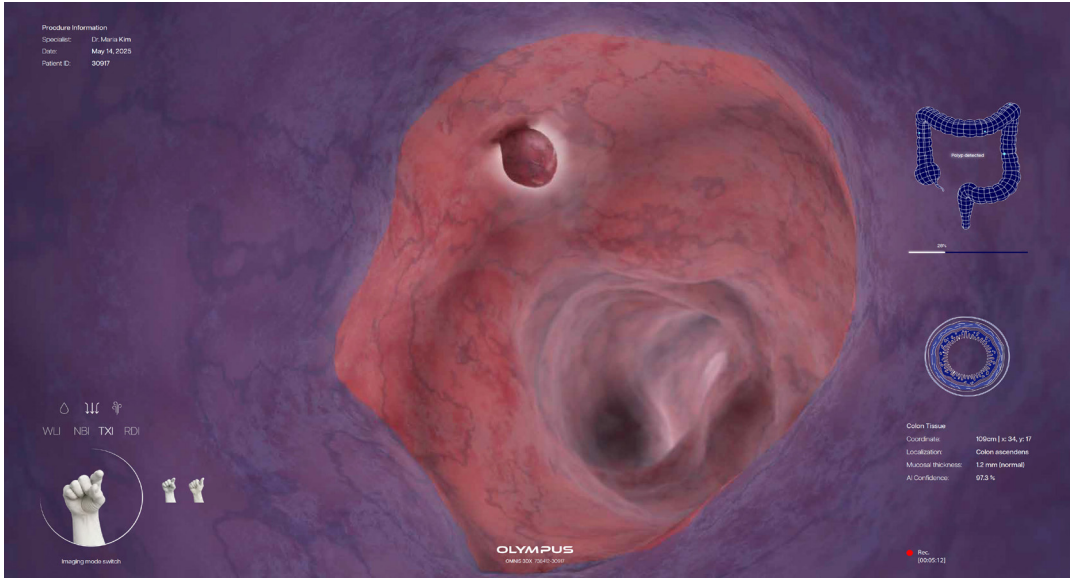
Two project groups developed design concepts encompassing campaigns, educational materials, bowel-preparation kits, endoscopy technologies, robotic assistance, technical imagery, AI enhancements, and new qualities of interaction designed to benefit both physicians and patients alike.

SUPERVISION OLYMPUS

- Danny Stoermer
- Lisa Fühner
- Dennis Bernhardt

STUDENTS

- Lisa Dethloff
- Jan-Phillip Gutz
- Jessica Kaufmann
- Jisoo Kim
- Laura Müller
- Katrine Struve





NEXA

— Group Project

PROJECTS

● ULTRA SIMPLE AUTONOMOUS FERRY

Waterside metropolises are a constantly growing habitat for humanity. Thus, there is a global need to develop more efficient and environmentally responsible transportation solutions. A central pillar of this future mobility are tailor-made and intelligent waterborne public transportation concepts that reduce car traffic and contribute to climate neutrality. NEXA is a cost-sensitive, high-quality and highly attractive solution for an autonomous ferry, Fundamental requirements were addressed, such as structure, materiality, haptics, information transfer, security perception and atmosphere. In addition to the structural development an innovative mobility system which integrates other public or private means of transportation, a new branding strategy and a quality tag which allows for the brand to be positioned world-wide as reference for innovation in the autonomous mobility industry were developed.

● SUPERVISING LECTURERS

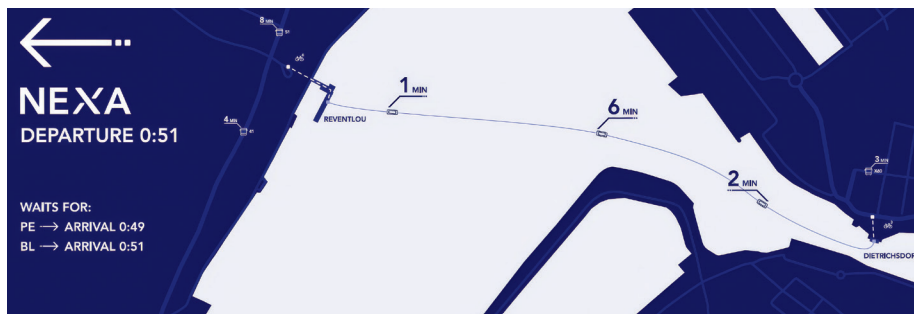
- Prof. Detlef Rhein
- Prof. Dr. Dirk Nowotka

● STUDENTS

- Alicia Kastner-Pöhlmann
- Hannes Latour
- Leon Lüneburg
- Lisa Dethloff
- Niclas Hedemann

● AWARDS

- _ Green Product Award Winner (Mobility Category)





(01.)

EXHIBITIONS

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(04.)

MEDICAL FRIDAY

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(02.)

INFOGRAPHICS

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(05.)

WORKSHOPS

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(03.)

*EXPERIMENTS
& PROTOTYPES*

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(06. – 07.)

*COURSE OFFER
& APPLICATION*

P. 108 – 111



1.1

01. EXHIBITIONS

1.1 – 1.6

Annual exhibit

1.7 Digital exhibition space



1.2

1.3





1.4

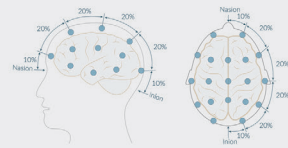


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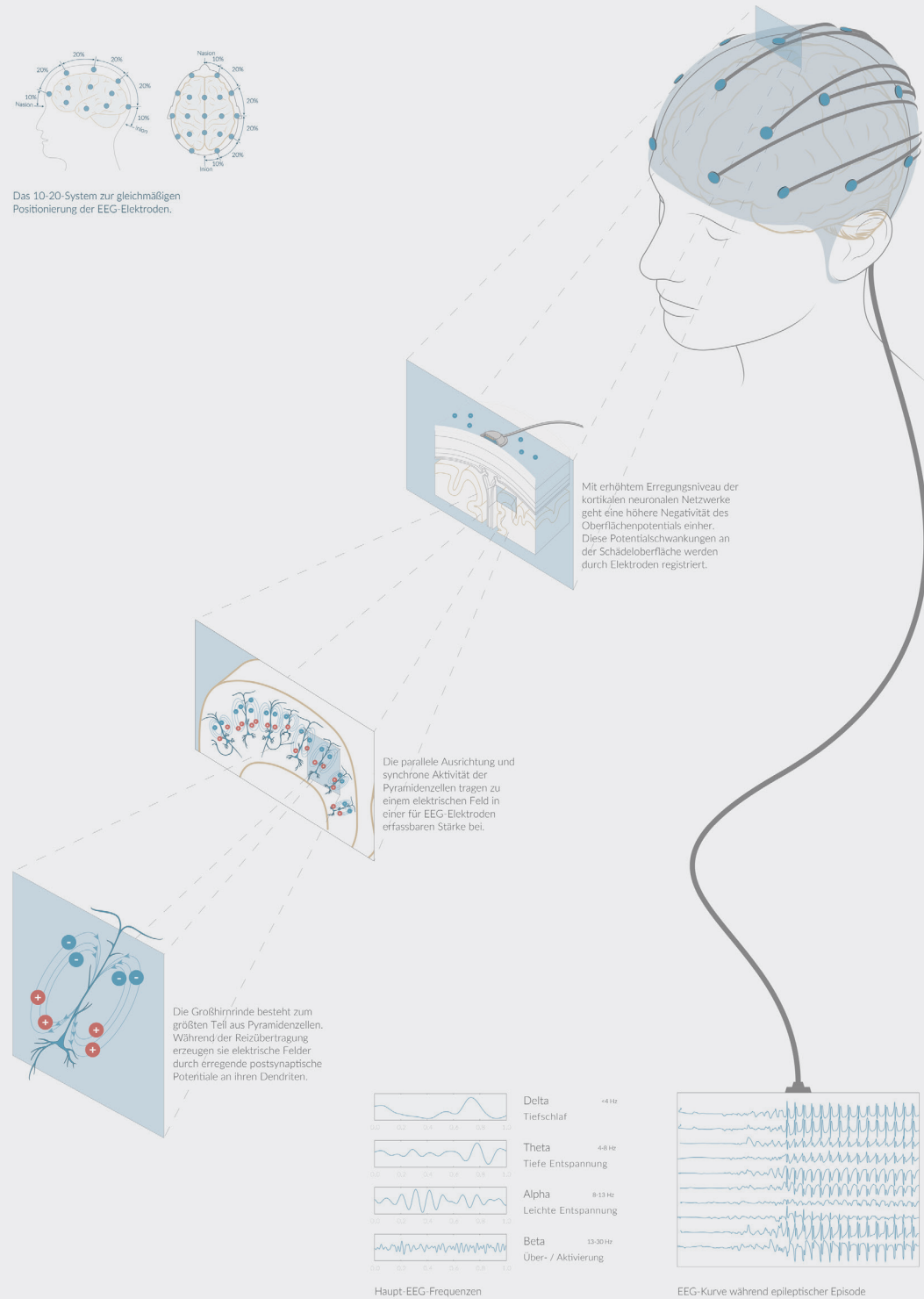
1.6







Das 10-20-System zur gleichmäßigen Positionierung der EEG-Elektroden.



02. INFOGRAPHICS

- 2.1 Visualising the Principle of EEG
– Olga Schikurski
- 2.2 Sense of Touch
– Jessica Kaufmann
- 2.3 New Objects of Desire
– Jadwiga Slezak
- 2.4 Visualisation of the use process of a hypothetical product
– Bo Kong
- 2.5 Key image of the use process
– Bo Kong

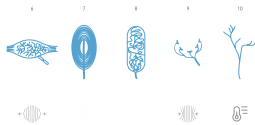
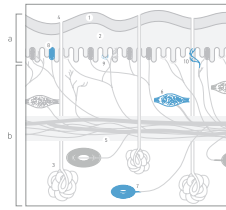
SENSE OF TOUCH

Jessica Kaufmann
Medical Design WiSe 24/25
Prof. Rhein

Aufbau Haut

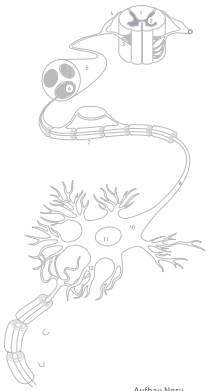
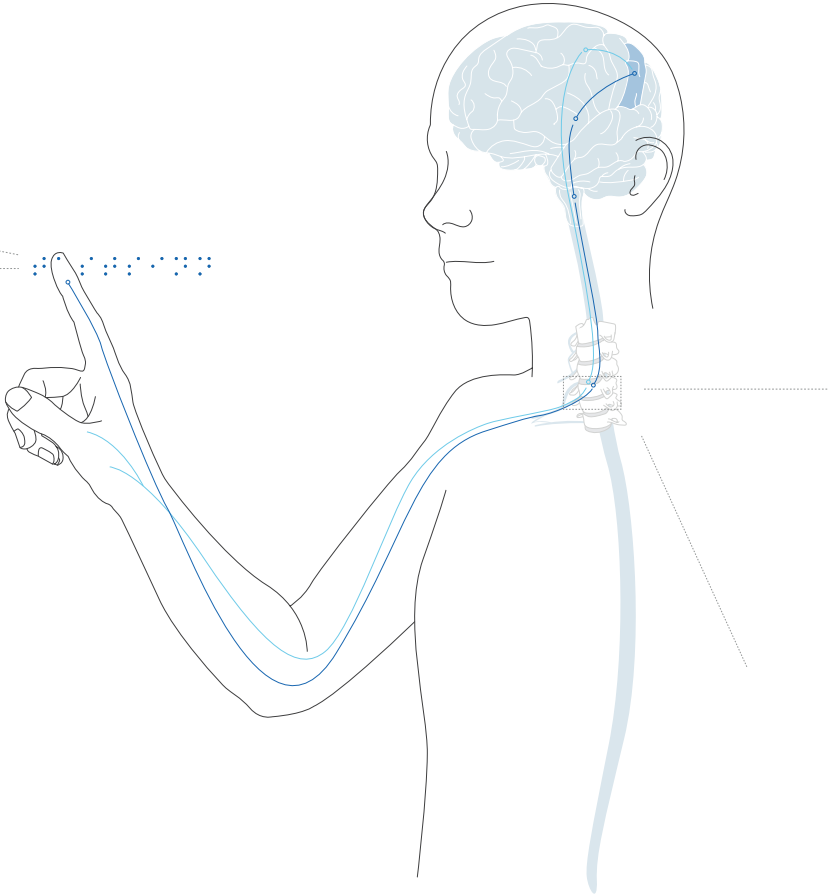
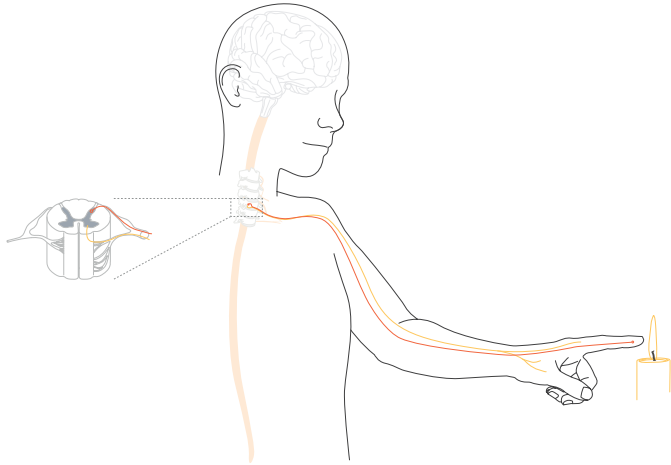
- 1 Hornschicht
- 2 Keimschicht
- 3 Schweißdrüse
- 4 Schweißpore
- 5 Nerv
- 6 Ruffini-Körperchen
- 7 Pacini-Körperchen
- 8 Meissner-Körperchen
- 9 Merkelzell-Rezeptoren
- 10 freie Nervenenden

a Epidermis
b Dermis



Reaktionswege: Reflexmechanismen vs. Handlungsprozesse

- Reizaufnahme
- Weiterleitung über periphere Nerven
- Verarbeitung im Rückenmark
- Aufstieg über die Hinterstrangbahnen ins Gehirn
- Thalamus (Zwischenhirn) als Umschaltstation
- Verarbeitung im somatosensorischen Kortex
- Signalübertragung zum motorischen Kortex
- Abstieg über die Pyramidenbahn
- Austritt über die Vorderwurzel
- Muskelreaktion

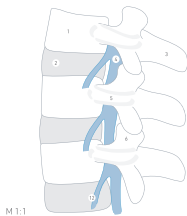


Aufbau Nerv

- 1 Weiße Substanz
- 2 Graue Substanz
- 3 Vorderwurzel
- 4 Hinterwurzel
- 5 Peripherer Nerv
- 6 Nervenfaserbündel
- 7 Schwannsche Zelle
- 8 Axon
- 9 Neuron
- 10 Zellkörper
- 11 Zellkern
- 12 Dendriten

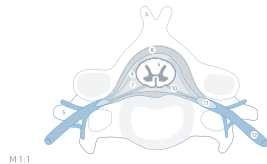
Aufbau Wirbelsäule

- 1 Wirbelkörper
- 2 Bandscheibe
- 3 Dornfortsatz
- 4 Rückenmark
- 5 Querfortsatz
- 6 Gelenkfortsatz
- 7 Gehirn-Rückenmark-Flüssigkeit
- 8 Epiduralraum
- 9 Hinterwurzel
- 10 Vorderwurzel
- 11 Spinalganglion
- 12 Spinalnerv



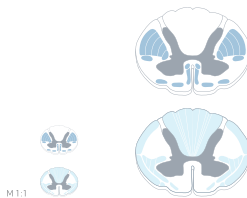
M 1:1

Wirbelsäule



M 1:1

Rückenmark und Wirbelkanal im Querschnitt



M 1:1

Rückenmark im Querschnitt

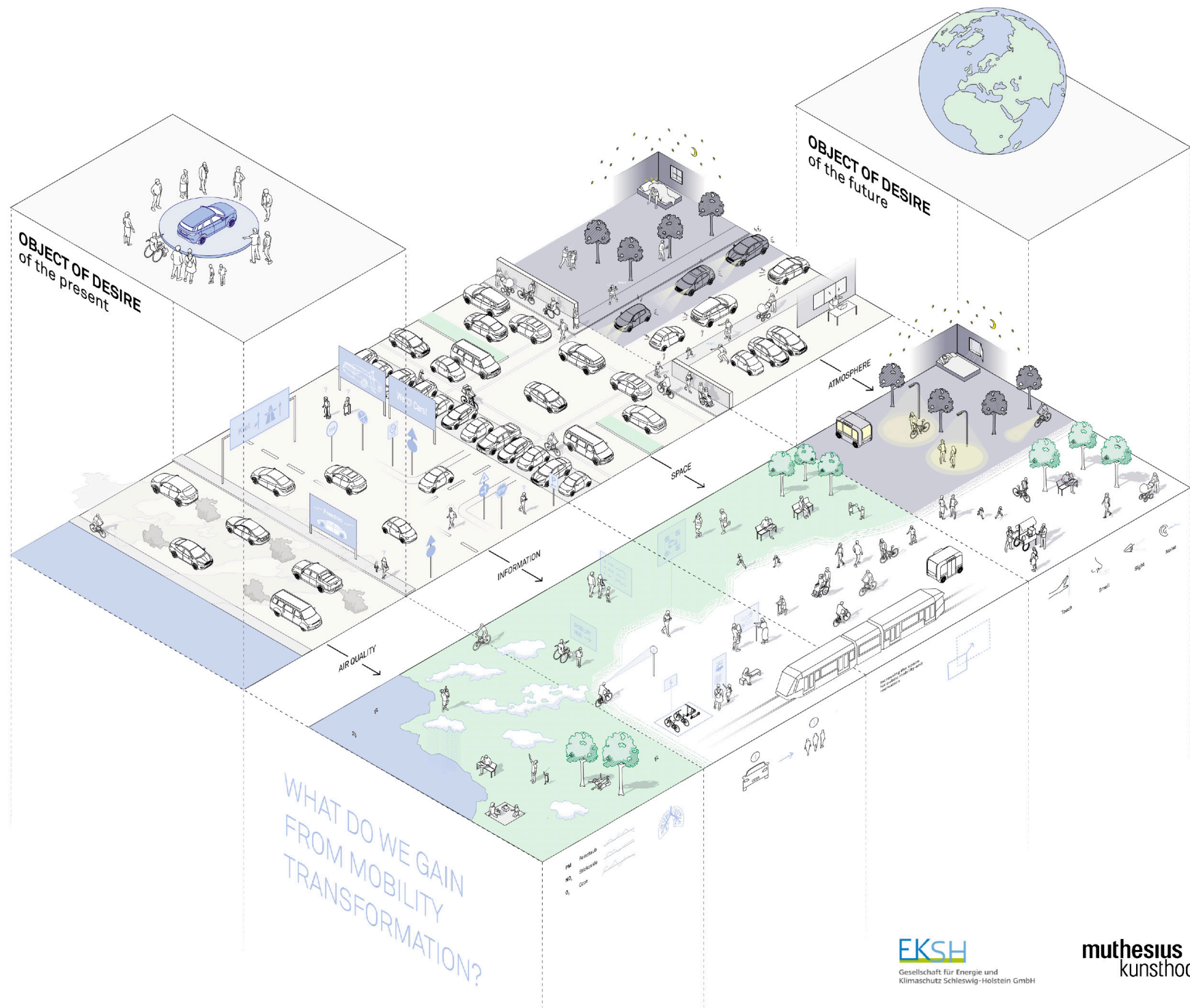
Signalweiterleitung

Aufsteigende Rückenmarksbahnen leiten sensorische Informationen wie Berührung, Schmerz und Temperatur ans Gehirn. Absteigende Bahnen übertragen motorische Signale zur Muskulatur und steuern Bewegungen sowie Reflexe.

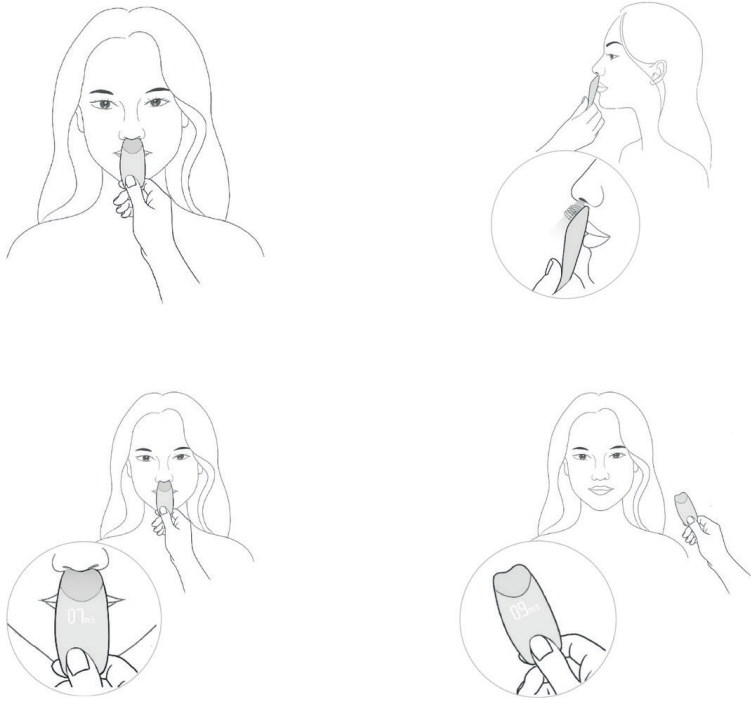
- absteigende Bahnen ("vom Gehirn weg")
- aufsteigende Bahnen ("zum Gehirn hin")

Geschwindigkeit der Signalweiterleitung





● 2.4



● 2.5





3.1

03. EXPERIMENTS & PROTOTYPES

- 3.1 Detail-oriented CAD modelling
- 3.2 Disassembling bluetooth headphones
- 3.3 Casting silicon – plastics workshop



[092–093]

● 3.3





• 4.1

04. MEDICAL FRIDAY

- 4.1 Student documents of how surgical tool is cleaned and sorted with the help of robots
- 4.2 Storage of surgical tool (UKSH)
- 4.3 Explanation of head blocks by one of the senior doctors in the central A&E department (UKSH – trauma unit)
- 4.4 Equipment in the A&E department
- 4.5 Practising the insertion of a cannula for venous access





4.3



4.4



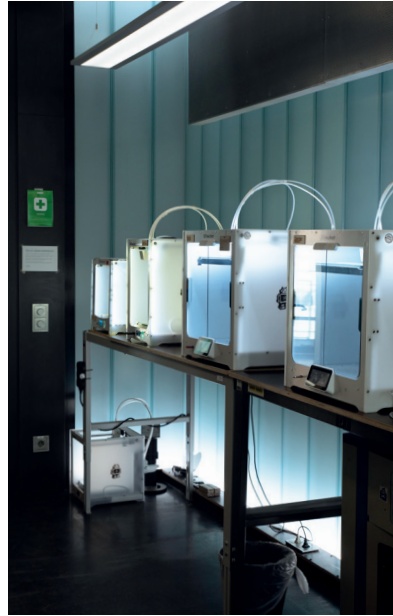
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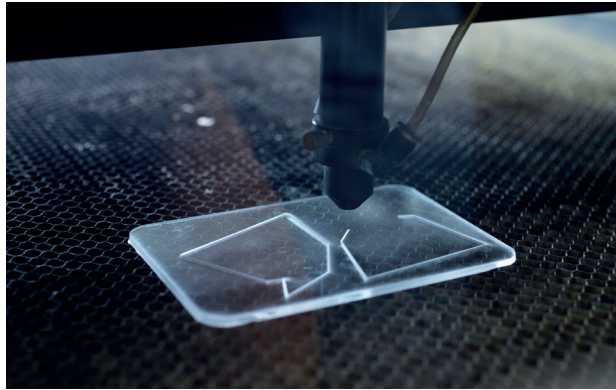
05. WORKSHOPS

The new workshop building is the central location of the Muthesius University of Fine Arts and Design. Experiments and realisations in different contexts are possible here. The wood, metal and plastic workshops provide classical work processes as well as the latest CNC and rapid-prototyping technologies. Moreover, this building houses the graphics, print and ceramics workshops, the computer lab, the interface prototyping workshop and the material research lab.

- Interface Prototyping
- Wood Workshop
- Metal Workshop
- Plastics Workshop
- Rapid Prototyping
- Ceramics Workshop
- Print Workshop
- Material Research Lab







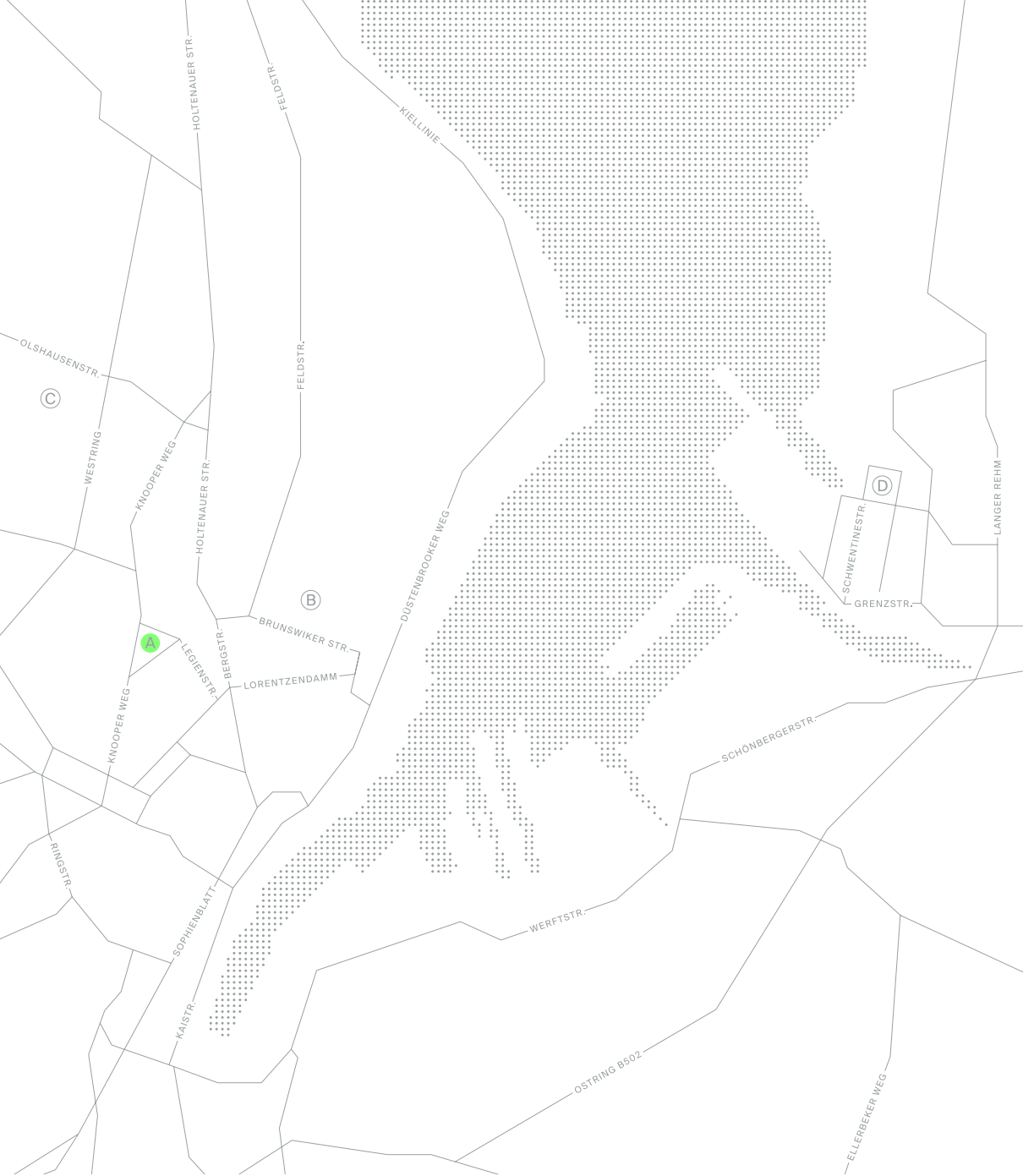
06. COURSE OFFER

The range of courses includes an in-depth spectrum of specialist knowledge, methods and techniques with which creative action and critical reflective competence are individually developed. This also includes courses offered by the Institutes of Art, Design and Media Studies and the Centre for Media.

The 1st semester is a basic semester for the development of strategies of information transfer and process- and context-oriented design. It also forms the basis for developing the ability to “re-understand” when defining project topics.

The course of study in the following semesters within the framework of the inter-semester “Master Studio” is optionally individual or group-oriented, interested in relevant future and research questions, internationally oriented (including cooperation with the TU Delft) and interdisciplinary. For the final thesis project, there is the possibility of already working out the theoretical and conceptual foundations in the 3rd semester (1-year thesis).

- Basics of Medicine
— Hon. Prof. Dr. Claudia Schreiber
- Anatomy
- Design Theory
- Sociology
- User Research
- Aesthetics
- Product Planning
- Design Management
- Service Design
- Creative Suite + After Effects
- Advanced CAD (SolidWorks)
- Human Computer Interaction
- Material & Sustainability



- A** MUTHESIUS UNIVERSITY OF FINE ARTS AND DESIGN
B UNIVERSITY HOSPITAL SCHLESWIG-HOLSTEIN
C CHRISTIAN-ALBRECHTS-UNIVERSITÄT ZU KIEL
D FACHHOCHSCHULE KIEL, UNIVERSITY OF APPLIED SCIENCE

[110–111]

07. APPLICATION

The master's study programme begins in the summer term and the winter term and is designed as a four-year course including the thesis. There are two dates for applications: for the winter term, 15th May, for the summer term, 15th November.

Questions can also be addressed to Prof. Detlef Rhein:

- RHEIN@MUTHESIUS.DE

All further information can be found at:

- EN.MUTHESIUS-KUNSTHOCHSCHULE.DE/APPLICATIONS/
- MUTHESIUS-KUNSTHOCHSCHULE.DE/DER-WEG-INS-STUDIUM/

– INTERESTED?
THEN APPLY NOW!

IMPRINT

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Medical Design M.A.

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