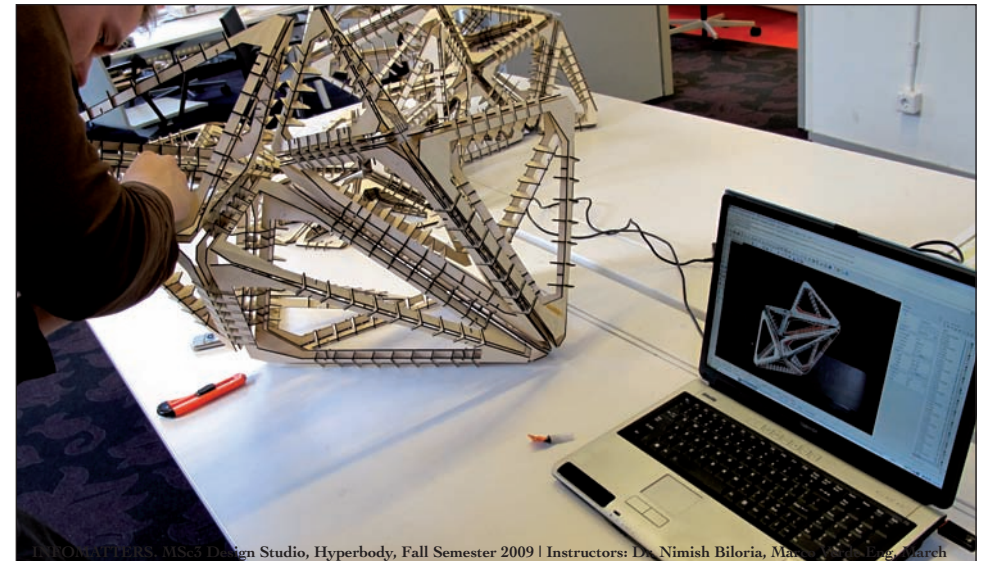Interactive
Environments

interactive environments

The Interactive Environments minor is a shared initiative by the faculty of Architecture, Industrial Design, and Electrical Engineering, Mathematics and Computer Science. The Interactive Environments minor is a five months multidisciplinary course involving the research groups Hyperbody (A), ID-StudioLab (ID), and Man-Machine Interaction (EEMCS). The minor is hosted by the Science Centre of the TU Delft in a dedicated laboratory space.

The Interactive Environments minor offers you an exciting, five-month ride through interactive architecture: you will learn new technologies at every scale, interact with exciting guest speakers and take part in a visionary and challenging course-length project. You will be full-time engaded in exploring the possibilities of multimodal, whole body interaction, working with new design methods, input devices, cybernetics, dynamic actuators, high-tech materials and rapid prototyping tools. You will apply your knowledge and skills in a real-life project, leading to creation of a full-scale working prototype of a large interactive structure.

The course aims at bringing together experimental architecture, form-prototyping technologies, human-computer interaction knowledge and the techniques of sketching with technology, to provide ambitious, multidisciplinary students with the conceptual and practical tools for mastering the newly emerging phenomenon: **interactive environments**.

The course structure of the Interactive Environments Minor is built around a group project assignment of an interactive social space, built up from autonomously operating smart building components. The students are assigned to design, fabricate and build a fully operational complex spatial interactive installation. All courses within the minor are geared towards supporting this goal in a variety of ways. The design assignment includes the design of interaction scenarios, and the integration of its embedded computing technologies.

If you're ready to take up the challenge, join the Interactive Environments minor!

Cover image: InteractiveWall 2009 | a collaboration between Festo, Burkhardt Leitner constructiv, and Hyperbody, as part of the Festo Bionic Learning Network. copyright Festo AG & Co. KG, photos Walter Fogel

INFOMATTERS, MSc5 Design Studio, Hyperbody, Fall Semester 2009 | Instructors: Dr. Nimish Biloria, Marco Verde, Ergün March

IE minor

interactive environments

Course Code BK-Mi-124-11
Course Title Interactive Environments
Course Coordinator Ir. Chris Kievid (A), Ir. Aadjan van der Helm (ID)
Course Tutors Prof. Kas Oosterhuis (A), Ir. Chris Kievid (A), Dr. Walter Aprile (ID), Ir. Aadjan van der Helm (ID), Dr. Joost Broekens (EEMCS)
Credit Points 30
Max. number of participants 30
Location Science Centre Delft, TU Delft campus

Introduction
The Interactive Environments minor explores the possibilities for dynamic, interactive spaces in which people and buildings engage in a mutual relationship with one other. By connecting the data and experiences that develop though this relationship between buildings and their inhabitants, the built environment becomes an interactive, adaptive and animate entity.

Our vision in today's dynamic information rich context is specifically geared towards developing strategic design methodologies via computation and interaction design techniques to produce socially, environmentally and economically performative design solutions and to demonstrate their buildability by developing 1:1 prototypes.

Minor Goals
The main field of study in the Interactive Environments minor is multi-user interaction with smart spatial environments.

The course structure is built around a group project assignment of an interactive social space, consisting of autonomously operating intelligent building components and smart products.

The group project provides a framework to which all course modules and individual student assignments fit in. This delivers a setup balanced between education and practice, geared towards helping students in acquiring practical skills and knowledge needed for building, testing and evaluating experimental interactive complex spatial environments

Minor Content
In the design course students are encouraged to formulate challenging design visions. Those visions are subsequently realized and tested in form of robust, fully operational and full-scale prototypes.

Students from different faculties work together in multidisciplinary groups that design, produce, and deploy unprecedented interactive spatial installations. You will receive professional guidance from specialists from all involved fields and direct, hands-on access to cutting-edge technologies provided by affiliated educational and commercial partners.

In process of building the prototypes you will acquire practical knowledge needed to undertake this challenge. This knowledge ranges from creative design strategies through project management skills to technical and technological means of physically constructing a complex interactive structure.

Minor Exit Qualifications
After successfully completing this course each student is able to:

- formulate an ambitious yet feasible spatial design vision, project planning and strategy, accordingly plan a systematic approach to the design project characterized by the use of theories, models and coherent interpretations, while having a critical attitude, and insight into the nature of most recent science and technology
- recognize and apply specific technical knowledge and skills required to complete the main assignment
- integrate and employ individual, major-specific skills and knowledge in a product-oriented group work environment
- develop and apply task-oriented group working skills and organization strategies, prove competence in cooperating and communicating; be able to not only adequately interact, but also have a sense of responsibility, and leadership
- develop and apply skills in using images and written and spoken word in order to convey the essence of a design to others
- learn practical skills for real-life project development
- estimate impact of proposed design on culture, society and environment
- deploy and user-test preliminary prototypes and the final design product
- gather knowledge and insight from developing working prototypes, being both building components and industrial products
- evaluate and defend the final design product

We have limited the maximum number of students to 30. If necessary 30 students will be selected from all subscriptions.

IE minor

academic chairs & affiliates

Hyperbody
Hyperbody is a contemporary information-technology driven research and design group at the Faculty of Architecture at the Delft University of Technology. The goals set for the group's research are to explore techniques and methods for designing and building of non-standard, virtual and interactive architectures.

ID-StudioLab
The ID-StudioLab of the faculty of Industrial Design is a multidisciplinary research community that aims to acquire and integrate knowledge on products, people, technology and context in order to support designers in creating conditions for meaningful and satisfactory product experiences.

Man-Machine Interaction
The Man-Machine Interaction research group is part of the Department of Mediamatics (EEMCS) at Delft University of Technology. The aim is to engineer effective experience with multi-modal interaction between human and artificial actors in a dynamic, social context.

Science Centre Delft
The Interactive Environments minor and the Science Centre Delft have initiated close cooperation. Science Centre Delft is the institution that acts as an interface between the Delft University of Technology and the general public. Its mission is to open up and share cutting-edge science and research of TU Delft with people of all ages and all social backgrounds. In this framework students work directly at Science Centre Delft in a dedicated lab, where prototypes of interactive environments can be fabricated, assembled and tested, while at the same time they become immediately exposed to the curious public. Visitors to Delft Science Center can meet researchers and students at work, help them with user-testing of developed prototypes and acquire understanding of this new kind of architectural environments.

Autonomous node prototypes of the "sCAPE" group design. In this way interactive architectural environments come to life, engaging their occupants in an unprecedented experience of a continuous dialogue with the occupied space. | Interactive Environments 2010

IEminor
Design and Prototyping studio

Course Code BK79000
Course Title Design and Prototyping Studio
Course Coordinator Ir. Chris Kievid (A), Ir. Aadjan van der Helm (ID)
Course Tutors Prof. Kas Oosterhuis, Ir. Chris Kievid, Dr. Walter Aprile, Ir. Aadjan van der Helm, Dr. Joost Broekens
Credit Points 15

In the Design Studio course students are encouraged to formulate challenging design visions. Those visions are subsequently realized and tested in form of robust, fully operational and full-scale prototype. The course will involve learning and application of:

- Design strategies and methods
- Project management and organization
- 3D and 4D modeling, scaled and 1:1 prototyping
- Presentation techniques and methods
- Knowledge gained in technical studies and workshop and lectures courses.

Ecology of light sensing and emitting creatures built in the 3-day workshop with Ruairi Glynn | Interactive Environments minor 2010

IEminor
Workshop & Lectures

Course Code BK7910
Course Title Workshop & Lectures
Course Coordinator Ir. Chris Kievid (A), Ir. Aadjan van der Helm (ID)
Course Tutors Ir. Chris Kievid, Dr. Walter Aprile, Ir. Aadjan van der Helm, Dr. Joost Broekens
*Credit Points* 6

The main field of study in Interactive Environments Minor is multi-user interaction with smart spatial environments. The Workshops and Lectures course stimulates development of a critical insight into the topic of IT-revolution in contemporary society and practical applications of systems science. In the Workshops and Lectures course students will be taught in a series of short intensive modules in forms of lectures, excursions and workshop sessions.

This course addresses recent developments in architecture, building, and information technology in hands-on workshops lead by designers, researchers, and engineers working in internationally relevant research institutes and factories, which employ computer-based design and fabrication methods.

As part of this course we are planning a trip to the Ars Electronica festival in Linz, Australia. This festival for Art, Technology and Society is the most important festival of digital art world wide.

Interactive installations built at our dedicated design laboratory space at the Science Centre Delft | Interactive Environments minor 2011
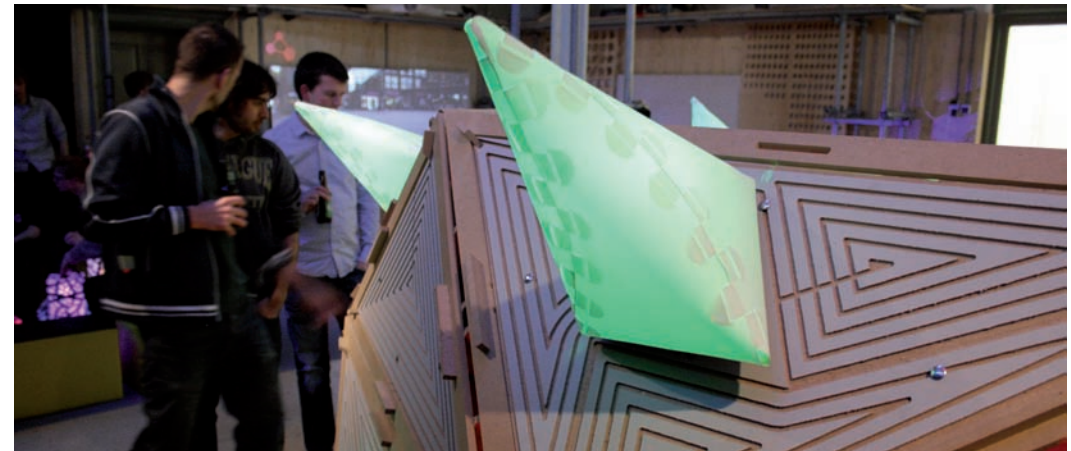
Fully working prototype of an interactive installations targeted at young children, developed by a group of five students. The structures is a dynamic system, which communicates with its visitors across different modalities. | Interactive Environments minor 2011

IEminor
Interaction Design Strategies

Course Code IO3872
Course Title Interaction Design Strategies
Course Coordinator Ir. Aadjan van der Helm (ID)
Course Tutors Dr. Walter Aprile, Ir. Aadjan van der Helm, Dr. Joost Broekens
Credit Points 3

Course aims to equip students in the Interactive Environments minor, with design theory on how to model and embed the user experience in interactive environments, such that real-time interaction in physical spaces and building interior objects can be enriched, while gaining practical design experience in the development of such environments. Specifically, work is focused on exploring and developing highly interactive environments with and adaptive multimodal user interface designs that interact with an underlying human experience model. Individual assignments are based on real-world application challenges. The course lectures, reading literature and practical work are inter-mixed throughout the semester. The course, offered in this framework, focuses on the following topics:

- Participatory Design and user involvement techniques.
- Interaction Design Basics (senses, user interface principles)
- Design research
- Design before Design (scenarios, personas, prototypes/sketches
- Computational models of emotion

IEminor
Hardware & Software Tinkering

Course Code IO3871
Course Title Hardware & Software Tinkering
Course Coordinator Ir. Aadjan van der Helm (ID), Dr. Walter Aprile (ID), Joost Broekens (EEMCS)
Course Tutors Dr. Walter Aprile, Ir. Aadjan van der Helm, Dr. Joost Broekens
Credit Points 6

This course presents basic interactive sketching techniques, and more general tools for evaluating and choosing technology. The course contains a theoretical part, introducing basic programming skills in procedural languages, higher level tools and languages (such as MaxMSP and Python), and techniques for interfacing hardware, from Phidgets to Arduino.

The study goals are to achieve the following:

- Acquisition of simple prototyping abilities
- Analytical ability to quickly scope out a technology and contrast it with others
- Ability to execute an appropriate technology choice in the context of prototyping
- Development of embedded software for physical devices

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