

INTERFACE CULTURES - ARTISTIC ASPECTS OF INTERFACE DESIGN

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In 2004 the University of Art and Industrial Design in Linz established a new master study program called Interface Cultures¹. The title of this program was coined by the university based on the book »Interface Culture: How New Technology Transforms the Way We Create and Communicate« by Steven Johnson (c.f. Johnson 1997). He predicted that new types of interfaces will alter the style of our conversations, prose and thoughts in the future and he rightfully foresaw that interface designs would be strongly linked to artistic innovation as they reach out into the applications of our daily lives.

Artists and designers in the area of interface and interaction design have long been conducting research on human-machine interaction (c.f. Weibel 1989, Sakane 1989, Laurel 1990, Cornwell 1992, Sakane 1995, Dinkla 1997, Hünnekens 1997). By designing interactive systems that bridge social, entertaining and artistic elements, their prototypes and installations have often reached into the wider field of media products and entertainment applications. An introduction to artistic prototypes that went beyond the art arena, into areas such as mobile computing, intelligent ambience, intelligent architecture, fashionable technology, ubiquitous computing and pervasive gaming is provided in literature (c.f. Sommerer et al. 2008).

When we were asked to take up the position of professors for Interface Cultures in 2004, we were able to start a whole new master study program that not only needed to concentrate on human-computer interface design in the classical computer engineering approach, but could also include artistic and social aspects. It was important for us to keep the field of Interface Cultures as open and as inspirational as possible. We thus mapped out areas of investigation, which we deemed promising for further artistic research. These areas are:

1 <http://www.interface.ufg.ac.at>, (March 14, 2008).

- Interaction and Interface Design
- Tangible, Multimodal and Hybrid Interfaces
- Auditory Interfaces and Audio-Visual Interaction
- Gaming Interfaces
- Ubiquitous Computing and Intelligent Ambiences
- Wearable and Fashionable Technologies
- Interactive Art, Net Art and Hybrid Art
- Experimental Forms of Interaction including Nano Art and Bio Art
- Media Art History and Media Archaeology

Being situated at an art university, we foremost concentrated on the development of artistic prototypes and projects that bridge the gap between art, design, entertainment and product development. One of our main goals is to create an environment where artistic exploration can be combined with technical and scientific research. Especially in the fields of human-computer interaction and media design, the development of innovative and perhaps at times unusual artistic interfaces can lead to new services, new paradigms and new forms of communications, as described by Johnson (1997).

The Interface Cultures program is a master study program. It teaches hands-on development of interfaces and interaction designs, and encourages students to test and implement their prototypes in real situations. For a long time the Ars Electronica festival in Linz, Austria has been a breeding place for interactive art works, as it established Interactive Art as a separate category for the Prix Ars Electronica competition in 1991 (c.f. Leopoldseder 1991). Every year experts in interactive art gather in Linz to present and discuss about the latest developments in media art and their societal implications.

Interface Cultures Student Project Presentations at Ars Electronica 2005-2007

In the past four years we have supervised and developed around 45 student projects. Each year the student projects were presented at the international media art festival Ars Electronica in Linz, Austria. This has proved to be very motivating for the students, as it gave them the opportunity to present their latest prototypes to an international audience of media experts, receiving valuable feedback and know-how in the process.

The first exhibition of projects by Interface Cultures students in 2005 showcased interface design work in the fields of interactive art, tangible

interfaces, intuitive music and composition instruments, acoustic and object-based interfaces as well as CAVE applications and examples of interactive games (c.f. Mignonneau et al. 2005).

The second presentation of student projects at Ars Electronica 2006 was divided into more or less five thematic clusters, corresponding to courses of study in the Interface Cultures program (c.f. Sommerer et al. 2006), these were:

Interactive Media Archeology

Works in this category dealt with media archeology. For example, the interactive installation *re:call phone* showed how new sensor technology and a picture screen can be added to a telephone from the 1920s to become an interactive tool that allows users to experience the history of telecommunications in a playful way. *The Digital Barrel-Organ* combined an old barrel-organ with digital MP3 sounds, delivering a satiric commentary on the pressure to innovate that contemporary musicians face.

Interactive Artificial Life Projects

Programming courses familiarized students with generative processes. The results included several interactive installations that dealt with the *game of life* theme and computer-generated nature.

Fashionable Technology Projects

Another area of emphasis of the Interface Cultures program is fashionable technologies and the development of sensor technologies. In a project entitled *No more under cover*, for instance, books that have been out on loan from the library too long gradually change color. Other works included *Enlightened Collection* and *Clothing that arranges the body*.

Intelligent Environments, Tangible Interfaces and Auditory Interfaces

This field gave rise to projects such as *iShaker*, which makes it possible to generate beats and sounds with three iPods, *AtemRaum*, an interactive environment that reacts to breathing, *Shape, Color & Sound*, a tangible interface that combines the worlds of Ittens and Schönberg, and *Scream Point*, an ironic work about interactive photography.

Robotic Interfaces

In a special course taught by Time's Up, students were introduced to the basics of artistic robotics and presented their robots in a performance.

The exhibition of these projects documented how interactive technologies are increasingly used in creative applications and hybrid art projects, and, via innovative recombination of technology and art, are giving rise to interesting prototypes at the nexus of media art, design and R&D.

The thematic emphasis on the projects selected for the Ars Electronica 2007 student exhibition was based on physical computing and hybrid interfaces (c.f. Sommerer et al. 2007). For this exhibition, the interface concept developed in the Interface Cultures program was expanded via links to other artistic and artisanal disciplines such as textile design, industrial design and interior design. These works embody original, innovative concepts for interaction, involving intelligent furniture, clothing and environments, interactive toys, pervasive gaming, new analog and digital musical instruments as well as technical, artistic and applied interactive prototypes and hybrid systems. The thematic clusters of this exhibition were:

Physical Computing Interfaces

News Knitter by Ebru Kurbak and Mahir M. Yavuz converts information that is gathered from the daily political news feed from the Internet into unique visual patterns for knitted sweaters.

Massage Me, by Hannah Perner-Wilson and Mika Satomi, consists of two jackets that are designed with integrated soft wearable game pads. As users massage each other they control two game characters, which fight against each other. *Massage Me* thus converts the game player's hectic finger movements into a relaxing massage.

Garden of Eden by Thorsten Kiesl, Harald Moser and Timm-Oliver Wilks consists of eight airtight Plexiglas domes that contain lettuces. The domes are connected to the Internet, which provides access to real-time data on current air pollution levels in the capitals of the G7 countries and Austria. This data is used to concoct the same concentrations of pollutants in the atmospheres of the individual domes as currently contaminate the air in the respective capital cities.

Affective Twins by Gabriela Carneiro consists of two interactive chairs where people can sit or touch each other over distance and also see these interactions being displayed as light patterns.

Pervasive Gaming Interfaces

Noon – A Secret Told by Objects by Christina Heidecker and Tiago Martins is a pervasive gaming interface that uses objects and physical space to convey an interactive narrative. The player takes on the task of

unveiling the origins of a tragic fire. He/She must don a special device, the Gauntlet, and use its powers to probe and navigate memories contained in salvaged objects. The advent of personal computation and public networks made new forms of gaming possible. We envision gaming activities that take advantage of real spaces and objects as interfaces themselves.

news machine by Nicole Weber is an interactive news mixer that enables users to personally generate their own news. To do so, users are provided with a wide variety of components (video samples) that can be variably combined and assembled in the spirit of »remix culture.«

New Musical Instruments

Mountain Guitar by Junichi Kanebako enables musical expression through custom-made sensor technology, which measures the height at which the instrument is held and transforms it to musical output during the playing session. *Mountain Guitar* has no strings, and anyone can make real guitar sounds by simply pretending to play through body movements.

PipeSound by Thomas Wagner and Lukas Rettenbacher is an experimental musical instrument that can be played by multiple users simultaneously. Moving the tubes closer together or further apart changes the pitch and duration of the instrument's tones; adjustable screws function as a mixing console; levers produce sound filters. Each tube serves as a channel, and each respective combination of them results in a novel sound experience.

Interface Cultures International Guest Lecture Program

Besides courses on interface and interaction design, media archaeology, programming, game design, sensor technology, fashionable technology, audio visual interaction, history of media art, interactive art, bio and nano art and robotics classes, the international guest lecture program is an important source for new inspiration. It is set out to cover a wide field of interface related subjects. The book »Interface Cultures – Artistic Aspects on Interaction« is a collection of these lecture notes by national and international experts who came to present their talks to the students. The thematic clusters of these talks can be grouped in five areas:

Information Design and Social Media

Professor Chris Stry, an expert in usability from the Kepler University in Linz spoke about usability and user experience in the development of interactive artifacts and the importance of hedonic qualities. Prof. Dietmar Offenhuber and Judith Donath write about visualizing communication along network paths, Jürgen Scheible gave a workshop on wireless communication networks, doctoral candidate Stefano M. Vannotti researches interface design for institutional repositories, Georg Weichhart gave an inspiring lecture on Software Agents, and Georg Russeger spoke about Software as Cultureware and its connection to pervasive media cultures.

Biologically Inspired Interfaces

Another strand of guest lectures researched new areas of interface design connected to physics and the life sciences. Here we invited Prof. Paul Thomas who talked about nano vibrational interfaces, Dr. Ingrid Graz who presented new packaging materials and glues based on nano technologies, Dr. Tomor Elezkurtaj who introduced evolutionary algorithms for industrial design applications, doctoral candidate Mika Satomi who researches body extensions and wearable technologies and Prof. Mischa Schaub who deals with neo-analogue interfaces and their connections to craft.

Cultural Aspects and Aesthetics of Interactivity

Regarding the aesthetic and cultural aspects of interactivity we were fortunate to have international experts such as Prof. Erkki Huhtamo talk on tactility in contemporary art and media, Dr. Christiane Paul speaking about media art and artware, Dr. Katja Kwastek teaching a whole class on the term, meaning and aesthetics of interactivity and doctoral candidate Penesta Dika researching motifs and visual aspects in interactive media art. Doctoral candidate Dorothee King, who is currently works on decoding gaze in immersive and interactive media art productions and doctoral candidate Mahir M. Yavuz, who is researching new interfaces for city mapping tools. Finally Prof. Giaco Schiesser spoke about the importance of willful obstinacy in the production of media art and Prof. Hiroshi Yoshioka stressed the importance of cultural parasitology.

Stage-Based and Audiovisual Interaction

An important and growing area of interface design is stage based and audiovisual interaction. Here we were also fortunate to attract some of the key experts of these fields. Internationally renowned choreographer

Scott De La Hunta talked about interactions between choreography, dance and new media technologies, dancer and choreographer Martin Kusch gave a workshop on interactive technologies for stage-based interactions and doctoral candidate Andreas Weixler and Se-Lien Chuang teach audio visual interaction and apply it to their own interactive audio-visual performances. Internationally renowned choreographer Klaus Obermaier talked about the interactive aspects of his stage performances and finally Wolfgang Kopper, and Oliver Wittchow presented game boy musical interfaces.

Interactive Art Practice

Over the past four years we also attracted well-known media artists to share their work and research practice with our students. Gebhard Sengmüller regularly teaches media archaeology and has presented many of his wonderful artworks. Ulf Langheinrich came to share his artworks that deal with conceptual forms of interaction and perception, and the renowned group Station Rose (Elisa Rose, Gary Danner) gave a comprehensive lecture on their 20 years of experience in media art production. Ursula Endlicher spoke about her ironical Internet driven art works and Japanese artist Keiko Takahashi presented several of her interactive artworks based on childhood memories. Composer and sound artist Kim Cascone gave a workshop on genetic programming for sound production, Herwig Turk talked about his installation work based on scientific metaphors and practices and Austrian media artist and game developer Sylvia Eckermann spoke about her interactive artworks that present virtual knowledge spaces in the art and game context.

Summary

This book is intended to give an overview of the research topics we have discussed at the Interface Cultures study program over the past four years. We would like to thank all the guest lecturers and the students who have put their time and energy into developing this exciting field of practice-based research and who have been open to explore new territory and embark on new fields of artistic investigations. We also hope to give the readers an impression and outlook of what kind of artistic research topics are to come in the future. To conclude, we would like to stress again the importance of artistic creativity and hybrid thinking in the development of new forms of interactions and communications. It will remain important to propose media productions that defy the strict boundaries of art, design, entertainment and product design.

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