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**Fraunhofer** Institut  
Medienkommunikation

The Exploratory Media Lab  
**MARS** Media Arts & Research Studies

## **NEW MEDIA ARTS IN EUROPE**

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### **MULTIPLE ROLES FOR NEW MEDIA ARTS**

In a study of the Rockefeller Foundation the definition for Media Art is:

- » The term new media art provides no single definition. One person's new media art is another person's social intervention and a third person's scientific research. (...) Despite the variety of definitions, there are theoretical commonalities used by artists and supporters of new media art to describe the work that often bridges the gaps among artistic, scientific and (technological or) sociological disciplines whose traditional discourses rarely intersect. Generally new media art is considered as art that not only incorporates computers and other emerging digital technologies into the work, but molds and subverts the computational power of the computer and technology to create new signs, meanings, communications and forms. (...) The overarching concepts that apply to new media art are connectivity, collaboration, interaction, open-work, networks, computability, social process and change. (...) This broad category does not include digital video art but does include web art, robotics, virtual reality, biotechnology and genetics. This definition(s) will change and evolve with each emerging technology. It is fair to say that new media art is often defined through its engagement with certain technologies that haven't existed before and in terms of how the artist or viewer approaches those technologies.

This interpretation shows us that digital technologies not only influence our working environment, they also have an impact on our everyday lives and are changing the way we live at all levels, whether economic, socio-cultural, psychological or physiological. At the same time, new cultural spaces – *digital cultures* – are emerging. Acceleration and simultaneity, networking, integration and increasing information density, miniaturisation and the disappearance of things.

The implications of digital media are too complex and multi-faceted to leave this discussion to the computer scientists and the technicians alone. All too often, the economic or technical considerations are the central point of debates, while the content-related dimension is overlooked, including in European Union Programmes. One way to address this imbalance is to involve new media artists into the wider debates and processes in order to change the technical discourse into a cultural one, for example, in European programs to develop digital technologies like I3 - the Intelligent Information Interface program or in the EU Information Society Technology program (IST).

New media art has acquired various different roles in the context of an all-pervasive digital technological discourse and environment. Primarily, new media art works must fulfil a social function – occupying positions and allowing reflection. They must take up issues, stimulate discourse and pose questions. Together with the technical developments embodied in the works, the general public is to be informed about changes in communications processes.

While there are multiple expectations and roles for the new media arts in Europe, the field itself is fragmented in two ways: The first is the co-existence of various new media art scenes alongside each other which have to yet to engage fully in trans-disciplinary co-operation. This reality reflects the complexity of various digital systems throughout Europe. The second relates to those distinct boundaries drawn between the domains of media art, design, computer sciences and

other related scientific disciplines on the one hand and national and cultural boundaries on the other.

There is clearly a need for a pan-European discourse that observes the many different roles of digital media and technologies primarily from the point of view of art, which places the main emphasis on the person and his/her capabilities, emotions and perception, and his/her mindset and view of the world. Therefore, our goal is to create a pan-European *network of excellence* that crosses the dividing-lines between practice and theory, between research, experimentation and application, and between media art, design, science, education, business and technology - a comprehensive concept of new media art which combines design-based and experiment-oriented disciplines with technical and scientific fields. The aim of a proposed *European Network of Excellence for Media Art and Technology* would be to serve as an interface from a man-machine network to interdisciplinary practice and a synthesis of text, image, sound, lighting, space, time. The digital technologies are to be conceived both as a means of investigation and at the same time as the object of the investigations.

In 1999, we created a national network called "netzspannung.org – an online competence center for new media art" in Germany as a means to further develop the foundation for a future pan-European network. It was developed at the MARS Exploratory Media Lab of the Fraunhofer Institute for Media Communication and supported by the Federal Ministry of Research and Education. For more information of the different activities see: [www.netzspannung.org](http://www.netzspannung.org)

In this article we will outline some of the main challenges in bringing together the various pieces required to build a collaborative pan-European space which bridges the roles and expectations of the new media arts. Some of the observations are based on discussions held during the conference "cast01/Living in mixed realities"<sup>1</sup> organised in September 2001 by the MARS Exploratory Media Lab. Others are based on our experience creating netzspannung.org.

We will begin with a look at the current struggle for intellectual property rights and move on to review questions posed by the changing technical standards and their implications for transnational co-operation. The discussion will turn to the broader debate about the interconnections between the fields of communication, arts, science and technology as a convergence point for creativity in the discipline of new media arts. Some suggestions for new support structures and resources will be made.

### **The Struggle for Intellectual Property<sup>2</sup>**

Today, electronic networks are undergoing tremendous change. One of the most important issues to be addressed in this context is the struggle for intellectual property. More recently, a discussion about copyright and user rights has begun which extends far beyond traditional or specialist circles and raises new "intertwined" questions for all stakeholders. For example, distributors are preoccupied with the development of technical blocking mechanisms to prevent digital works placed on electronic networks to be copied at will and therefore the main issue for them is a question of "access rights". The emphasis is placed on distribution flows, the future "return on investment" in the "content sector"; authors are merely consulted and their rights are not incorporated into this model. Mediators, on the other hand, are being forced to change their involvement in a network which is "end-to-end" and "peer-to-peer" and no longer requires their direct involvement in a "mediated product". They are developing new roles which separate themselves from the product or work itself. The challenge is to make their new services visible and create a new market for themselves by, for example, creating additional uses of the work and to join with other communities.

Change creates uncertainty. Uncertainty creates fear and fear leads to overreaction - that is the situation with copyright today. Technical developments have thawed old political compromises that have been frozen into copyright legislation. Distribution struggles begin anew. For example,

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1 A list of recommendations from the conference is available from [www.netzspannung.org](http://www.netzspannung.org).

2 This section is based on a discussion with Dr. Herbert Burkert, Scientific Adviser at the Fraunhofer Institute for Media Communication and Private Lecturer in Information and Communications Law at the University of St. Gallen, Switzerland.

rather than relying solely on collecting societies, authors are now able to monitor the distribution and use of his/her own digital works over electronic networks via special "labels" which can be traced directly to the end-user; otherwise known as "content management systems".

How does this apply to collaborative projects? In the field of new media art, a team of people is usually involved in the production of interactive environments or of projects that combine interaction on the Net and "in situ". In this case, there are two possible forms or patterns of work/authorship. For example: in some projects, programmers put into practice the concepts completed by the artists, which makes them the implementers rather than authors. In other projects, programmers are already working with artists at the development stage. Certain artists want to recognise this work as the product of joint authorship. The question is to what extent these forms or patterns of work are reflected in the discussion on copyright issues?

The current legislative environment bestows all rights to the person who provides the money for these brave new works; the investor determines the allocation formula, provides the funding, and if the result is particularly successful, he/she might offer a second helping of funding. Perhaps over time, if a member of the team has been able to generate enough attention on the Net, he or she might succeed in improving the allocation formula and become an investor. This scenario is of course, nothing new and has been addressed in copyright law for film production decades ago. According to Herbert Burkert, the development of copyright law for works produced for or over the Net is being pursued in a similar manner. The works or intellectual creations are no longer the issue. Securing investment cycles has become much more important. One example can be seen in the regulations on database protection. Databases - such as factual databases - that do not represent any intellectual achievement were not protected under copyright law until recently. According to the new regulations, databases will now acquire protection that is similar to copyright simply if enough money has been invested in their development. This example confirms that it is no longer a matter of intellectual achievement, but of investment that counts.

In an interview with Herbert Burkert, we asked him to what extent he, as a lawyer, sees [netzspannung.org](http://netzspannung.org) as an opportunity to test new ideas regarding collaborative productions and copyright?

- » "The concept of the author involves considering what it was always about: to promote the progress of science and the usefulness of the arts by securing, for a limited time, the exclusive right for authors and inventors to their respective works and inventions, as it is so well put in the U.S. constitution. With new media art productions presented at or produced by [netzspannung.org](http://netzspannung.org) you can go through test scenarios. This means drafting rules on how people should behave towards each other in a collaborative production. After a trial phase, you can develop contract texts on the basis of the regulations and the experiences. These have to stand up to further testing, particularly in the solution of conflicts, so that the contracts do not lead to legal disputes that involve going to court. As with a doctor, the noblest function of the lawyer consists of preventing situations, which he or she is needed for. Then it is even possible that forms of behaviour of this kind will at some time contribute to the shaping of legal standards beyond the scope of individually negotiated contracts. With each of the co-operation models you are putting onto the Net, you force artists to think about how to work with what is known as digital property and also to discuss this with each other and, as you are doing now, with other people, reconciling their wishes with reality. When a large number of people are thinking about this matter, people's awareness is changed. Lawyers are also increasingly expressing dissatisfaction with what one lawyer once described - he was certainly exaggerating a little - as 'copyright brawls'. Finally, regarding the above quotation from the American Constitution, discussion in the USA has been more open for a long time".

### The Changing Nature of Technical Standards<sup>3</sup>

Technical standards in the field of new media arts is continuously changing. It has become a very important and recurring question for many involved in the field including those working with on-line archives (especially archiving of on-line materials) and indeed on-line art works.

One of the results of this environment is a wealth of justifiable complaints from both new media artists and computer users that they feel they have become slaves of updating technical standards. In the on-line world this problem is even more severe and key questions need to be solved urgently: What should actually be archived and preserved? Is it the work as a whole, to be preserved as accurately as possible? Or rather just a description of the work? Which is a more appropriate solution when the actual work involves real life and immediate social interaction? Should a technical copy be stored as an accurate simulation within a more up-to date technical standard? What counts as a faithful reproduction? In some cases, media art works are produced for a specific software standard. What is archived in such cases? The work itself along with the viewing software, the work and the appropriate plug-ins? What about the hardware?

The question of what to archive in a technical sense leads to the more general issue of selection. In much of the traditional arts and culture fields, the identity of cultural institutions and initiatives is not defined by their inclusiveness, but rather by their careful and critical selection. In the on-line world, however, everything seems to fall prone to the ideology of connectivity. It begs the question how far the seamless connection of on-line archives and databases is desirable in terms of definition of identity, meaning and context.

The interconnection of archives and databases raises important technical questions. First of all there is the question of shared standards that would allow for "interoperability". The next, even more complex, question is that of categorisation and standardised keywords for database indices. The same term might mean something different in another context. An important point to consider is the 'local' standards of meaning, within certain interest communities or geographies. There is certainly no universally correct or agreed upon description of any object. The fact that such texts may only communicate certain information within a specific local context is not a reason to disqualify their value.

The concept developed for the [netzspannung.org](http://netzspannung.org) archive<sup>4</sup> is based on the "user as producer" approach combined with the use of intelligent agents as intermediaries for complex information systems and complex user requests. Based on our neuronal network system which analyses words and clusters them into a semantic map, all information entered into the database is contextualized with knowledge discovery visualization tools.

In this context it is important not to forget the protection of personal data. By filing user behaviour data within an on-line database, a tailored service for individual users can be developed for recurring visitors. The profiling of regular users is, however, not without privacy risks. The system amasses sensitive and highly specific personal information about the profiled users, which is valuable in marketing terms. Therefore, a clear privacy policy, combined with a clear preference for anonymous systems above systems that identify individual users should be a common concern.

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<sup>3</sup> The observations below were discussed at the V2 workshop Digital Dive (DEAF 00), lead by Eric Kluitenberg, programme maker of De Balie, Amsterdam and from our experience developing the [netzspannung.org](http://netzspannung.org) internet platform and online archive for new media art.

<sup>4</sup> [netzspannung.org](http://netzspannung.org) is based on an open system architecture (open-source) and is a distributed content management system for new media art and culture. The concept of the distributed Internet platform on which it is based uses a middleware system that supports modular expansion and dynamic configuration and has been implemented and expanded in accordance with the set goals. At its core is a middleware architecture that allows applications to be composed of components which are stored and administered in a decentralised manner and that configures itself dynamically during the runtime. This means that to a great extent the database, network and platform topologies are separated and a homogeneous application environment is created within a heterogeneous system environment.

On-line archives have been developed by several new media arts organisations, cultural institutions and festivals over the last years such as the Ars Electronica Center in Linz, V2 in Rotterdam and the ZKM in Karlsruhe. Each of their archives have been designed according to specific needs and with a wide variety of emphases. The aim of the MARS group is to create a single on-line point or platform where the knowledge collected in the various new media art archives across Europe can be researched and accessible via a shared interface developed on the [netzspannung.org](http://netzspannung.org) archive. Instead of having to search the websites of various different archives and enter the same search query each time, a search query made via the interface of the networked archives would yield an overview of the search results from all the networked archives. Since it is unrealistic to expect the different archive operators to agree on the same technical interfaces and content systems, a system must be developed that allows the various data sources and systems to be linked. The challenge is to develop a kind of dynamic data-adaptor for semantic mapping between the different types of data structures and categorisation systems of the various archives.

### **Art – Science – Technology: trans-disciplinary co-operation and forms of support**

Above we have described two of the main challenges facing practitioners working in the new media arts field, namely intellectual property and changing technical standards, and their implications for trans-national co-operation. We will now turn our attention to the intersection of communication, art, science and technology as creative disciplines and the structures required to support such activities.

The discussion below is based on a number of issues raised during the conference "cast01/Living in Mixed Realities" organised in September 2001 by the MARS Exploratory Media Lab.<sup>5</sup> Full proceedings of the conference are available from [www.netzspannung.org](http://www.netzspannung.org).

### **Trans-disciplinary junctures**

The missing links and relationships between the various creative disciplines are described or characterised in many ways, for example, as an interface<sup>6</sup> or as a form of networking<sup>7</sup>. We are reminded by Machiko Kusahara (new media curator), Maurice Benayoun (new media artist), and Olivier Avaro (computer scientist), that the roles for the artist and the technologist in this trans-disciplinary constellation needs consideration. From a practical point of view, should artists and technologists work together on a common project and thus facilitate a new form of trans-disciplinary co-operation or should a single person become proficient in both art and technology and therefore work independently. As Olivier Avaro pointed out, "it is unrealistic to expect that many people will become trans-disciplinary, although it is helpful that there are some people who are. If we wish to encourage this type of work, we must ask ourselves what kind of institutional and strategic support we can offer to those working in this new area between the disciplines".

However, what is this new trans-disciplinary space we are talking about? Hiroshi Ishii (computer scientist, MIT Media Lab) prefers not to think of this space as something new, but rather as inhabiting the edge of established disciplines. That does not mean those working in the field live on the margins. In fact, the contrary is developing with new communities of professionals working together and interesting areas or regions are where art, science and/or technology overlap.

Maybe it is useful to think about the constitution of this trans-disciplinary field in a different way; occupying a triangle between art, science and technology, and cultural critique.<sup>8</sup> Today we can

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5 At the end of the conference, Stephen Johnes proposed to introduce the notion of "shared reality". Individuals which "clustered" together during the conference are now transforming into nodes of a network. This network - and this is very fortunate - already has as a support structure via the Internet platform "[netzspannung.org](http://netzspannung.org)", which has begun to generate new forms of interdisciplinary co-operation.

6 Proposed by Leon van Noorden, EU representative at the cast 01 conference.

7 Martin Reiser, Director of the Institute for Media Communication.

8 This triangle is not intended to exclude other disciplines or possibilities such as design, human-computer interaction, and performance - each of them a product of the three sides of the triangle.

find evidence of various projects which combine these three poles in different ways and to different extents. For example: Pedro Sepulveda's (new media artist) project "Digital Shelters" or speculative designs for protecting the public from cell phone radiation; the latter combining an artistic/architectural project with critiques on the information saturation of cities.

In this context, the role of cultural critique is important to highlight as a common denominator between the three axis of the triangle. It is well known that it is common practice for artists to think and produce works which combine dimensions of art and cultural critique. The latter emphasising the potentially active role of the humanities and social sciences in this new intellectual field, rather than as silent partners in the background. Projects which combine science and technology with cultural critique grapple with many of the same issues as those which combine science and technology with art. For example, Manfred Faßler (media theorist) has called for the necessity of "software critique", to develop new tools for evaluating the human meaning of software systems in ways which are not a part of traditional computer science. In this context software as an artistic concept means not to take software for granted, but to pay attention to how and by whom programs were written. Contrary to conventional data such as digitised images, sound and text documents, the algorithmic instruction code allows a generative process. It uses computers for computation, not only as storage and transmission media; the question of authorship remains. Support is needed to create media labs for trans-disciplinary thinking and for creative production in this direction.

Another way to understand this trans-disciplinary space is through the concept of "shared reality", a form of social networking and communication between different realities (both real and virtual). One example of a shared reality system is a project by Atau Tanaka's (musician & new media artist) called "Global String"; a one-string musical instrument which exists partly in real spaces and partly over the internet, allowing for distributed duets. Others include Sara Roberts's (new media artist) distributed, networked doll project and Mina Hagedorn's installations for remote communication.

Quite often projects in shared reality are motivated by a hope for connection, tolerance, and unity. An understanding that our realities are intertwined with others' must, however, be accompanied by a realisation that shared reality also brings us up against conditions where those realities are incommensurable, for example, the terror attacks of September 11, 2001.

### **New Support Structures are Needed**

In the development of a any new discipline, its basic concepts and parameters, comes questions of how to support and nurture it in concrete terms. Support for the new media arts comes in various forms ranging from new approaches to education to alternative funding models and sources.

### **Education**

Some of the most pertinent and basic questions which require attention in the field of education are:

- » How is the role of education changing?
- » Who is actually teaching the students?
- » Is the traditionally strong relation between culture and education weakening?
- » Are there other structures that promote the necessary cultural discourse?

Due to the speed at which technology is changing, students in the field of new media arts tend to conduct their projects on their own and do not often interact with their professors. This situation requires a new understanding about teaching and interaction. One possibility is to think of the professor not as a communicator of knowledge but as a facilitator of student projects. Another possibility is interdisciplinary team teaching – if useful and necessary together with students.

Roy Ascott (artist & cultural theorist) reminds us that current university structures have difficulty supporting trans-disciplinary work; his CAiiA-Star Ph.D program<sup>9</sup> for artists and computer scientists is one rare example of a new institutional structure that can support such work. While there are few such structures, there are interesting examples of new kinds of courses developing which provide the kind of trans-disciplinary or "shared reality" opportunity for students. Some of them include<sup>10</sup>:

- » Axel Roch's "His Master's Voice" as a remarkable students' project developed in Lab III for Art-, Media Studies and Computer Science at KHM, Köln.
- » Jürgen Enge's innovative application for mobile technologies as a main focus of a new postgraduate course of the HGK Zürich on mobile application design.
- » Andrew Vande Moere's course and exhibition "Recombinant Realities" held at the Architecture Department at the ETH Zürich. In this course many aspects, from conceptual design to programming, were combined to create an appropriate learning experience.
- » Irina Kaldrack's CD-ROM "Interfaces - Interaction - Performance. About the use of digital technology in theatre". It was designed as a space which is open for questions and reflections from students.
- » Ralf Schreiber's "living particles" installation and workshops at KHM Köln, where electronic sounding particles form a living system using solar cells as no end technology.
- » Mina Hagedorn's (alumna of RCA London) "information bodies" re-establish a physical aspect in our relation to telecommunication, the idea of physical networks of awareness as opposed to purely screen-based ones.

## Funding

Some recent studies<sup>11</sup> have been conducted on the existing forms and future requirements of support for the field of new media arts and artists. One common conclusion is that those funders who want to support this actively evolving field would need to consider new methods and possibly even philosophies of funding, including program related investments and funding models that combine non-profit and for-profit aspects. The new media arts community, non-profit institutions and funders such as the European Commission, Federal Ministries responsible for research, education, culture or business or Public Foundations, should join forces to come up with a five-year plan to increase financial support and strengthen the infrastructure required for the continued growth and development of the field.

Resource requirements in the field of new media art ranges from monetary support for the artist during the creative process to basic infrastructure and equipment such as computers or software. Emphasis needs to be placed on developing support structures for innovative creative work that utilises advanced technologies as the main vehicle for artistic practice. However, priorities differ across Europe. For example, in parts of West Europe, artists generally need more support for production, technical expertise, and unencumbered creative time more than access to equipment. In other parts of Europe, for example in the East, access to state-of-the-art equipment is also needed.

There is a need for all sizes and categories of grants for new media arts ranging from support for R & D to promoting mobility through study or travel grants.

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9 <http://www.caiia-star.net/>

10 These projects / courses were presented during the cast01 conference.

11 For example: Pamela Jennings, "New Media Arts | New Funding Models", The Rockefeller Foundation, November 2000 and 1998 – 2002 MARS lab survey and interviews with artists, scholars, curators and scientists.

- » R&D grants: at the moment artists find it difficult to raise the seed money required to develop project concepts, do research and write applications. Given the length of time required to undertake larger projects, some have recommended the creation of a "risk fund" with a fast turn-around time so that applicants would not have to wait months for an R&D grant of 5,000 Euro.
- » Study grants: to provide resources to cover the living expenses for artists to visit designated institutions for a year or longer to do research and project development. In exchange, the artists could be responsible for producing a set number of projects, publications or other types of professional research activities.

Given that the new media arts do not yet have a critical mass or established genres as in other arts practices, program officers must constantly re-assess what criteria is needed to evaluate grant applications, which experts should run the selection process and the terms of reference or vocabulary required to discuss the applicants projects. For example, jury members of the MARS Labs digital sparks 2001 competition called upon two experts for advice to explain the technical, design and aesthetic concepts presented in the applications.

New media arts not only stands at the intersection of art, science and technology, but also at the intersection of the traditionally non-profit arts world and high-level commerce. Today, new media artists and arts organisations are exploring or supporting the incorporation of business ethics and protocols into their daily arts practice to secure self-sustainability through revenue-making ventures. Marcos Novak comments:

- » "the ideal (funding model) is to find ways which make artists self-reliant. That's where business strategies comes in as a positive challenge, because it promises to give a degree of self-reliance, but it also asks the artist to articulate the relevance of what they're doing in terms that other people can understand."

A non-profit venture capital model - which requires artists to return a small percentage of any profits resulting from a funded project - could be an ideal model for the future of new media art funding. Based on a model of entrepreneurship, the artist / innovator posts a description of the project to an Internet based database like [netzspannung.org](http://netzspannung.org) that is accessible to potential private and public partners. The Internet platform would then serve as a broker between parties that want to enter into an artist / supporter relationship. Foundations looking to develop programmes based on investment or venture-capital models to fund new media arts initiatives need to ensure that the grant applications are sound on a business level, as well as in their artistic or social goals.

## Conclusion

Digital technologies are omnipresent and will determine the course of the 21<sup>st</sup> century. Supporting a critical view of the new media and questioning the changes they bring about to our living conditions is a cultural undertaking of paramount importance to society. In this sense, new media art can provide a discussion platform to make the effects of new technologies in all areas of life visible. To overcome the disciplinary divisions, it is necessary to regard new media artists and their profession in the same way as technologists or information scientists and to include them similar research institutions and support programmes.

Innovations do not result from industrial research and development work alone but in connection with the creative, forming visions of artists. Their point of view and methodology affects the development of these technologies on the one hand and influences the perception and reception of digital content on the other. New media art is also an important means to examine the borders of contemporary and future digital cultures.

Success will only begin to come about when institutions or centres have been founded where professionals coming from various disciplines can work closely together, learn from each other and develop a common linguistic understanding through joint research and in an interactive manner.

In order to achieve our goals successfully, we need to create "real or live events" where people meet face to face and interact with each other. Web platforms based on this interaction can then be created to keep personal relationships alive and enable them to further develop. At the moment the web is overloaded with meeting places, events, platforms and discussion forums. It is very important to first bring people into a real and physical shared reality which is then accompanied by a platform such as netzpannung.

### Short biographies of the authors

**Monika Fleischmann** (Monika.Fleischmann@imk.fhg.de), born 1950, German research artist, studied visual arts, theater and computer graphics. Since 1992 she has been artistic director of the Institute for Communication; since 1997 she has been head of the MARS exploratory lab at the Fraunhofer Institute for Communication in Sankt Augustin. In 1999 she started - together with Giaco Schiesser and the Knowbotic Research group - a New Department at the University for Art & Design in Zürich. In 1988 she was co-founder of Art + Com, Berlin, a research institute for computer-assisted art, architecture, design. Her multidisciplinary background - fashion design, art and drama, computer graphics - made her an expert in the world of art, computer science, and technology. Her research projects are based on interface design and new forms of communication. The design of interfaces as a toy, a tool, a space, and a situation is the basis of communicative action and is the motivation for her exploration of mixed realities – the linking of physical and virtual space. Her interest is to bring poetry and an aesthetic of interactivity into art. In opposition to the theory of the disappearing body, she uses digital interfaces as a playful interaction of bodies, art and technology. Her main research topic is to extend the idea of interaction and communication by interfaces combined with interactive virtual environments on the base of perceptive processes. "I want to visualise the impact of technology on society, to understand that increasingly we inhabit two worlds: the one we live in with our bodies and the one inside computers."

**Wolfgang Strauss** (Wolfgang.Strauss@imk.fhg.de), born 1951, is an architect and research artist. He studied Architecture and Visual Communication and has held teaching positions in Interactive Design at the School of Fine Arts HDK Berlin, at the KHM Art School in Cologne, at the School of Fine Arts in Saarbrücken and the Kunsthochschule (Art Academy) in Kassel. In 1988 he was a co-founder of Art + Com, Berlin. While teaching interactive he developed an experimental curriculum, the "house of illusion" program, for art, architecture and design students. As a guest researcher and invited artist at MARS he has been directing the conceptual and technical development of Mixed Reality and Knowledge discovery environments. His recent work is about intuitive interface environments related to the human body and digital space. "With digitization, the field of architecture extends: we must build the exterior, but also electronic interior, spaces to create the aesthetics of a new eco-system."

**The Media, Arts and Research Studies, MARS** (<http://imk.fraunhofer.de/Mars>) research group was founded in 1997 by Media Artists Monika Fleischman and Wolfgang Strauss at the Fraunhofer Institut für Medienkommunikation (then known as the GMD-Forschungszentrum für Informationstechnik). Its goal is to make greater use of art-oriented strategies when developing media technology and, conversely, to promote media-technology skills in art, culture and education. The MARS Exploratory Media Lab is an experimental research laboratory organised into teams of architects, artists, designers, IT experts and scientists for developing cutting-edge tools for the art of the tomorrow, examining issues relating to the life of a networked society (Living in Mixed Realities) and exploring online knowledge space tools for knowledge management and knowledge discovery.

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