



Editorial

Today, both art and science are getting more and more involved with advanced technologies: digital media, bioengineering, smart materials, (distributed) actor-sensor-systems, robotics – to mention just a few of them. Artists often focus their research upon the “limits” of these technologies, in working on realizations of esthetic concepts as well as simultaneously reflecting critically their achievements, and thus pushing technological development towards new and unexpected horizons.

Especially in the academic fields of research in art and science, the activities in both of these areas remain institutionally quite unrelated. It seems important then to dramatize, support and deepen the existing interfaces between art, science, and technology – transgressing traditional principles and styles of research, and selectively overcoming the side-by-side coexistence in favor of an integrated “laboratory of the future”.

In 2006, the University of Bremen hosted the *10th RoboCup*, an internationally reputable event, where advanced robotics technologies are brought into competition in a soccer-based scenario.

We took this as a welcome opportunity to bring together artists, scientists, technologists, and theorists in a Symposium (SMARt 2006), primarily to identify the current state of the art in robotic-based technologies, discuss recent developments in corresponding interdisciplinary projects, and to envisage prospects for future development. Complementary, several artistic robotics projects were presented at different places in the City of Bremen. The topics included *Autonomous Systems*, *Artificial Life*, *Biomorphs*, *Cyborgs*, *Philosophy*, *Media Theory*, and *Embodied Cognition*.

As SMARt 2006 was conceptualized as an informal event – intentionally in the spirit of ancient *symposia* in Greek academia – we decided not to publish proceedings in the usual manner. Instead, we present here a book with loosely coupled contributions of most of the conference’s participants: *Machines as Agency*.





Due to the interdisciplinary and cross-boundary character of this symposium, it is almost impossible to organize these contributions in a linear, hierarchical vein – we would create rather artificial taxonomies and dependencies. Thus, we setup three main balance points, which should be seen as kind of “supernodes” in a widespread, complex network of articulated thoughts, actions, and esthetic experiences: *Agency ... as ... Machines*.

Agency

This part collects four papers, mainly about topics of embodiment and agency in general.

Jin Hyun Kim delineates the dis- and re-embodiment of the sound generation process over the past 50 years, focussing on the conflicting relationship between phenomenological and mechanistic narratives of the body, primarily in the context of robotics. She expects intensive discussions in this field in the near future.

Christoph Lischka analyzes the dominance of computational metaphors within contemporary technoscience, and its prospects for the emerging field of *convergent technologies*. Particularly in the life-sciences, he complains about a lack of awareness of recent conceptual developments in physics, biology, and philosophy – arguing for a move towards a symmetric, post-computational praxis of *mechano-poïia*.

Lüder Schmidt outlines a framework for music cognition based on *dynamical systems theory*. Summarizing the current state of research in Cognitive Science of Music, he describes a dynamics-based concept of embodiment which is extended to include music-related cognition, resulting in a model of “man as a musical machine”. First steps towards a robotics-based implementation are presented.

Gil Weinberg and *Scott Driscoll* describe *Haile*, an improvisational robotic percussionist. This robot implements both perceptual modeling techniques as well as algorithmic music capabilities, and combines them with the visual and gestural richness of acoustic music playing. *Haile* is intended as a test-bed for novel forms of musical human-machine interaction.

... as ...

The second part accumulates contributions broaching the issue of “being as ...” – oscillating between the humans and machines, without (hopefully) getting trapped into mainstream categories.



Peter Gendolla opens this section with an analysis of the cultural history of the Android. Automata, as they can be found already with the ancient Greek and Chinese, were conceived both as slaves and “useless playthings”. Inspired by La Mettrie, Gendolla then analyzes the various pathways of the idea of machines as extensions or substitutes of the human. But things are changing: due to progress in neurotechnology, the very border between man and machine vanishes.

Friedrich Wilhelm Heubach argues as psychoanalyst. The seemingly straight attribution of *robots as machines* is challenged by events like 9/11. People described as “machines of evil” blur the difference of man and machines, providing a rich repository for unconventional thinking. Heubach gives several illuminating examples, covering Turing, Kismet, cyborgs, sex, mom and paradise, with a short digression concerning “Die Verbesserung von Mitteleuropa”.

Andrea Sick investigates the idea of “shared agency” between man and machine, and its popular articulations. She suspects that events like the RoboCup competition elude the dichotomies of subject and object, natural and artificial, man and machine, instead of overcoming them. One of her main questions is: How does the space open up between different styles that find their different echo in the different tones of different disciplines?

Jutta Weber analyzes the role which media representations play in research strategies, particularly in robotics. She first introduces the field of personal service robotics, and presents some preliminary thoughts on the growing impact of media representation; she then extends these to Human-Robot Interaction and technosciences in general.

Machines

The third and last part compiles accompanying texts for some of the exhibits.

Krimhild Becker comments on her artwork as a painter, and how she uses photography to explore the boundaries between man and machine. E.T.A. Hoffmann’s narrative “The Sandman” is a beginning for Becker to open the sight for seduction, perfection, and the ambiguity of the artificial and “natural”, machine-man and man-machine.

Gary Cass and *Alan Mullett* present their project “Bioalloy”. In their research, Cass and Mullett explore possible futuristic evolutionary pathways of the living and the non-living. “Bioalloy” engages with the possibilities of interfacing a living system to a machine, eventually creating an artificial life entity – a Cyborg, thereby predicting an evolutionary leap in the 21st century where cybernetic entities are becoming more viable.



f18 Institute, an international artist group located in Hamburg, introduce their performance-installation “LivingRooms”: an ambient and a situation which applies to ideas and dreams to improve our daily life and environment. Starting with electrified kitchen via electronic bureau and virtual space towards “Augmented Environment” or “Ambient Intelligence”, a mixture of virtual and real space creates a picture which we can relate to our past and future.

Bill Vorn gives an overview of his research on adaptive machines for interactive robotic art. The aim of robotic art projects is to induce empathy from the viewers towards characters which are nothing more than simple articulated metal structures; their strength relies therefore on subverting the perception of these creatures by simulating organic and metabolic functions, and by creating dynamic virtual architectures..

Bremen, July 2007

Christoph Lischka, Andrea Sick

