

Simulation data can also derive from various, independent sensor sources, for instance, when our purchases via a customer card are personified and stored or the coordinates of a mobile telephone are retained over a period of time. Even this text, which I am writing on a computer keyboard composed of pressure sensors, is generated by an image made up of letters on a screen, which in turn can be traced back to the movements of my fingers. The multifunctional character of the computer makes it possible not only to register visual data but to process any electrical information. The pattern recorded by the sensor is thus one piece of a potentially multidimensional simulation in which every individual element carries within it the information making up the simulation as a whole. Each individual element is thereby a facet of the overall image.

In the above-mentioned examples of images, the observer of the simulation is confronted with the “medial extension of the nervous system,” as Herbert Marshall McLuhan puts it in “The Magic Channels.”^{>02} These extensions of the human nervous system and the resulting internal and external viewpoints have made it possible to create simulations that are independent of time and place and that would otherwise be beyond the perceptive capacities of the human senses. They can thereby form a comprehensible basis for understanding facts which are not obviously perceptible and for grasping the connections which arise from them.

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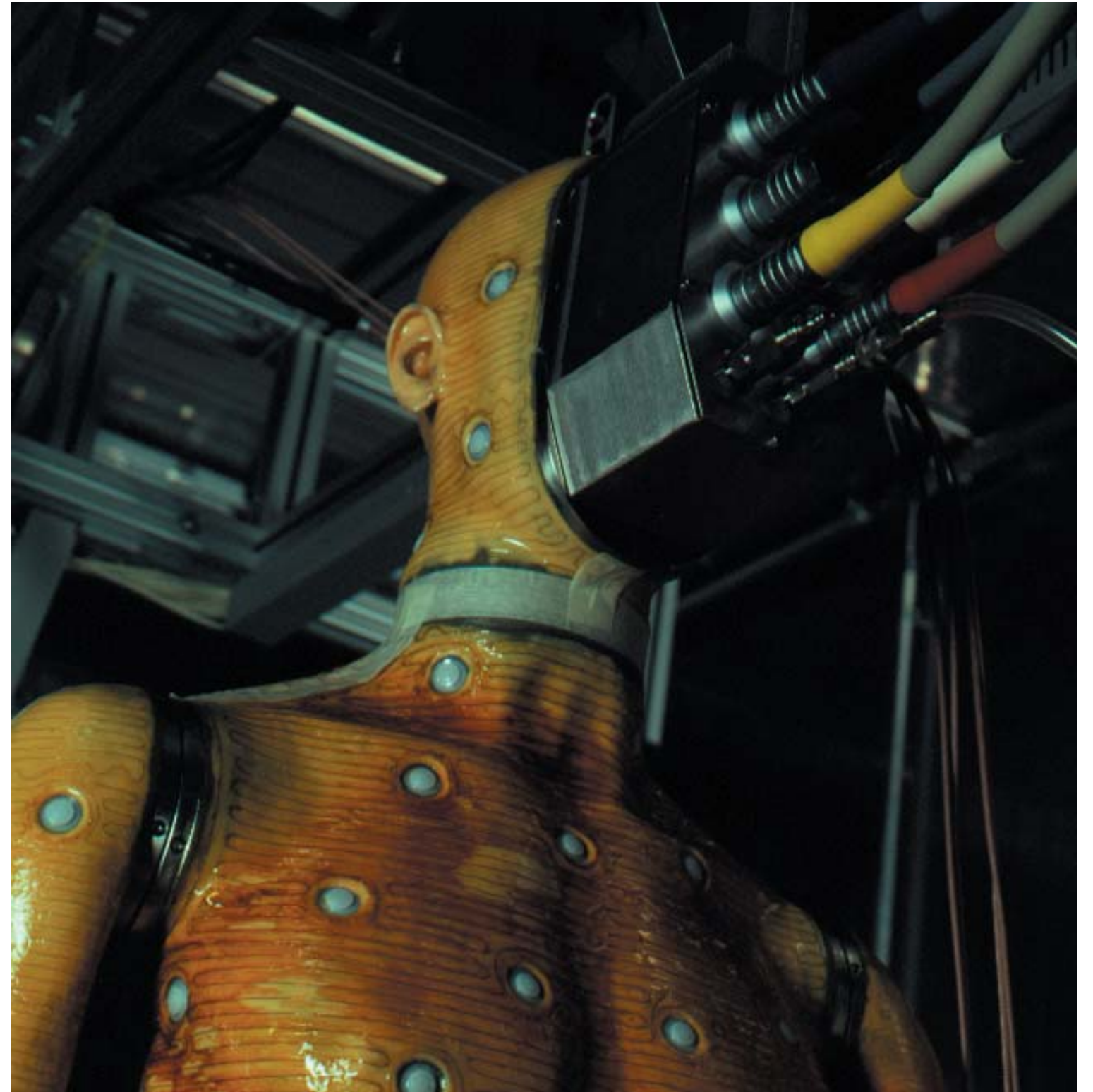
3 Communication with Machines

3.1 Do you like my profile?

Whether consciously or not, we are surrounded by a multitude of electronic devices. In order to respond to commands and to be able to respond to our needs, such devices must possess a sensory apparatus. This apparatus is constituted in such a way that it acts as a filter that only perceives the events relevant to it. This sensory perception yields a collection of data that reflects one of many possible views of reality and thus forms a partial representation of the event. Seen in this way, every data trace left behind in virtual space is a partial simulation as well as a new element and a documented history of the personality of the causative agent. The machine’s perception becomes the point of departure for the exchange process between human and machine. The form this takes is all the more agreeable the more precisely our wishes are recognised.

In most cases, a machine has access to a preprogrammed number of possible answers, from which one can be selected. This results in a further range of options. Represented pictorially, each selection level is attached to several branches, and the user thus proceeds along a prescribed “decision tree.” The exchange process follows the user profile perceived by the machine. When a question is put to the machine, it responds with a range of answers; the answer which is then selected becomes a further piece of the profile. This means that the profile can be altered during use – a process described in many software applications as interaction. However, what is of fundamental importance here are preprogrammed actions by both machine and human. The reactions of the user to the interfaces of the machines, and their dynamic reactions to the user, generate a circuit. The machine’s program sneaks, as it were, into the user’s physical reality – in the sense that the ensuing reaction and its effect on the physical space are an element of the total amount of all possibilities contained in the machine’s program. The user thus compiles a two-part program in accordance with his needs. The first part is played out as a simulation in virtual space, while the second is executed in physical space.

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One possible reaction to depictions of ourselves in virtual space is the confrontation with the ensuing consequences. Such a confrontation can be very surprising in cases where we are not aware that we have been “captured” – as is the case when a speeding ticket makes us aware we have been driving too fast.

A more subtle instance is that of encounters with Internet book retailers, who analyze the click and purchasing behavior of their customers and make offers based on associated themes. The same applies to supermarkets that establish customer profiles by way of customer cards in order to adapt retail outlets to customer needs. In the case of the supermarket, it may be that individual customers are targeted with a special offer for their favorite product. Due to the fact that the retail outlet and the exchange process are in the public sphere, the visitor’s experience is the same for all consumers. The personalized offer by the Internet book retailer is different. It is not possible to check how good the offer is in comparison with those for other customers, how it came about and which titles are not being included in the offer. Perhaps the same article is being offered to another customer at the same time for a better price. Whatever the case, personalized offers that are independent of location have advantages. There is a greater possibility that the offer corresponds exactly to consumer interests, and it is easier for the supplier to build up an effective inventory system.

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3.2 Smile please

“It is just when people are all engaged in snooping on themselves and one another that they become anesthetized to the whole process. Tranquilizers and anesthetics, private and corporate, become the largest business in the world just as the world is attempting to maximise every form of alert. Sound-light shows, as new cliché, are in effect mergers, retrievers of the tribal condition. It is a state that has already overtaken private enterprise, as individual businesses form into massive conglomerates. As information itself becomes the largest business in the world, data banks know more about individual people than the people do themselves. The more the databanks record about each one of us, the less we exist.”^{>03}

In this gloomy prediction, McLuhan refers to the power that accrues from knowledge of society and the individual. Whether intentionally or not, this knowledge is a byproduct of the electric lifestyle and entails a high degree of responsibility for those who possess it, since the use of such data can easily impinge on ethical and moral boundaries. However, this does not exclude the possibility of appropriate use.

According to an article in the monthly journal De:Bug^{>04}, the popular and functionally superior search engine Google runs some 70 to 80 percent of Internet searches. Google, which has built its success on the analysis and evaluation of link structures, is far ahead of the competition in terms of providing precise hits.

Recently Google acquired the firm Pyra and its weblog system “Blogger”. Weblogs, or blogs, are uncensored, personal and regularly updated websites featuring texts and links relating to current events. The weblog provides a detailed reflection of the prevailing zeitgeist from the subjective viewpoint of its editor. A refined picture of the most current topics on the Net is offered by so-called blog indices such as blogdex.net, daypop.com or blogosphere.us. These search through the huge number of blogs and the sites they are linked to.

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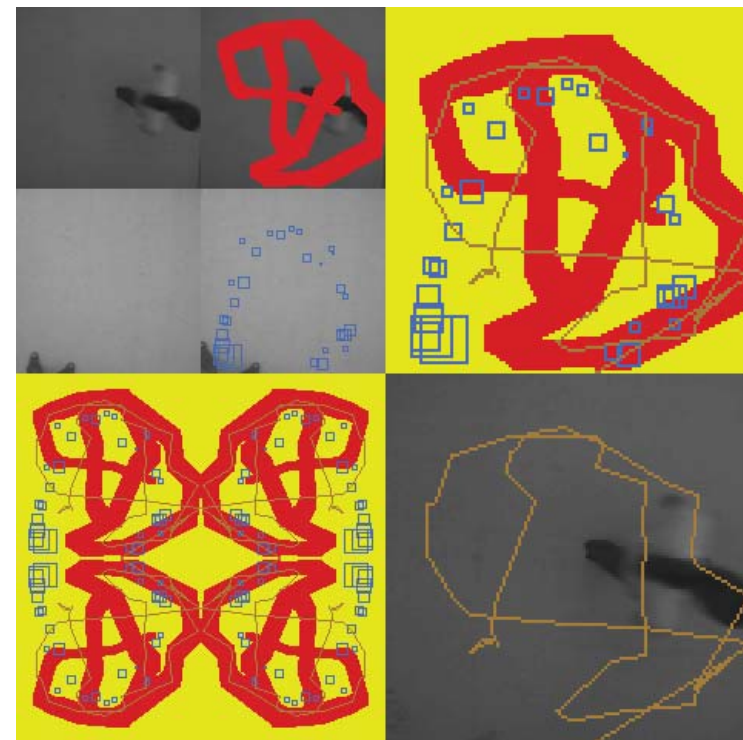
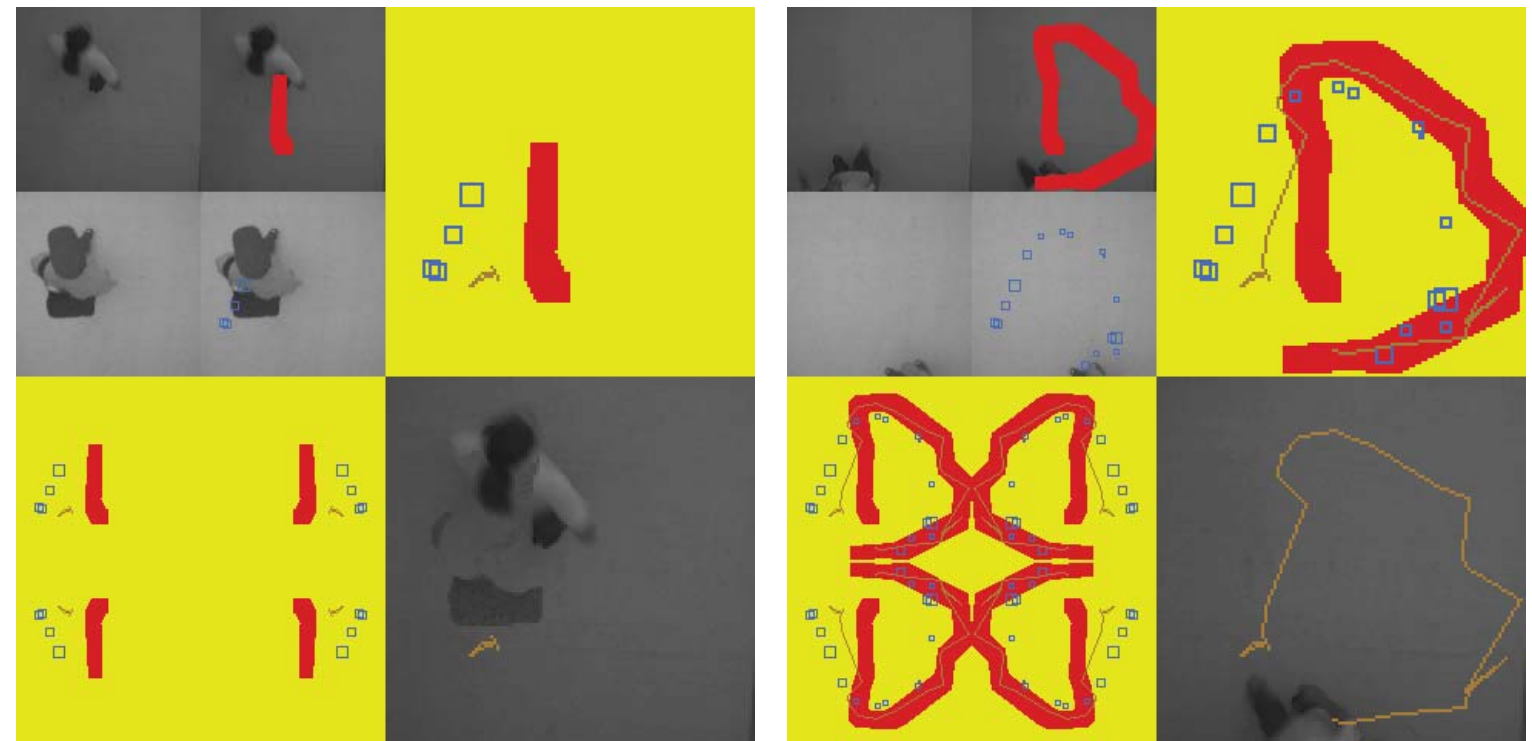




The most current themes and the most commonly linked websites are then presented on the blog indices. In the future, using its search engine and innumerable weblogs, Google will be in a position to offer precise “snapshots” of the networked society, a service that will certainly be taken advantage of by journalists in search of exciting subjects – which will in turn have an effect on the weblogs. Weblog services gather information in part through other blogs and in part through media reports. This can lead to a thematic short circuit.

According to De:Bug, Google is actively collecting data on its users. With the help of a cookie which will operate until 2038 and which is loaded onto the computer when the search engine is used, the company hunts down data. The Internet Explorer on Windows systems includes an additional Google toolbar. Both are designed to send the IP addresses, time, date, browser configuration and language of each search inquiry to the company. Furthermore, a partnership exists between Google and Alexa, an enterprise belonging to the online retailer Amazon.com which has specialized in the collection of user information. To meet the demand for knowledge, Alexa also offers a toolbar, the technology for which is a standard inclusion in the Internet Explorer and the Windows XP operating system.

There are advantages to having access to the depictions of current events provided by blogs. The information published in this way is more current than search engine results. Since the latter re-index themselves every few weeks, it is almost impossible to track down current events on them. In their capacity to comment on the news as it breaks, blogs form a Net-wide feedback system for people in the public eye and institutions which shape public opinion. As a result, the information and imagery presented plays a mediating role between interacting parties, forming an information circuit which affords equal rights to all parties involved.



3.3 Dresscode 0.55

My installation Dresscode is an example of the exchange process among equal partners.^{>05} The point of departure was the question of how data traces and the patterns emerging from them could return to the real space in recognizable form. The installation allows two people to create and visualize virtual patterns with a computer. Dresscode consists of two cameras connected to a computer, each of which is aimed at a field on the floor. When two people enter the visual fields of the cameras, the computer visualizes their positions in “real time.” In this process, their movement patterns become virtual patterns. In order to shift the latter into real space, I used textiles that were made into garments that could be worn by the originators of the patterns. Textiles consist of a matrix of threads which form a digital pattern comparable to that used in computer technology. Like the data traces in virtual space, our clothes provide information about our personality.

The aim of this work is to return the data generated in a surveillance situation to its originators in an independent design process. In a jointly executed interactive process, two equal partners generate a pattern that reflects the executed actions as visualized data. However, there is no possibility of retrospective correction. This means that the communicative behavior of those using the installation takes on a central significance. When processed in the form of textiles, the interaction process can be experienced physically. The patterns thus become a reminder of a jointly designed process and a new reality.

3.4 Reflections

In medicine, bio or neuro feedback therapies involve the application of a feedback loop for therapeutic purposes. The basic aim here is to measure electrical charges in the brain or the muscles. Using a visual or acoustic simulation of the relevant voltage, the patient can learn to normalize the abnormal frequencies through a process of training. Moreover, he or she can also develop an awareness of a normal state. Of course, to establish the measure of a normal state and to diagnose the need for therapy, a data base of comparative values is required. The potential risk here is that the comparison with mean values can

result in a “normalization” of individual characteristics.

This use of the feedback loop involves a type of symbiosis between human and machine and illustrates how a direct connection between parts of the body can be established through the transformation of electrical voltage. In this way the simulation is given a comprehensible form and transformed into physical experience - a true extension of the nervous system.

It is conceivable that the images generated by such interactive processes could also lead to a degree of self-awareness in the non-medical area. It would be very interesting to know what was purchased and where it was purchased in the course of a month. We would finally know in detail what we are eating and the relationship between costs, calories and the businesses we support. Access to the simulation would complete the circuit of information. If we let down our mask then it should be apparent in retrospect how we are perceived. The resulting increase in our self-perception would potentially extend our pre-programmed radius of action. In order to be able to recognize individual characteristics in the digital mirror image, a comparison of personal data with mean values would be indispensable, since it is only in context that a meaningful assessment becomes possible. Interrelations not directly self-evident in our lifestyle would become apparent. We would be able to observe a record of our connections and entanglements – a depiction of the consumed goods, a counterpart to financial accounting, a personalized piece of globalization that only we could account for. Cause and effect would be brought into direct confrontation. Not only the information as to “what” we consume but also the possibility of answering “why” could generate the knowledge that could in turn promote a self-correction.

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colonization of space. Planet Earth has been depopulated following a nuclear war, and only those who cannot emigrate remain. The androids are such perfect copies that they can only be distinguished from human beings by means of a special testing apparatus. They are organic robots, and the latest series possess an intelligence superior to that of humans. The only thing distinguishing them from their creators is their inability to feel genuine emotions. However, the question of how genuine human feelings actually are becomes a problem for the android hunter Rick Deckard. Six androids have fled to earth, and it is Deckard's task to hunt them down and liquidate them in order to preserve the human-android distinction and balance of power. Androids can adapt to situations and produce appropriate reactions, but they are not emotionally affected. They are incapable of feeling compassion. They are loners who do not participate in the collective emotional illusions of the society. This is ultimately the reason why their presence on earth cannot be tolerated. The collectively experienced illusion of emotions is based on a total mediatization of society. Mood-controlling devices determine the feelings and state of mind of human beings, and an "empathy box" provides its user with total immersion in the repeated, collective experience of the rise and fall of Mercer, a Sisyphus-like figure who has assumed religious proportions. The empathy box connects the users emotionally and enables them to exchange their feelings. In this way a positive experience is contributed to the empathy box. While this represents a gain for the community, the user's own capacity to feel is thereby reduced. On TV, the androids "Buster Friendly and his friendly friends" present a twenty-three hour media spectacle daily. No one questions the humanity of Buster and his friends, although the fact that they always look good, are in a good mood and are permanently on screen appears somewhat suspect. In this world devoid of feelings and senses, a society that is both self-programmed and externally designed, the capacity for empathy has become the most important human quality. Androids are hunters and must be destroyed, since, according to android hunter Rick Deckard, hunter and prey do not feel any empathy in nature. ↴

commands or by hand – a significant factor that underlies the way they converse and the relationship that develops from this. K.I.T.T. has a good sense of humor and is very interested in human emotions, which it seems to learn over time. In particular, when Michael is attracted to a woman, the machine seems to abandon its rational world view and becomes unpredictable. The intelligent automobile is given a certain degree of autonomy, which enables it to navigate independently. In addition, it is equipped with comprehensive knowledge in many areas of science. If necessary, it can link into computer systems in order to gain further information, which it displays and reviews on two screens. Infra-red, X-ray and a range of other sensors enable K.I.T.T. and Michael to form a precise image of their prevailing situation and plan their next move.

There are several major differences between the two heroes: on the one hand, their specific skills, on the other, the important role of feelings and instinct. Michael approaches his partner on a very intuitive level. His instinctive way of navigating the car is matched by his uninhibited communication with the artificial intelligence that has been built into it. The physical extension of the driver through the mechanical navigation of the car fuses with the extension of the nervous system achieved via the vehicle's electronic capabilities. The two become a single object, whereby the mechanical actions can be assumed by the artificial intelligence, which in this case only resembles a human in terms of its voice. The human lives in and with the mobile electrical and intelligent ego-sphere, an artificial intelligence that extends the sensory apparatus of the human being and "houses" him. Michael Knight lives in a computer which is simultaneously a car.

3.6.2 Do Androids Dream of Electric Sheep? and Blade Runner

The relationship between humans and their mechanical neighbors is cast in a different light in Philip K. Dick's 1968 novel *Do Androids Dream of Electric Sheep?* and Ridley Scott's 1982 film version *Blade Runner*.

In a highly developed technological world, humans have created androids for military purposes. These are used as slave labor in the

vide the material for the assessment and interpretation on which a reaction can be based. Many of ASIMO's capabilities are based on the assessment of camera images and the differences between voices and noises – which are ultimately also human capabilities.

3.6 Examples

"Motive," the construct said. "Real motive problem, with an AI. Not human, see?"

"Well, yeah, obviously."

"Nope. I mean, it's not human. And you can't get a handle on it. Me, I am not human either, but I respond like one. See?"

"Wait a sec," Case said. "Are you sentient, or not?"

"Well it feels like I am, kid, but I'm really just a bunch of ROM. It's one of them, ah, philosophical questions, I guess ..."^{>07}

The co-existence of man and machine is an integral element of many science fiction novels. However unrealistic these might be, they offer good illustrative material and deal with themes that may in the future take on greater relevance for us. In order to illustrate the possible co-existence of man and machine, I would like to focus on the TV series *Knight Rider*^{>08} as well as the novel *Do Androids Dream of Electric Sheep?*^{>09} and its film version *Blade Runner*.^{>10}

3.6.1 Knight Rider

The protagonists in *Knight Rider* are the Knight 2000, alias K.I.T.T., the intelligent, indestructible car equipped with special sensors as well as active components, and Michael Knight, its driver. As members of the "Foundation," they hunt down evil-doers and fight for justice. Although very different, they complement each other, and their relationship is a very loyal one. K.I.T.T. is programmed never to endanger a human life and, as a consequence, is cautious and rational. Michael Knight, who is by nature daring and instinctive in his actions, complements his partner by protecting any endangered human life at all cost. K.I.T.T.'s solicitous warnings to his adventurous and irrational partner often fall on deaf ears. Yes, the two do speak with one another. If he chooses to do so, Michael Knight can steer K.I.T.T. using voice

3.5 Machines as Partners

Having machines in our vicinity is not unusual in itself. For the most part, communication with them proceeds via non-intuitive interfaces. Due to a lack of adequate deployment or a technologically "backward" sensory apparatus, what we want machines to do must usually be abstracted and typed in. Were we able to communicate with machines as with people, we would probably accord them a certain equality as artifacts or partners. Furthermore, it would be possible to design the interactive process itself in a way far better adapted to human beings. The closer machines come to our appearance and our sensory world, the more they come to reflect human nature. One example is the latest version of the humanoid robot ASIMO, developed by Honda.^{>06} It moves on two legs, has two arms and hands and looks a little like an astronaut. Its limbs are largely modeled on human extremities, and due to its capacity to recognize speech, sounds, gestures, postures and faces, it is able to form a multifaceted image of its environment. Its perceptive apparatus is equipped with intelligent evaluative and reactive mechanisms. These make it possible to freely interact with the robot. It can, for example, shake hands, conduct a conversation and move in an indicated direction.

ASIMO offers the potential for interactive communication in the sense that its artificial intelligence allows for the emergence of a spontaneous self-referential interchange – a mutual relationship between man and machine which is not encountered in all systems described as "interactive." It is often the case that communication with machines is "reactive." If the machine is to be an active partner and not merely a medium of communication between human beings, it requires more than a preprogrammed input and output. Researchers refer to genuinely interactive systems as adaptive systems or artificial intelligence; based on learned criteria of assessment such systems react "spontaneously" or, more aptly expressed, enter into an interactive relationship with the user.

The sensors which feed information into the system play a central role here. They generate sensory impressions which together provide the machine with a view of the world. These sensory impressions pro-

It is only empathy that distinguishes man from machines. Ultimately all human beings are influenced by feelings and moral values. In part disseminated by the media, these feelings cause the individual to feel part of a whole, calm him or mobilize him.

The process of interaction with machines can no longer be distinguished from that between humans. Machines have a similar sensory apparatus to humans and can perform human tasks if required. It is crucial that “Blade Runner” Rick Deckard is able to distinguish between the original and the simulation. As the intelligence of the androids is already superior to that of humans, the only small difference is in the realm of feelings, and this can only be detected by a testing machine. A subjective assessment is not possible. The fact that Deckard feels himself attracted to a replicant places him in a difficult situation. He recognizes himself and his inhuman callousness in the machine. His doubts as to the authenticity of his feelings challenge his belief in his own humanity. The only small difference between the original and its simulation appears to dissolve.

Whereas K.I.T.T., as a multifunctional “tool” with limited autonomy, acts as a partner for the human hero, in Blade Runner the machine has become the turning point of the society – a horror scenario in which machines can no longer be distinguished from human beings. The sensors and limbs of the androids correspond exactly to human ones. For their part, humans program their feelings and are dependent on the media extensions of their senses. It is an exaggerated depiction of the power of electronic media that does not seem completely unfamiliar to us: a media-saturated society in which unfeeling human beings are threatened by the integrity of machines. Although the androids can refer to stored experience and thereby calculate a correct behavior in nearly all situations, they remain deprived of a personally emotional relationship to the world.

4 Where We May Go

The development of non-human sensors has resulted in an extension of the spectrum of human experience. It has also opened up the possibility of building machines that can react to and even interact

with their environment. The design of these dynamic artifacts demands an extension of qualitative requirements which no longer correspond to conventional product criteria. What we understand today as product design will increasingly change into process design. While conventional product design is oriented to industry leaders and attempts to draw notice without confronting customers with anything unfamiliar, innovation is blocked by a type of conformity. If a tactile or virtual product is not distinguished from its competition in either aesthetic or conceptual terms, the design of the interactive process between the customer and her product will become a decisive design factor. Practicing process design as a discipline will provide the aesthetic aspect with new impulses and change the conceptual requirements. Aspects such as the user-friendliness of the interface and the technology it is based on will have a direct influence on the use of the product. Questions such as how quickly a user can call up functions, how flexible and modular the technology is, how precisely the product responds to a set task and how the manufacturer deals with personal data will become important. Leaving aside horror scenarios and science fiction, the autonomy and characteristics given to technology will also become an important factor in process design, as will the degree to which the product can be converted and extended. Software is more comparable to a continual flow than to an object that is divisible into units.

This will be a “process design” that is no longer tied to the formal concept of beauty. Naturally, sensory experience will continue to play an important role. The visual design of electronic media has established itself with a wide range of forms of expression, standards and conventions. Building on this, our focus in the future will be on well-formulated processes and their content, on design that expresses exchange between people as well as with autonomous machines, and that adequately deploys channels of communication in the private or public sphere. In this context, external factors such as cost-effectiveness must also be taken into account. We will have to practice asking technology the “correct” and relevant questions in order to receive proper answers – provided there is electricity available.

Regarding the pictures

The series of large-format pictures feature the robot SAM (Sweat Articulated Manikin). SAM was developed in the Clothing Physiology Department of EMPA (Swiss Federal Materials Testing and Research Institute) in St. Gallen. The robot’s main task is to wear pieces of clothing and to test their materials. SAM not only looks like a human being, but also has two distinctive skills: he can “walk” and he can sense the heat stored by the clothing he is wearing. This allows him to sweat like a person.

SAM thus represents a highly interesting development. He “works” unquestioningly in the extremely adverse conditions of the climatic cabinet and at the same time simulates the most distinguishing aspect of a human being involved in physical labor: he sweats, and does so until his clothes are wet.

Thanks

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