

UNMASKING INTERFACES. Archaeological moments of visually mediated knowledge

### **The *prosopopoeitics* of inter“face“**

The term and the practice of *interfacing* still adhere to an anthropomorphic discourse, while a non-metaphorical use of „interface“ liberates machines from rhetoric, separating metaphorical interfacing from its technical functions, de-anthropomorphising technical media from the ways they are being *personalized*.

The criminal archive has long resided on photographic portraits of delinquents or of collected fingerprints. The iconic or indexical paradigm nowadays is *dataveillance*. Even if these data sets are still phenomenally generated as „images“ on interfaces (computer monitors), they can hardly be called „images“ any more. The identification of some 2200 victims of the WTC attack could only succeed by comparative DNA analysis, in order to be able to literally sort (or assemble) 14.000 found fragments of corpses. When the faces are destroyed, they are being replaced by the data "mask".

The basis for symbolically coded communication are alphabets or numeric data (even if masquerading in the guise of images). The literary genre of „ghost talk“ in European Humanisms and Renaissance (Macchiavelli, Petrarca) has been as a genuine function of writing systems. Script-based society trusts into the possibility of storing intellectual energy in writing which can be synchronically re-activated across time by reading.<sup>1</sup>

### **Deferred interfacing of knowledge: letters**

"By letter we may absence make / even presence selfe to be.  
And talke with him, as face to face, / together we did see" (William Fullwood, The Enemie of Idleness, 1582). In letter-based communication, the partners have always been aware of the temporal delay when taking a letter into their hands; such delay tends to be effaced in "live" tele-communication. For the telephone, the answering machine has been a *re-entry* of the postal message - *Voice-Terminal-Echo* (Jonathan Goldberg).

Telematic communication generates - technically formulated - depersonalized forms of interfacing; partners of communication have become signals and ciphers of addresses. Michel Foucault imagines the human face vanishing in the sand - a sand which is *silicon*.

### **Loose and tight interfacing**

The printing revolution created a complete reconfiguration of interfacing knowledge. The function of the interface is *coupling*. A loose coupling would still be identifiable as „medium“, according to Fritz Heider, and the tight coupling freezes into „form“.

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<sup>1</sup> Aleida Assmann 1999: 124

The term *communication* usually points to oral communication, automatically thought of as a two-person game. "This may extend to letter writing. For printed communication, however, it is completely inadequate."<sup>2</sup>

"Once writing is defined as a symbolic trace in a receptive material, signs are perforce transmitted through a technological interface. The book is an interface no less than a way tablet or a woodcut print. But from the woodcut to the computer, we have come to require machinic arrangements of greater and greater complexity to translate representations into visible and sonice arrangement our bodies are capable of perceiving."<sup>3</sup>

The acoustic medium provides for the tight coupling of noises. The optical medium provides for the tight coupling of things (Luhmann *ibid.*).

Under the title *Simulationspace* the media art group Knowbotic Research installed a *Mosaic of mobile Datasounds*, an interactive walk-in sound data space, collected through the Internet, installed at the Ars Electronica festival in Linz (Austria) 1993, later at the Siggraph '94 in L.A. Here, the visitor navigating a "datascape" missed the usual feeling for orientation; „the composition of the information in the darkness reveals new clues of perception, new sense of space, the processing of information.

## **Medieval heraldy and parchment as interface**

Heraldry has been a technique of designing a screen: the art of dividing a shield into several figurative, geometrical or coloured sections; the medieval chart as well has a „metaphorical machine“ (using Pierre Bourdieu´s term). Media archaeology, though, focuses on the disruptive discontinuity between such cultural techniques and truly techno-logical devices.

Every screen is not transparent, but a shield, hiding its material, technical or logical infrastructure - hiding by showing. The task of media archaeology thus is an act of un-covering. Hypermedia dramaturgies, starting with TV and video and resulting in the digital worlds, consist of surfaces everywhere. These surface phenomena, though, can not be opposed to a hidden interior, since no semantic depth is intended. They are what they show. When the Universal Turing Machine renders data for display, this is not metaphorical, but its direct enunciation.

## **Iconic / idiotic interfacing**

In pre-modern times, images as *ikones* communicated to the illiterate. Such icons have returned on the computer screen. Umberto Eco, in his essay „MS-DOS is Calvinistic“, opposes the (nowadays prehistoric) MS-DOS interface user to the Macintosh User, mirroring the schism between catholicism and

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2 Luhmann 1992

3 D. N. Rodowick, *An uncertain utopia - digital culture*, in: Claus Pias (ed.), *Medien. Dreizehn Vorträge zur Medienkultur*, 1999

protestantism in Christian religion. The Calvinist version is concentration of information on the alphabet, equalling programming, while the Catholic version is counter-reformation by iconicity.

Icons are functional pictures used by computer graphics designers on the media scene of the man-machine interface. Even if iconic communication might historically be the most natural, earliest form of symbolic communication, the archaeology of writing indicates that complex cultures require symbolic interaction by more abstract signs, such as numbers and the alphabet. Since Alberti, images have become a function of mathematics - the linear perspective, as explained in Dürer's *Anweysung zur Meßkunst*.

With clickable icons, programming-as-writing and the simulacricity of interfaces may coincide, when it comes to *visual programming*. Iconic programming environments make diagrams (or pictograms, graphical notations) transitive: they do, what they metaphorically indicate, thus being metaphorical no more in a rhetoric sense, but in a technical meaning of data transfer. Programming is carried out simply by arranging icons on the display. Here, "objects which the system deals with such as data and program are represented in terms of icons. Programming is carried out simply by arranging icons on the two-dimensional display screen and specifying flow of data."<sup>4</sup> Icons are not just small images on a display to visually assist the communication between user and machine, but they are conceptual objects "including both an object consisting of an icon image displayed on the screen and the functional description associated with it such as a program code and a data value"<sup>5</sup>; the icon, in its semiotic sense, here bears resemblance with the coding as a kind of visual short-cut of algorithmic lines. But the way images are being processed in the human brain disguises how they are algorithmically generated from within the computer: "An image is captured as a whole. It is processed in a parallel manner, and the semantics are entered into long-term memory. <...> The speed of image processing and the accuracy of image recognition are two factors on which an iconic-based man-machine interface can capitalize."<sup>6</sup> But icons may be much more culturally ambiguous than the mathematical codes they dissimulate. Is a virtual machine like the BALS (Brown Algorithm Simulator and Animator) a simulation or a performance of such proceedings? Monitoring of programs in execution by such visualizing tools can lead to immediate interaction with the program observed, and thus advance from simple displaying / viewing algorithms in execution to actually control it. The visual paradigm means monitoring the execution of an algorithm in the cybernetic sense (communication resulting from feedback + control), comparable to the Williams tube in early computing (which did not only visualize but actually physically perform storage / time-delay functions).<sup>7</sup>

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4 Tadao Ichikawa / Masahito Hirakawa, *Visual Programming - Toward Realization User-Friendly Programming Environments*, in: Glinert (ed.) 1990

5 *Ibid.*, 61

6 Kenneth N. Lodding, *Iconic Interfacing* [*IEEE Computer Graphics and Applications*, Vol. 3., No. 2, March/April 1983

7 See Marc H. Brown / Robert Sedgewick, *A System for Algorithm Animation* (1984), reprinted in: Ephraim P. Glinert (ed.), *Visual Programming environments: Applications and Issues*, IEEE Computer Society Press 1990

Temporally dynamic interfaces are manipulating temporal knowledge: „BALSA provides facilities for displaying multiple views of data structure, all of which are updated simultaneously during program execution to give a motion picture of the program in action.“<sup>8</sup> Interfacing history: "BALSA could replay its saved history of interesting events and the view would update itself incrementally as if the program were executing. This method has the problem that one might not be interested in what happened in the algorithm over history; rather the current state is of interest."<sup>9</sup>

Users of the operating system UNIX, by applying the order HISTORY, can re-call a chronicle of terminal events - a visual history, providing for temporal transparency. The *RAND Corporation*, in trying to automatize military simulation games, called this *synthetic history*.<sup>10</sup> Interfacing knowledge thus transforms from intransitive (i. e. without a direct object, from late Latin *intransitivus* , literally "not passing over") to transitive communication („passing over“) - communication with no interface any more, like the non-symbolical archiving f. e. of biometrical data (fingerprint) on passports?

## Visual knowledge?

Radar once extended perception beyond the optical horizon of the visual, while at the same time reducing perception on decisive data or identification and control. Still, the optical metaphors stubbornly survive. Radar signals are being represented by the cathode ray tube visually, thus establishing an interface between the technique of radar and its human interpreter.

Complex data cluster, when represented in abstract symbols and data strings, can hardly be comprehended by human reading any more which is too slow. For the sake of human understanding, they are being abridged by images. Knowledge and seeing converge, both etymologically and in the act of decoding. The early design of a visual interface called *Dataland* in 1973 resulted from the wish to create a multi-media data bank where information could be spatially processed and retrieved - without using key words or logic or relational criteria. On the computer screen there emerged a virtual surface with visual symbols (icons) representing different forms of data quantities (William Donelson).

## Unmasking inter“faces“: From visual interfacing to *monitoring data*

Civil use of computing needed to create interfaces as user illusions. "At PARC we coined the phrase 'user illusion', to describe what we were about when designing user interface", Allan Kay confesses in his essay „User Interface: a personal view“. Neither visual properties nor similarities can guarantee the meaning of an icon, but their advantage is that they suggest to the user who might be completely ignorant of machinic procedures the option of directing

8 Brown / Sedgewick 1984/1990

9 Brown / Sedgewick 1984/1990: 119

<sup>10</sup> See Claus Pias, *Synthetic History*, in: *Archiv für Mediengeschichte*, Weimar (2001), 171-183 ; online Version <https://www.uni-due.de/~bj0063/texte/history.pdf> (accessed September 2017)

the machine. Thus icons fulfil the traditional task of transferring coded commandments to persons who don't know this code. What is the alternative? Transforming users into programmers? But icons themselves might become a form of knowledge, as already practiced in scientific techniques of visualization. To be more direct: The „black box“ of the computer, its hardware, might be iconized down to its most minute register, in order to turn - analogous to Cusanus' notion of the *icon* - the reading of the central processors into seeing, that is: making them visible, transparent.<sup>11</sup>

Visual and sonic navigation in dynamically generated information landscapes are central tasks for multimedia designers. But do interfaces necessarily require audio-visual orientation, or is a mathematical interface thinkable, as visioned by Leibniz - interfacing knowledge in logical space?

The media art group Knowbotic Research (KR+cF) devised a knowledge space to represent the Antarctis, a model of a Computer Aided Antarctica. "KR+cF in its DWKTS installation, limits the material to the available computer-processed information on current antarctic research as it appears in public data networks. [...] the data space give rise to phenomena which are difficult to conceptualize - a Computer Aided Reality. [...] KR+cF designs knowbots, devices operating as spatially and temporally dynamic interfaces for the observer's interactive navigation through the information landscape."<sup>12</sup> Since the Antarctis as data pool actually happens outside the Antarctis, as artificial nature in data representations of measuring and sensing instruments covering this area and procuding, every second, a stream, a flood of data (like satellite vision). These informations tend to become independent and can be grasped and administrated only by artificial intelligence agents (learning algorithms, so-called knowbots) in computer networks. These agents, in the mentioned installation, create out of the flood of information images from the south pole. The data body of this Cyber-Antarktica is based on temperature data and Ozone values - scientific material which has lost any deep sense or semantic meaning (ibd.), thus rather equalling the Shannon- than the cultural studies-like notion of communication. Visual, interactive data clouds instead of fixed interfaces, as explained by Christain Huebler in „Discovering CyberAntarctic“:

"Our installation 'Dialogue with the Knowbotic South' <...> is based on knowbots, which generate a vision in a data-network. They originate a hypothetical nature, a Computer Aided Nature (CAN). <...> We have designed a visual form for every knowbot's algorithm corresponding to the data sets. <...> *We do not have an interface any more, a mechanical interface, in the real world, we have interfaces in the network, the dynamic network*" (italics W. E.).

Finally, visual interfaces become redundant in machine-to-machine-communication. The coupling of knowledge to visual interfaces generates *monitoring* in all senses (panoptical survey) - the option of tele-control, control in distance. But is there any transparency beyond the monitor(ing)? Digital calculation beyond the individual subject refers neither to the differential

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11 See Stefan Heidenreich, *Icons: Bilder für User und Idioten*, in: Birgit Richard / Robert Klanten / S. H., eds., *Icons - Localizer 1.3*, Berlin 1998

12 Blast 1996; <http://www.krcf.org/krcfhome/1dwtkts1.htm>

symbolic order represented on the screen nor to a world outside this screen (physical reality behind the screen is chips and current only); the digital machinery retreats into total untransparency, invisibility (Slavoj Žižek).

## **Knowing = telling?**

Knowledge has become the skill where to find information about it: *infomapping*<sup>13</sup> - diagram rather than image, from *storing* data to *sorting* data. *Information*, as defined by Shannon and Weaver (1949), has come to mean the combination of data into messages intelligible to human beings. But this understanding does no longer necessarily requires a narrative shape - which is a culturally specific form of ordering knowledge in (linear) time. To know is to recognize differences, in its most radical technological reduction to tell 0 from 1, digitally. The ultimate interface is the one between the physical and the logical world, the analogue-into-digital transformer.

## **Interfacing *time-based* knowledge**

David Gelernter proposes the data flow of *lifestream* as a future alternative to the desktop-metaphor of present computer interfaces. The dominant mode of actual knowledge is transitional, transitory, equalling the form of the electronic current itself - a literal „liquidation“ of spatial metaphors to temporal ones. Instead of emphasis on spatial memory (on hard disk) „the Lifestreams system treats your own private computer as a mere temporary holding tank for data, not as a permanent file cabinet“<sup>14</sup>. Future and past become just segments, functions of a floating interface differentiating data flows. Analog electronic screens are time-windows already.<sup>15</sup> The computer-screen, though, is a monitor in time, *interfacing time*. Images, symbols, data, points and pixels which appear on the present time window of the monitor and disappear as fast, sink back to the memory, from where they can be re-called every moment into a ever repeatable re-presentation. Once quantified, time is fragmented, becoming divisible into smaller and smaller usable bits (Götz Großklaus).

Dan Graham's video installation *Present Continuous Past* (1972) interfaces the presence of the audience by delay. Narrative time in Bill Viola's video installation *Slowly turning Narrative* (1992) is being replaced by a technical *close circuit* between camera and monitor, with deferred time. In Gary Hill's video installation *Inasmuch as it is Always Already Taking Place* (1990) video tapes whose time code (numbers) remains visible are being rewound again and again. And in Viola's video-installation *Heaven and Earth* (1992) two monitors mirror each other *in time*, one (with a baby's face) mirroring the other (a old, dying woman's face)<sup>16</sup> - interfacing time itself.

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13 Bolz 2000: 131

14 David Gelernter, *Machine Beauty. Elegance and the Heart of Technology*, New York (Basic Books) 1997

15 Großklaus 1994: 55

16 Belting 1995: 97

## **Against the invisible interface: aesthetics of *enhancing the difference* between man and machine**

*Is the transparent interface a medium? Aristoteles writes to metaxu, literally the „inbetween“. It becomes obvious only in moments of breakdown: "Objects and properties [...] arise only in an event of breaking down in which they become present-at-hand. <...> A breakdown is not a negative situation to be avoided, but a situation of non-obviousness, in which the recognition that something is missing leads to unconcealing <...>. This creates a clear objective for design - to anticipate the forms of breakdowns and provide a space of possibilities for action when they occur."<sup>17</sup> The interface can become a zone of conflict; only irritation reveals the technical medium to the human senses.*

But current interface design heads towards the oblivion of hardware by software operations, in order "to break free of the computer, to break free conceptually. <...> Cyberspace is unlike any physical space. The gravity that holds the imagination back as we cope with these strange new items is the computer itself, the old-fashioned physical machine. <...> every key step in software history has been a step away from the computer, toward forgetting about the machine and its physical structure and limitations - forgetting that it can hold only so many bytes, that its memory is made / of fixed-size cells, that you refer to each cell by a numerical address."<sup>18</sup>

### **Interfaces**

What if the interface is not transitive, but intransitive? When the screen does not simply translate signals or information from computer hard- and software to visibility, but is in itself the message? The television screen has been a media scene for critical interface experimentation: "Everyone should have as many controls as possible to permutate the size, shape, and color of what they're watching. [...] generally they're offered to "adjust" a picture which is thought to be abnormal, rather than to create your own electronic kaleidoscope. However, one thing you can do is draw a magnet across the face of the picture tube. This messes with the magnet field on the picture tube and distorts the image (without damaging the set) at your control."<sup>19</sup>

On the computer screen, all space becomes an abstract computational space, and all time becomes abstract algorithmicized time. At the heart of digital computing, there is interfacing to the external signal world by translation already, the transformation of physical reality into coded data (that is, whatever can be „read“ by the computer). The world is abstracted into binary values (embodied as voltage); whatever cannot be translated into numbers, literally *does not count*.

### **Interfacing as metaphor / translation**

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17 Winograd / Flores 1986: 36 u. 165

18 David Gelernter, *Machine Beauty*, New York (BasicBooks) 1997

19 Shamberg & Raindance Corporation, *Guerilla Television*, 1971

The keyboard or the monitor of a computer are interfaces for communication between human and machine which transform between different states or representations. However, also parts of software are interfaces which allow for communication between two or more programs written in different languages. In contrast to the hardware case, the software-to-software interface can not be physically, only logically localized. It is the functionality behind it that allows to speak of an interface.

"A computer monitor <...> is a cascade of interfaces that transforms internal electromagnetic states via data buses, oscilloscope, fluorescent material etc., to electro-magnetic states in the visual range of wavelengths. A purist may write down a [partial] differential equation of the whole thing on a microscopic level where the notion of an interface seems to become rather arbitrary. It seems, that the intuitive notion of an interface is a relativistic concept."<sup>20</sup> Even the present "now" is pure interface for the integration of different temporalities.

### **Interactive interfaces**

"Machines, instruments, dispositives were built to deceive the eye. The new dispositives will deceive the brain. For that new interfaces have to be developed [...]."<sup>21</sup> In military action, smart bombs that interactively check observations of the terrain against a stored map of their routes are 'smart', i. e. they „know“ as soon as they are able to enhance algorithms with interaction, while traditional linear algorithms are metaphorically dumb and blind because they cannot adapt interactively while they compute.<sup>22</sup>

### **Transitive interfacing**

In *Alice in Wonderland*, the protagonist jumps down into the Looking-glass room. The ultimate interface would be the abandonment of interfaces, the immediate sending of sensual data from computer to human senses / nerves, constructively: no simulation any more, but cerebral stimulation. As opposed to traditional *mimesis* (mirroring reality), such an interface *generates* (virtual) realities - from mirror to monitor. The notorious Turing test though requires an interface between man and machine, a teletaper (as proposed by Turing in „Computing Machinery and Intelligence“), since direct coupling between man and machine is (still) not yet possible.

There is a media-epistemic rupture as well in the temporal sense: When compared with most traditional physical interfaces, which remained relatively stable over long periods of time (like the book page), the digital (virtual) interface is uniquely open to reconfiguration and radical redesign. Current interface design still metaphorically (or iconically) mirrors or "re-mediate"

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20 Hans Diebner, Timothy Druckrey and Peter Weibel [ed.], *Sciences of the Interface*. Proceedings of the International Symposium, preface

21 Peter Weibel, director of the ZKM - Center for Art and Media Karlsruhe, Germany, on *The Art of Interface Technology*

22 Peter Wegner, Why interaction is more powerful than algorithms, in: *Communications of the ACM*, vol. 40, no. 5, May 1997



(Bolter / Grusin) the old media aesthetics (following McLuhan's law), like the „folders“ in current windows still conservatorily mirror the bureaucratic, archival paradigm of administering knowledge, new forms are genuinely information-based. As long as the key-board of computers is alphabet-based like a type-writer for printing just letters, the paradigm of printing remains dominant.

Just like the media theoretician professor O´Blivion says in David Cronenberg´s movie *Videodrome*: The electronic image from the screen is mirrored by the retina of our eye and can be transferred from there to the computer screen. Electronic signals invade bodies by the very physical act of perception. All of the sudden, the interface is within. The future will be the transition from exterior to interior interfacing. The term „immersion“ indicates the dissolution of the interface as such. The dialogical model is replaced by the immediate.