Interface Perception

The Cybernetic Mentality and Its Critics: Ubermorgen.com *

by Søren Bro Pold

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> During long periods of history, the mode of human sense perception changes with humanity's entire mode of existence. The manner in which human sense perception is organized, the medium in which it is accomplished, is determined not only by nature but by historical circumstances as well (Benjamin 222).

Walter Benjamin suggested in the 1930s that the mode of human perception changes historically. Human perception is not only governed by nature, biology and its slow evolution, but our perception acts, is organised and accomplished through media that are also governed by historical circumstances. For example, we do not only see the world with our eyes; our seeing is also accomplished and takes effect in a way that is governed by semiotic and material media, which are historical constructions in our reality.[1] We may still see with the physiological eyes of the hunter and gatherer, but what we perceive has changed a great deal when we watch reproduced images or film or read a text. And if we want to understand the social, historical and cultural role of perception, we have to examine how media and representations challenge and change our way of perceiving and simultaneously incorporate certain modes of perception in their own technological and material form.

A current significant example of this is the cybernetic interface. This kind of interface is constructed through a remediation of older representational forms such as images, film, texts and sounds, complete with their various traditions, genres and media characteristics, like linear perspective, film editing grammar, the conventions and designs of the pages, sound design and musical styles (Bolter and Grusin; Manovich). But the contemporary interface also incorporates cybernetic feedback and interaction. It allows the user to interact with its representations, and it registers the user and his/her interactions through input devices, sensors and tracking. In this sense the interface simultaneously builds on media history and aesthetic traditions of how to represent things in ways that are distinguishable and meaningful to human perception, and it constructs its own perceptional feedback loop.

In this article, I will argue that it is important to follow this interface perception in order to understand our current social, political and cultural reality. But when we look at an interface, we only see half of it, since the machinic, cybernetic part is largely hidden from our senses,

though it still has effect. In order to take a closer look at these effects and discuss interface perception, I will look to some contemporary net art projects by Ubermorgen.com. Ubermorgen.com consists of lizvlx and Hans Bernhard, who started his artistic work with the net art group Etoy in the 1990's. Ubermorgen.com has received numerous awards and distinctions, e.g. at ARCO (Madrid), Transmediale and Ars Electronica, has exhibited around the world and received a great deal of media attention, some of this under-cover as part of media activism such as [V]ote-Auction. I divide Ubermorgen.com's projects into outward-reaching activist projects and more inward-oriented psychological and epistemological projects. Of the former, I shall focus on Google Will Eat Itself (2005-09), which is the first project of the EKMRZ (ecommerce) trilogy, and my example of the latter is the Psych|OS cycle (2002-09).

While writing this article, *Ubermorgen.com – Media Hacking vs. Conceptual Art* has been published with an overview of Ubermorgen.com's work until date and with short essays by a number of writers (e.g. Inke Arns, Florian Cramer and Jacob Lillemose also present in this volume). Florian Cramer puts Ubermorgen.com into an art historical perspective of net art and the avant-garde and shares my description of the double character of the work: "It is simultaneously reflexive and actionist, introverted and extroverted, it is melancholy put into action, hyperactive melancholy, acted out a high personal risk in it, running battles with lawyers, the courts and personal burn-out" (Cramer in Ludovico 187). Both these two strands of Ubermorgen.com's work are, however, united in exploring the contemporary networked interface, and I find both the differences and the similarity illuminating in my attempt to understand interface perception.

First, however, I will elaborate on mediated and cybernetic perception. My argument will primarily address seeing, but a seeing that is thoroughly synaesthetic and thus connected to the other senses, e.g. in the way that seeing is related to a perceptional, cultural and mental experience in Ubermorgen's projects. Towards the end of the article, my exploration of the interface mentality leads me to psychotropic drugs, bipolar disorder and ADD following Ubermorgen.com in a discussion of how art reflects cultural changes in perception.

Media culture, perception and the interface

Walter Benjamin pointed out how a distracted and tactile perception developed as a response to the challenges of modern life – sometimes as a defence against the speed and intrusive nature of modern visuality, sometimes as a therapeutic or overwhelming shock in order to shock the senses into perceiving again, which is necessary in order to avoid unconsciously adopting the manipulations of the media in propaganda, spin etc. Several historians of visuality have pointed out that a new sort of mediated perception was gradually trained in the course of the 19th century (Crary *Techniques of the Observer*...): a construction of a new mobile, virtual gaze (Friedberg), and a disjunction of the near space from the distant far space such as it is experienced while travelling in a train, or in a panorama (Schivelbusch). Several of these studies were explicitly written as media archaeological prehistories to discover the effects of digital media in relation to perception.

What is found in embryo in the 19th century was developed in the 20th century and further amplified by the ubiquitous screens of our century. The disjunction of near and far space and

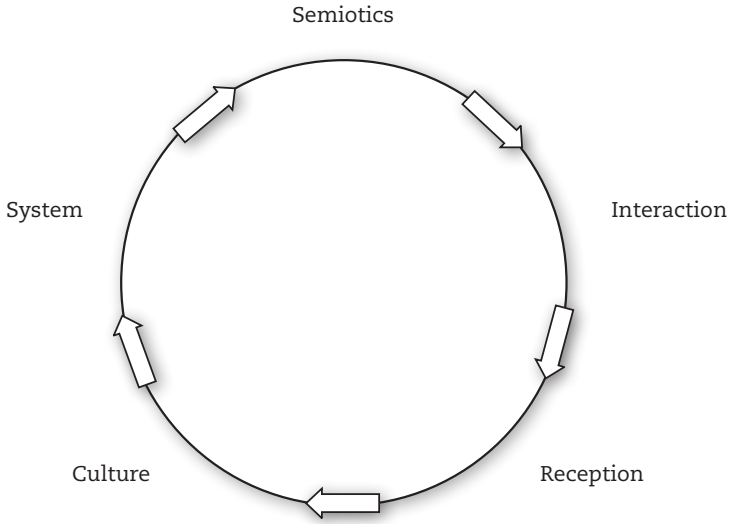
the mobile gaze are still important sensory characteristics when driving a car in *Grand Theft Auto* or shooting your enemy in *Counter Strike*, but the interface also contains a cybernetic feedback-loop between recipient and interface. Interfaces contain an action-reaction pattern, which, through sensors, input devices, tracking, data-mining and surveillance, registers the recipient and incorporates his/her responses and reactions – it is this mechanism that is sometimes marketed as 'interactivity'. Cybernetic feedback was invented by the father of cybernetics, Norbert Wiener, as a way to control machines by measuring their actual performance in real-time and feeding the results back in a continual loop. The functioning of feedback is, according to Wiener, "to control the mechanical tendency towards disorganization; in other words, to produce a temporary and local reversal of the normal direction of entropy" (*The Human Use of Human Beings* 25). Wiener moves on to consider cybernetics as a general vision for organising – if not controlling – a modern liberal humanism.[2]

This cybernetic interaction takes place on many levels since, as Florian Cramer points out elsewhere in this book, interfaces exist on many levels between hardware, software and humans. Interfaces exist from the intra- and inter-machinic as procedure calls and commands in the code and between layers of code, between machines and in networks, to human-computer-interaction and human-computer-human-interaction, e.g. on the Internet. In addition, interface logics spread as cybernetic processes in culture at large, say in economic exchanges, strategic communication and poll-based democracy. Things are packaged in measurable units which feed back on themselves in cybernetic loops – a key characteristic of our contemporary interface culture.

This cybernetic interface culture can be expressed as a cybernetic interface-cultural feedback loop in five phases, moving outwards from the internal systems through representation, interaction, reception and to culture:

1. System: In the internal systemic processes of the machine, for example the procedural calls and self-references – the way the systems run and are maintained – and how these system processes are also a model of human perception.[3]
2. Semiotics: In the sequence or selection of output signs (e.g. images, sounds, text and signs for interaction) that is presented at the interface, where the selection process is further regulated by the cybernetic circuit between the interface and its contexts and users.
3. Interaction: In the way the interaction is communicated and modelled in the interface, e.g. as input devices, and represented by buttons, menus, metaphors, staged perspectives etc. Here we have the staging of the use-situation and the user – which, to a large extent, is what interface design is about.
4. Reception: As the recipient's horizon of expectation and interpretation; we increasingly expect that we can interact with representational, aesthetic artefacts (e.g. as we can interact with the fictional space in a computer game, with music in remix culture, or with knowledge in Wikipedia).[4]
5. Culture: As an interface culture, a culture that increasingly adopts itself to and repeats this cybernetic interface-cultural feedback loop – often blindly and unknowingly.

The transmission between the phases – from the system to culture and back again (as human culture in itself becomes increasingly ready for digitisation and systematisation, and as systems



ILL. 1: The interface-cultural feedback loop.

simultaneously become more adept at handling culture) – is in itself cybernetic as feedback loops that translate one phase into the next.[5] Consequently, each phase presupposes and contains the others, and the system is reinforced by the continuing dynamic development, in fact in itself a loop.

The interface itself is actually a sense organ – it integrates still crude but far-reaching sense apparatuses, which are sometimes embedded in networks and procedural calls between layers of code and at other times are modelled or mapped on the human senses (hearing, touch and sight). Furthermore, it is multi-medial and cross/syn-aesthetic in a specific way: It treats all data as a sort of generalised, statistical text, with no access to the ontology or semantics of the data, such as the image character or the meaning of the text, but only to its behaviour and relations.[6] One can argue that the interface measures the senso-motoric body of the recipient through input devices and reads his/her semiotic activity through analysis of clicks, choices and input; a process which is often utopically advertised as a more or less direct coupling on the consciousness allowing the machine the ability to establish a direct connection between mind and machine. In this way, it can give the recipient what he/she wants even before he/she has formulated the wish, and as such it can be the perfect butler, partner or surveillance apparatus.

However, as we all know, it does not work seamless nor without errors or mismatches. Unfortunately, or perhaps fortunately, computers only observe our semiotics statistically, with no real access to the semantics and ontology. This statistical scanning can be quite effective, but there is still space for artistic exploration in the misunderstandings and mismatches, which can help our culture to develop a critical understanding of this defining cultural technology. We need art to teach us the effects of the interfaces, which run, partly hidden, cybernetically, under the surface of our culture. I will continue by looking at two art projects that act in the cybernetic feedback loop in order to demonstrate how art critically explores the cybernetics of the interface.

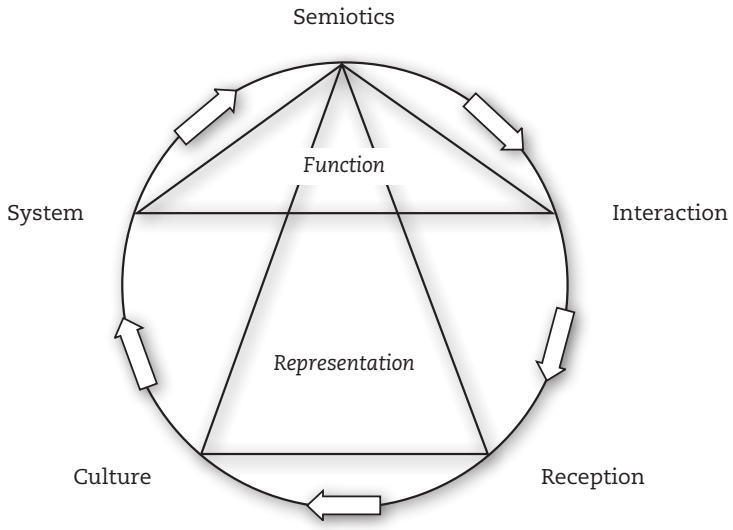
Ubermorgen's interface activism

The interface connects machine, representation, reception and culture, as we have seen in the interface-cultural loop explained in the model above, but we are only slowly seeing and learning the consequences of this, even though they are already pervasive. On one hand, the interface is a functional tool with which one can perform various tasks and automations. On the other hand, it is a represen tational medium used for cultural production and experience.

Exactly this chimerical character of the computer, which Frieder Nake characterises as an "instrumental medium", which is simultaneously a machine and a representational medium, is distinctive for the interface and its cultural potential. It renders the signs and representations functional, as when one moves and double-clicks icons in order to start processes and carry out transactions and simultaneously enters the functional machine into the domain of

semiotics and thus reception, interpretation and culture. In fact, the system both measures and interprets; while the viewer him/herself simultaneously is fed into the system, tries to beat its cybernetic system by partly becoming one him/herself, and reflects on the cybernetic process and its cultural implications.[7] In this way, the cybernetic interaction and feedback connects the representational and the functional, and even though these connections are not seamless, the chimerical character of the interface pervades both the machine and the medium and influences the culture around it.

As stated in the introduction, Ubermorgen.com has worked with the interface in ways that both reach outwards to culture through net actvism and in others they are more concerned with sense perception, recognition and the cybernetic mentality. Often their work provokes reactions from media, audiences, and the companies and institutions that become involved. Especially



ILL. 2: The interface-cultural feedback loop with triangles of function and representation.

pieces such as Etoy's Hijack, Ubermorgen.com's [V]ote Auction, Amazon Noir and Google Will Eat Itself are good examples that try to extort the cybernetic discourse economy of the net culture and turn it back against itself – a kind of cybernetic criticism of a cybernetic culture. However, simultaneously some of Ubermorgen.com's works are directed towards the psychological, perceptional or epistemological, especially the works around the Psych|OS project, where Ubermorgen.com and Hans Bernhard project a somewhat autobiographical, vulnerable subject into focus.

While these two strands of Ubermorgen.com's work at first glance seem very different, they are in fact related as the two sides of the interface – the functional and the representational. Some projects reach outwards in order to examine a cybernetic culture; others look inwards to examine how this culture influences and stresses the subject and perception. As such they also critically explore the effects of the cybernetic interface-cultural loop I presented in the above: What happens when machines and humans become more closely interrelated in culture?

GWEI – disrupting the feedback

Google Will Eat Itself is an example of how Ubermorgen's activist projects are turning the cybernetic feedback mechanism back against itself, thereby adding noise to the system and disturbing its order. As the artists (Ubermorgen's Hans Bernhard and lizvlx, Alessandro Ludovico and Paolo Cirio) themselves argue, Google has established a market monopoly by becoming the 'giant middleman.' In cybernetic terms Google accomplishes the feedback mechanism, mapping the content of the internet and giving it back to people through packaged services such as the company's search engine, gmail, blog and video services (Blogger, YouTube, Google-video). Furthermore, Google controls advertising on the net through adwords. As such, Google has become the dominant accomplisher of the net, its market and the access to it, thereby giving the company enormous powers and knowledge that alone make it worth keeping an eye on this 'funny dictator.'

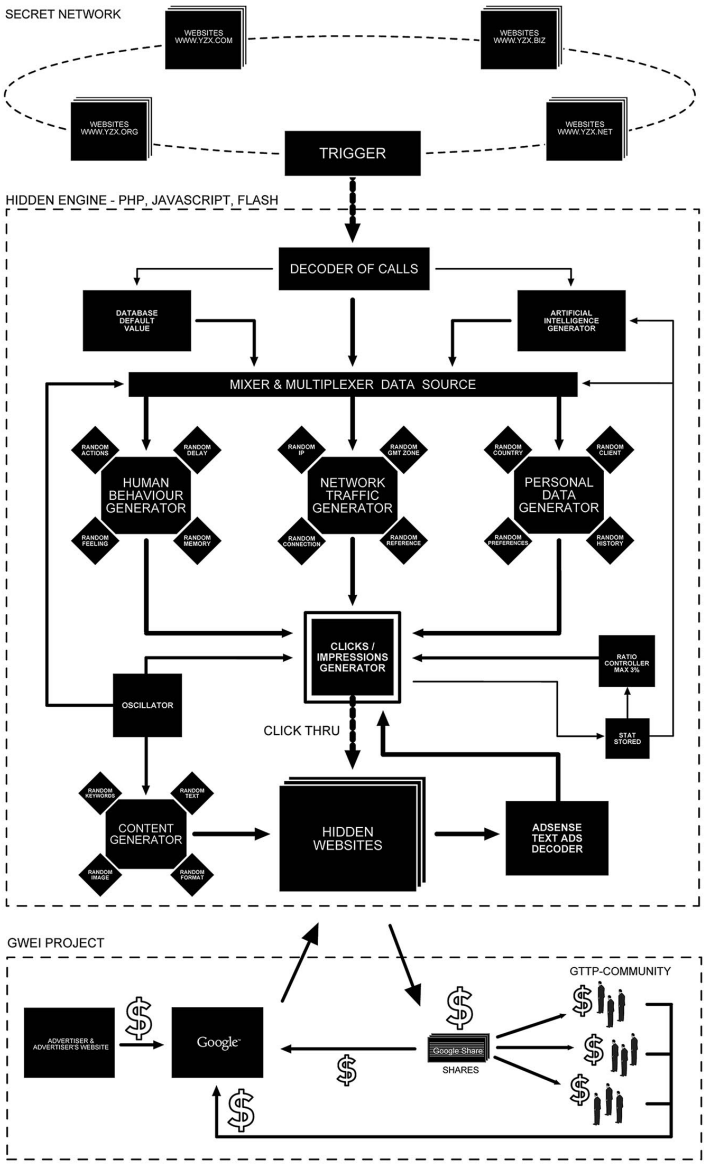
The way the project critically examines this cybernetic feedback middleman is by "hacking the Google self.referentialism," in praxis by launching a humoristic parasite (Bernhard et al.). This is done by creating a hidden website with adwords and generating fake clicks on the ads. This creates revenue from Google, which is fed back into Google via buying Google shares thus gradually (in 202 million years!) Google will eat itself and be redistributed to the people through GTTP, Ltd. (Google To The People). Even though this project probably cannot harm Google seriously, the company has felt threatened to the extent that it has sent cease-and-desist letters and for a period banned the website from the search engine. Ironically, this made things worse for Google, as a search for *GWEI* consequently only displayed websites about the ban – the censorship has currently ended.

The project strikes at Google in three interrelated ways: Firstly, by disrupting and misleading the advertisement chain through fake websites and fake clicks, resulting in no real display of the advertisements to human eyes and thus no real generation of human traffic. Secondly, by critically demonstrating the power of Google, and by forcing Google to take countermeasures such as censorship.[8] Furthermore, the project not only hacks Google's advertisement chain,

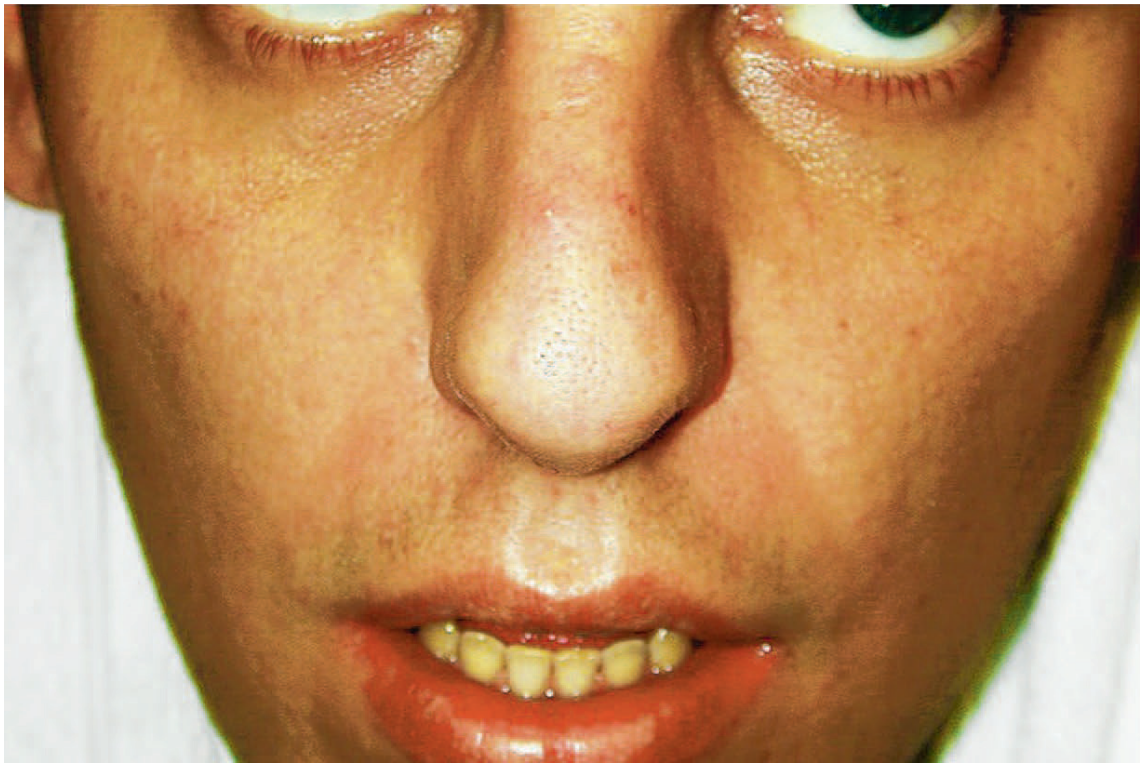
ILL. 3: Ubermorgen.com: Google Will Eat Itself, (gwei.org).

but also Google's own worth by buying shares with the revenue from the fake, and jokingly threatening to take over Google and redistribute it to the people. As Hans Bernhard puts it, it is hard to evaluate the value of Google shares because the Google share is highly volatile (Mancuso). Google's market value is itself a cybernetic system that one can interact with through the shares, parallel to the ways in which the Etoy artist group interacted with the shares of the eToys online children's toy store in the Toywar project; however the 'new' cybernetic economy of the Internet has apparently become more stable than before the dot-com crisis.[9]

In this way, the project fundamentally attacks Google's role as the 'giant middleman' or the accomplisher of the feedback that sets up the Internet as a market, and it does so by disrupting and misleading the feedback, by spending the revenue from the misled feedback to make Google eat itself and, in doing all this, critically revealing Google's power.



ILL. 4: Ubermorgen.com: Google Will Eat Itself diagram showing the system.



ILL. 5: Ubermorgen.com: Psych|OS Cycle – Hans Bernhard Self-portrait.

Psych|OS - Cybernetic noir

There are other projects that focus on the activism-oriented dimension, such as the *(F)original* project and its generators, *Amazon Noir*, which attacked the Amazon website through the "Search inside the Book" feature, stealing and redistributing copyrighted books (cf. Dieter), and *[V]ote Auction*, with its slogan of "bringing capitalism and democracy closer together" by making a web-based auction house for votes. But there are also other kinds of projects that are more inwardly oriented towards psychological, mental dimensions: thematising the conditions for perception, recognition and psychology – most are collected under the fitting *Psych*|OS headline. As the following quote implies, these projects are initiated out of a personal disease, though it is not the autobiographical dimension that interests me here, but the relations between media, perception, identity and drugs. Even though the project is autobiographical, there is also an explicit artistic distancing from the merely personal in the presentation and the references to the fictional Blairwitch Project:

> In October 1994 three student filmmakers disappeared in the woods near Burkittsville, Maryland while shooting a documentary. A year later their footage was found... http://blairwitch.com: *The Blairwitch Project*.
>
> In March 2002, Ubermorgen's Hans Bernhard experienced a manic outbreak [bipolar affective disorder] in Capetown, South-Africa. He was airlifted to Austria – General Hospital Vienna. Two and a half years later, Ubermorgen found video footage of his stay at the Mental hospital - Station 4B, Department of Psychiatry. They decided to release the

material unedited, only with minimal contextual information to go along with:

> "We are the children of the 1980s. We are the first internet-pop-generation. We grew up with radical Michael Milken [The King of Junk Bonds] and mythical Michael Jackson [The King of Junk Pop]. Hans Bernhard is loaded with 10 years of internet & tech [digital cocaine], mass media hacking, underground techno, hardcore [illegal] drugs, rock&roll lifestyle and net.art jet set [etoy]. His neuronal networks and brain structures are similar to the global synthetic network he helped build up and maintained subversive activity within. And now they are 'infected' by a manic-depression [WHO ICD-10, F31.1.], both Hans Bernhard and The 'Network' are infected by this structural disorder. (...)" (Ubermorgen).

This text is kept in Bernhard/Ubermorgen's typically explicit, slogan-like rhetoric, and though many nuances are omitted, it is worthwhile to follow the project as a solemn reflection on the interrelations between our perception, psyche and the media. This is emphasised by how the project was exhibited in Dortmund at Hartware MedienKunstVerein, according to the description on the website:

> The Installation is a common projection, a sensitive mem-brane [the screen] which serves as a thin skin which is penetrated by light and onto which a unique reality is projected. This membrane moves if you touch it or it curls if you blow: the image twists. The membrane represents the human and the network – it is hypersensitive.[10]

The installation showed Bernhard's own video footage from the mental hospital. The interface in the installation is a thin, fragile membrane in both concrete and metaphorical ways that one can physically interact with in the installation, and this interface represents both the human mentality and the network, which is disrupted by drugs, technology and mania. Ubermorgen further argues that our collective media mentality is becoming manic, abusing technology and drugs:

> > Waves of mania and depression are running through the technical, social and economic structures. Contemporary high-tech societies deal with hardcore brains using bio-chemical 'agents' to control the internal information flow, we call them psychotropic drugs (Ubermorgen).

The medical diary, Hansbernhardblog, has entries on Hans Bernhard's drug and food consumption every day since 2005, where he lists the drugs he is prescribed; often drugs that act primarily upon the central nervous system where it alters brain function, resulting in changes in perception, mood, consciousness and behaviour. Furthermore, the *Psych*|OS project contains the *Psych*|OS generator, which through a question and answer process generates a prescription mocking a diagnosis and rendering it into a cybernetic machine.

The cybernetic interface culture is articulated in the *Psych*|OS project through its darker sides, producing a cybernetic mentality complete with cybernetic diseases, diagnosis, treatments and cures. Ubermorgen.com demonstrates this with a personal blog, which, instead of being a medium of individual expression, portrays the subject through lists of the medical and nutritive inputs, indexed and linked to pharmaceutical information. Furthermore, diagnosis and prescriptions are left to a cybernetic machine, the *Psych*|OS

Generator, and the subject of the *Psych*|OS project, the drugged and hospitalized Hans Bernhard, is left passive, with no personal memory, identity or free will. This also distinguishes the 'Hans Bernhard' of the *Psych*|OS project from the real Hans Bernhard – the project is presented in a cool and unsentimental tone, remarkably cleansed of any romantic attempts at glorifying the mental disease.

ILL. 6: Ubermorgen.com: Psych|OS Cycle (video stills).

ILL. 7: Ubermorgen.com: Psych|OS Cycle – Hans 2.

The conditions for criticism

Does this noir-cybernetics work as criticism? Can we learn any analytic or methodological tools from it? Well, as GWEI's Paolo Cirio says, it is difficult to criticise the cybernetic system from a distanced standpoint and with clear rational paroles:

> The only way to avoid this process is to do strange things and to behave highly unusual. The more noise you inject into their data base, the more difficult it is for them to understand who you are. To be free means to be unpredictable (Mancuso).

This might even be too romantic! The cybernetic processes of Google and others do not need to "understand who you are"; they only need to be able to map you and your behaviour and relate you to the cybernetic system through feedback. Furthermore, unpredictable behaviour is a basic substance of information, according to information theory.[11] However, there is a possible lesson at another level, if we look at the artistic strategies of the projects – how they perform a noir cybernetics: Disrupting the feedback, attacking the mechanism and feeding the system with itself might be a viable strategy, since it will render the system potentially unstable, and consequently lead to some kind of recognition of the workings of the system. Likewise the system, or the people struggling to maintain it, will try to reject the noise and malfunctioning, as was the case with Google's banning of GWEI from its search engine. As Norbert Wiener points out in discussing intention tremor and Parkinson tremor, excessive feedback potentially leads to a breakdown of the system's ability to reverse entropy and thus order chaos. He hopes to be able to use cybernetics to cure this disease (*The Human Use of Human Beings* 163 ff.).

Consequently, the conclusion must be that cybernetic criticism must be cybernetic in its form in order to enter into the system, but also an outspoken meta-reflection of the machine in order to avoid merely confirming the order of the system and becoming a speech-less part of it, as just another wheel in the machine, or a banner ad on the front page of the cybernetic spectacle. This way *GWEI* manages to both enter into the system, use it to gain maximum effect, and disrupt it in ways that forces it to defend itself, whereas *Psych*|OS portrays the crisis of the cybernetic interface mentality.

Interface mentality

Are cybernetic interfaces a cure for our diseases, a necessary updating of our sense perception, or does cybernetic information technology make us sick? It is difficult to judge whether it makes sense in medical terms to speak of parallels between Bernhard's bipolar disorder/manic depression, the Internet network and his activities in it, and the related psychotropic drugs. It is, of course, complicated in both medical and cultural terms to compare such phenomena and distinguish between cause and effect, related to the discussions about whether video games and multitasking lead to ADHD (Attention Deficit Hyperactivity Disorder) or ADD that can be found flourishing on the Internet. But if we for a moment skip the more strict scientific descriptions of cause and effect and look at perceptual alterations and how they are experienced in art and culture, such as suggested in the Benjamin quotation in the opening of this article, we might recognise experiences of even our everyday life with software.

If we look at how our software and operation systems perform, invading our concentration through millions of more or less helpful suggestions, disturbances and multitasking options, there seem to be parallels, and I guess we all feel a bit attention-deficient after a stressful day at the office, trying to achieve some concentration in the midst of emails, telephones and the all-invading software upgrades with their annoying prompts to re-start your computer.[12]

When the software and hardware upgrades are insufficient to cope with modern reality, we are constantly urged to reinvent, develop and renew ourselves through adaptability, and there is a thriving industry ready to help us by 'upgrading,' 'reprogramming' or 'overclocking' our brain and 'hacking our performance' through smart guidelines and smart drugs.[13] We might draw a parallel to the industrial society of the 19th century where new diseases, cures and drugs were created and many artists were exposed. For example, hysteria and neurasthenia with cures such as magnetic therapy were much in vogue and many artists such as Charles Baudelaire and Edgar Allen Poe used hashish and opium (Lyhne). Our current networked information society also has its characteristic diseases and cures that affect sensitive information workers, including artists and intellectuals, such as stress, ADHD, anxiety disorders and functional disorders.

In *Suspensions of Perception*, Jonathan Crary points to how attention has become increasingly essential through modernity in both work and cultural activity, and that we live through a topical "immense social crisis of subjective dis-integration", which is "metaphorically diagnosed" as a "deficiency of 'attention'" (1). To Crary, concentrated attentiveness signifies a strict control of perception that excludes large parts of the sensed – e.g. when navigating in traffic or concentrating on writing and reading this article. In a comment on the diagnosis and medical literature of ADD, Crary writes:

> The diagnosis of ADD in adults is increasingly linked to feelings of underachievement, in such a way that any sort of economic shortcoming or social insecurity is now understandable in terms of failure to apply oneself attentively to the ideologically determined standards of performance and 'achievement'. In a culture that is so relentlessly founded on a short attention span, on the logic of the nonsequitur, on perceptual overload, on the generalized ethic of 'getting ahead,' and on the celebration of aggressiveness, it is nonsensical to pathologize these forms of behaviour or look for the causes of this imaginary disorder in neurochemistry, brain anatomy, and general predisposition" (36).

Clearly, Crary does not see ADD as a disease but as a sign of a social crisis. He even explicitly links this to screens and interfaces as "methods for the management of attention that use partitioning and sedentarization, rendering bodies controllable and useful simultaneously, even as they simulate the illusion of choices and 'interactivity'" (75). Whereas the subject in romanticism was interiorised, this is now reversed in a cybernetic interface:

> The inwardness of what Hegel called romanticism is not so much exceeded here as it is paradoxically turned inside out, into a condition of externalization: attention as a depthless interface simulates and displaces what once might have been autonomous states of self-reflection or a *sens intime* (79).

ADHD, stress, anxiety disorders, functional disorders and bipolar disorder are definitely separate phenomena that should not be equated too quickly, and if one suffers from any of these it does not help to know that it might be a sign of a social crisis. Also, I do not aim to make an argument that is valid within psychology or medical sciences. The aim here is to discuss art and how it reflects cultural changes in perception.

Perceiving interface perception

The interface works in two ways, translating the machine to us and us to the machine. It renders the computer sensible, and it is the sense-organs of the computer, whereby it becomes a part of human culture. This double sensory process entails a contemporary relationship between interface and perception: Perception becomes mediated and cybernetic. However, as the interface-cultural loop in the above pointed out, this relationship is not purely techno-biological, but draws on complex cultural processes, where culture, human-beings, organisations, societies, increasingly incorporate cybernetic behaviour. This is further implemented through becoming accustomed to interfaces (on the web, on the job, in computer games, in social software and Web 2.0), but also through management guidelines, understanding of self-development from popular self-help psychology, from education, and finally from drugs and medication. Consequently, we do not see a direct coupling between human perception and the machine, but a cultural process that artists can interact with, and that can be critically analysed and reflected.

It is potentially misleading to make excessively harsh comparisons and connections, which will easily lead us to a one-sided understanding of technology and hinder our capacity to engage critically with it on several levels. Still, I believe we see a central effect of digitisation here; that artefacts and representations become data injected in a cybernetic interface-cultural loop, and that we begin to see and understand the world in this way too.

I hope to have demonstrated through analysis of two digital art projects that systems, semiotics, culture and perception are related in a cybernetic interface-cultural loop, which can also be a perspective on larger societal and political issues such as new public management or the topical dramatic increase in the consummation of Fontex and other antidepressant drugs. This interface-cultural loop is difficult to acknowledge because we are part of it and, like a website that knows our preferences or a VR-simulation, it wraps itself around our sense-perception and subjectivity. But as these projects have demonstrated, even though the effects are massive, it does not work seamlessly, but through semiotics, representation and culture. Through artistic exploration it can be experienced.

It is tempting to conclude by asking whether this development is fundamentally evil, alienating, damaging – or thrilling, dynamic and perhaps even democratic? Perhaps it is an unavoidable development of our visual culture, sense perception and market economy? Developing our sense perception and culture accordingly, in keeping with the time, is definitely necessary in order to not just be immersed in the cybernetic spectacle. We need to develop, experience, understand and culturally integrate cybernetic perspectives and interface perception in order to experience the changing conditions that the interface sets up for perception, experience and culture.

Thanks to Hans Bernhard for letting me reproduce images, the anonymous reviewer for useful suggestions, and Stacey Cozart Madsen for corrections on the language.

NOTES

1. Cf. also Wartofsky, who argues that "the forms or modes of perception, its structures themselves, are historically variant; that this variation is related to *historical* changes in the forms or modes of human action (or *praxis*)." Perception is for Wartofsky "a highly evolved and specific mode of human action or praxis" which is "mediated by *representation*". Furthermore, Wartofsky writes that "it is by the variation in modes of representation that perception itself comes to be related to historical changes in other forms of human practice, and in particular, to social and technological practice." (189).

2. Wiener develops the idea of cybernetic as a way of organising society in *The Human Use of Human Beings* but with-draws somewhat in his later speech "Men, Machines, and the World About" where he argues for understanding the machines and warns against worshipping it (72). N. Katherine Hayles explores this apparent change and in order to explain it she describes how the cybernetic feedback loop in fact undercuts Wiener's liberal humanism, how he "looks into the mirror of the cyborg, but then withdraws" and tries unsuccessfully to restrict cybernetics from societal issues. (Hayles 108). However, as discussed below, cybernetics continued to play an important social role as a way to control and manage.

3. This description of machines and humans itself clearly draws on (second order) cybernetics in how it sees the human and other entities (systems) as self-contained systems with internal cybernetic feedback-loops (cf. e.g. Hayles' description of the second order cybernetics of von Foerster, Maturana and Varela and Luhmann).

4. As my oldest son said some years ago, when he was about five, well accustomed to children's games, and saw on the web a plain photograph of a house that we had rented for our summer holiday: "Click on it so we can get inside!" – This episode (although it should not be over-interpreted) does give some evidence that perception and recipient expectations are changing towards the expectation of dynamic and interactive representations. In education, too, there is evidence that children brought up on computer games expect to continue this kind of explorative reception in their learning.
   Valery Grancher's web paintings also illustrate this. They absurdly comment on how we begin to see images as interfaces by reversing the process and turning an interface into a painting. (http://www.nomemory.org/webpaint/data/text.htm (21/12/2007)).

5. N. Katherine Hayles describes how cybernetics is fundamentally without borders between humans and machines and between phases and disciplines: "Border crossings accomplished through analogy include the separation between flesh and world (sense perception), the transition between one discipline and another (for example moving from the physiology of living organisms to the electrical engineering of a cybernetic machine), and the transformation of embodied experience, noisy with error, into the clean abstractions of mathematical pattern" (Hayles 98).

6. This is what Hayles sees as a shift from content to pattern, which she also traces in structuralism's and de Saussure's concept of language as a system: "Thus, perception, mathematics, and information all concentrate on pattern rather than content. As data move across various kinds of interfaces, analogical relationships are the links that allow pattern to be preserved from one modality to another. Analogy is thus constituted as a universal exchange system that allows data to move across boundaries. It is the *lingua franca* of a world (re) constructed through relation rather than grasped in essence" (Hayles 98).

7. The process of playing a computer game has been described in this way by e.g. Friedman as an aestheticisation of our cybernetic connection to technology. An art installation that directly explores cybernetic sensation through an eye-tracking mechanism that measures what the viewer looks at and generates new sets of images from a media art database based on this measurement is Eye-Vision-Bot (Scherffig; Pold "The Critical Interface").

8. In this way it is parallel to Christophe Bruno's Adwords project, which worked by disrupting the semantics (cf. Pold "Literature from Page to Interface...").

9. The Etoy Toywar project took place around the turn of the millennium and documentation can still be found at http://toywar.etoy.com/, in Pold "Litteratur I Nettet..." and Wishart and Bochsler.

10. The quotation continues: "The sound is played quietly via speakers and very fat via earphones. The room is bright with daylight so the mood of the viewer is influenced by the weather outside. There is no difference to a room in a mental hospital" (Ubermorgen).

11. N. Katherine Hayles describes how information theory with Shannon and Weaver views the unpredictable: "Heuristically, Shannon's choice was explained by saying that the more unexpected (or random) a message is, the more information it conveys" (Hayles 102). This also holds true culturally, e.g. if one thinks of marketing or perhaps the art market, that the game is driven by differentiation in order to attract attention. So the romantic rebel becomes the new market leader, which does not necessarily mean total defeat, but definitely that it is not possible to stay outside of the system.

12. As Lev Manovich has pointed out, the logic of software and its underlying databases are primarily paradigmatic, promoting alternatives and substitutions instead of syntagmatic cause-and-effect relations and a temporal or narrative way of ordering the world. When this becomes excessive as information overload, it counteracts distinctive, qualitative ordering and the creation of cohesion (Manovich 212 ff.).

13. Cf. book titles such as *Mind Performance Hacks (TM) – Tips & Tools for Overclocking Your Brain* (Ron Hale-Evans, O'Reilly, 2006), *Upgrade Your Brain: Boost Your Memory, Think More Clearly, and Discover Your Inner Einstein* (John Middleton, Perigee Books 2007) or the concept of Neuro-Linguistic Programming.

WORKS CITED

Benjamin, Walter. *Illuminations*. Transl. Harry Zohn. Reprint ed. New York: Schocken Books, 1985. Print.

Bernhard, Hans, et al. "Hack the Google Self. Referentialism." *Google Will Eat Itself*, 2005. Web. 12 Aug. 2010. <http://gwei.org/pages/texts/theory.html>.

Bolter, Jay David, and Richard Grusin. *Remediation: Understanding New Media*. Cambridge, Mass.: MIT Press, 1999. Print.

Crary, Jonathan. *Suspensions of Perception: Attention, Spectacle, and Modern Culture*. Cambridge, Mass.; London: MIT Press, 1999. Print.

---. *Techniques of the Observer on Vision and Modernity in the Nineteenth Century*. October Books. Cambridge, Mass.: MIT Press, 1990. Print.

Dieter, Michael. "Amazon Noir: Piracy, Distribution, Control." *M/C Journal 10.5* (2007). Web. 12 Aug. 2010. <http://journal.media-culture.org.au/0710/07-dieter.php>.

Friedberg, Anne. *Window Shopping: Cinema and the Postmodern*. Berkeley; Oxford: University of California Press, 1993. Print.