The Hyperaesthetics of Technology

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Abstract

Analog and digital technologies are an immanent part of postmodern lifeworld's around the globe, and they are a fundament or – in some cases – driving force for mass media, telecommunication, art, and design. This omnipresence and ordinariness of technology make it very difficult to take sides: the defender determines a specific value of technology for creative processes and the opponent proclaims a general worthlessness of technology for artistic creation. This essay focusses not on different judgements, but it will analyze some important aspects of the structural dynamic of technology in the context of a creative mediatization. This means, that a work of art, a design concept or a communication medium has to be understand as a specific aesthetic artefact that enables a perceptual relation or interaction of a technological repertoire, a specific mode of representation and a sensory awareness of the recipient.

This interconnection can be understood within a phenosemiotic sign relation that allows an analytical structuring of aesthetic processes as embodied and perceptual processes. This phenosemiotic analysis gives insights in the specific interconnectedness of technological processes, sensory and perceptual dynamics and the construction of meaning in a cognitive perspective that is always embedded in the bodily processes of reception. Additionally, the phensosemiotic framework is also able to give insights into a possible redefinition or enhancement of the concept of aesthetics in general, which is highly correlated with the sensory processes of the recipient: This means, that postmodern artefacts of mediatization are more and more pushing the boundaries of perception and are simultaneously expanding the structural horizon of a classical aesthetics toward a technological-driven hyperaesthetics.

Prototype Aesthetics

To argue for the concept of a prototype aesthetics we have to consider some analytical implications that are reaching back to the so-called Stuttgart School of Semiotics in Germany and its research in the range of semiotics, information theory and cybernetics. In this perspective every aesthetics or aesthetic field has something to do with creative processes, decisions about materiality, functionality, object perception and action (cf. Bense 1971). That means, no matter if you focus on art, design or mass media, every creative practice can be described as a sign producing principle.

The goal of this sign process is a specific aesthetic perception that is triggered by the artefact and consolidates a relation of sign creation, sign manifestation and sign use (cf. Walther 1979). In this perspective, every form of aesthetics or prototype aesthetics has to deal necessarily with the specific creation of a sign in interdependency with the communication effects to make statements about the aesthetic experience: a prototype aesthetics should be able to characterize the relation of the sensation that is triggered by the material organization of an artefact and the perception of form that gives the aesthetic structure. This analytical horizon has a lot of benefits because it transforms aesthetics into a precise methodology that focusses on the specific repertoire of an artefact, describes the media materiality and highlights the perceptual and semiotic dynamics. So, prototype aesthetics is connected with a media aesthetics and the difference of an artwork or design artefact is not established by an innovative singularity but more through a functional embedding in a media ecological context. Therefore, the prototype is in itself an aesthetic object that enables an aesthetic experience through an artefact-driven perception based on functionality. Max Bense, the founding father of the semiotic inspired Stuttgart School, has argued that a design object has a lot to do with the concept of a sign: It is determined by the technologic materiality, the object form and functionality (cf. Bense 1971).

The prototype is a design object that offers a specific aesthetic logic of perception, which is not equate to a naïve aesthetics of pure pleasure. In fact, the aesthetic experience is grounded in a perceptual process that is structured by the deployed means – that is the selection decision of the designer. In this perspective, a prototype aesthetics (like every perceptual and phenosemiotic-driven aesthetics) is a dualistic construct that categorizes the intra-medial and extra-medial dynamic

of an object (cf. Bense 1965). The intra-medial categorization is a micro-aesthetic perspective, in which the structural levels of a design decision and selection can be analyzed and transferred to the object functionality. The extra-medial categorization is a macro-aesthetic perspective, in which the perceptual conditions of artefact perception (sensory and perceptual relation, poly-sensuality, multimodality, cross-modality etc.) can be analyzed and transferred to evaluation criteria and aesthetic judgements of the recipient (understanding style, form, context, content, figure, ground, historical developments, meaning, expression).

If we compare the micro- and macro-aesthetic features of modern media, we can clearly indicate a broad range of technological decisions based on the digital conditions of software and hardware culture. This indicates an additional shift within the aesthetic tradition, because it is not necessarily a brilliant artist, the myth of a muse or a contemplative inspiration that are consolidating the fundament of an artefact, but more the complex range of material decisions embedded within the artefact. So, the question is, how can we describe the more and more complex material decisions and effects within the micro-aesthetic perspective? Let us search for an answer within the perceptual reality of the recipient.

Body and Code

The human body is the first interface. But why? There is no uniform tradition of perceptual theories but more a great number of frameworks and different approaches in academia. The phenosemiotic approach is an aesthetic approach to analyze sensory and perceptual processes and it integrates philosophical, phenomenological and semiotic perspectives and findings of neuroaesthetics and perceptual psychology. In short: Every aesthetic experience is a sensory relation of a human body and an artefact. The human body itself is an interdependent perceptual system that integrates a relation of sensory and perceptual modalities.

The sensory system is the first interface structure and it transfers energy patterns, which were created by sensory receptors, into sensory codes for a further decoding by the perceptual system. So, the sensory system organizes a kind of bodily pre-processing of these sensory codes whereby the perceptual system activates mental concepts and generates an output that merges into higher order cognitive processing (cf. Mausfeld 2010). If we use this perceptual approach for the analysis, we can understand sensory inputs as a kind of trigger mechanism for mental conceptualization processes. Therefore, it is possible to clarify the conceptualization processing as an biological element of human nature and a necessary condition for consciousness and mental processes: "They form a texture of internal concepts which determine the ‚internal semantics' of the system, i.e. the set of concepts that are important for internal processes, and therefore the vocabulary of the system in which the different subsystems communicate"[1] (Mausfeld 2010, 14).

These concepts integrate and stabilize a variety of human conditions, like bodily and mental orientation, social behaviour, and perception of emotional states of other people, food search, use of tools and tool creation, action, thinking, anticipation, memory, language and much more (cf. Mausfeld 2010). It is necessary to argue for the fact that the human body is the first interface in every sensory and perceptual condition. And therefore, in every aesthetic condition. This means, that a prototype aesthetics has to clarify first, how the artefact is triggering sensory codes based on the micro-aesthetic strategies or signals of the designer, and second, which concepts the sensory codes are triggering within the perceptual reality of the recipient. If we understand a prototype aesthetics this way, then it is a theory of the transfer of sensory and perceptual information: a tool for the classification of phenosemiotic sign relations.

With regard to the recent developments in computer and digital culture it is important to understand that the concept of aesthetics has necessarily to be extended. The reason for this assumption lies in the range of poly-sensual, multimodal or cross-modal effects of modern media technologies. Let us take three interesting examples for a further clarification:

1. HaptoMime (Tokyo University) is a technological media system based on an IR touch sensor with a screen-less frame, aerial imaging plate (AIP), liquid crystal display (LCD) and an ultrasonic phased array transducer. This technical ensemble generates an effective interaction with a floating image, which receives sensory evidence through an ultrasonic tactile feedback by deflecting acoustic radiation pressure. The result is the visual perceiving of a floating virtual screen (Figures 1 and 2) and depicted virtual objects, and the "ultrasonic phased array transducer delivers focused ultrasound onto the fingertip so that it encounters a mechanical force at a position and timing consistent with the floating image" (Yasuaki 2014, 664).
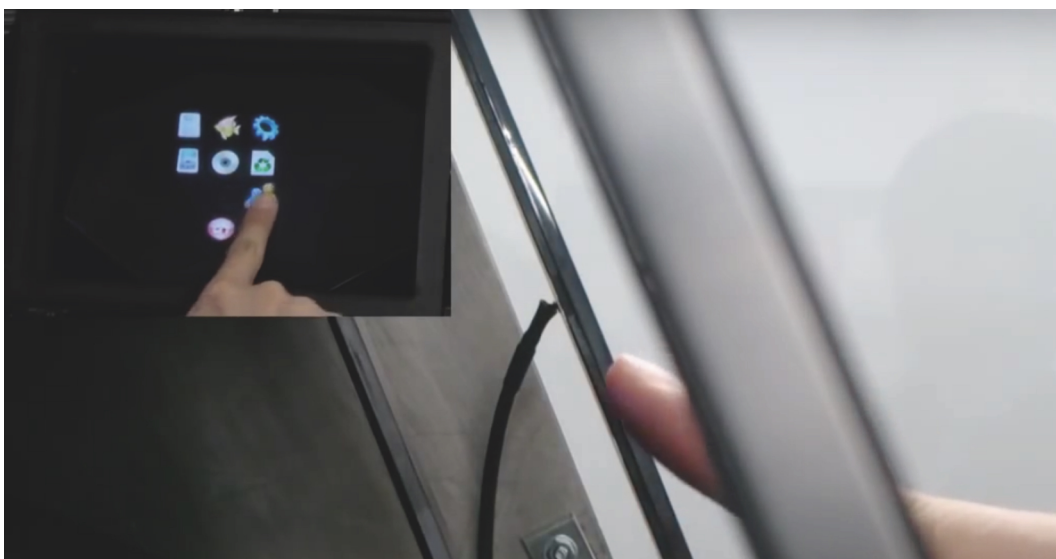

Figure 1: Haptomime. Screenshot from "HaptoMime (full version):
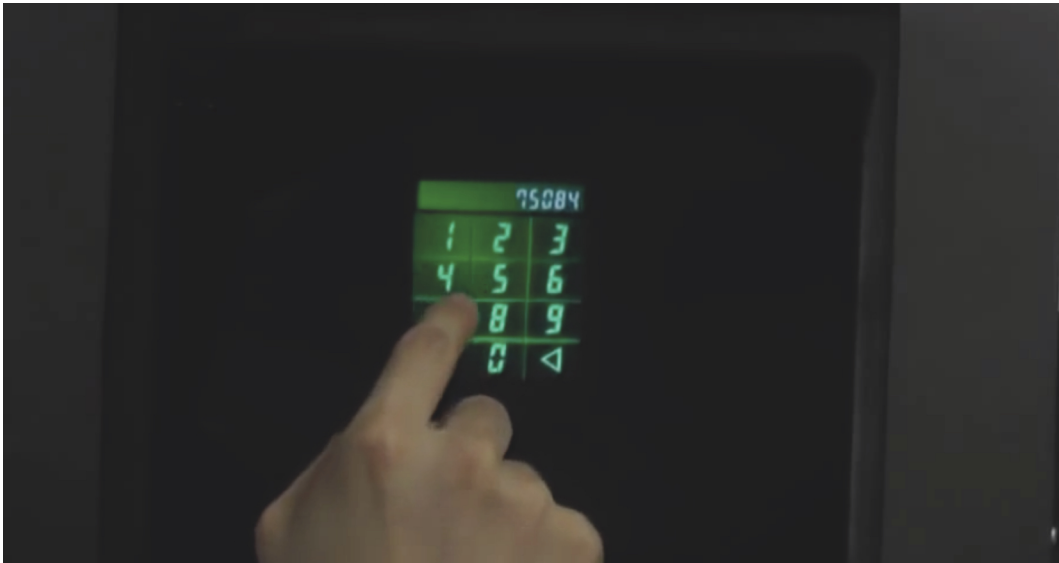Mid-air haptic interaction with a floating virtual screen"
https://www.youtube.com/watch ?v=uARGRlpCWg8

Figure 2: HaptoMime. Screenshot from "HaptoMime (full version):
Mid-air haptic interaction with a floating virtual screen"
https://www.youtube.com/watch ?v=uARGRlpCWg8

2. The 3D tactile rendering (Disney Research) enables a complex addressing of the tactile sense modality through the use of a specific friction force based on a rendering algorithm for touch displays (Figure 3). Through the use of electro-vibrations, the user can feel three-dimensional objects that are depicted or represented on the flat display and these vibrations intensify the reception by a haptic feedback (a real difference compared to the static and anti-tactile representation of standard touch displays). What at first looks like a 2D display offers an enhanced phenosemiotic interaction: the tactile friction force interacts with the mechanoreceptors of the user's skin and synthesizes this sensation with the sign structure of the depicted object (ridges, edges, pointed shapes etc.). The combination of the primary and secondary sense modalities within the micro-aesthetic dynamic (feeling and seeing) intensifies the aesthetic experience and triggers the mental conceptualization for the understanding of real objects.

Figure 3: 3D Tactile Rendering.
Screenshot from "Tactile Rendering of 3D Features on Touch Surfaces"
https://www.youtube.com/watch?v=zo1n5CyCKr0).

3. The MetaCookie+ (University of Tokyo) is a media system that primary enables a gustatory and olfactory perception. Additionally, a haptic experience is influencing the proprioceptive contact with a specific cookie by holding it in the hand. The micro- and macro-aesthetic structure of this system is able to change the perceived taste of a cookie "by overlaying visual and olfactory information onto a real cookie with a special AR marker pattern. MetaCookie+ combines AR technology and olfactory display technology" (Narumi et al. 2011, 95). The media system is based on a head mounted display, two cameras (for the detection of the cookie and the specific eating process), an olfactory display (air-pressure pumping system for the different scents) and a cookie that is tagged with a QR code by a food printer. If the recipient reaches the cookie the first camera captures it and within a specific distance between hand and mouth the second camera is involved to eliminate blind spots. The QR code triggers a specific glaze

or icing that gets applied on the cookies surface as a visual augmentation (Figure 4). Parallel to the augmentation the olfactory display sprays scented air in front of the recipients nose to enable an olfactory input synchronized with the type of the glaze applied to the cookie (e.g. chocolate scent in case of chocolate glaze). The closer the hand leads the cookie towards the recipient's mouth – as a moment of haptic perception – and during the process of eating the intensity of the scent gets increased to restructure the gustatory perception (Figure 5) by a multimodal structure of perception (cf. Narumi et al. 2011).

Figure 4: MetaCookie.
Screenshot from "Meta Cookie at Exploratorium After Dark"
https://www.youtube.com/watch?v=Oe39HQH78x4

Figure 5: MetaCookie. Meta Cookie at Exploratorium After Dark
https://www.youtube.com/watch?v=Oe39HQH78x4

These three examples are indicating a poly-sensual and multimodal structure within the micro-aesthetic selection process of the designer that directly interacts with the cross-modal effects within the macro-aesthetic evaluation: the micro-aesthetic signals of the materiality are leading directly towards an macro-aesthetic judgement of the recipient in feeling or perceiving the media effects as real and physical or tangible forms with a specific meaning.

The conditions of poly-sensuality or multimodality are definitely expanding the bodily and mental effects within the reception process. Therefore, it seems necessary to enhance the aesthetic concept for a modification of already established or old analytical tools. The phenosemiotic sign relation, which highlights the micro- and macro-aesthetic interdependency and addresses the sensory and perceptual transfer, directly contributes to a restructuring of aesthetics. In this perspective, it seems plausible to use the extended concept of hyperaesthetics that is logically connected with hyperesthesia, which was used by the anthropologist David Howes for highlighting the modern consumer culture as a lifeworld based on multisensory meaning processes with a focus on the hyperestheticization of the body (cf. Howes 2004).

Conclusion

Talking about prototype aesthetics is not a simple reference to wires, processors and transformers. Instead, a progressive prototype aesthetics is focusing on the hyperaesthetic reception dynamics in the context of modern media technologies and modern media materialities. The analytical perspective is explicitly connected to the phenosemiotic framework that characterizes the micro-aesthetic selections and its influence on the macro-aesthetic level of hyperaesthetic judgements and experiences. Accepting the hyperaesthetics of technology implies that future research has to consider a complex sphere of different phenomena: The medium is no longer in a specific distance to the recipient because it synchronizes more and more with the sensory and bodily reality of the recipient. This synchronization is sensorial, perceptual, embodied and also temporal and it requires new phenomenologic- and semiotic-driven approaches for the understanding of hyperaesthetic media systems. Also, we have to consider, that established and traditional media constellations and concepts are changing. If we can now for example touch, smell and taste the image representations we need new concepts. Is the image of a cactus still an image when I can directly perceive the sting?

If we use the concept hyperaesthetics, then we have to consider the specific structure of inter(re)activity (cf. Arsenault and Perron 2009: 120) of a medium because performance (action) and depiction (representation) are fully related to the perceptual reality effect of the recipient. We have to think of media content (like depicted images or sounds) as active excitation patterns within the sensory and perceptual transfer. And we need a progressive corporeal phenosemiotics that is able to deal with media content that get object-like attributes, a physical form, an appearance or body.

The hyperaesthetic perspective addresses new problems and possibilities in art-, design-, image- and media theory and requires the integration of the sensory and perceptual dynamics in the academic media discourse. If we understand media systems in this perspective as technological-driven excitation patterns, then, the classical or traditional view on images, visuality and perception has to change to deliver analytical tools and new concepts for coherent characterizations, analysis and descriptions. It seems to be evident that hyperaesthetics represents a technological border experience of the interdependent relation of structural media transformations, corporeality and processes of signification.

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Note

1. Original quote: „Sie bilden ein Gewebe interner Konzepte, die die 'interne Semantik' des Systems festlegen, d.h. die Menge an Konzepten, die für die internen Prozesse von Bedeutung sind, also das Vokabular, den Wortschatz des Systems, in dem die unterschiedlichen Teilsysteme miteinander kommunizieren" (Mausfeld 2010, 14).

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