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Design and semantics of form and movement

DeSForM 2015

Aesthetics of interaction: Dynamic, Multisensory, Wise

Cover image: Electroluminescent surface printed on folded paper (Karmen Franinovic and Luke Franzke, "Luminous Matter: Electroluminescent Paper as an Active Material", page 37-47)

DeSForM 2015 is supported by:



PHILIPS

TU/e



With the financial support of Telecom Italia



ISBN 978 88 6493 031 2

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Aesthetics of interaction:
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Aesthetic and ethic issues in interaction design

Aesthetics and interaction design

The role of designers and, between the others, of interaction designers, does not simply consist in the facilitation of the innovation processes, but can also be provocative and open new directions of development, beyond stereotyped solutions, indicating new perspectives of intending contexts and solve project questions.

In the disruptive evolution and spreading of digital technologies, the academic communities engaged in research for interaction design should not restrict the discussion to the topics of design methodologies and education approaches, but they can also offer a relevant contribution to the innovation of the discipline, developing original directions of research, and promoting the critical thinking about the potential scenarios made possible by the technical innovation.

In doing this, we may refer to the tradition of industrial design that has always found its cornerstones in technical and language experimentations, in the most comprehensive quest for quality as well as in social commitment, and in the courage to exercise a critical analysis of the dominant trends, also proposing meaningful and paradigmatic alternatives. To this respect, the growing interest aroused by aesthetic issues in the community of interaction designers can be interpreted as a sign of maturity of a discipline that, in the lapse of a few decades, progressed from the discussion about usability and user centred methodologies, to the design of emotions supported by the neurosciences, to finally land to aesthetics.

The topic of aesthetics is quite vast and the word itself is employed with a variety of different meanings [1].

The aim of making digital products and systems more pleasurable and desirable is and remains a very relevant issue; on the other hand, we can profit of the discussion about aesthetics to better clarify and reinforce the specificities of the role played by industrial designers in the project of technology based solutions and to highlight their original contribution with respect to other actors involved in projects. The aesthetics issue supports a renegotiation of the importance attributed to formal factors with respect to functional ones, since the research about formal qualities is indeed a research about human needs, perception phenomena, ways of involvement, and so on, that can be very difficult to describe in terms of objective statements. The formal attributes of a product or of a service have a value on its own, and should not be considered only as a means to support the access to functions.

The reasoning about aesthetics is, therefore, a discussion about quality or, better, about the possible ways to intend quality in interaction design and it is possible to refer to aesthetics theories to find new ways to investigate quality

factors that cannot be expressed in terms of rational and measurable elements even if their relevance can be clearly and unmistakably experienced in subjective ways.

As an example, we can go back to the origins and take as a starting point the invention of the word itself, aesthetics, by the German philosopher Alexander Gottlieb Baumgarten who claimed for a science of sensations as complementary and independent from logic sciences [2]. While philosophers as Leibniz, Christian Wolff, Kant [3], differently referred to aesthetics in the need of discussing the nature of clear sensible knowledge as opposed to logics and scientific exploration of the world, other authors considered aesthetics mainly as theoretical discussion on art, and others, such as Gernot Böhme, as a theory of perception [4].

In the time, the theoretical discussion about art generated reflections around beauty, taste and subjective evaluations, and produced the popular use of the word as synonymous of formal quality and beauty. But when we talk of aesthetics we should not only focus on the characteristics of the artefacts, but better, we focus on the kind of experience that the artefacts can produce.

The Italian professor of aesthetics Paolo D'Angelo calls aesthetic experience [3] a specific state of mind that can be elicited by the contemplation of artworks (even if the contemplation of a piece of art does not guarantee in itself the state of aesthetic experience), but also by other circumstances not related to art; a state of mind capable to deeply involve us both from the cognitive and emotional points of view, a state that we are neither able to fully untangle in its complexity nor to rationally explain, but that we clearly and unmistakably experience as something intense, meaningful and capable to produce relevant changes in ourselves.

If we take this definition as a reference, the research about the aesthetic of interaction should deal with the ability to create new languages based on the shaping of the interactive processes; in order to produce meaningful experience through interaction, we need to experiment different ways of engagement, also investigating the sides of human perception that appear as confused, uneasy, contradictory and dark, as artists have always been able to do, going beyond beauty and pleasantness. Through the research about the aesthetic of interaction, we should be able to investigate the different states of mind that can be produce in human minds through the interaction with digital solutions.

If we refer to the specific of industrial design culture and, as an instance, to the Italian masters of design, the reference to aesthetics as theoretical issue is seldom explicit while most of designers instead reflected on art and on the relationship between art and their personal work as designers. Authors such as Bruno Munari considered themselves as an applied artist and a pragmatic explorer of the expressive potentialities of fabrication techniques. In his book "Arte come mestiere", Munari claimed: "a person employing an object designed by a designer can feel the presence of an artist who worked also for him/her, so to improve his/her life and favour the change in his/her relationship with aesthetics" [5].

Enzo Mari remarked that industrial design is the unique discipline that faces three different cultural horizons: production technologies, scientific knowledge of natural phenomena, and expression. He stated that the formal quality of a designed artefact must be the outcome from the synthesis of deep knowledge or of motivations experienced as deeply involving. Again, the aesthetic issue is presented as a way to embrace human complexity also on the base of subjective readings of contexts and project questions; designers should be conscious that in their work, they have to produce the best synthesis between functional and formal goals, and the two have the same dignity [6]. The masters of traditional industrial design have always been quite conscious of the power of formal qualities of material products as means to convey meanings and messages, and of their ability to produce deep and relevant effects by shaping the form of their artefacts. Gropius aimed to the production of good forms so to translate life processes into images; he considered psychological needs as basic and primary, while interpreted the technical elements as tools to realize non-tangible effects through tangible solutions [7]; with a similar vision, Breuer got to the point of ideating a chair made of a flux of air as the sitting process was taken as more relevant than the chair in itself [8]. This awareness implied and should always imply a sense of responsibility connected to the profession of designer: the good form of tangible and non-tangible artefacts can induce emotions, fulfil psychological needs, communicate messages, induce value changes. From the market point of view, design can be seen as a way to add value to material products making them more attractive; on the other hand, the discussion about formal characteristics of products is

indeed a discussion about social concerns and ethics; the form of every kind of artefact we produce, has effect in terms of communication and meta-communication [9] and has an active role in the shaping of physical and virtual environments.

Interaction design is, for excellence, the domain of collaborative and multidisciplinary projects, mainly based on robust methodologies requiring data collection, ethnographic research and behaviour modelling; the discussions about the aesthetic of interaction can be therefore interpreted as a kind of provocation: a claim that now is the time to experiment new design approaches, to better investigate new forms of fulfilment and to redefine the ways we perform evaluation.

Furthermore, the issue of aesthetics also proposes the focus on art as a research approach; it indicates the relevance of investigate unproductive activities, emphasizes the analysis of subjective evaluations in their complexity and of the exploration of ambiguity as fundamentals of research methodologies. On the other hand, digital technologies offer opportunities of creating forms of experiences that are completely new in human history, most of which have only partially experimented and studied. As well documented in her book, *Aesthetic of Interaction in Digital Art* by Katja Kwastek [10], we can learn very much through the study of the modes of art and media engagement that produce the hybridization of physical world, digital information and interactive mechanics. The domain we explore is the new urban space that is generated by architectures based on these three elements.

In the tradition of industrial design, the formal attributes depend on material features of products; on the other hand, in interaction design the fulcrum of the discussion about aesthetics is based on the awareness that interaction is a dimension of human experience that humans perceive as relevant in itself. More: the shaping of the interactive dynamical processes offers the opportunity of creating new and engaging languages.

In industrial design, designers can create languages, elicit emotions, produce messages by acting on the form and colours of material objects; in the same way, by shaping the dynamics and mechanics of an interactive process, we can produce messages, stimulate emotional and cognitive processes, provide meanings and engage far beyond the simply optimization of affordance with respect to functions.

Every human activity and, consequently, every interactive process are inseparably based on the perception through the senses and therefore depend on the material factors of the material solutions enabling the interaction. Nevertheless, interaction is something that transcends and surpasses the perception of the characteristics of the material world with which we interact, and is developed through the implementation of the possibility of action that the relationship with the materiality sensitive makes possible. While we experiment new forms of interaction, we can actually investigate states of mind that are enabled by the interactive process.

To clarify this concept, we can opportunistically quote the German philosopher Gernot Böhme who employs the concept of atmosphere and states that seeing a tree is a very different experience than seeking shelter from the rain or the heat under the crown of a large tree [4]. In the search of a shelter under a tree, while we escape from a sudden rain or we search relief from the heat of the summer sun, our experience is clearly related to the formal qualities of the tree enabling the event, but, undeniably, the core of the experience itself is connected to the dynamics of the event (i.e. the change of state produced by entering into the protective cover of the tree) and to a tangle of other factors such as the physical characteristics of the tree (its dimensions, the shape and texture of leaves and trunk, the space defined by the shadow casted by the tree), the state of our active involvement (body and brain), and the way we perceive ourselves with respect to the features of the tree, as we see the potential shelter and begin to move toward it as a solution to a maybe unspoken problem, so experiencing a mental activity that we can describe in terms of (physical) problem solving. More, going back to the now disused concept of affordance, we could say that the only way to know a tree is through the exploration of all the possible interaction we could enact with it: getting shelter under it, climbing on it, building through it and so on.

When we design interactive processes, the shape is related to the physical design of the interactive solution, but also (mainly) to the mechanics of interaction and to the kind of affordances (i.e. the freedom of action) made available to the user. As we can do with the material shape of objects, in interaction design we can create languages acting on the form of the interactive process, and we can play with archetypes; we can overlap functions, meanings

and sensations; even in games, we can make strict procedures or, instead, encourage personal approaches [11], and we can play with ambiguity.

As designers, we can shape the interaction only designing artefacts that support or induce activities through the use of the solutions we design; on the other hand, as technology offers a growing number of opportunities to reduce the materiality of the devices involved in the interactive processes by producing electronic sensors and actuators that do not need touch or typing, we should develop the ability to reify interactive processes so to be able to play with forms of experience even when the material elements involved in the interaction have not a significant shape in their own.

Design and critical thinking

The dynamic and interactive processes can be quite powerful in producing emotions but also in transmitting and make acceptable metaphors and paradigms; the involvement produced by interactive solutions can be much intriguing and even convincing just for the kind of involvement associated to being active part of a process. Some research already use the understanding on how interactive processes can be employed to convey messages, to produce effective experiences capable to modify opinions and attitudes [12].

If we accept the assumption that by shaping interaction we also produce meanings and messages in voluntary and involuntary ways, we should also acknowledge that the discussion about the quality of interactive products and systems is a matter of ethics as well as of aesthetics. The effort to gain the awareness about the implicit messages carried by the formal attributes of the artefacts we design is mandatory.

The adoption of digital technologies is transforming the ways we search for information, the perception of time and space, the use we do of our personal memory; also our mental frames and our brain-senses perception strategies change with the use of technologies, and the innovative communication tools we use modify the way we socially interact with other people and the way we intend priorities, hierarchies and roles, personal rights and privacy. On the other hand we must be very conscious that, in the design of technological devices and services, we have often a limited ability to fully govern the messages conveyed by the artefacts designed by us, and it is very difficult to predict *ex ante* the social consequences of an innovative solution. Quite often, even when technology is employed to support traditional and apparently unmodified functions, the amount and nature of the changes induced by technical innovation are predictable only in a limited way during the design process, and the full understanding *ex post* of the long term consequences on individuals and social systems connected to the use of a digital solution can be often performed only in time. To this respect it is important to invest in the critical analysis of the changes induced by the adoption of digital technologies and on the emerging scenarios, as performed, for example, by the authors that contributed to the book edited by Ulrik Ekman [13].

Back in 1999, Alan Cooper wrote a successful book entitled “The inmates are running the asylum” where he introduced his Personas and declared that “we need to radically rethink the interaction between humans and machines” [Cooper]. In this book, Cooper described technological solutions with the metaphor of a dancing bear: when we see a dancing bear we are so amazed by the fact that it is a dance performed by a bear that we tend not to notice that there is not a real quality in the dance itself.

After almost twenty years during which digital technologies evolved and became pervasive, still we often have a complacent attitude with respect to the final quality of technological solutions, and often we do not evaluate them at the light of their actual implementation, but our judgements tend to make allowances since we consider that tolerance is due to novelties. Digital innovation is always radical innovation, and we are still exploring the real beginning of the digital era. To produce knowledge in this exploration, there is no other way than to experiment, prototype, test and evaluate, on the other hand, we should pay more attention to the task of critical evaluation of the solutions we design and the directions to respect with we exert the evaluation: very often the changes induced in social rules by the adoption of digital technologies are implicit and therefore are not fully discussed in their final

consequences. Now we know that the technology should be designed to fit humans and not, the other way round, that humans should adapt to technological solutions, but we tend to consider the disadvantages provided by the introduction of technologies in process as temporary effects. The technological structures and systems are the new virtual urban environments in which we will live, and as such we should take care of them.

In order to carry on a relevant and effective discussion about the quality of interactive products and systems, we can go back to the history of design and inspire ourselves by the example of masters of design who, in their search for absolute quality, did not make scruples in expressing their severe critics, most of which were not “scientific” but mainly based on subjective sensations.

In 1997, in the early stages of the digital era, the genial Thomas Maldonado wrote a book named “Critica della ragione informatica” [14] in which he anticipated a number of relevant issues related to the spreading of computers and of digital solutions. At that time cd-rom were still considered as innovative supports of information, and some authors argued that the turn of interest from passive media (i.e. television), toward the new interactive information and entertainment solutions made available by internet and multimedia pc was quite uncertain since they supported the idea that human beings are naturally attracted by media requiring low level of active involvement.

Really, the awareness of interaction as a dimension of expression was still far away, nevertheless, in his survey on the tangle of issues related to the construction of the then called cyberspace, Maldonado was quite conscious that the realm of digital technologies was something unique and new with respect to the tradition of industrial design; the peculiarity of digital technologies in the shaping of the future requires a more complex and articulated modelling of human mind and perception processes. To this purpose, Maldonado called in scientists such as V. Ramachandran and S. Zeki to indicate the need of acquiring new knowledge to face the digital change and the related project opportunities.

The book framed some questions that are still relevant: How the new technological inventions are going to modify human organization systems? Which innovative urban scenarios are made possible by the spreading of internet and of computers? How human perception is going to be modified by the intensive use of digital prosthesis? How will we manage an unprecedented amount of information? How cognitive and emotional processes will change in the new environments created by the intersection of physical and digital spaces? Which changes will be produced by technologies on language, personal identity, sense of self, sense of personal freedom and rights? And more: which forces, beyond the market and the economical interests can orient the innovation toward a sustainable and desirable future? The book of Maldonado is still fascinating as it conserves the ingenuity and clairvoyance associated with the reflections developed at the dawn of a great change. His questions cannot find a final answer but should accompany us in the development of future solutions and scenarios so to maintain the perspective we had of the future when we were moving the first steps into the digital space. More, we should be able to afford in a more direct and explicit way the discussion on the real desirability of digitization of processes, case by case, and in some circumstances, we should be brave enough to oppose against the use of indiscriminate adoption of technological solutions when this is not supported by real progress.

A drawing through dots

The challenge posed by the DeSForM Topic entitled “From smart to wise: toward a new conception of digital products and services” focused the call on the differences between two words, innovation and progress, that we should try to maintain distinguished.

The papers collected in the track propose different approaches to the topic and offer an interesting map of the state of the art of research. Each of them enlightens, from a specific and original perspective, the efforts addressed toward new ways to intend quality in interaction design.

Elif Özcan, in his paper entitled “Toward wise experiences: The role of wisdom in design for well-being” deals with relevant definitions of wisdom coming from psychology, phenomenology and philosophy, and he extracts from them a conceptual system useful in the design of products and in their evaluation with respect to well-being.

The paper “Examining Sensorial Interfaces as the Stimuli for remote Affective Communication” by Xinchu Zhang,

Lois Frankel and Audrey Girouard presents a study of communication activities in families; the analysis deals with emotional factors such as concern, sense of togetherness, memory, and provides insights for the design of innovative communication solutions.

Jacklynn Pham wrote “Expanding the Palette of Digital Interaction”, a paper reporting a design exercise based on a tool intensively employing reflectivity in the design process so to widen creative potentials.

In their writing entitled “ The delicacy of handshakes: reflection on the aesthetic of interaction”, Marc Hassenzahl, Eva Lenz, Sarah Diefenbach and Nigel Geh Keong Teck investigate interaction at the intersection between material and immaterial experiences and present a design philosophy focused on experience, based on design practices, conceptual thinking, and experimental findings.

Bin Zhu, Yanqing Zhang, Xiaojuan Ma and Haibo Li offer a reasoning about the evaluation criteria in interaction design from the perspective of cultural specificity and explore the contribution that the Chinese culture about aesthetics can provide to the reasoning about the topic in interaction design. Their paper is entitled “Bringing Chinese Aesthetics into Designing the experience of Personal Information for Wellbeing”.

In “Social Shopping in Smart spaces” Shushu He focuses on social shopping, discusses the main issues in this field, and indicates the relevance of acting on factors such information asymmetry in the purchase process, of trust-forming policies and evaluation criteria.

Marco Spadafora presents a design tool supporting the creation of innovative concepts interactive products, and while he focuses on the dialogue between users and machines, he refers to aesthetic values in design to get out of the constraints of efficiency; the paper is entitled “ Object’s Personality, a Tool to Chase Aesthetic Approach in the Design of Smart Objects”.

The last three papers of the track refer to the domain of game design but with different perspectives.

Ilaria Mariani and Ida Talelbasic, in their paper: “The reverse Engineering of Emotions”, introduce the idea of employing serious game in reverse modelling of emotions as a preliminary activity in the design of NFC based solutions for daily applications so to investigate the emotional pattern of users involved in the interactive processes.

The paper “In Search of the Right Design Abstraction for Designing Persuasive Affordance towards a Flourished Society”, Mizuki Sakamoto and Tatsuo Nakajima deals with interactive digital rhetoric and outline an investigation of its influence on human behaviours.

Annamaria Andrea Vitali in “Play Design and Sense-making: players and games as digital Interactive Contexts for Effects of Sense” bases her writing on case-study analysis and design experiences, and investigates sense-making effects on the base of semiotics theories.

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