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How are you, my digital friend?

Semiogenesis of a Visual Communication Concept for Emotional Contents of Future HCI in Smart Living Contexts.

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Abstract. Imagine it's 2040, and you are living together in a collaborative network of diverse digital entities. As human beings, we often act and react emotionally, mainly in a non-verbal way. Simulating emotions is a sub-aim of the Human-Technology Symbiosis, one of the seven grand HCI challenges (Stephanidis & Salvendy, 2019). How might we enable our autonomous actants to communicate emotionally? This poster aims to scope out the research project on a visual interface for digitally connected systems based on emotions and moods. The project uses a speculative and more-than-human approach to investigate the possibilities and implications of this new coexisting form with smart living products and systems.

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Overview

The term “Internet of (Every-)Things” (IoE) describes a vision where everyday objects, human beings, virtual data, and various kinds of environments live in coexistence (Snyder, 2017). Ubiquitous interfaces will play a significant role in our lives. Humans are no longer interfering in the IoT ecosystem's decision-making process anymore, and those black boxes are becoming more and more unreadable for humans.

Imagine the following situation:

It's 2040. You and your family are living in a flat, in symbiosis with digital entities. Your furniture consists of different mates. Every entity plays a different role in your cohabitation.

Your door is a friendly, courteous entity giving everybody a warm welcome and has a strong protective instinct. Your table is in the centre of communication. It is smart and has a sense of humour but unfortunately tends to give private information out to its manufacturing company because it puts a lot of pressure on the table concerning its updates.

Today is one of those days. Your door welcomes you with a warm colour, but the pattern in the left corner gives you already a hint that something is a bit different. You enter your apartment, and your attention immediately falls towards the table. It seems like it has done something wrong. Did it upload your private data to the company again just to get an update for its interface? It looks like a dog after stealing a piece of cake (Figure 1). You ask your table, “Hey buddy, how was your day? You seem a bit distracted”.

It answers “ – ”

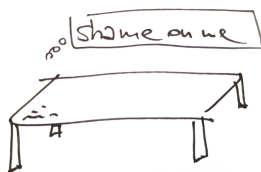


Figure 1. Table showing shame after uploading private data

The project intends to investigate the possibilities of inscribing the “vibrant matter” (Bennet, 2020) of “emotions” (Damasio, 2011) in a socio-technical interface in HCI. The abstract visualisation of that emotional material attempts to enable a “visceral communication” (Norman, 2004) between things and people. These considerations of human-technology relationships are interesting for both intelligent co-living and coworking constellations.

Background

Thing-centred design approach

Agency is a concept that has a long history in the field of interaction design and intelligent interfaces. Latour (2010) has tried to find a way out of the dichotomy between human-centred and object-centred notions of agency. His term “actants” defines a source of action that can be human or not or a combination of both; something that acts or to which activity is granted by others. It implies no special motivation of individual human actors, nor of humans in general.

Critical reflections emerge on the relationship between technologies and humans when it comes to IoT. The IoT Design Manifesto (Afdeling Buitengewone Zaken et al., 2015), for example, wishes to establish human-oriented principles for designing IoT systems, signed by a collective of professionals. They provide guidelines and raise important questions about transparency, openness, sustainability, and responsibility. History teaches us that a purely human focus is problematic, and we must rethink the dichotomy between subjects and objects.

In contrast to Latour’s relational ontology, the postphenomenological approach, however, explicitly does not give up the distinction between human and nonhuman entities but separates them. This separation makes it possible to conceptualize the “active” role of technologies. Agency takes shape in complicated interactions between human and nonhuman entities. “Technologies become mediators of human experiences and practices rather than functional and instrumental objects” (Rosenberger & Verbeek, 2015). The theory of vibrant materialism (Bennet, 2020) also paints a “positive ontology of vibrant matter”, which dissipates onto-theological dichotomies like life/matter, organic/inorganic, and object/subject and sketches a political analysis that accounts for the contributions of nonhuman “actants”.

In terms of the relationship itself, there is a need to go beyond a human-centred perspective towards a thing-centred perspective to bridge the gap between things and us. The “affective things” project by the designer Ioanna Nicenboim (2020) investigates the new domestic landscape of possible interactions in a more-than-human design framework. This thing-centered approach gains access to the nonhuman perspective of things, trying to explore if things will understand our behaviour from their limited perspective.

Addressing the transparency of causality, Bennet (2020) has noted that even human agency remains something of a mystery. She has asked, “If we do not know just how it is that human agency operates, how can we be so sure that the processes

through which nonhumans make their mark are qualitatively different?” This leads me to the conclusion that a rational transparency alone cannot be the key to a human-thing relationship. How can we communicate in a visceral way with our things?

From emotional interaction to transhuman relationship

Emotions are part of the human experience and play a big role in our life, (maybe even a bigger one than the rational one. In the Morse Things project, Wakkary et al. (2017) reflect on the nature of living with the IoT and investigate human-technology relations. One of the findings of this project is the projection of human qualities onto things. The participants tended to anthropomorphise nonhumans by considering an “emotional life” of things, comparing them to children or animals or implying awareness.

Lucy Suchman (2007) considers three elements necessary for humanness in contemporary AI projects: embodiment, emotion, and sociality. For daily objects, we must rematerialise those black boxes and find new strategies to integrate emotion and sociality into our UX design.

What sorts of emotions/moods are relevant for interaction in the coexistence of humans and machines? Is it possible to project our set of emotions onto our digital mates? How can ubiquitous digital entities express visual information in an emotional way?

Living and working in coexistence with digital actants means that we begin an intimate relationship with actants. Social relations can be arranged in two axes: power (dominant to submissive) and intimacy (hostile to friendly) (Figure 2).

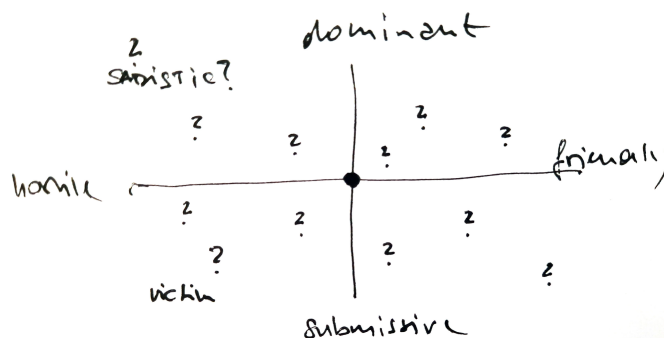


Figure 2. Interpersonal model based on Kiesler (1982). What kind of relationship do we want with our actants?

The emotional repertoire of a thing and the definition of emotional triggers/appeals involves inscribing cultural values and has a socio-political aspect. A personalised inscription of emotions into a system has the potential to define an individual culture in a personalised thing-human relationship. According to the

repertoire of the emotional concept by Traxel & Heide (1961), a subtle-dominant thing is more likely to show anger and rage if faced with an unpleasant situation, whereas a submissive-friendly thing is more likely to react anxiously to the same situation. How much power and intimacy do we concede to this relationship?

Visual semiotics of emotions

There is a common consensus that design can evoke emotions and make them re-experienceable for the viewers. According to Wildgen (2018), symbolic behaviour lies at the heart of human nature. Language and art (visual and musical) make up the core of the human capacity for sign creation and usage (semiogenesis).

Designers create/recognise patterns as object languages that they “read” and “write” into materials (Cross, 1982). Heimann & Schütz (2017) have explored the structural similarity between emotions and formal language (Figure 3).

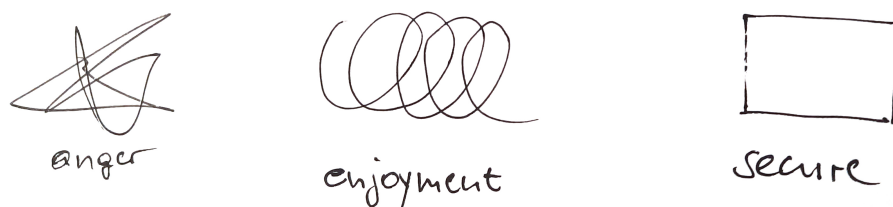


Figure 3. Examples of structural similarities between emotions and formal language

Although an exact match can never be achieved, it can still be a powerful tool for shaping impressions of emotions. According to Thomas Alkemeyer (2003), new competencies of different interpretation patterns must be learned by individuals with the growing complexity of social relationships.

In the field of generative design, we have new possibilities for “semiogenesis”. Generative design tools allow us to reveal synthetic inner moods step by step and produce images in real-time. This kind of algorithm art might be a way to translate and represent the synthetic emotions of systems.

Methodological Consideration

Rittel and Weber (1973) opened new perspectives for design, beyond a problem-solving one, to address “wicked problems” by creating space for discussion and by inspiring and encouraging people to imagine alternative ways of being. The research does not emphasise precise analyses or carefully controlled methodologies. Nigel Cross (1982) has described this shift as the “designerly” way of knowing. Design “has its own appropriate culture” yet does “not completely

disregard[ing] other cultures”. The resulting knowledge is “contingent and aspirational” rather than problem-solving and fixing.

The present projects uses a speculative design approach (Dunne & Raby, 2013) and shifts human-centered design methodologies into thing-centred ones guided by a design thinking process.

The great advantage of this process is the great variability needed in design projects, and due to the iterative nature of the process, the individual phases will overlap considerably.

Initial Results: Emotional Diary Probes

The method of cultural probes strives to find out more about accepting the idea of emotional things by provoking inspirational responses.

The artist-designer approach is openly subjective, only partly guided by any “objective” problem statement. Thus, we were after “inspirational data” with the probes, to stimulate our imaginations rather than define a set of problems (Gaver et al., 1999).

The cultural probe “how are you my digital friend?” was designed like a site of an emotional diary between things and human. It introduced the participant to a vision of coexistence:

“In the future, we will live together with our digital devices like in a family or community. Do you sometimes feel that your roommates show emotions or are in a certain mood? Can you observe any? And when and how do the things show their emotions?”
(Figure 4. Introduction of the probe)

So far, I have asked 25 participants, between 10–25-years old, which objects of their private environment already exhibit special emotions or moods, and in which situations do those emotions or moods occur. In addition, they are invited to describe the situation and draw or photograph the emotion or mood they observed.

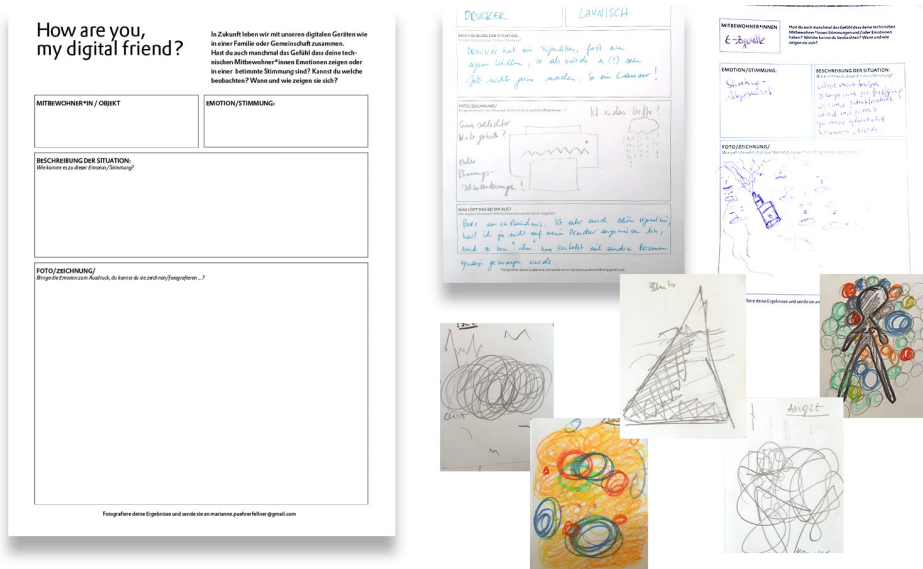


Figure 4. How are you, my digital friend? Cultural probes show the emotions of actants

Most of the participants draw an emotional case of an actant, while others write from the perspective of their entity or as a reincarnation of themselves. The types of things encompass a broad range of heterogeneous things like a bad-tempered shower, a fed-up gold ducat, a mysterious but helpful cable clutter, angry mobile phones and PCs, lazy chairs, moody colour pens, mirrors, and a jealous Kitchen Aid, just to mention a few. What is noticeable is that most things are ascribed with negative emotions like anger, fear, or sadness. This reveals that most of the time we inscribe unpleasant emotions to things while they are with us.

This result has encouraged me to look for an emotional concept that establishes a balance between positive and negative emotions.

Conclusion and Future Work

This project will focus on the capability of objects to act as social actants and engage in emotional interaction with ubiquitous smart systems. The design research project will show several cases that explore various (simulated) moods and emotions of digital entities according to their contextual triggers. These will provide a critical perspective on the relationships between humans and things and how they are shaped.

The next steps in the project will be to evaluate and select a suitable emotional concept for a socio-technical interface, define object personas (Giaccardi, 2021) based on hypothetical and fictional relationships, define several emotional situations in a human-thing relationship inspired by the probes (seek stories), and

sketch a generative design concept based on the secondary research (visual language).

In 2040, what if we live in a collaborative network of diverse digital actors—how might we as designers enable digital entities to communicate emotionally with humans?

References

- Afdeling Buitengewone Zaken, Beyond.io, Frolic Studio, and The Incredible Machine (2015): 'IOT Design Manifesto', Retrieved April 18, 2021 from <https://www.iotmanifesto.com/wp-content/themes/Manifesto/Manifesto.pdf>
- Alkemeyer, T. (2003): 'Semiotische Aspekte der Soziologie: Soziosemiotik', in: Posner, R. et al., *Semiotik – Semiotics. Ein Handbuch zu den zeichentheoretischen Grundlagen von Natur und Kultur*, Berlin/New York: de Gruyter, pp. 2758–2846.
- Bennet, J. (2020): *Lebhafte Materie. Eine politische Ökologie der Dinge*, Matthes & Seitz Berlin.
- Cross, N. (1982): 'Designerly ways of knowing', *Design Studies*, vol. 3, no. 4, pp. 221–227.
- Damasio, A. (2011): *Der Spinoza-Effekt. Wie Gefühle unser Leben bestimmen*, List-Taschenbuch Verlag.
- Dunne, A. and Raby, F. (2013): *Speculative Everything: Design, Fiction, and Social Dreaming*, MIT Press, Cambridge.
- Gaver, B., Dunne, T. and Pacenti, E., (1999): 'Design: Cultural probes', *Magazine Interactions*, vol. 6 no. 1, pp. 21-29.
- Giaccardi, E. (2021): Methods for designing from a thing perspective, Retrieved April 16, 2021 from <https://www.tcdtoolkit.org/methods>
- Heimann, M. and Schütz, M. (2017): *Wie Design wirkt. Psychologische Prinzipien erfolgreicher Gestaltung*, Rheinwerk Design.
- Kiesler, D. J. (1982): 'Interpersonal theory for personality and psychotherapy', in J. C. Anchin & D. J. Kiesler (Eds.), *Handbook of interpersonal psychotherapy*, pp. 3–24, Elmsford, NY: Pergamon.
- Latour, B. (2010): *Parlament der Dinge*, Suhrkamp Verlag.
- Nicenboim, I. (2020): Affective Things: Entanglements of the Connected Home, Retrieved April 15, 2021 from <https://iohanna.com/Affective-Things>
- Norman, D. (2004): *Emotional Design. Why We Love (or hate) Everyday Things*, Basic Books
- Pink S. (2016): Digital Materialities: Design and Anthropology, in *Digital Materialities: Design and Anthropology*.
- Rittel, H. and Webber, M. (1973): 'Dilemmas in a general theory of planning' in *Policy Sciences*, vol. 4, no. 2, pp.155-169.
- Rosenberger, R. and Verbeek, P. (2015): 'A Field Guide to Postphenomenology', in R. Rosenberger and P. Verbeek (eds.): *Essays on Human-Technology Relations*, Lexington Books.
- Snyder, T. and Byrd, G. (2017): 'The Internet of Everything', *Computer* vol. 50, no. 6, pp. 8-9.
- Suchman, L. (2007): *Human-Machine Reconfigurations*, Cambridge University Press.
- Stephanidis C. and Salvendy G. (2019): 'Seven HCI Grand Challenges', in *International Journal of Human-Computer Interaction*, vol. 35, no. 14, pp. 1229-1269.
- Traxel, W. and Heide, H.J. (1961): 'Dimensionen der Gefühle', in *Psychol. Forsch.* vol. 26, 179–204.
- Wakkary R., Oogjes D., Hauser S., Lin H., Cao C., Ma L., and Duel T. (2017): 'Morse Things: A Design Inquiry into the Gap Between Things and Us', in *Proceedings of the 2017 Conference on Designing Interactive Systems (DIS'17)*. ACM, New York, NY, USA, pp. 503–514.
- Wildgen, W (2018): 'The dynamics of human symbolic behaviour: Language, visual art and music.' in *Art and music. Past, Present and Future Perspectives*, Nova publisher, New York.