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Happy, Happy, Sad, Sad: Do You Feel Me? Constellations of Desires in Affective Technologies

Serjoscha Wiemer

Affective media technologies are becoming more and more standardized, and objects of commercial interest. Based on concepts of critical discourse analysis, this contribution argues that current developments cannot be explained solely as the result of technological progress, but should be understood as the effect of a heterogeneous network of relations. A central element for the stabilization of this network lies in the characteristic "constellation of desires" (Hartmut Winkler) of affective technologies. What are the relevant promises and expectations that drive the ongoing "industrialization of emotions"?

> *… affective computing is not just the science fiction of tomorrow; it is being used today not only as a marketing tool but also in medicine and a number of other fields.*
> *Tara J. Brigham (2017, 400)*

Affect technologies have recently been met with a previously unknown interest. This is not only true for theories of affect in cultural and media studies.[1] For some years now, there has been a growing number of applications for technologies that are optimized towards the recording, processing, and influencing of affects. In addition to robotics, security research and psychotherapy ("augmented mental health"), such fields of application also include gaming and health applications, and various types of recommendation systems. Individual affect technologies are part of everyday smartphone apps. Automotive technology (e.g., EVA[2]), marketing and consumer registration ("affdex for market research") are commercial hotspots for affective media.

The company Affectiva, which can point out that Rosalind Picard, one of the well-known protagonists of so-called affective computing, was one of its co-founders, promotes its services by claiming one quarter "of the Fortune Global 500, including 1,400 brands like Mars, Kellogg's and CBS" would use its "emotion database" for advertising and media analysis.

Affective technologies are also being used, or scenarios for their implementation being developed, in the fields of education, training and human resources management as well as employee training and workplace

1 With the "affective turn" an increased attention to affects was already observed in the 1990s. However, as Clough (2008) states correctly, this "turn" was connected with debates in cultural studies since the 1990s, and could in part be attributed to a movement against structuralist and poststructuralist theoretical approaches (cf. Gregg and Seigworth 2010). In addition, the affective turn showed an interest in the body and the temporality of movements that could escape regulation and measurement or could not be fully controlled. The new interest in affects, which has been emerging since the 2010s, differs from the previous affective turn in that, among other things, technical and biomedial constellations are now given, which are accompanied by a fundamental media-technical reconfiguration of affects. The field of affective computing is exemplary here, in that it is now precisely the measurement and technical regulation of affects and affective constellations that are at stake.

2 EVA is the acronym for a research agenda on Emotion-Awareness for Intelligent Vehicle Assistants (Vögel et al. 2018).

design.[3] A survey a few years ago already counted more than 100 publications that deal with applications of "affective computing in education" (Wu, Huang, and Hwang 2016).

Despite all the differences in detail, the core of each of these publications deals with the developments in and applications of human–machine systems that are optimized for affect detection and production. In view of the breadth of possible applications, it is not surprising that affect technologies are discussed in economic and technical discourses.[4] In order to find out what expectations, hopes, and promises characterize affect technologies or are associated with their introduction, I have examined a collection of discourse fragments.[5]

The material I have examined has been selected to bring together affirmative positions in the field of application-oriented discourses. In particular, I have looked at those strands of discourse that are related to the development and dissemination of affect technologies and those that include management aspects. Texts, videos, software and databases from the fields of affective computing, management, computer science and information economics were selected as sources. In addition, I looked at different cloud services offering the recognition or processing of emotion and affective data in a standardized form.[6]

Most of the corpus comes from the field itself:

– One source, for example, is taken from the journal *IEEE Transactions on Affective Computing*. The author Björn Schuller is co-founder and Editor in Chief of the journal and is himself a computer scientist, university

3 Mental health, audience research, and marketing or advertising are the leading "success stories" on affective computing company Affectiva's website: www.affectiva.com/success-story.

4 This is quite a remarkable development considering that only a few decades ago the preoccupation with affects could be located primarily in the fields of art, psychoanalysis, or cultural theory. Now, in addition to artists, psychologists and cultural theorists, programmers, engineers, economists and managers are increasingly concerned with affects.

5 In the terminology of discourse analysis, a discourse fragment is a materially present utterance that deals with a specific topic. A "strand of discourse" consists of discourse fragments on the same topic. An important question in discourse analysis is how discourse fragments are combined to form strands of discourse and how different strands can "intertwine." This is relevant for the effectiveness of discourses. It can be assumed that effects of discourses depend on how they can intertwine, i.e., how they can influence and support each other (Jäger 2004, 159f.).

6 The blog rapidapi presents more than 20 providers of such services and gives a comparative market overview (RapidAPI Staff 2018).

professor for artificial intelligence, and entrepreneur. Among other things, he was involved in an EU research project dealing with "Social Semantic Emotion Analysis for Innovative Markets," which aims to combine big data analysis with emotion recognition.[7]

- An EU-funded research project named the "Mixed Emotion Toolkit": The project publishes reports on its approach to developing an open-source software infrastructure that combines all popular forms of emotion monitoring in one package in a generally accessible way.
- Other discourse fragments are taken from the growing cloud business of standardized emotion recognition services. Websites are promoting their services of cloud-based application and data exchange interfaces. Among them are the large companies in the IT industry such as Microsoft, Google, Amazon and IBM, followed by YouTube tutorials for these services or other third-party offerings.

This brief list is intended to illustrate what is meant by the notion of industry-related or affirmative discourse fragments. As "fragments" they may represent certain positions within the affirmative discourse with exemplary and explicative value.

The heterogeneous discourse fragments refer to affective technologies in quite different ways. What they have in common is that they participate in processes that I suggest understanding as the movement of the "industrialization" of affect technologies. By this I refer to efforts to institutionalize and standardize technologies and practices that work towards the broadest and most effective dissemination, application, and economic exploitation of affect technologies or affirmatively accompany such developments.

Methodological Orientation: Structures of Desires, Affect Technologies, and Discourses

For the fundamental question of the promises, hopes and expectations associated with media transformations, Hartmut Winkler's approach of the "constellation of desires" contains an elaborated theoretical concept. Winkler developed the idea that media history "pursues describable sets of implicit utopias" (1997, 17). For the study of media history it is not sufficient to describe the state of the technological tools and to hold it responsible for media development. Rather, Winkler claims, the implementation of certain

7 "MixedEmotions = Big Linked Data Platform for Emotional Analysis" as described on the project's website (Buitelaar n.d.).

technologies in media history is based on a "precisely describable structure of desires" (17). In his investigation into discourses of digitalization and the computer, he shows that it is possible to identify certain desires through affirmative enunciations, which are important for a media constellation and for the interrelation of politics, society, technology and economy, also in the sense of an invocation and evocative practice. A constellation of desires is presented by Winkler as a "terrain" on which different exposed points can be identified (51).

What is interesting about Winkler's concept of desire is that a characteristic of desire is seen in its "impossibility." It is not clear whether this applies to all desires in Winkler's sense, but it is certain that one of their important functional principles is seen in the fact that, "despite a real impossibility, they have very real effects" (40). The desire can thus also become effective in terms of media history, without the desire itself having to be fulfilled. Here, "desires" are not bound to persons and individual subjectivities. The term does not directly belong to a "psychological" theory, but rather designates certain structural elements of discourse dynamics. Constellations of desires are related to deficits and contradictions in existing media–technological formations. They gain their relevance because they reject them or promise the dissolution of existing contradictions. In Winkler's concept, desires are not only mirroring certain media developments or making them describable, but can, more broadly speaking, function as "a driving force" in the development of new media (40).

The question of structures of desire in the current development of affect technologies concerns the relationship between media technology and discourses. I use the term "discourse" here in reference to approaches to critical discourse analysis, following Foucault, and with regard to a discourse-analytical concept of media, as a part of German media theory (cf. Conradi 2015, 65–90; Winkler 2004; Stauff 2005). A characteristic feature of the theory of critical discourse analysis is that discourses are seen as relevant power factors. Discourses exercise power, for example, as "'carriers' of respectively valid 'knowledge'" (Jäger 2004, 149). And they contribute to the "structuring of power relations in a society" (149). If the dynamics of the development of affect technologies in media history depend on the fact that technical, economic and managerial strands of discourse can overlap, influence and support each other, then constellations of desires can be seen as an element of the interweaving of these strands of discourse.

According to discourse-analytical concepts of media formations, discourses are not external to technologies or media formations. Structures of desires and discourses are not a kind of affirmative accompaniment of affective media technologies or a side effect of technical developments, but are involved in the very production of these technologies and in their social, political, economic, and infrastructural shaping. In critical discourse analysis, the strategic as well as legitimizing function of discourses is particularly emphasized in order to underline their operative and productive effectiveness (cf. Jäger 2004; Link 2008).

For a contemporary concept of media that describes the constitution of media as the concatenation and formation of practices, discourses, and technology, the function of discourses is even further amplified. Markus Stauff, for example, understands media as a temporarily stabilized "heterogeneous network of relationships" (2005, 200). Such a concept of media not only takes into account the changing dynamics and instability of digital media (formations), but also draws attention to the fact that discourses and practices are included in the development of media from the outset. Discourses "enable and stabilize the technical functioning" (192). This applies in particular to the realization of new technologies, which in their emergence are dependent on the interplay, the increasing interlocking—and thus on the intertwining—of different fields of knowledge and spheres of action. If one considers affect technologies in this sense as media-in-the-making or as media formation, then the constitution and productivity of affective media technologies must be analyzed as a concatenation and temporarily stabilized formation of heterogeneous practices, discourses, and techniques.[8]

A decisive hurdle for the media function appears in the problem of concatenation. How does a discourse organize its own continuity and the interaction of heterogeneous practices and discourses? It is important to understand how the operativity of discourse stabilizes the heterogeneous elements, the "heterogeneous network of relationships" (Stauff), and how the continuity of a formation is established in the first place.

The assumption that constellations of desires and the expression of hopes and expectations play an important function is supported by the fact

8 The distinction between discourses, practices and technology is anything but strict. In materialist traditions of discourse theories, the term "discourse" does not designate specifically a totality of *symbolic* practices, but can refer to practices as well as utterances. Similarly there is no strict ontological difference between technology and practices as technology emerges from continued practices (cf. "the model," Winkler 2004, 116–30).

that—as will be shown later—an intensification of the parallelism of discourses of technical application and of the articulation of wishes can be observed in the field of affective media technologies.

Algorithmic Affective Technologies—Steps towards the Industrialization of Emotions

The fact that the IEEE (the Institute of Electrical and Electronics Engineers) has been publishing *Transactions on Affective Computing* since 2010 can be seen as a sign of a flourishing scientific and commercial interest in affective technologies. The IEEE describes itself as the "world's largest technical professional organization for the advancement of technology." It is influential as a scientific community and a relevant institution when it comes to technical standardization. The regular volumes of the *Transactions on Affective Computing* follow the aim of "disseminating results of research on the design of systems that can recognize, interpret, and simulate human emotions and related affective phenomena."

In the introduction to the first issue, Rosalind Picard emphasized the shift of affective computing from an experimental theoretical field to a widely received and "serious" undertaking (2010). She claims that "insights about emotions" have become a necessary part of the "engineering dreams to build intelligent machines." In 2017 Björn Schuller took up the rhetoric of this "engineering dream" in an editorial for the journal, to merge these "dreams to build" with the rise of artificial intelligence to form a new dream of commercial success that should come when the technology conquers broad consumer markets:

> In its eight years, the *IEEE Transactions on Affective Computing* (TAC) has witnessed a time of great opportunities for the field: Artificial Intelligence (AI) and Machine Learning have recently made great progress increasing the distribution and usage of intelligent solutions in the greater public and commercial world. This progress bears many great chances for Affective Computing, as with increasing intelligence of machines, one may increasingly desire according intelligent systems to also possess emotional intelligence as the "next big thing" in commercial exploitation of AI—the Artificial Emotional Intelligence or AEI for short. To give but a few examples, with the advent of spoken language assistants in our homes, and the day-by-day rising usage of such assistants on smart phones and personal computers, it seems more than timely to also lend these assistants the ability to

> understand their users' emotions and react appropriately to them. Similarly, there is a huge trend in measuring oneself in many ways to track activity, steps, heart rate, sleep time, and whatnots 24/7—one may easily expect emotion tracking to become of broad interest soon, as well, which certainly also bears high promises for serious medical applications. As a last example, with gradually smart retrieval of multimedia, the emotional aspect will likely soon play a much more important role, when—for example—asking your retrieval agent for some funny pictures, bluesy music, or a movie loaded with tension and surprises. Obviously, this also bears a huge challenge for robustness, as the expectancy will be nothing but high once Affective Computing finds its way into the broad consumer market where severe real-world conditions need to be faced. (Schuller 2017, 1)

This quote is given in such extensive detail to convey the way in which a rhetoric of desire or "dream" is unfolded here, which provides an understanding about the direction in which affect technology is developing in the phase of its industrialization. Or more precisely: how different strands of discourse are intertwined in order to continue the discourse and create a "future." One striking feature, for example, is the formula of "next big thing": the rhetoric used raises expectations and sketches future prospects in a way that makes it difficult to distinguish between the description of possibilities and the call to actively bring about a certain future.

An entanglement of scientific, economic and institutional strands of discourse becomes apparent. As the rhetoric of Schuller and Picard reveals, these different fields of action and discourse are strategically linked with each other, which, following Stauff's discourse-analytical concept of "media," can be understood as a discursive practice to stabilize a heterogeneous "network of relations" and to secure a (future) technical functioning (aiming at the realization or market-driven implementation of partially new technologies compatible for broad consumer markets).

Parallel to this type of discursive practice, transformations take place at the level of tools and techniques, which are characterized by tendencies towards the standardization and automation of procedures and processes. There is a trend towards a standardization of modules or building blocks that can be used to produce more effectively and uniformly what is "manufactured" in the course of an "industrialization of emotions." This happens in order to identify, excite, reproduce or simulate and process emotions on a mass scale and at low cost.

This development is based in particular on the algorithmically rationalized side of affect technology. It is precisely through the use of software that the scalability of applications (for growing markets) and thus ubiquitous mass compatibility is expected. The production of software itself, however, is often dependent on services that cannot be completely standardized: programming can be characterized as a highly individual, creative, and manual process. Software can be understood as a "mosaic of algorithms, protocols, infrastructures, and programming conventions" (Mackenzie 2006). Nevertheless, software development also operates with levels of standardization in order to achieve uniformity, effectiveness, or cost savings. Basic examples are the use of standardized development environments (IDEs), quasi-standardized tools (such as certain editors for writing code), and unifying interoperability interfaces (APIs), shared databases, or standardized code libraries.

An example of these standardization tendencies is the approach of the Mixed Emotion Toolbox, an open-source toolbox for multimodal emotion analysis.[9] This programming toolbox is a plug-and-play platform that combines functionalities for the "multimodal" analysis of text, audio, video and data structure links in one package. This includes functions for sentiment and emotion analysis from texts, for the recognition of emotion, age and gender from audio processing, and functions for face detection and emotion tracking with video processing, which also includes estimation of head and body postures, and the integration of linked data as knowledge graphs (Buitelaar et al. 2018, 2455).

Another example of the state of development towards the commercialized mass application of affect technologies and associated standardization are the numerous cloud services that offer emotion recognition as a technical service. Among the market leaders in this area are the market leaders in the IT industry such as Microsoft, Google, Amazon, and IBM. All these companies offer cloud-based application and data exchange interfaces. They provide an infrastructure that allows virtually any user or programmer to perform algorithmic identification and processing of "emotion" according to pre-defined schemes without the need to invest in individual infrastructure or deep knowledge of affective computing. The number of providers of such services is so large that there are guidebooks and online

9 It should be noted that the Mixed Emotion Toolbox can be seen as an example of standardization efforts. However, its actual function could not be verified. Questions to the authors of the Mixed Emotions Toolbox, via the official e-mail-address, on the status of the projects remained unanswered.

comparisons that offer "customers" orientation in a growing market of cloud-based emotion recognition services.[10]

At Google, the emotion-recognition application interface is part of Google Cloud Vision. The "Cloud Vision API" provides face recognition based on different characteristics; emotion identification is simply one of several modules integrated into the face recognition infrastructure. Microsoft, with the "Oxford" project, has offered an application interface for the recognition of emotions since 2015. Emotion recognition is part of the "Microsoft Azure" cloud computing platform. The company points to the fact that since 2019, emotion recognition has been generally integrated into its face recognition services: "Try the emotion recognition capabilities of Face API now." The offer is addressed to the potential customers who build "personalized apps." The associated pricing model includes a free service to get started ("Emotion API—Free: 30,000 image transactions free per month") and prices between $0.10 and $0.25 per 1,000 transactions (Azure 2018).

These and other offerings are complemented by a variety of available databases on the internet that provide access to photos or videos of facial expressions either free of charge or for a small fee (e.g., to train neural networks), or databases with text segments that are already pre-categorized according to emotional values to perform language analysis as sentiment analysis.[11] In addition, there are—no surprise—numerous YouTube tutorials that explain how to use the offerings and how to program your own apps, e.g., for smartphones.

Discourses and Great Promises

As the examples show, the technology is on the market and ready for widespread use. This supports the hypothesis that affective media technologies are in a phase of industrialization and standardization. And it helps to illustrate the change in media history that is taking place with regard to affective media. The relevant function of the constellation of desires that supports and drives such a change becomes more apparent against the background of the actual breadth and intensity of this development. So what are the related promises and desires? And what are the existing contradictions that they are positioned against?

10 For example, more than 20 vendors are compared in Kairos and Rapid API (RapidAPI Staff 2018; Virdee-Chapman 2018).

11 A selection of such databases is presented on https://www.face-rec.org/databases (Grgic n.d.).

In her essay "Merging Technology and Emotion," Tara Brigham (2017) refers to the unavoidable and ubiquitous "interactions between humans and computers" that permeate everyday life and the work environments as the basis for one of the fundamental promises of affective computing, which, according to Brigham, consists of optimizing interaction and understanding in the handling of computer-based technologies. Technical systems could be improved if they would respond to subtle or subliminal traces of emotional expressions in their interaction with users, in order to increase the "effectiveness and satisfaction" of human–machine interactions.

What Brigham describes is a common trope in the discourse of affective computing. It is often that this idea of an optimized human–machine interaction is accompanied by the promise of a more "natural" interaction. The prospect of optimized machines is also mutually connected with the concept of an optimization of human users, for example in the idea of augmenting human emotional abilities. An example for this position can be found on the blog of "ventureradar":

> While great advances are being made in the analytical capabilities of computer systems there are also impressive developments being made in *making computers more emotionally intelligent*. This field is known as Affective Computing, and is defined as the study and development of systems and devices that can recognize, interpret, process, and simulate human emotions (or affects). These developments are being *driven by a need for more natural human–computer interactions*, but there are also many examples where affective computing technology is augmenting our own abilities, and *enabling us to become more emotionally intelligent*. (Thomson 2016, emph. SW)

Another position in the affirmative discourse aims at an increase in knowledge and cognition. Machines that process emotions are imagined as being useful "in order to understand humans better" (Brigham 2017, 400). However, the idea of an increase in knowledge is not limited to philosophical self-knowledge, but can repeatedly be found linked with business thinking or the desire for commercial exploitation. In the magazine article "Empathy—the killer app for artificial intelligence," the hope for a new man–machine relationship is expressed, in order to "help businesses peer into our inner feelings" and to "make customers and employees happier" (Noga et al. 2017).

A technologically enhanced, controllable and digitally expandable "emotion awareness" could benefit companies, customers and employees alike and help them achieve greater "happiness." These and similar topoi can

be found in many places, albeit with different accents. For example, in an article in the business-oriented online magazine D!GITALIST, which explains "How Emotionally Aware Computing Can Bring Happiness to Your Organization," the promise of increased attention to feelings is associated with happier employees (heading: "Do You Feel Me?"). Employers could observe the feelings of their employees and thus change work processes in such a way that productivity, effectiveness, and job satisfaction increase. The happiness promised or longed for here is not only "satisfaction" at work for employees, but, combined with it, an economic benefit—as if it would belong together: "increase in productivity, effectiveness, and satisfaction" (D!GITALIST 2017).

To achieve these promises, it is seen as necessary (and desirable) for employers to be able to monitor the mood of employees at any time and in any place by means of "mood recognition technology": "through the application of machine learning, Big Data inputs, image recognition, sensors, and in some cases robotics, artificially intelligent systems hunt for affective clues: widened eyes, quickened speech, and crossed arms, as well as heart rate or skin changes" (D!GITALIST 2017). The monitoring of feelings could help to identify and classify negative moods at an early stage in order to counteract them with appropriate measures. Through "positive feedback," motivation and satisfaction should be increased.

Maricel Cabahug, the "Chief Design Officer responsible for SAP's overall design strategy and product design," describes the future of a "more emotional" work environment through the emotional responsiveness of machines in a euphoric manner and optimistic terms: affect technologies would create "room for more natural kinds of dealings with machines" and the interaction between man and machine would become more emotional and thus more personal (Cabahug 2018).

Affect technologies, Cabahug claims, would make dealing with machines less abstract, and instead more natural, intuitive, and therefore more human. An "emotional connection" with the digital tools would be created in a mutual fashion. This could be achieved in particular through digital assistants equipped with "personality." Affect technologies, in this perspective, are a means of overcoming the separation between man and machine and enabling more "intimacy" and connectedness.

> Our expectations for intelligent systems to understand us, help us, and connect with us on an emotional level will increase exponentially in the coming years. We will be conversing and interacting more and

> more with machines, expecting them to sound and react in a way that is convincingly human. (Cabahug 2018)

The company itself is thought to be transformed into an "emotional enterprise." The transformation of the work environment that Cabahug envisions is staged as a radical "disruption" with a new "immersive experience" on the horizon: "Being transported visually and acoustically in time and space gets under your skin and goes directly to primitive centers of the brain … work is about to get much more human and much more rewarding" (Cabahug 2018).

Constellations of Desires and "Natural" Machinic Intimacy

Looking at the briefly outlined positions, it is striking that it is not only about the topic of "emotion," but many different motives are addressed: human self-awareness, the relationship with machines, the hope for more happiness, more efficiency, more satisfaction at work, more control over employees, more knowledge (and power) over customers, success in business, etc. Many of these topics are—considered separately—quite trivial. They are formulas that one might associate with product advertising—life should become more beautiful, better, happier. According to the theoretical concept of a constellation of desires, however, it is not the superficial advertising messages and clichés that are remarkable, but rather the characteristic *constellation* of heterogeneous and partially contradictory structures, which in sum contribute to the result of the stabilization and continuity of the discourse.

Concurrently the discourse fragments show that a bundle of statements directly addresses problems of *technological mediation*, such as user interfaces, man–machine communication and, in general, the mediality and relationality between man and machine. In conjunction with the turn towards affect technologies, the desire for overcoming abstraction and for a more "natural," humane and personal technology is articulated. In addition, the desire for a dissolution of boundaries and resistances between human sensory realities and machine "others" is emerging. An example of this can be seen in the vision of an immersive emotional connection (Cabahug 2018), which is to be created from "natural kinds of dealings with machines." The affirmation of affective technologies poses itself thus, at least in part, in opposition to the characteristics of modern, technology-dependent society or is connected with the (paradoxical)

desire to overcome alienation, abstraction and a-human technology by an intensification of human–machine interactions.

At this point, it should be recalled once again that the "impossibility" of their fulfillment in Winkler's concept can almost be considered a characteristic of desires. At least in so far as it is one of their (discursive) functional principles, "despite a real impossibility, the more real effects they have" (Winkler 1997, 40).

"Natural" interaction, intimacy, immediacy and emotional connectedness as characteristics of human–machine communication are virtually opposed to the complex technicity of communication through digital mediation. The discourse on affective media technologies is resonating with the desire for a-mediality and immediacy. This desire for immediacy is diametrically opposed to the factual logic of computational quantification and the hypermedial machinic coding and re-location of emotions in complex media networks, databases, and human-algorithmic-sensory assemblages. A further analysis could take this contradiction as a subject for further investigation into the discursive dynamics of affective media technologies.

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