The ‘Cultural Technique of Flattening.’

An essay introducing and at the same time revising an idea

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1.

We are socialized in the tradition of well-known rhetoric: Fertile thinking is oriented toward depth, and profoundness is desired, but superficiality is devalued; being directed to the surface is intellectually nearly taboo. We all are familiar with this mindset. Maybe it forms a distant echo and inheritance from Platonism: what is fundamental and essential lies *behind* the phenomena. Consequently, cognition and understanding are interpreted as being rooted in penetrating a given surface in order to uncover the hidden meaning behind and below. Another source for privileging epistemically 'diving into the depth' is modern sign theory and semiotics: Its representationalism distributed the perceptible sensuousness and the imperceptible meaning to the poles of exterior form and interpretable content of a sign ('significant' – 'signifié': Saussure 1967). 'Text' – within this context – was understood as a sensuously visible structure whose meaning is not visible, but rather to be inferred and unlocked through interpretation. The text became the paradigm for the readability of the world (Blumenberg 1986), the model of what is to be part of the universe. In the following period, hermeneutics advanced as a key method in the humanities.

This reconstructed narrative of penetrating surfaces to be intellectually profound is much too short and woodcut-like. Yet what matters here is that this attitude has been *eroding* since the end of the last century, and – by the way – has never been unchallenged in the past two thousand years. Even Plato was less of a Platonist than assumed: Again and again, he uses diagrammatic drawings as instruments of recognition and reasoning (Krämer 2016a). Yet we confine ourselves to the present. We can find a tendency to rehabilitate operating on surfaces emerging in a variety of disciplines and discourses over the last two decades.

This essay is part of this tendency by examining the 'cultural technique of flattening' as a phenomenon and as a creative cultural and epistemic resource. [1]

2.

Already at the end of the last century, there are two striking theoretical developments that fundamentally criticize and problematize the ideas of representation and interpretation as the guiding matrix of humanities' work.

[1] Idea and concept of a 'cultural technique of flattening' is already developed in: Krämer 2016a, 2016b, 2021, 2022, Krämer forthcoming.

(1) *Rehabilitating culturalistic materiality:* On the one hand, this is the discovery of the materiality of communication in general and, at the same time, of the thingness of research objects in the humanities and cultural studies: the absolutization of hermeneutics as a key method and supreme discipline is relativized and broken (Gumbrecht/Pfeiffer 1994).

(2) *Conceptualizing culture as performance:* On the other hand, impulses of ethnography, theater studies, and philosophy of language aimed at the analysis of a constitutive performance and performativity of culture. Social action can only become thematic in the concrete performance of its practices and not in the form of the causal-deductive primacy of abstract systems of rules (Austin 1962; Phelan 1993; Schechner 2002).

Cultural materialism and cultural performance create the horizon in front of which we can identify some contemporary positions – albeit very selectively – in which the reference to the surface becomes a determining feature:

(i) *Flat ontology:* In social and cultural theory, Theodore Schatzki (2003, 2016) develops a flat ontology of society whose practices do not diversify into a multitude of levels, but rather take place on only one level.

(ii) *Surface significance of language:* In parts of linguistics, the construct of a 'language behind speech' is dispensed and the prioritization of competence and deep structure is displaced in favor of performance and surface significance (Linke/Feilke 2009).

(iii) *Media-Philosophy:* Vilém Flusser elaborates a phenomenological media philosophy under the title 'In Praise of Superficiality' (1995). Explicitly, he pursues the goal of freeing superficiality from its function as a derogatory word. The reduction of four-dimensional space-time to a digital universe of dots is a cultural-historical tendency, which he describes as a 'game of abstraction.'

(iv) *Notational iconicity:* In the theory of writing, scripts are not considered solely in terms of their potential for representation; rather, the phenomenon of notational iconicity is elaborated as the epitome of the materiality, perceptibility, and operativity of writing (Krämer 2003).

(v) *Surface Reading:* In text theory, the model of symptomatic

reading, in which the meaning of a text is orientated to the interpretation of what is unsaid and hidden behind the visible surface, is mitigated in favor of a methodology of reading that is orientated to the sensuously visible signature of the text (Best/ Marcus 2009).

(vi) *Diagrammatology:* The role of diagrams and graphs is explored in the sciences, the arts, engineering, architecture, and administration. Diagrams show invisible concepts and relations by perceptible, drawn relations on paper (Krämer 2016b; Stjernfelt 2008).

(vii) *Screenology/Interface Studies:* Film studies examine the development and potential of screens in terms of media archaeology; interface studies analyze and construct the intersections of human-machine interactions (Huhtamo 2004).

This list is incomplete, but its diversity illustrates already that the reference to surfaces forms a core of crystallization and provides a common denominator for varying approaches: It consists of the methodological orientation towards the significance of processing and reflecting surfaces.

In what follows I want to identify a 'cultural technique of flattening' and use this terminology in a positive, non-pejorative sense, exploring it in terms of cultural history and media philosophy.

3.

We live in a three-dimensional world, yet we are surrounded by illustrated and inscribed surfaces. For modern civilizations, the use of inscribed surfaces is indispensable. Sciences, many arts, architecture, technology, and bureaucracy derive their complexity and distribution from the possibilities of using texts, images, maps, catalogs, blueprints, etc. to make visible, manipulable, explorable, and transportable something that is in many cases invisible or conceptual. Two-dimensionality became a medium of experiment and design, communication, and instruction. Everything that is, that is not yet, that can never be (like impossible, logically inconsistent objects), can be projected into the two-dimensionality of the plane.

In the interplay between eye, hand, and brain, inscribed and illustrated surfaces become a laboratory for thought, a playing field for artistic composition, or an experimental space for architectural work.

The bureaucratic and social organization of modern societies is also hardly conceivable without the rectangular form of personal documents, forms, files, credit cards, scoreboards, and tickets of all kinds. The production and use of two-dimensional representations can be found in nearly all cultures. From skin tattoos and cave paintings to the invention of pictures, writings, graphs, diagrams, and maps, from photography, film, and television to smartphones, computer screens, and tablets, threads and echoes of the cultural technique of artificial flatness can be found, although this is not the place to discuss the historical ubiquity of this phenomenon.

A misunderstanding should nevertheless be avoided from the beginning: Within the perspective of human cultural behavior, there is no two-dimensionality as an empirical, real fact. Every membrane that is perceptible to humans has unintended indentations, bulges, dents, abrasions, scratches, etc., even if they can neither be seen nor felt. And this is even more true for labeled and illustrated surfaces. We exclude here the electron microscopic perspective of Graphene and similar 2D materials with promising attributes for high mobility and optical transparency in physics, situated at the nano-molecular level (Chia/Pumera 2018), as also Benjamin Blackwell's essay in the 'Deep Surface' volume of *Metode* investigates. Back to culture: Through practices of engraving, illustration, application, and inscribing, the outer skin of still voluminous bodies is treated *as if* it had no depth. All that matters to reception on the part of the reader and viewer is completely in front of their eyes and hands.

4.

From a media-theoretical and cultural-historical perspective, it is important to emphasize that the concrete modes of artificial flatness are embedded in a difference and tension between continuity *and* rupture, tradition *and* discontinuity. We must not forget that the performance of a concrete anthropo-technique becomes operative and effective only depending on standards and routines of socially distributed knowledge and power. An analogy illustrates this: Cultural techniques such as sifting and filtering also seem to be universal and a ubiquitous global phenomenon. Hardly any culture can do without mechanisms of selection and segregation, be it of things, living beings, persons, or information: Think about the fishing net that allows small fish to survive or about scholarly networks that regulate inclusion and exclusion within a scientific community. And it is obvious that with contemporary filter bubbles,

echo chambers, and the black box of search engines, digitization is creating a completely new – and at the same time highly problematic – way of concealed sorting, screening, and selection. My argument here is that the conceptual generality of a cultural technique should not obscure the fact that this technique always has a unique and unmistakable signature (and ambivalence too!) in its respective concrete cultural-historical embedding.

5.

What are the roots of the epistemic, aesthetic, technical, and organizational productivity and creativity of the cultural technique of flattening? I want to suggest – as a first step – two answers.

(i) *Body reference:* Our embedding in the world is oriented along the three perpendicular body axes: right/left, above/below, and in front/behind. What lies behind us remains – without a rear-view mirror – a domain that is beyond visibility and control. The invention of inscribed mobile surfaces, especially when they are allied with the medium of paper, creates a medial format that is in front of the eyes, can be grasped with the hands, and can simply be shared with others. An artificial space has emerged that is completely visible, manipulable by hand, controllable, and, moreover, mobile. Bruno Latour (1986) has drawn attention to this context. But we want to go one step further – and thus also beyond Latour – in understanding the potential of flattening out.

(ii) *Media theoretical reference:* Media – as we put it on the horizon of our messenger model (Krämer 2015) – are in the position of a third party, situated between heterogeneous poles, fields, or systems and creating a nexus without hereby eliminating their difference. *Connecting*, as unattractive as this term may seem, is a basic operation of media. If we insert the cultural technique of flattening into this media-philosophical horizon, something is striking. Time is – usually – considered to be one-dimensional: We can be in one place for a repeated time, but not at one and the same place at different times. The irreversibility of time is existential and inescapable for living beings. Space is – usually – considered to be three-dimensional. We do not refer to mathematical n-dimensional spaces, but to the constitution of our lifeworld environment, with

which we are connected by metabolism. Within this perspective, artificial flatness is a medium that bridges the gap between the one-dimensionality of time and the three-dimensionality of space. Thus, it is possible to translate and transform time sequences into spatial configurations and vice versa; think of the timeline and timetables of historians, or of alphabetic writing, transforming oral phonemes into the spatial constellation of letters.

It is important to emphasize that the mutual transformation of time sequences and spatial constellations does not have the character of a mapping or even mimesis. Rather, it is a matter of transfiguration, in which what is *transfigured* undergoes a momentous metamorphosis that not only brings about a new 'way of being,' but also releases new potentials and risks. The inscription of speech by texts, for example, opens up entirely new possibilities for communication and cultural memory. At the same time, the handling of text can be an instrument of power and authority (think about script-based religions) or a tool for excluding nonalphabetical people from social life. The existence of geographical maps opens up new ways of traveling and navigating unfamiliar terrain. Sometimes maps are an instrument to distort reality and can become something closer to a labyrinth, like Neda Genova describes in her 'Deep Surface' essay in this volume of *Metode*.

Let us note: The two-dimensionality of the images, writings, and maps feeds off the amputation of the depth dimension and acts like a 'translation manual' between time and space. To enable the conversion between time and space and vice versa is the most prominent cultural potential of artificial flatness.

6.

We have intentionally called the transformation of time sequences into spatial structures 'transfiguration.' 'Transfiguration' is originally a religious, Christian term; it refers to the metamorphosis of the corporeal Jesus of Nazareth into the transfigured, heavenly figure of Christ as God's son, experienced by the apostles on a mountain. We use the word 'transfiguration' in a secular sense that underscores that transfiguration is always more than a mere transmission and translation. We will demonstrate this transfigurative meaning with two examples: the first with regard to shadows, the second to geographic maps.

6.1. Shadows as a natural form of flattening out?

When looking for precursors of flattening out, the aesthetic and epistemic use of shadows is an interesting phenomenon (Gombricht 1995). Steffen Bogen (2005) has brilliantly examined the artistic-aesthetic as well as the scientific use of shadow lines.

Fig. 1 Daughter of Butades drawing her lover.
Etching in Joachim von Sandrart's 'Teutsche Academie', ca. 1675

The legend of the origin of art and sculpture described in Pliny's *Naturalis Historia* (1997) is sufficiently well-known in the Western tradition: The daughter of the potter Butades of Sicyon traces the shadow of her departing lover, which is cast by the light of fire onto a wall. The father, in turn, transforms this silhouette into a three-dimensional clay figure.

Shadows *flatten*. By accentuating the outlines of shapes, things are deprived of their volume, their corporeality. Through the use of the graphic line, the silhouette becomes the record of shadowy disembodiment. At the same time, however, it also creates a new modality of physicality and materiality, that is, graphism. Drawn graphism is a sui generis corporeality and is not subject to the temporal disappearance of the shadow. Pliny's legend of the origin of pictorial art shows how the irrevocable passage of time is potentially averted through *spatialization*. For us it is a relevant hint that the graphical line has the potential of transfiguration: It converts time into space – and vice versa.

The spatialization of time also plays a role in ancient sundials, which are similarly based on the *epistemic* use of silhouettes. As we know, the time of day is readable through the lengths of the shadows cast by illuminated things: The shorter the shadows, the higher the position of the sun. Vitruvius (1st century BC), Roman architect and theoretician, describes the functioning of an ancient

sundial in his *Ten Books on Architecture* (Vitruvius 1964). A gnomon or pointer is placed in a hole within a network of lines that is subtly constructed as a diagram based on astronomical observations and mathematical calculations. The shadow cast by the gnomon onto this network of lines, the analemma, allows the hours of the day and the months of the year to be ascertained and deduced. What matters most is not the recording of the shadow – as in the legend of Butades' daughter – but rather the shadow's successive changes as it moves across the diagrammatic field.

6.2 Is Gerhard Mercator's world map a Eurocentric project?

The second example refers to different modes of representing the world with 'realistic' geographic maps. In 1569, Gerhard Mercator designed a map of the world that is a familiar sight to us all today. From the equator to the poles, the areas represented on the map increase in relation to their factual size, so that northern regions appear disproportionately large compared to equatorial regions.

Fig. 2 Mercator's world map

The modern accusation that this map reflects a Eurocentric view of the globe was not long in coming, and in 1974, Arno Peters developed a map projection that claimed to represent real geographical conditions.

Fig. 3 Arno Peter's world map

What is important here is that the distortion on Mercator's map was not the result of a political program but rather a necessary logical-mathematical side effect. Mercator's map was not simply a 'world picture,' but rather it served as an instrument of navigation. We can explain Mercator's method of projection using an image: Imagine a globe; a paper cylinder is wrapped around it like a coat, and the paper only touches the globe at the equator. A light emanating from within the globe casts the shadows of the continents onto the paper. If the cylinder is cut open at a certain point, then the result is Mercator's map. The angles in the array of longitudinal and latitudinal lines are thus equal, but the areas are *not*, as it is impossible for a map to visualize correct angles and correct areas at the same time. A practically useful projection of the earth's surface on a plane is only possible as a *distorted* illustration, and it is the practical *purpose* of the map that determines the kind of distortion preferred. Mercator's map makes it possible for the 'loxodrome' or 'rhumb lines' – virtual lines that spiral around the globe – to appear as *straight* lines. Once a navigational course has been determined by means of this map, ships can then be steered on a constant bearing over a non-marked ocean with nothing but a compass. The Mercator projection is still the basis of nearly all nautical and aeronautical charts today.

7.

The example of cartographic navigation in particular suggests the question of what happens when inscribed and illustrated surfaces are transformed into electronically networked interfaces. Digitization draws undoubtedly on the cultural technique of flattening and radicalizes this technique.

Let's first clarify something: What does 'digital' and 'digitization' mean? On a basic level, digitization is a process in which a continuum is broken down into individual elements in such a way that these components can be encoded independently of one another and combined more or less arbitrarily. In this generalized perspective, the alphabet already constitutes a modality of digitizing; the flux of oral speech is broken down into discrete letters.

The binary alphabet of 0 and 1, invented by the philosopher Leibniz (1966), not only reduced the decimal number system to just two characters, but later became the prototype of digital coding.

As such, digitization is historically independent of the computer. There is an embryonic digitality already with alphanumeric literacy; think about the alphabet or the introduction of written calculation by decimal numbers. These early forms of the digital, however, become fundamentally radicalized when electronic devices are used. Computers are – as Jay Bolter has shown – writing machines. Computer programs, the activatable link on the screen and databases, constitute new forms of textuality. Ada Lovelace (1843), who designed the first computer program, wrote it down in the form of a table. At any given time, every state of the machine parts took the form of a written sequence of characters.

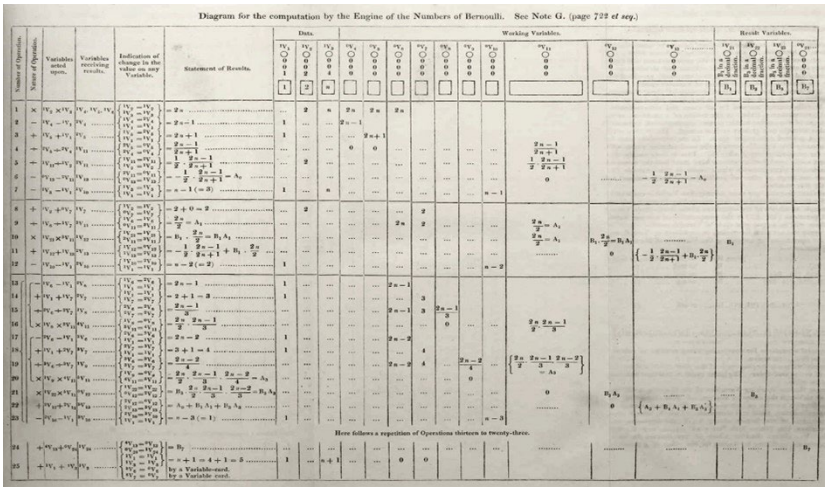
Diagram for the computation by the Engine of the Numbers of Bernoulli. See Note G. (page 722 *et seq.*)

Fig. 4 Ada Lovelace's *Programme* for Charles Babbage's Analytical Engine for calculating the Bernoulli numbers (1843)

Artificial flatness is an ongoing matrix and medium within the history of digital culture.

But let us return to the relationship between artificial flatness and the electronic interface. Contemporary digitization can be characterized by at least four conditions:

(i) algorithmization

(ii) datafication

(iii) networking

(iv) visualization

Our present society is situated in a field characterized by this framework. Completely new potentials, but also *risks* arise for which there is no forerunner and model to be found in the embryonic digitality of alphanumeric literacy.

Very succinctly, I want to illustrate this by the example of one of the four factors, namely algorithmization. Al Khwarizmi (ca. 780-850), a Persian Islamic scholar, brought the Hindu-Arabic numerical script to the Europeans, thereby introducing the possibility of calculating with written signs only, without any further physical tool like an abacus or a reckoning board. Al Khwarizmi's proper name in its Latin version condensed – in the following centuries – to the term 'algorithm.' Algorithms are computational rules for schematically processing a problem, which can be written down as a sequence of characters and can then also be solved by mechanically manipulating these characters – whether realized by humans or machines. But with the current development of Big Data and Deep Learning, what was originally just a rule for solving problems is currently transforming into a *method of prediction*, with which past data can be used to infer future events. Problem-solving algorithms have become predictive algorithms (Finlay 2014). And they are used to predict trends in almost all areas of society and to provide the basis for decisions in medicine, insurance, 'curated shopping,' companies, and so on.

However, the internal models developed during the training and testing stages of the 'learning algorithms' can no longer be extracted or deduced from their output: The problem of blackboxing arises. Bruno Latour's statement is well known: Blackboxing is 'the way scientific and technical work is made invisible by its own success. When a machine runs efficiently, when a matter of fact is settled, one needs to focus only on its inputs and outputs and not on its internal complexity. Thus, paradoxically, the more science and technology succeed, the more opaque and obscure they become' (Latour 1999, 304). With the progress of the so-called Deep Learning technologies, which underlies almost all sophisticated data technologies from spam filtering to speech and

face recognition, a region of a non-knowing is increasing: A lot of the machine's *knowing how* can no longer be transformed into humanly recognizable *knowing that*.

Our point here is that the depth dimension returns, on whose amputation and annulment the cultural technique of flattening was built: In front of the screen, users write, read, and produce texts and images as usual. But behind the screen, a universe of interacting networked computers, protocols, and algorithms proliferates like a rhizome, which can no longer be seen or controlled by those located in front of the screen.

The promise of transparency and control – which was originally associated with the cultural technique of flattening – turns into a new opacity and into a loss of control.

8.

But this 'return of depth' – that is, the recurrence of a third dimension – is the digital implementation of time into the artificial flatness. With contemporary digitization there is a continuation and radicalization of the technology of flattening (which we hope to have shown), but, at the same time, it is a decisive rupture.

The distinctive break is the implementation of time on the inscribed surface. With artificial flatness, time was spatialized, and became a sensually perceptible – yet stable – spatial structure, which can be converted back into processuality outside artificial flatness in the physical world, for instance transforming text to oral presentation, written scores to musical performance, or architectural or technological blueprints to factual construction. With the electronic and networked interfaces, time itself becomes something like the *subface of the surface*. The term 'subface' we take from Frieder Nake (2008), but with a change to Nake's meaning of the term. We have already mentioned typical examples of the operational processuality implemented in the interface: the link that can be clicked and thereby activated, the barcode or radio frequency identification systems (RFID) integrating products in the 'internet of things,' or the QR code that can be read and opened with a smartphone. The essays by Loukia Tsafolia and Severino Alfonso, Jakob Oreddson, and Andreas Ervik in this volume of *Metode*, for instance, illustrate how to make fixed scripture mobile. The possibility of temporal movement is applicated on the inscribed surface.

An objection might be stated that the return of a third dimension is the emergence of animated three-dimensional models that now replace the two-dimensionality and overcome the spatial limitations of artificial flatness. But this is illusionary. Even computer-generated three-dimensionality is still based on artificial flatness, to which – once again – the innovative insertion of the temporal dimension is now added as a novelty. Today, this idea of implementing time as a third dimension is still a hypothesis, if not speculative.

But I would like to give one further example taken from the advanced form of digital storage technology, the so-called Bigtable. The problem that Bigtable has to solve is that the World Wide Web pages are constantly changing, while others remain unchanged. If search algorithms could limit their search to the modified files only, this would significantly reduce search time. The Bigtable database – developed in 2004 and used for instance in Google Maps, Google Earth, and YouTube – is based on exactly this principle. The two-dimensional maps of a database contain horizontal rows and vertical columns, but now a timestamp for temporal indexicalization is added as a *third* matrix. This technique underlying Google's cloud enables search algorithms to consider only the most recent version of the data. A digital search query can now deliver results in real-time even for the very largest data corpora. 'Real-time' is precisely the point, we want to emphasize.

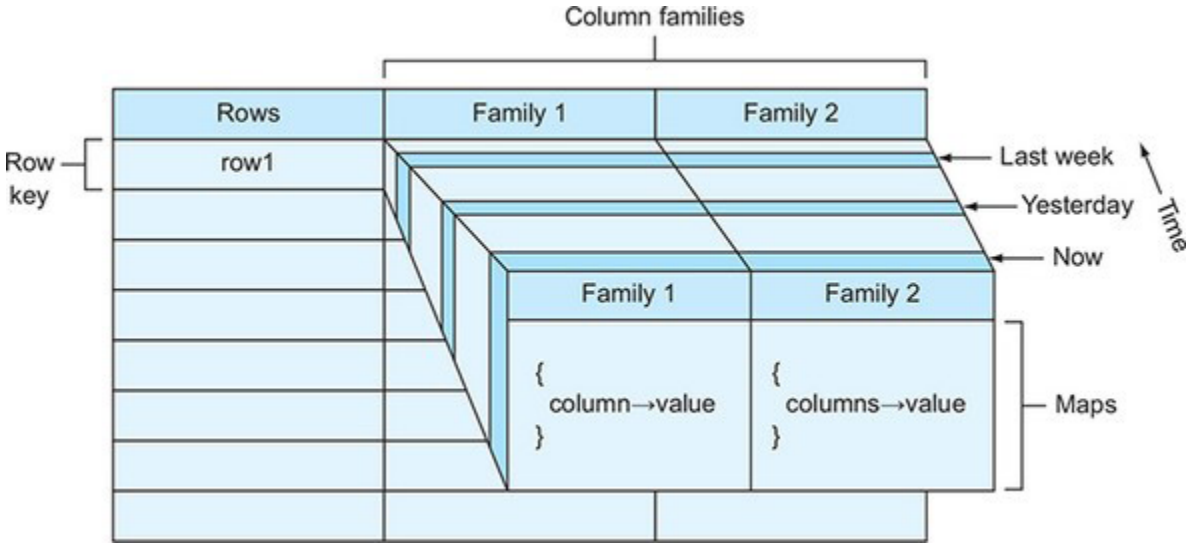

Fig. 5 Three-dimensional Google Cloud storage (https://livebook.manning.com/book/google-cloud-platform-in-action/chapter-7/40)

The diagram in figure 5, explaining Google Cloud storage, illustrates this third-dimensionality.

9.

Since the Theory of Relativity, we speak of 'space-time' and thereby mean that the three dimensions of space and the one dimension of time form a *four-dimensional continuum* together. The term 'continuum' indicates that space and time are interconnected. They are no longer absolute and independent quantities as in classical physics. Recall our statement that digitalizing is to *break down a continuum*. When time is implemented in the electronic interface, then the physical reality of four-dimensional space-time is transformed into a human-created, digitalized, and three-dimensional space-time, in which two spatial dimensions and one temporal dimension together form the register and interact.

This all seems immensely abstract, but it has immediate consequences for the human perception of time. A novel modality of time emerges: computer-generated real-time or 'micro-temporality' (Myazaki 2012). The time of a computer operation can no longer be perceived as a temporal interval, as a time-consuming event by human beings. It appears instantaneous, what to the computer still embodies a time gap.

The philosopher Henri Bergson distinguished two forms of time: the objectively measurable, spatialized time and the subjectively experienced, continuous duration of time. But now – this would be my hypothesis – a third form of time is emerging: a computer-generated microtemporality. By implementing time to the two dimensions of artificial flatness, a new form of time has emerged. Microtemporality becomes the subface of the electronic surface.

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