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Introduction

If historians of the future, would look back at our time, they will certainly recognize the importance of resources like plastic or other material. But what really changed in the last decades the means of production, consumption and furthermore the very definition of society itself is the growing importance of algorithms. They became increasingly ubiquitous and essential to our lives. Despite being intangible by nature, algorithms are as constitutive to our modern world, as bricks and mortar. In this so-called algorithmic turn (Uricchio 2011, 25) our individual fates are deeply connected and depend upon the proper working of services like air traffic control, automated trade in the stock market, computerized logistics of medicine and food or maintaining a stable electric grid . Politicians as well as researchers and professionals of all sorts, rely heavily on digital technologies. Their capability to handle large amount of structured information, such as in climate models or GPS networks, opens tremendous possibilities, that have been out of reach till now.

Considering the many people, who base their decisions on digital algorithms to figure out, what to buy, what to eat or who to love, it seems important to pose the question: What are those entities in our midst?

This paper and the corresponding art work try to explore this question, by focusing on the role of digital algorithms in our everyday live and their different modes of existence.

The goal is neither to glorify nor to condemn them, but to find a critical approach to the topic, by “making facile gestures difficult” (Foucault 1988, 154) and to reflect on the underlying assumptions and practices.

When trying to understand “the digital” as a phenomena in its own rights, it is easy to get lost in its complexity and overwhelmed from what John Law calls 'the imaginary of the 'One-World World' (Law 2011,7). A way to avoid this problem is to break “the digital” down to its most basic building blocks and reduce it to the immediate experience. Focusing on the simplest gestures of this interactions, aims to be both starting point and method of the reflection.

The digital Algorithm

So what exactly is an Algorithm? One may be reminded of tedious calculations in the classroom or endless lines of cryptic symbols on a flickering screen in movies. In general algorithm can be defined as “A finite set of unambiguous instructions performed in a prescribed sequence to achieve a goal, especially a mathematical rule or procedure used to compute a desired result. [...]” (The American Heritage Science Dictionary 2005,17). It is in fact a rather broad term and the definition can vary strongly, depending on the author and the context. Probably the simplest way to picture an algorithm, may be a cooking recipe. After gathering all the ingredient one can follow a specific series of steps in an intended order, given that the cook is capable of properly understanding the instructions. If

followed correctly the result should be every time the same. This metaphor has of course its obvious limitations and it is arguable if a recipe for a banana fudge pancake may truly be recursive or non-linear.

Algorithms have a rich and colorful history throughout the development of mankind. The origin of the word resulted from a faulty translation of the mathematician Abu Dscha'far Muhammad Ibn Musa al-Chwarizmi, which lead to the creation of the latinized word Algorismus (Daffa 1977, 18). Going further back in time, we find in ancient Greece Euclid's algorithm to figure out the greatest common divisor (Knuth 1997, 318). And it is also likely that the astonishing achievements of the architects of the ancient pyramids in Giza and the Dahshur plateaus, couldn't have been realized without some understanding of algorithms regarding astrological constellations and building techniques (Aboulfotouh 2015, 227). Throughout the history algorithms contributed to the development of technologies, inspired our approaches of solving problems in general, and enabled us to see the world around us with different eyes. But it was only in the second half of the 20th century, that they started do through a substantial change, namely the 'algorithmic turn'.

The Algorithmic turn

As pointed out before, the growing relevance of algorithms has deeply affected the way our modern world is shaped, given the many technologies that would be unthinkable without them. But it is not only its technological

utility we are confronted with. The new media are accompanied by an equally new kind of subject-object relation, that can be referred to as 'algorithmic turn'. This concept is based on Heidegger's idea that the world can only reveal itself to a person through the horizon of the “Umwelt” or environment in a broad sense. Therefore are changes in our surrounding world, not only transformative, but also reconstitute the ”Welt-bild” and therefore the visual regime (Uricchio 2011, 30).

This is of course true for every big change in culture and technology (Benjamin 2008, 23), but what makes the algorithmic turn different is the fact that digital algorithms embody a kind of agency, that challenge in many respects the given understanding of authorship, both in the capacity of producing objects, but more importantly in the way of experience them. “ [...] it [a computer program] is the author of the experience – that is, the navigating user; fundamentally enabling, it is the author of the algorithm; and in terms of what we actually see and select from, it is the algorithm as author.“ (Uricchio 2011, 31). Algorithms allow us to interact with the world in all kinds of exciting ways, but by doing so, they define the rules of what is possible or visible and what is not. This shifting of boundaries constitutes a big phenomenological change (Graham 2011, 87).

The Black Box

Paul Valery's words regarding the emergence of the cinema and the radio at the beginning of the twentieth century seem strangely prophetic, when

looking at the possibilities that are granted to us by contemporary computers.

“Just as water, gas, and electricity are brought into our houses from far off to satisfy our needs in response to a minimal effort, so we shall be supplied with visual or auditory images, which will appear and disappear at a simple movement of the hand, hardly more than a sign.”(Valéry 1964, 225)

Computation simplifies a great number of tasks, that required in former times a bigger effort. But this computational power has a paradoxical nature. Despite its omnipresent in so many aspects of our lives, it seems nearly invisible. The complexity behind a single key stroke on the keyboard is a result of a mindbogglingly amount of processes, in which a multitude of components code and decode electrical currants. Decades of scientific efforts developing a staggering amount of lines and crafting compatible hardware manifest in a nearly instantaneous visual response on a screen. We stand undoubtedly on the shoulders of giants(Westfall 1981, 274). The totality of technology in its genealogical dimension becomes an entity beyond the reach of our immediate perception. We are confronted with a 'black box'.

“[...] 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 need 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)

In many cases technical objects are designed with an intentional opacity (Elgesem 2008, 233). The complexity and inaccessible design are put into place to prevent persons to 'game' with the system or manipulate it to their benefit. This reveals certain power structures behind these algorithms. Only specific people are allowed to define the rules of the digital interaction. From this point of view a hacker unveils the hierarchy beneath it and may even alter the rules of this digital encounter for other users.

Standards

Before we have a closer look at algorithms, it seems important to consider another entity the algorithm has a lot in commune with, namely standards.

Standards are a constitutive element of the way we live together. They are a set of rules, which are put in place for certain objects and social practices. Busch refers to them as formalized rules, that aim to give the specific object of standardization its handiness (zuhanden sein) (Heidegger 1977, 65) . In this sense they obtain a tool-like characteristic to shape and form the world around us (Busch 2001, 32). This could be the DIN paper size, the health regulations for restaurants or the diagnostic standards of the ICD (International Classification of Diseases)

One peculiar thing about Standards is the fact that they easily become 'naturalized' if they are in place for a while (Busch 2001, 30) On the one hand they are rendered invisible by seamlessly becoming a 'normal' part of live. Constantly reflecting and justifying the form and meaning of all the things around us, would very quickly overwhelm our capacities. On the other hand they let us perceive a thing as right or wrong, not necessarily on grounds of a reflection, but because we are used to them. The United States of America, Liberia and Myanmar for example are the only three countries in the world, which don't use the metric system (CIA, 2007). The fact that these countries still use this system, despite the general tendency of globalization to unify industrial standards, may indicate that these countries attribute a different kind of values to it, beyond reasons of mere practicability. The habit of doing or perceiving something in a certain way seems like a force in its own rights.

“[…] unlike the direct power often exercised by a ruler, standards display anonymous power. Even if we know who established them, standards taken on a life of their own that extends beyond the authorities in both time and space”(Busch 2001, 29) Its political relevance becomes obvious when we considers the astonishing example of the ICD (International Statistical Classification of Diseases and Related Health Problems) catalogue, which is issued from the

WHO. Till the release of the ICD-10 in 1992, homosexuality was listed as a personality disorder (WHO, 2011).

Who and how standards are defined becomes, in the light of all these considerations, a deeply political question. There is in fact a big number of

organizations that are solemnly dedicated to define and establish technical standards. But also governments, companies, research facilities and many more are involved in the process of defining standards on different levels and scope.

We use algorithms for nearly anything. They advise us what to eat, what cloth to wear, what book to read, and many other things. Digital algorithms in themselves are a series of standardization, that govern how information is processed and structured. By doing so, they predefine the way the user has to interaction with the program. This is not by any means necessarily bad. On the contrary, a program without preconditions is impossible, but it is important to always consider, what this predefining structures are. In this sense the algorithm or the program it constitutes, can not be considered as a political neutral entity.

Algorithms as Institutions

In the digital realm algorithms govern the content like texts, photographs and films and hold therefore a similarity to institutions. As Napoli puts it in the paper 'The Algorithm as Institution': “Algorithms obviously serve as prime examples of constructors and codifiers of knowledge, particularly in contexts such as search engines, which play a central role in aggregating, categorizing, organizing, and presenting information.” (Napoli, 22-23)

Institutions are classically defined as “ [...] an interlocking double-structure of persons-as-role-holders or office-bearers and the like, and of social

practices involving both expressive and practical aims and outcomes." (Harre 1979, 98) The 'office-bearers' are in digital structures not always that easy to identify, but they clearly define the practical aim and outcome of interactions. Registering a blog for example, requires correctly submitted, has the user created a new blog.

In December 2015 a fan of the Band Peking Duk called David Spargo wanted to gain access to the backstage area, to get to know the band. Instead of trying to sneak in, he went up to the security at the backstage entrance and falsely claimed that he is part of the family of a band member. He managed to convince the security, by showing him the Wikipedia entry, he had shortly before altered (Hunt 2015). This is of course a trivial anecdote, but it illustrates the trust, that digital information hold in the 'real world'.

The power of algorithms becomes also obvious in the field of finance, since an increasing amount of trading on the stock market is made by algorithms. One specific kind of algorithmic trading is called High Frequency Trading (HFT) that is used to order and trade shares in fractions of a second. It was estimated that their market share amounts to 70% in the US and 40% in the EU (Swinburne 2010). What makes them so special is their staggering speed. This makes it increasingly difficult for actual humans on the physical trading floors to compete with this superior reaction time in the field of short term investment (Simpson 2011).

The speed of algorithms does not only alter the social practices of finance, but also redefines the rules the entire market functions. An article in the Wall Street Magazine opens with the sentence: "You don't need a crystal ball or a tipoff [sic] if your computer connections are fast enough"(Gassan

2009). The article describes how some hedge funds engage in a race of speed, to benefit from the minimal time difference it takes dark pools to get the current market prices from the NBBO. This is completely legal, but is still giving the one it still benefits from technical disadvantages from others.

In general is high frequency trading considered beneficiary to market fluidity, but in at least two instances they lead to a deteriorating. In 2010 the series of mistakes lead to a so called flash crash Stock Exchange in 2010 and $4.1 billion evaporated into thin air in a matter of seconds (Gassan 2009).It was caused by a minor calculation mistake of a high frequency trading algorithm that lead to a chain reaction. In this sphere of exchanging money in an incredible speed, humans can hardly influence and are again exposed to a black box effect. "At electric speed, all forms are pushed to the limits of their potential."(McLuhan 1988, 109) This is certainly true for this financial catastrophe. Mistakes are always bound to happen and it is as true for humans, as it is for algorithms. But the creation of such a complex and incomprehensible network is always the risk of highly intertwined and opaque systems.

A universe at our fingertips

“It follows that the soul is analogous to the hand; for as the hand is a tool of tools, so the mind is the form of forms and sense the form of sensible things. “ (Smith 2015, [432a]) Aristotle regards in this beautiful analogy the hand as the ultimate tool, which enables a person to access the utility of a nearly

infinite number of object. It is hardly possible to chop a tree or to carve a sculpture into solid rock with bare hands. The hands act as a gateway to other means, which allow us to form and transform the world around us. In return one wouldn't expect an axe or a chisel to chop or carve something all by itself, like the brooms and buckets in Goethe's 'The Sorcerer's Apprentice '. In the same way a smell or a sound become assessable by the senses and the mind is capable to create an infinite number of thoughts. Both the hand the mind and the sense act as doorways to the world. Through which doorway is the algorithm accessible ?

The paradox of technology lies in the fact that it appears to be omnipresence, but remains at the same time rather hard to grasp or stays even completely invisible. Latour claims that there are two reasons for that: “The habitual ravages of Double Click on the one hand and on the other the confusion that is always made between technology, or the technical, and the things left in its wake.” Double Click is a mode of existence that Latour named after the computer mouse, because it creates the illusion that our world is directly at our fingertips. More specifically that operations of translation or displacement are not recognized as such(Latour 2016, 93). Looking up the shortest route to the next Supermarket at a GPS device, may seem easy enough, because the information appears after just a short series of gestures, but it relies on a complex system hidden underneath.

Humans are often attributed with the ability to create a second nature, in that they replaced the natural caves with man-made houses or the uncontrollable flow of the river with the tamed water tap. The existence of the digital world proves this assumption right, and adds to it another dimension, where even

the temporal and spacial rules differ. Peter Weibel calls this realm of the algorithms a narcissistic insult to the way humans and nature act, since algorithms replace them with their own automated laws and rules. It even puts the notion of the sovereignty of the human individual into question (Weibel 2004, 39). Unlike a hammer or a Nail, this entities are capable of acting seemingly apart from the intention of the user, by strictly follow the logic and rhythm inscribed in them.

Norbert Wiener himself, one of the pioneers of cybernetics (a meta-science that tries to solve all sorts of problems, by translating them into circular feedback systems) warns the reader in one of his late papers, about the dangers of to application of algorithms. He says that algorithms are very literal-minded and will seek for the goals we give them and not necessarily the ones that we want (Wiener 1966). Just like Goethe's poem about the sorcerer's apprentice, that tried to avoid his chores, by casting a spell to bring brooms and buckets. Once brought to live he could not stop them, turning a beneficial intention into a destructive force. “The penalties for errors of foresight, great as they are now, will be enormously increased as automatization comes into its full use”(Wiener 1966, 63). Knowing upfront the outcome of a computer program can be very important, specially when the risk of failing inclines dangerous consequences.

Looking in the same direction

A simple photography grants us the ability to overcome the boundaries of time and space. Our eye can wander to the very moment the picture is taken, gazing at places we may never visit. As McLuhan puts it: "All media are extensions of some human faculty- psychic or physical" (McLuhan 1967, 26) The viewer becomes even able to transgress social boundaries, by bringing her to areas that are restricted or meant to be only accessible for a certain group of people. This capacity of transgressing boundaries is doubled by the possibilities of the internet and the algorithms that process and harness its wealth of information. Walter Benjamin was intrigued by the idea that a gramophone is capable of bringing an entire orchestra into our living room any time we wish(Benjamin 2008, 21-22). Now we have algorithms, which allow us to have a personal music expert any time at our fingertips, that can give us recommendations, not only on basis of a nearly infinite knowledge of music history, but also of our personal preferences.

The new media preset the user, with a huge variety of ways to surpass their confined space of natural senses. A search engine for example is a powerful instrument in this regards, but it is of course the search algorithm behind it, that decides what we actually see. It becomes the author of the list of results presented to the user. This authority of deciding what is visible to the users and what not, can have a tremendous impact on the opinions people form. This power can get abused by governments and institutions to suppress certain information, like in the case of the ‘Great Firewall of China’, which is put into place to regulate and filter the flow of digital information in the People’s Republic of China (MacKinnon 2009).

A similarly problematic aspect of algorithmic authorship, is the filter bubble. Digital services like social networks and search engines use increasingly metadata to “individualize” the presented contend. Location, age, political or sexual orientation (Jernigan & Mistree, 2009) are some of the many factors that determine what we perceive on the screen. Unlike the classical gatekeeper theory of mass media (Park, 1922) the algorithm give us to have a personalized gatekeeper. This filters may appear innocent enough, since they promise to give us more of whatever we tend to like, but their main intention is of course to steer our attention, to the next product we are likely to buy. “Personalization is based on a bargain. In exchange for the service of filtering, you hand large companies an enormous amount of data about your daily life--much of which you might not trust your friends with”(Pariser 2011, 45). Even then it may seem like a perfectly useful service for some people, but this algorithms can also keep the user in a personalized information-ecosystem of her own preferences and ideologies. A catholic priest and a liberal biologist will get a diametrical ranking of pages and even a different amount of results, when googling 'stem cell research' (Parramore 2009, 8). This algorithmic filter creates a bubble that makes it more difficult to find content, that contradicts the world views of the user or doesn't fit the search profile.

The very gaze of the user influences the digital reality she looks at. “We become what we behold. We shape our tools and then our tools shape us” (Culkin 1967).With our extended vision into every corner of the earth, we seem like Argos the hundred eyed giant of the greek mythology. But this illusion is a dangerous one, since the world that we see, becomes a reflection

of ourselves in an unprecedented transformation of our gaze. In this double contingent relation between the user and the algorithm, we may get what we want, but not necessarily what we need. Parramore even describes a case, where two persons googled BP shortly after their catastrophe on the Deepwater Horizon. Only one of them found an article about it, on her first search result pages (Parramore 2009, 10).

A Matter of Trust

When using this google or other search engines, we normally operate under the assumption that we tap into a general knowledge of the internet. It is this false belief that we share with everyone else the same information, that makes the filter bubble so problematic. What makes the algorithms so trustworthy? And should we stop trusting them or is it just the price we have to pay for its amenities? “The promise of the algorithm leans much less on institutional norms and trained expertise, and more on a technologically inflected promise of mechanical neutrality. Whatever choices are made are presented both as distant from the intervention of human hands, and as submerged inside of the cold workings of the machine” (Boczkowski, Foot, Gillespie 2006, 181).

What seems to make the algorithms so appealing is the fact that they appear to capture the distilled essence of reality in a formalized and quantifiable manner. One of course has to accept the assumption that the complex phenomena can be broken down into a series of commands. This position

can even be inverted in a way, that true understand is only achieved by the ability to recreate it as an algorithmic.

„It has often been said that a person doesn't really understand something until he teaches it to someone else. Actually a person doesn't really understand something until he can teach it to a computer, i.e., express it as an algorithm. […] The attempt to formalize things as algorithms leads to a much deeper understanding than if we simply try to understand things in the traditional way”(Knuth 1973, 709).

Heuristic

There are of course multiple ways of designing algorithms and not all of them produce straight forward formalized solutions. Some problems are too complex to be solve by clearly formalizing every aspect of the phenomena or exceed the computational capacities to calculate the optimal answer. A famous example is the salesman problem. In a nutshell it asks the question, how to calculate the shortest route for a salesman that has to travel to many destinations. If we try to calculate every possible route and compare them afterwards, it would become very quickly a big challenge to calculate them, since the possible connections would grow exponentially (Lawle 1985).

In the attempt to emulate natural phenomena or adequately portraiture reality, one can find two broad fundamental approaches in science and technology. On the one side it is possible to start from the broadest concepts

and refine a formula or model, to successively fit the problem at hand. Like a classical sculptures that carves of the material of her piece, to get to the form she wants to realize, concepts and formulas are refined from a broad starting point. On the other side, one would try to start from a small detail and let it 'grow' till it finds an adequate solution. To put is in philosophical terms, either essence precedes existence or existence precedes essence (Sartre 1946, 38)

Like the metaphor of Achilles and the turtle, where the legendary hero always gets closer to the animal without ever reaching it, the heuristic method is a process of approximation, and tires to reach the ideal solution, without out the need of necessary finding the ultimate solution, but rather a fitting one . It avoids relying on predefined complex structures by creating a simple structure to create complexity. A famous example is the “game of live”. This program follows a set of simple rules, to form complex patterns. Instead of crafting every corner and curve of a phenomena, the solution emerges from its simplest form. This of course is the big challenge of the heuristic method, to find the simplest form that contains all complexity.

If we would ask a person how to figure out, how to find an ideal partner, we probably get a lot of different answers. A computer may answer this question in this form:

$$\text{iff } 95\% + \frac{1}{\sqrt{|s|}} < M$$

This is in essence the algorithm of the website of OkCupite to determine if two persons match (Turner 2015). This algorithm is of course embedded in a big network of other algorithms and has to be feed with information to calculate the formula accordingly. But is this what we want to call love, or even something that can be relevant us? The following chapter will have a look on identity in the digital world.

What makes an Algorithm an Algorithm?

Despite its ubiquity it certainly poses a challenge to talk about digital algorithms as something graspable. Gilbert Simondon dedicated a lot of his writing to the question, how to think and talk about the technical object in a meaningful way in their own right: “Recognition of the modes of existence of technical objects must be the result of philosophic consideration; what philosophy has to achieve in this respect is analogous to what the abolition of slavery achieved in affirming the worth of the individual human being”(Simondon 1958, 43). This may seem at first glance as a completely delusional claim, but it expresses the importance to reflect and redefining the ontological status of the technical object. Technology is often regarded as a straightforward means to fight contingency of some sort. We have to reestablish what technology truly means to find a way to benefit from the algorithmic, without sacrificing what it truly means to be human.

When we posse a question of identity, we ask ourselves, what makes one thing, this particular thing and not anything else. The identity of a specific

object and the concept of it, posed since the very beginning of philosophy and science a challenge. Where does bravery end and reckless behavior begin? What is free will and what is influenced by others? Is heat a different energy than cold? Changes in defining identity, can have a big impact on the way we see the world. We only have to consider the paradigmatic shift caused by Einstein's famous equation that time, space and energy are fundamentally the same.

The concept of fractal identity is crucial for understanding, what technology and specially algorithms do to our reality. One take on this is described in Deleuze and Guattari's book 'Anti-Oedipus'. They introduce the idea of the desire machines, whereas desire is understood as " […] a machine, and the object of desire is another machine connected to it." (Deleuze and Guattari 1972, 28). Object and Subject are intertwined in a modular way. In a universe of endless chains of interconnected machine, classical demarcation lines of a person or object fall apart (Deleuze and Guattar1972, 8). A closely related idea is the cyborg.

The concept of the cyborg originates from Manfred Clynes and Nathan Kline and considered how humans have to become part of a cybernetic system to survive the otherwise hostile environment of space travel

(Clynes and Kline 1960). This holistic view created a broad framework to think of technology as something inherently connected to the human. A person with a bike or glasses would already classify as a cyborg.

Haraway introduced the concept of the cyborg into the gender discourse (Gane 2006) Identity is not something given but rather something that is fractal, and is created while we engage in this world. Instead of thinking of

humans as individuals the divide seems more relevant. Boundaries of man and women and machines are constantly reconfiguring themselves.

Technology is often regarded as a straightforward means to fight contingency of some sort. The walls of our houses and air conditioner create a climate, independent of sun and wind. The packaged and frozen food is supposed to be impervious to the germs and bacteria around it.

Luhmann argues against this linear status of technology. He suggests not to reduce technology to a relation of purpose and means (or as a reduction to a mere tool), because every new technology gives way to equally new problems and aims, that create complexity. It would make more sense to consider it as a simplification of a specific causal relations, that inherently creates new complexities. Complexity does not have a negative connotation, but rather an indication of possibilities that emerge (Luhmann 2005, 69-72). This denying of a linear fulfillment of human intention may seem counterintuitive, but it seems closer on how we experience technology.

Algorithms where traditionally mainly used in mathematics to develop systematic mathematical proofs. In this sense lies a great shift between the way for example Gödel used algorithms in comparison to Lovelace or Turing. “The Turing machine went beyond the conceptual recursivity through the exteriorization of reason in concrete and material terms.” (Hui 2015, 131p)This materialization opened in a same way the door for a completely new contingency.

Conclusion

In 1997 the chess computer Deep Blue defeated the chess grandmaster Garry Kasparov, which became a symbol for the power of digital computation. In response to this, the chess community started to organized tournaments of Freestyle Chess (or advanced chess) where computers and humans could compete freely which each other. A group that seemed especially successful, where the so called Centaurs. Like the half-human, half-horse creatures in Greek mythology, this teams consist of both computers and humans working together. They benefit from the strength of the raw computational force and the human intuition, and became better then any computer or human on their own (Cassidy 2014). Finding ways to work with the digital computation rather then have it fight against us, may not only improve our chess game, but redefine how we tackle problems in general. Maybe it is a broader notion of technology, but in the case of the digital algorithm, it becomes obvious that they are often designed as a black box, where the user is ultimately unaware what is happening. In the process of redesigning our relationship with the computer our relationship with the algorithmic world, we might have to also redefine us as dividuals, there your identity is not something fixed, but is redefined and reestablished in the processes of encounters and engagement.

The art works tries to relate to the topic of the algorithm, by illustrating its diverse nature of constituting and restructuring the social world. It shows the human body as a dividuum, a fragmented identity of machines that allow the viewer to experience the different modes of existence, where algorithm work with and against humans work with, and against each other. The digit is both considered as a gatekeeper and a guiding force. Manifesting this simple interaction with the digital in an automated mechanism mirrors the function algorithms impose in our daily live. They seamlessly become part of our perception, while changing and redefining the "rules of the game".

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