CODE, DESIRE AND CONJURING
ON THE MAGIC FABRIC OF CONTEMPORARY COMPUTING TECHNOLOGIES

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MAGIC
LANGUAGE
DESIRE
DIGITIZATION
INTERFACE

In this paper I endeavor to bridge the gap between the concepts of magic and of digital technology. I do this by focusing on the intersection between the magic spell and software or code. By scrutinizing the interplay between the (magic) formula and the way it is performed in order to achieve a specific impact, it becomes possible to describe a close proximity of the magic formula with contemporary software. Today, digital machines and their relevant algorithms are almost exclusively seen in the light of a narrow rational and technical concept. Historically, the 'use' of technology is much more diverse, and I argue out of this perspective that it is time to historicize the working structure of digital machines in a way, that they can be embedded within the long history of magic conceptions.

INTRODUCTION

This paper aims to adapt the concept of magic to approach core characteristics of contemporary digital computing media. For this purpose phenomena, which are normally not connected to the concept of magic, will be analyzed. In the historic conception the terms or concepts μαγεία, ars magica and magic have been adapted, reevaluated, expanded and restricted in various ways during their European history (Otto, 2011). In the following paper the concept of magic is understood as a poetic strategy, using symbolic or expressive procedures in order to transform 'reality'. And by highlighting, that nowadays our everyday life-world is permeated by algorithms operating in the background of broadly dispersed computer-interfaces, respectively 'intelligent' artificial entities guiding and monitoring our movement through our digitized and interconnected environments, I will demonstrate a new relevance of the concept of magic. As I will show, technological interface networks nowadays rather ask for 'desires', 'wishes' and in particular specific poetic communication strategies, instead of orders and arguments. The term 'magic' hence will be used to analyze the way how digital computational media changed and changes the actual living reality of people to a place (again) defined by 'opaque'[1] entities. I will explain, how today's computational media explicitly epitomize 'magic' characteristics of technology thereby changing our perception on reality.

MATERIALS AND METHODS

In the following, I will rely on historical and theoretical contextualization of contemporary technological phenomena. Contemporary computer code and Artificial Intelligence algorithms will be counterpositioned with historical concepts like the magic spell or magic invocations in order to point out similar aims and interaction strategies.

DISCUSSION

The magic spell

Language is not only a 'medium' for modulating physical and temporal distances. Language also is a poetic tool allowing us, to change and develop relations between ourselves, our environment and other 'non-human' entities. Or to put it another way, language has a dimension of "magical" powers in the sense, that it affirms (medial) communication structures in characteristics, that might contradict rational 'objectivity'. This argumentation can be validated by relying on etymology. As the linguist Michaela Essler proves, the term 'magic' has a clear reference to ritualized speech, to the 'effect' of direct invocations and thus to actors focusing on memory and the power of thought (Essler, 2017, p. 237). But it goes without saying that magicians never saw themselves as linguists analyzing connections between signs, metaphors, formulas and symbols. Magical invocations (ideally) transform representation, respectively symbolic or expressive procedures into reality. They do not allow signs to represent things or events, but rather update them in targeted effects (Bracken, 2008, p. 113).

For magicians language thus possesses a specific (medial) immediacy, which enables them not only to categorize the world, but also to address a desired state of the world. In speaking or more precisely speeches, in the famous magic formula, magicians thus emphasize a potential synthesis between wish and word, between magical expression and its effect. Magical approaches accordingly define a specific syntactic system allowing to link wishes, respectively poetic imaginations by relating wordings to planned effects.

Magical machines

In superficial contrast to this, (digital) technology is generally categorized as a rational phenomenon strictly building on 'technological' approaches. I question this classification by focusing on the structural build of contempo-

rary computing machines and our current computerized networks. As is broadly understood, the functionality of a 'computer' is defined by its software and only restricted in its working power by hardware. Fundamentally relying on the concept of the 'Turing machine', which proved a valid functional model, depicting the possibility to technically perform any calculation (Wiener, Bonik, & Hödicke, 1998), a computer is in its core a universal machine, which can 'run' a potentially unrestricted number of software-programs[2]. The utopian climax of this conception is the so-called 'cyberspace'[3], which in its pure technical vision is a realm, in which software gets downright transcended and freed from the restrictions of our physical world. This is why the cultural scientist Vincent Mosco speaks of an electronic or digital sublime manifesting itself in present cyberspace visions (Mosco, 2004, p. 24). Cyberspace hence can be understood as techno-magic spheres, in which software changes to the status of a magic formula.

It has to be mentioned however, that the actual 'cyberspace', we are dealing with never was (beside science fiction stories) a realm of unrestricted magical freedom. In fact, for example our digitally networked machinery is still highly dependent on the fossil fuel that is running their energy-consuming server infrastructure. It is hence rather the vision of universality, that has to be identified as one magic 'marker' inscribed in the concept of software. I hence argue that software or better code can be related to the magic spell, in its characteristic as a 'universal' problem-solving concept, even if the reality is much more complex. But in order to further determine the inner connections of software and magic, we must continue to deepen and differentiate.

As the cultural scientist Yuk Hui highlights, modern computational machines are to be understood as 'syntactic' rather than semantic machines (Hui, 2016, p. 76). They hence rely on the possibility to install relations and not to define, respectively stabilize sense systems. And here we

are faced with another characteristic of software, cause also the way computers work, relies on establishing connections between wordings and functions. Since software or better the applied (source) code has to be a 'language' to be transformable in binary code[4], it has to create relations between input and commands. In consequence, software or source code have to link more explicitly to the concept of orders or wishes, than to actual transfers of meaning. Against this background, it is possible to further evaluate the connection between code or software and the magic spell. In fact magical formulas were historically constructed like code, they consisted or consist of individual 'elements', which are perceived as powerful, if they are combined in the right way (Lecouteux, 2015, p. XI-XXV). (Historic) magic spells link speech patterns or vocal elements with targeted effects. Software hence is comparable to magic spells in its characteristic to allow a computing machine to translate / process (combined) working instructions and building on this, perform operations, which are targeted by its user.

So, if Lev Manovich claims in his famous book *Software takes command*, that software has become our interface to the world, to our memory and our imagination (Manovich, 2013), he relates himself, without explicitly referring to this, with the ages old history of the magic formula. Out of this perspective, one could even claim, that positions like those of Manovich aim to define a new adamic language. One could claim, that they understand language as a powerful magic 'tool' offering true power in understanding and changing the fundamental bases of our reality and being (Benjamin, Lönker, & Benjamin, 2019). It is no need to further deepen this perspective to understand the familiarity of software or code with the concept of the magic spell. But how to allow people, who are not able to write and read code to work with a computerized machine (system)? With this question, we will have to start considering the discussion of the interface.

Interfaces and co-users

In the context of digital media, contemporary computing interfaces define 'zones', in which dynamic relationships between people, machines, devices, digital processes and networks as well as entire organizational structures are created and negotiated (Hookway, 2014, p. 4). Classical Graphical User Interfaces (GUIs), as they are still used today (for example in our computer desktops), define since decades our interaction processes with digital technology. GUIs allow control operations based on man-machine feedback loops (Wardrip-Fruin, 2003, pp. 3-82). GUIs thereby promise to form powerful technological structures with a user-subject in its center. As Nishant Shah classifies: The GUI was a way by which complex technical background processes, "the normative nature of pre-programmed algorithms, the restricted variables that determined the stable state of the computer, and the controlled nature of code, were made invisible behind animated point and move gestures that would allow the newly enfranchised user to initiate a pretended conversation with the computer" (Shah, 2017, p. 185). The GUI hence is a powerful tool for man-machine cooperation, that rather simulates then performs interaction. Against this background, it is striking to consider, that the concept of the GUI lost its central position during the past years. Today, it is far more relevant to address the topic of the 'network', or rather the networked life-world of human and non-human (algorithmic) actors. The cultural scientist Benjamin Bratton describes this new network reality as defined by technical 'layers', as a place of 'participation' or technical 'containment' and names it with the term 'the stack'. As Bratton argues, human beings located in the stack must permanently network through a variety of 'interfaces' with non-human 'co-users' in order to survive his or her everyday life (Bratton, 2016, p. 38).

So following Bratton, the interfaces today changed from tools suggesting or simulating user control, to a system built on a variety of 'docking ports', which includes the user in a broader networked structure. That's a classification, with

which every owner of a smartphone for sure can agree. But what is explicitly relevant for understanding the digitally networked reality of the stack is Barattons introduction of co-users. To explain this classification, it is relevant to turn to the so-called neural networks, respectively artificial intelligence computer programs (AIs). As the computer scientist Melanie Mitchell explains, contemporary neural networks build on 'connectionist' strategies, what basically means, that they 'weight' connections between units they are trained to recognize (Mitchell, 2019, p.65). The semantic proximity relevant for those 'Algorithms' is thereby deduced from statistical proximity between all of the terms in the corpus of themes relevant for the respective AI (Cardon, Cointet, Mazières, & Libbrecht, 2018). AIs hence are nowadays involved in so called pattern-recognition processes. We are again confronted with a structure valuing syntax over semantic.

For example Googles web search engine is a good example for explaining the connectionist approach dominating our contemporary AI infrastructure. This search engine AI constantly analyses with sheer computing power the way how webpages are interconnected, plus the way human users interact with this infrastructure. Relying on its breakdown, the Google AI offers results "useful" for human users and even more useful for companies, who want to develop target specific advertising. Out of this reason Google has to constantly update its AI relying on new user requests. To organize its results, the Google AI hence needs not only content data, but also user interaction data. The functioning mode of AIs so can be defined at this point, is one of an 'autonomous' machine, that constantly has to be 'serviced' with human user input in order to gain access to semantic perspectives. Against this background Hamid R. Ekbia and Bonnie A. Nardi are speaking of 'Heteromation', when describing our contemporary digitized economy. As the authors show basically most companies using AIs have to rely on services like Amazons 'Mechanical Turk' platform[5], to be able to produce discreetly functioning neural networks (Ekbia & Nardi, 2017).

Following this Brattons description of being a co-user gets now understandable. Bratton obviously wants to highlight, that we nowadays do co-evolve within our digital networks with new computational 'actors'. And this situation means, that we can neither fully control nor monitor our digital machines anymore. Living in the 'stack' hence means relying on new modes of interaction with our digitized environments. It means, that we have to develop new (magical) interaction 'formulas', new interface structures in order to integrate in our brave new computerized living-world.

CONCLUSIONS

If one considers against this background, that, inside the digital environment including the user, communicative 'interaction processes' with our opaque co-users function in a way that can be classified as poetic, one can further claim, that there are profound relations between magic and contemporary digital technology. Today, for example, one cannot just use any wording to approach a digital assistant like *Google Now*, one has to know its name to start the conversation and rely on a specific way of talking in order to enable the algorithm to interact. Against this background, one could even claim, that the syntactic synthesis between wish and word, between magical expression and its effect characterizing historical magical strategies, recently was updated in the stack by rules focusing on the pattern recognition abilities of AIs.

Furthermore, without a co-user offering a clear semantic input, respectively the capability to link his wishes or his desire with specific wordings, the digital actors evolving with us obviously loose structure and objective. In interaction with our digital co-users, we hence are forced to act like classic shaman magicians constantly aiming to allow mediation between words and effects, wishes and will (Descola, 2013, p. 20). It is crucial to again recall at this point: Magical approaches accordingly define a specific syntactic system allow-

ing to link wishes, respectively poetic imaginations by relating wordings to planned effects. As was shown, todays digital machines are building on similar 'connections' of wordings and effects. Those machines, one can claim at this point, not only use computing power to detect patterns and frameworks to rely on. They are also creating 'animacies' in the words of Mel Chen. They are creating communication and interface structures, that in fact rather utilize the alchemical or poetic 'magic' of human 'language', than the structure of human attributions (Chen, 2012, p. 23). Out of this perspective one can claim, that in fact the human ability to allow a synthesis in between wording and will, between poetic abstraction and direct manifestation is central for contemporary AI based machines. Todays stack hence is basically an artificial 'garden' full of non-human 'beings', that all ask for 'desires', 'wishes' and 'invocations', in order to allow a co-evolution, respectively a co-development of our shared 'reality'. The magic spell, the idea of invocation, of hidden powerful beings, that was relevant for centuries of European history is again central today. We just are not using its historic name till now.

NOTES

1 For example Google engineers have to use so called "concept activation vectors" in order to explain the functionality of their AIs (Rodriguez, 2019)
2 A good introduction in the setup of the turing machine can be found on the following webpage: https://plato.stanford.edu/entries/turing-machine/
3 The term cyberspace was invented by the science fiction author William Gibson in his book *Neuromancer*. In this book he describes the cyberspace as a location, in which people can leave all 'restrictions' of their flesh behind and become pure digital animas.
4 Binary code is a translation of the source code a digital machine needs in order to function. It is basically the only means allowing a computing machine to react on external triggers.
5 Amazon Mechanical Turk (MTurk) is a crowdsourcing marketplace that makes it easier for individuals and businesses to outsource their processes and jobs to a distributed workforce who can perform these tasks virtually. https://www.mturk.com/

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