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Playing Software: The Role of the Ludic in the Software Society

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Introduction

In the beginning of modern computers, there were love letters. Christopher Strackey, a close collaborator of Alan Turing and perhaps the first digital artist (Wardrip-Fruin, 2005, Montfort and Fedorova, 2012), programmed a love letter generator for the Manchester Mark I. The purpose of the program was "to parody the formulaic process of love-letter writing" (*ibid*, p. 82). By doing so, it showed something else: how software can be used as an expressive, aesthetic tool, through playful engagement with its possibilities. Strackey's program sets a historical precedent to the playful use of software.

Expanding Huizinga's (1971 [1938]) argument that there is a ludic drive at the heart of culture, this article provides the theoretical foundations for identifying a ludic drive in the software society (Hayles, 2005; Cohen, 2012; Floridi, 2013; Goriunova, 2019). Software shapes society (Floyd, 1992; Manovich, 2013), but it is also shaped by social structures (Suchman, 1995, 2006; Winner, 1986; Latour, 1992). This article argues that play has a role in those processes of sociotechnical shaping. Play can be understood as a vision of data, a mode of making sense of the data worlds we live in.

Drawing on play studies, philosophy of technology, and media theory, I propose a definition of play and playfulness as strategies that make sense of software through the adoption and creation of new practices. Software is here understood as a computer program running on a specific platform, performing processes on data based on formally defined rules. This article's understanding of software is broad: all computer programs that perform operations on data are software. Many of the examples in this article are software that uses sensors as a form of gathering user input and data. However, the conclusions of the article should be applicable to the playful experience of any kind of software, as the diversity of examples analyzed here illustrates.

The article starts by suggesting a definition of play that can be applied to the analysis of the ludic drive in digitized societies. It follows with an overview of the literature that studies the digitized society through the lens of play. A brief example on the application of these

concepts to understanding voice assistants illustrates the applicability of this definition of play. The article ends with a warning about the possible negative implications of play as a mode of engaging with software. While play might facilitate the adoption and understanding of software technologies in daily life, it can also be used to promote negative and alienating discourses. The study of this dark side of play goes beyond the scope of this article, but it will be mentioned as one of its natural continuations.

This article proposes that play is a strategy to make sense of the limits and possibilities of software. To play with software is to establish a relation with the processes, rules, and agencies of software, a relation that is not based on functionality or productive, but on the pleasurable logics of play.

Understanding Play

In order to explain the role of the ludic in software society, it is important to try to define what play is. In *Homo Ludens* (Huizinga, 1971), the foundational work in the study of play and culture, Huizinga argues that "genuine, pure play is one of the main bases of civilization." (1971, p. 5). This argument is supported by an analysis of ludic manifestations in culture, from poetry and laws to war and games. Huizinga provides one of the first, and most influential definitions of play as the origin of cultural phenomena:

> "Summing up the formal characteristics of play we might call it a free activity standing quite consciously outside "ordinary" life as being "not serious", but at the same time absorbing the player intensely and utterly. It is an activity connected with no material interest, and no profit can be gained by it. It proceeds within its own proper boundaries of time and space according to fixed rules and in an orderly manner. It promotes the formation of social groupings which tend to surround themselves with secrecy and to stress their difference from the common world by disguise or other means." (*ibid,* p. 13).

Huizinga's definition has set the foundations for play studies in the 20th century (see also Stenros, 2015). These theories consider play to be a separate, free and unproductive activity, structured through rules that facilitate social relations and help the activity define its own goals. The metaphor of the magic circle, highly contested by contemporary play scholars (Consalvo, 2009), explains how play creates worlds through the imposition of rules and time and space

boundaries. New social and cultural forms emerge from that separation. This article investigates how software creates new worlds, and how these worlds can be experienced, and made sense of, through a play lens.

Play theorists have expanded and questioned Huizinga's foundational work. Caillois (2001) formulated a useful distinction between rule-bound competition play (*ludus*), and free-form play (*paidea)*. In *The Ambiguity of Play* (1997), Sutton-Smith proposes the concept of rhetorics of play, which describe how "play" is used in a particular time and sociocultural setting to analyze, describe, and categorize phenomena: "[…] the rhetorics of play express the way play is placed in context within broader value systems, which are assumed by the theorists of play rather than studied directly by them" (ibid, p. 8). That is precisely the goal of this paper: to understand how play is used to make sense of software.

Henricks formulated a definition of play as "a pattern of engagement with the world" (Henricks, 2016, Kindle location 487-490) that allows him to engage with contemporary phenomena like video games, as well as with classic objects of study in play theory. For Henricks, play is at the heart of cultural and social structures. Henricks sees play as a form of individual self-realization that has both creative and a destructive sides (Henricks, 2009). Henricks' work allows us to look at the role of dark play in shaping software.

Digital culture scholars have studied the phenomenon of play (Malaby, 2007), leading to the establishment and consolidation of Game Studies as an academic field (Aarseth, 2001, 2017). While the early works in the field were mostly focused on the study of (digital) games, more recent work has expanded the scope, using games as a lens to understand broader aspects of the software society (Bogost, 2016). Gamification is also a popular topic in the study of play in the software society (Walz and Deterding, 2015). While there is a rich prehistory of this phenomenon (Nelson, 2012), it has been singularly relevant for many scholars working on the software society. In fact, some key scholars in game studies have already proposed the idea that "the ubiquitous presence if digital media in our everyday life is implicitly prefiguring our experiences and actions in a playful way" (Frissen et al, 2015, p. 36), for example by making the mundane experience of banking into an aesthetically pleasing one, or by the agonistic competition implicit in the quantification of responses to social media posts.

A Definition of Play

This article wants to contribute to that conversation by providing a definition of play that accounts for the relations established with software and data representations. The concept of

play proposed here extends Lugones' (1987) and Sicart's (2014) definitions, while being influenced by the work of Nippert-Eng (2005) and Cohen (2012). Play makes sense of software by creating new relations with and through the formal rules of software, and the worlds it creates. Through these relations, play helps modulate forms of human and computational.

Sicart (2014) defines play as an appropriative, expressive, autotelic, carnivalesque mode of being in the world (*ibid*, pp. 6-18). Playfulness is defined as "a way of engaging with particular contexts or objects that is similar to play but respects the purposes and goals of that object or context" (*ibid* p. 21). Sicart's theory is flexible enough that it can be applied to phenomena beyond games, as it distinguishes between the activity of play and the attitude of playfulness, a critical distinction to understand the presence of the ludic in digital societies.

This article adopts Lugones' definition of playfulness as an attitude that positively "involves openness to surprise, openness to be a fool, openness to self-construction or reconstruction and to construction or reconstruction of the "worlds" we inhabit playfully. Negatively, playfulness is characterized by uncertainty, lack of self-importance, absence of rules or a not taking rules as sacred, a not worrying about competence and a lack of abandonment to a particular construction of oneself, others and one's relation to them." (pp. 16-17). To be playful is to have an attitude towards the world that puts pleasure, exploration, and human agency at the forefront.

Play and playfulness are related to order and rules. To create the world in which play takes place, rules are necessary. Some are created by specific play technologies, like games, while others are the consequence of player intentions and creativity. Play has an irreverent, carnivalesque relation to the rules that facilitate it (Bakhtin, 1984; Sicart, 2014, p. 11). Sometimes playing by the rules is pleasurable. Sometimes, playing with the rules is the source of pleasure. Sometimes, playing against the rules dominates the purpose of the activity. Play is establishing relations with rules as world-creation possibilities, and the technologies that facilitate them. To play, and to be playful, is to explore the pleasures of breaking or submitting to rules and boundaries, of obeying or disobeying them.

For example, the fitness app developed by Carrot (meetcarrot.com) uses surprise and dark humor to make the experience more playful. This is a classic fitness app, that will track behavior, recommend activities, and remind the users of their commitments to good health and habits. It will do so however by not taking itself too seriously, wrapping the processes in a layer of humor that allows for surprise. Playfulness is manifested here through an invocation of curiosity that is rewarded with unexpected results. It is a form of designed playfulness that becomes a mode of experiencing the delegation of agency to a smartphone.

Relational Play

To play is to appropriate the world to create another world in it, "[...] temporary worlds within the ordinary world, dedicated to the performance of an act apart" (Huizinga, 1971, p. 10). World-making in play is a consequence of the relations established between players, context, and play technologies. Engaging with a software implies making sense of its rules and processes. To do so, some technologies are designed to be experienced playfully, like the Carrot fitness app. In these cases, users will perceive the rules and processes as open for playful engagement.

Even though constructivist approaches (Stenros, 2015) would be valid for analyzing world-making through play, Cohen's (2012) concept of the networked self, and Nippert-Eng's idea of boundary play add the notion of relationality as a key element in play. According to Cohen, play is at the heart of the tactics that determine relations with software (Cohen, 2012, pp. 32-59). Cohen argues for an understanding of play as an in-between movement, a constant negotiation with the rules and parameters of software. This focus on play as a negotiated movement between embodied subjects and software echoes Gadamer's writings on play (Gadamer, 2004, pp. 102-157). For Cohen, play is a practice of engaging with the digital, a relational approach to software in the context of emerging practices and institutions.

This focus on relationality is also present in Nippert-Eng's concept of boundary play, which describes the evaluation and creation of social and cultural behaviors based on a playful exploration of boundaries. Boundary play is a form of relational play that connects to already existing boundaries, dichotomies, and concepts, and how interacting with them creates new forms of expression.

This notion of relationality is arguably present in classic play theory, from Huizinga to Gadamer. In the work of Cohen and Nippert-Eng, relationality is applied to address in detail forms in which play creates social practices. Extending their argument, I propose that play is a way of establishing relations with technology. Understanding the role of play in the digital age implies considering it as a relational approach to software.

For example, Apple's Animojis provide a playful mode of understanding face recognition algorithms and depth cameras. An Animoji is an emoji animated by recognizing and copying the facial gestures captured by the forward-facing camera of a modern iPhone. Animojis allow users to be silly with the camera that "sees them"; they are toys that help explain and normalize machine vision. Laughter, surprise and curiosity become the foundations of a new relation with

a particular peiece of software. Animojis help develop an understanding for the possibilities of a new technology through playful relational engagement.

Play and Postphenomenology

Studying play in culture will require a relational theory like postphenomenology (Ihde, 1990, 2012; Verbeek, 2006). A postphenomenological understanding of human experience implies making sense of the mediating role of technology. A critical concept in postphenomenology that addresses the back-and-forth between experience and mediating technology is "multistability", understood as "[…] the ever-present potential for a technology to be used in multiple ways through multiple contexts" (Rosenberger, 2014, p. 373). The process of stabilization of the mediating modes of technology is essential to understand human experience. To stabilize is to "read" the technology, partially decode its intentions, match it with intentions, and give it meaning and purpose in the human experience of the world. For example, the mundane SMS message technology, with its strict character count, was intended exclusively to be a short information, need-only system (Taylor and Vincent, 2005). However, it became a popular mode of keeping in touch, affordable but also expressive, open to playing with its limits. The technical limits of the technology were interpreted as an expressive limit, and hence new relations between people through technology were created (Frissen et al, 2015).

How are multistable technologies stabilized? Rosenberger (2009, 2012, 2014) proposed the concept of relational strategies " […] to refer to the particular configuration of bodily habits, intentions, and conceptions that make it possible for a person to take up a particular stable relation" (Rosemberger, 2009, p. 7). Relational strategies focus on the intention of the users of these mediating technologies. This makes design a central issue, since technologies are inscribed with particular worldviews, politics, and agendas.

Play as a relational strategy has value for users. Because play is autotelic, users can feel an increased sense of agency in the worlds constructed by play, since they are capable of negotiating the conditions of engagement. Play provides the value of pleasure and increased agency in the relations established with software. Play and playfulness are strategies that stabilize the mediating role of software in human experience. When playing, a particular relation with the world is established, interpreting it and assigning agencies that make sense within a pleasurable experiential frame. Cultural practices and manifestations take place in those relational engagements.

The Software Society Through the Lens of Play

This section provides an overview of the digitized society and its relation to the idea of play. Software changes the world by establishing new possibilities for relations between humans and technology, and between different forms of agency. According to Floridi, developed societies cannot live without the presence of computing machines (Floridi, 2014). The Information Age is a point in history in which "societies and environments where ICTs and their data-processing capabilities are not just important but essential conditions for the maintenance and any further development of societal welfare, personal well-being, and overall flourishing" (*ibid*, location 252-254). In the Information Age, software has become an agent in the world (Floridi and Sanders, 2001; Grodzinsky et al, 2008; Floridi, 2013) with which humans engage in relations that shape the boundaries and possibilities of human agency.

STS has also argued for the agency of non-human entities (Latour, 1992; DeLanda, 2006, Verbeek, 2006, pp. 47-99). STS applied its methods to the study of software (Vertesi et al., 2019), laying out theories and research questions directly related to the software society, from the politics of source code (Couture, 2019), to the ontology of algorithms (Seaver, 2019) or the relations between energy, computation, infrastructures, and social practices (Ross Winthereik, Maguire, and Watts, 2019).

Media and software studies provide another perspective for understanding software. According to Manovich (2013), "[...] our contemporary society can be characterized as a software society and our culture can be justifiably called a software culture—because today software plays a central role in shaping both the material elements and many of the immaterial structures that together make up "culture." (Kindle location 639-641). Manovich focuses on the work of Alan Kay to argue that the (personal) computer is unique because it can simulate any other medium, but that by doing so media becomes "softwarized" - for example, digital pictures can be zoomed in, and text is more malleable in a word processor than in any other prior medium. Within Software Studies, platform studies (Bogost and Montfort, 2009) has studies the technologies that lead to playful and aesthetic uses of software, from the arts to the home console. Lessage's (2015) concept of "middlebroware" illustrates how media software mediates but also configures aesthetic practices. Software is a point of contact between human agency and technical mediation (Galloway, 2012, pp. 1-24); a point of contact that challenges human agency and requires a process of meaning-making.

For example, Trevor Paglen has led an artistic inquiry on machine vision (Paglen, 2019). Paglen's work illustrates how the "sight" of a computer, understood as the result of software processes on data captured by camera technology, is radically different than that of a human. Introducing this "computational" sight into the domain of human experience irrevocably alters the world: "The fact that digital images are fundamentally machine-readable regardless of a human subject has enormous implications. It allows for the widespread automation of vision, as well as the exercise of power on dramatically larger and smaller scales than previously possible." (*ibid*, p. 23). Computer vision uses sensors that can translate data into computable information. What computers can "see" determines not only what they can process, but also when actions in the world that become "visible" for a computer. Software's "alien" sight becomes its agential projection in the world: "if we take a peek into the internal workings of machine-vision systems, we end a menagerie of abstractions that seem completely alien to human perception. The machine-to-machine landscape is not one of representations so much as activations and operations". (ibid, p. 26). Play can be a strategy to make sense of the alien agency of machine vision software, like in the aforementioned case of the Animoji.

Culture, Society, Computers

Paglen describes what Hayles (2005) defined as "technogenesis", a process of reciprocal causality between humans and technologies. Hayles argues that human subjectivity is co-constructed by the interaction with technologies. Hayles situates this co-construction in what she describes as the "Regime of Computation […] a narrative that accounts for the evolution of the universe, life, and mind reflecting on mind by connecting these emergences with computational processes that operate both in human-created simulations and in the universe understood as soft-ware running on the "universal computer" we call reality" (*ibid*, p. 27). While the concept of the Information Age focuses on computational/informational agency, the concept of the Regime of Computation does the same with a stronger focus on cultural productions. That focus allows us to include play as a mode of engaging with software. This is not a new perspective, as Turkle (1984) and Murray (1997) already highlighted the importance of play to understand computational culture. In this sense, it is possible to argue that early conceptualizations of the software society were already aware of the roles of play in our relations to software.

Turkle (1984) studied how computers are catalysts for culture formation. Her work looked at how games are examples of the processes of subjectivity-and-world creation that are

afforded by software (Turkle, 1997). In this sense, Turkle was a pioneer in extending Huizinga's inquiry on the role of play and games in creating culture, within the context of the regime of computation. Games provide the possibility for role-playing in worlds with internal logic and rules that are voluntarily accepted by users. Since software uses rules and procedures to create a world, games, in their explicit use of rules and limitation of agency, are examples of how subjectivity is created by software. For example, in the online game *EverQuest* (Taylor 2006), players were free to create characters of different types, predetermined by the game. These characters are all bound to both the rules of the game (how much combat damage they can take), the rules of the gameworld (how does the simulated gravity work), and the rules of the player community (how players should treat each other).

In *Hamlet on the Holodeck* (1997), Murray argues that computational technology, thanks to its procedural nature, creates new worlds that are constitutive of new forms of subjectivity. Murray's work provides another example on the role of (playable) software in creating worlds. Furthermore, her research on interactive narratives and games is another example of pioneering work on the role of software in creating cultural forms, like Aarseth's *Cybertext* (1997).

Computers and Representation

Hayles, Turkle, and Murray describe how computers run processes based on representations of the world, and how by doing so software creates worlds. A good example of representation is step tracking software. Step tracking programs contain a model of the human step that is compared to the data gathered by sensors. If the conditions for a model-defined human step are met, then the software will tally "one step". Sensors feed the software with data that is procedurally evaluated by the software. The steps tracked by this software are not necessarily "steps": they are the outcome of a computational process that evaluates sensor data and produces a result based on a representation. That representation is encoded in a computable model that is part of the software. These representations are critical for understanding the software society, as they are the instruments used for software to be a part of that society. In order to understand the relations between software and humans in the software society, we need to first understand the concept of representation (Agre, 1997, pp. 222-241).

In this article representation is understood as a process of abstraction that uses formal rules and processes to make the model of a particular problem/situation addressable by software. This representational process is a cultural task. (*ibid*, pp. 16-20). Programming software involves understanding a problem, its context, its implications, and coming up with solutions

that allows for new actions, agencies, behaviors and limits. Step tracking software uses a representation of the human step to compute human action. This type of computational co-creation of agencies and behavior (Introna, 2007), when filtered through the lens of play, has as a result apps like Carrot, which mediates playfully the effects of software running on data representations of users.

Computational representations both model and act in the world, a process Floridi called re-ontologization: "[…] a very radical form of re-engineering, one that only designs, constructs, or structures a system […] anew, but one that also fundamentally transforms its intrinsic nature, that is, its ontology or essence" (Floridi, 2013, p. 6). In other words: through representations that are acted upon by processes, software creates modes of agency and thus also new worlds. This is an idea explored in media studies, STS, and central to the work of Hayles, Turkle, and Murray. It is also critical from the perspective of play, because play is also a way of creating worlds and shaping modes of agency.

For example, users of step tracking software will walk ten thousand steps according to their software, regardless of the fact that maybe not every step is counted. And they will do so because it has become commonplace in wellness apps to think about the ten thousand step mark as a milestone of good daily physical activity. The software rules of these step trackers determine what a human step is, and how many steps we should take a day to get a reward. That computational of a human step and of a health milestone are re-ontologizing processes. When play is used as a way of establishing relations with software, with its rules in the worlds it creates, new forms of cultural and individual expression take place. Play is a way of engaging with the re-ontologization processes of software, by establishing new relations with the rules that constitute the founding programs of the software society.

The software society, the Information Age, the Realm of Computation, they are all populated by the "alien" agencies of computational machines (Floridi, 2015, pp. 138-146). Sharing a world with these "aliens" might be creepy (Shklovski et al., 2014; Phelan, Lampe and Resnick, 2016; Pierce, 2019) because software agents act in the social world of people, in their communities, in their societies, modifying how people behave (Finn, 2017; Whitson, 2018). Understanding these uncanny agencies requires strategies that help make sense of them. Play is one of those strategies.

For example, Google's AI Experience *Quick, Draw!* illustrates a way of using play to make Machine Learning more understandable. *Quick, Draw!* is an online game that lets users draw doodles that the computer then tries to identify. This experiment playfully teaches users what computers can analyze, and at the same time it trains the algorithms to be better at recognizing

doodles. The tiresome task of training a Machine Learning system with data becomes more pleasurable through play. Furthermore, the alien agency of a piece of software capable of categorizing doodles becomes relatable because it is presented within the surprising, pleasurable conditions of a playable experience.. *Quick, Draw!* is a tool for playfully engaging with the re-ontologization process that takes place when computers begin to understand doodles, when we start adapting how we draw so it is "easier" for the computer to guess the result. Making that process playfully pleasurable is an application of play to the normalization of the alien agencies of artificial intelligence.

The relational strategy of play towards software also adds a particular type of value to the user experience. Play makes the relation with rules and processes pleasurable. Since software is rules and processes run by computational machines, play can be used to present, explain, and make users emotionally engage with those rules. Because play is in general considered a positive mode of being in the world, experiencing the worlds of software through play might ease the re-ontologization processes of software. Furthermore, play might also allow for exploration and appropriation of the agential possibilities of users in software worlds, making it more pleasurable to learn how to act *with* the alien agency of software.

Playing Software

This section applies the relational concept of play to software beyond videogames, more specifically to conversational agents. The purpose of this section is to illustrate the applicability of the concepts presented in this article. I will argue here that playful relational strategies are ways of making sense of the data-based rules and processes of conversational agents. What the software does is technically complex but simple to explain: it listens to audio data, compares it to vast databases of other audio data applying specialized algorithms, and when results that are formally defined by rules are met, other rules and processes are triggered to synthetize speech and provide an answer. All these rules and processes are presented to users as open to be playfully experienced, by for example understanding jokes or puns. This process illustrates how play is a mode of making sense of the complex processes and rules of software agents in the world.

Let's start with Weizenbaum's venerable ELIZA (Weizenbaum, 1966), an early attempt at creating a conversational AI. Even though ELIZA was Weizenbaum's illustration of the problems of human-machine communication, the software became a surprising success. According to most accounts (O'Dell and Dickson, 1984), early users of the software enjoyed

exchanging words with a simulated psychologist. ELIZA can be seen as a software agent designed so that people would treat it as if it was a person. This is an example of mimicry (Callois, 2001), one of the primary modes of experiencing the world through play. ELIZA is not a role-playing game but interacting with it evokes a playful attitude through the invocation of make-believe as a relational strategy. Reeves and Nass (1996) provide empirical data to show that we treat computers as social beings. ELIZA wrapped that effect with a layer of make-believe, becoming a playful interface to artificial intelligence.

This form of role-playing can be traced to Siri, Alexa, and the Google Assistant. These voice-activated conversational agents are access points to cloud computing distributed systems, designed not only with efficiency and usability in mind, but also as being open to interpretation (Sengers and Gaver, 2006). These devices have been designed with "personalities" so that mimicry becomes a relational strategy to make sense of the way they mediate the world.

This play-angle can be used to analyze why humans tend to interact with computers as people. Facing the experience of software with agency in the world, humans pretend these alien agencies are people, or at least a social equivalent to people. Make-believe is a way of making sense of the rules of operation of these alien agencies. This process facilitates the exploration of the computational rules that have an effect in the world. Siri has a personality because it is easier to understand how the software works through those rules, much like ELIZA was framed as being a therapist. This is not just play "for fun". There is a seriousness to maintaining the role-playing attitude that makes playful engagement with software more than just mindless entertainment. As Huizinga already observed, play has *and requires* its own seriousness. In treating these conversational agents as characters, an element of pleasurable seriousness is added to the experience.

Bounding the world with rules so that new meaning and new experiences can emerge is a characteristic of play. In the case of voice assistants, mimicry is used to invoke a playful attitude. By doing so, the possibilities and limitations of these devices as defined by their software, are experienced through the relational strategy of play. They are made sense of not only as consumer software devices, but also as companions, as agents people live their lives with.

This might actually be a future of AI. The inherent alien-ness of machine learning and evolutionary algorithms makes them challenging to understand. A playful approach can be an instrument to make all forms of AI-based services and products a little bit more bearable. Google's AI experiments (experiments.withgoogle.com) use play and the playful attitude to develop strategies to understand and make these technologies an accepted part of the software

society. Play can be a strategy for understanding the opaque agencies of Machine Learning through interactions that are enjoyable, surprising, and open for appropriation. These are software toys that allow for an appropriate, expressive-driven interaction with Artificial Intelligence, so its complex modes of agency become more (playfully) relatable. By doing so, users become familiarized with the possibilities of software, as Google makes explicit on their AI Experiments site: "AI Experiments is a showcase for simpler experiments that make it easier for anyone to start exploring machine learning […]" (https://experiments.withgoogle.com/collection/ai). This familiarization helps users situate software in the experience of the world, it helps them develop emotional and cognitive relations with the alien agencies of software. It also helps make these AI systems palatable. The possible concerns about privacy, or the scary possibilities of deploying these systems in the world might be watered down by framing them as playthings.

Let me detail how playful relational strategies are structured: all software operates as rules and processes than run on data. In the case of conversational agents, the data is the voice commands as matched and evaluated with the natural language processing datasets stored remotely, which give the software the procedural capacity to "understand" what is being said. Play makes those rules and processes present for the user in a specific frame: conversational assistants understand jokes and puns, and they can provide responses that are funny and surprising. By interacting in playable ways, users understand what the rules of the software are, and what to expect from it. Play provides freedom to explore the possibilities of software and allows users to partially define their own goals for the interaction.

This positive side of play should not obscure the importance of understanding its negative uses. Experiencing software agencies as play can have negative effects. For example, the playful engagement with AI in the form of small, toy-alike experiences, might obscure the fact that these systems are designed to extract private data from users that can be commercialized without their consent. Furthermore, play is traditionally and culturally understood to be an activity with goals and consequences limited to the consensual experience of the world of play; consequences that are negotiable and freely accepted by players. When that same strategy is used to create interfaces and experiences that have potential non-negotiable effects, for example playful banking applications, or the Social Credit System in China, we ought to be aware of the potential ethical, social, and cultural risks of playing software. The dark side of playful relations with software is beyond the scope of this article, but a critical part of the research agenda proposed here.

Play helps identify the rules and processes of software as instruments so they can be explored in an appropriative, autotelic, separate activity not defined by productivity or the end results, but by the pleasures of the experience itself. By doing so, users learn to understand the limits of software, they develop modes of relating to its agency in the world, and they become attached to these technologies. Play can be designed for, to ease the way in which software inserts itself into human experience; play can also be a form of creative appropriation of the possibilities of software, redefining what software can do, and how people engage with it. Play and playfulness are a set of strategies based on the nature of play to specify how those relations are constructed and experienced.

Conclusions

In the closing chapter of *Homo Ludens*, Johan Huizinga warns the reader about the presence of "false play" in culture: "To be a sound culture-creating force this play-element must be pure. It must not consist on the darkening or debasing of standards set up by reason, faith, or humanity. It must not be a false seeming, a masking of political purposes behind the illusion of genuine play-forms" (Huizinga, 1971, p. 211). Written during the rise and apogee of European fascism, *Homo Ludens* laments the instrumentalization of the play drive and how it might be helping the collapse of forms of Western culture. Fuchs (2014) already observed that "[…] Huizinga's awareness that the materiality of the world was in direct conflict with his idealistic concepts" (p. 535). Huizinga was admittedly fascinated by the medieval and renaissance world of regulated contest. His words might sound like those of a conservative, and we need to question notions like "purity". And yet, all revisions of Huizinga's work need to pay attention to that closing warning.

The idea of play understood as a relational strategy to make sense of software and its role in society proposed in this article can help analyze how technology creates or shapes social and cultural relations. This concept of play also let us cast a warning. Play can be used nefariously. This article barely mentioned how play and playfulness are used to leverage the ways in which software can lead to forms of control. Future versions of this argument will apply the lens of play and playfulness to the analysis of the dehumanizing practices of "gamification" in Amazon warehouses, or even the Social Credit system in China. Through competition, points and rewards, totalitarian systems, from predatory corporations to states, can force people into behavioral change and activity control masqueraded as an allegedly pleasurable experience. The freedom of play can be used as a rhetorical patina on top of architectures of algorithmic

surveillance and control, so that users feel they are freely opting in the totalitarian panopticon. As Postman (2005) observed, we may be playing ourselves to death.

Play has historically been considered a positive force, one that entertained us, liberated us, helped create art and taught children about the world. But play can only be an engine of change and pleasure because it can become a harmful force. Play is a relational mode of being in the world, of making sense of things, of making sense of each other. These relations can also be imposed. In the Information Age, play can be used as a weapon for complacency, control, and submission. Only by critically addressing the role of play in our times we will be able to discern when we play, and when we're been played.

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