Automated State of Play

Rethinking Anthropocentric Rules of the Game

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Abstract

Automation of play has become an ever more noticeable phenomenon in the domain of video games, expressed by self-playing game worlds, self-acting characters, and non-human agents traversing multiplayer spaces. This article proposes to look at AI-driven non-human play and, what follows, rethink digital games, taking into consideration their cybernetic nature, thus departing from the anthropocentric perspectives dominating the field of Game Studies. A decentralised post-humanist reading, as the author argues, not only allows to rethink digital games and play, but is a necessary condition to critically reflect AI, which due to the fictional character of video games, often plays by very different rules than the so-called "true" AI.

Game AI: Of Illusions, Fictions, and Simulations

Two Greek painters allegedly competed with one another in order to create a perfect Aristotelian imitation of nature. Zeuxis, the first one, made an attempt to depict grapes as realistically as he could. And although his competitor Parrhasios immediately saw through the illusion, a flock of birds, by far less skilled observers, started to pounce the fruit. Parrhasios took up the challenge and presented Zeuxis with his own painting still covered with what seemed a veil. Once Zeuxis tried to take the veil off, he discovered it was indeed painted.

Friedrich Kittler evokes the above anecdote in *Optical Media* (2010: 38) to draw attention towards the deception of sensory organs and the degree to which such deception influenced the animal and the human. In the first case, according to Kittler, we are dealing with a first-level simulation, in the latter with a second-level one. But, simulation is a tricky term. Painting, writing or composition all manage to create deceptions by means of approximations and conventions, rather than simulations. This also becomes visible in an anecdotal account of Umberto Eco's alleged death. His friend Georgio Celli published a short story "How I murdered Umberto Eco" in the Bologna newspaper. Usually, everything published in a newspaper should be taken seriously, except for the instances of "artificial fiction" printed traditionally on page three, explains Eco (1994: 120). Not familiar with the

DOI 10.14361/dcs-2018-0112

convention, the readers understood the story in literal terms. A line demarcating fiction from truth turned out to be very thin.

Traditional arts, such as the above examples of painting and literature, merely produce illusions. Only technical media are able to deceive by means of simulation (Kittler 2010: 38). As fictitious spaces staged within the medium of a computer, video games[1] seem to be simulations by their very technical nature. And simulation is inexplicably linked to the process of automation, which relies on the use of a broadly defined Artificial Intelligence (AI). This diverse set of techniques and practices united under one capacious term may refer to "pathfinding, neural-networks, models of emotion and social situations, finite-state machines, rule systems, decision-tree learning", amongst many others (Mateas 2003).

Such a vague and encompassing definition of AI, "cobbled together from a grab bag of disparate tools and techniques" (Kaplan 2017), is highly problematic. For the purpose of this article then, let us assume a general working understanding of AI – expanding upon Seth Giddings (2005) – as referring to autonomous agents, autonomous behaviours of the game itself, or the capacity of the game's system to respond in meaningful and complex ways to the actions of the human player. The first two categories will become vital for the examples of automatic play to follow. The third one points to an important characteristic of AI to respond in a way that is understood and interpreted by humans as meaningful. Game AI creates the impression of a "living" self-governing game world, "... the sense that there is an entity living within the computer that has its own life independently of the player and cares about how the player's actions impact this life" (Mateas 2003). As players, we are tricked into believing that the game or in-game characters "think", "feel" or "play".

With regards to video games, as will become evident on the pages to follow, AI is a particularly problematic issue. Firstly it is so, because it largely tends to perpetuate the classical use of the term denoting a representational simulation of human actions and cognition, which this issue aims to challenge. Secondly, AI manifesting itself within video games is not necessarily concomitant with research into "true" AI, which supposedly "requires that the computer program or machine exhibit self-governance, surprise, and novelty" (Bogost 2017). These are the elements that separate AI from mere computational automation according to Bogost. Or to put it with Sherry Turkle, "true" intelligence is no longer calculated but expected to emerge (1996).

AI within the domain of video games plays by very different rules than AI within a non-fictional setting. In most entertainment video games it corresponds precisely to computational automation. It is the human that is supposed to be the governor of the game world, which should be responsive and surprising just enough to maintain the delicate balance needed to keep the player suspended

1 Video games are to a computer what film was to television, extending upon Kittler's argument on the content of the medium being always another medium (2010: 31).

in disbelief. What I would like to propose on the following pages then, is first to rethink digital games and play, shying away from the purely anthropocentric perspectives according to which humans are the sole active subjects and the game a mouldable object of their desire. I will start with a few examples of AI-driven automation of play, an interesting phenomenon pointing towards various games, in-game mods and practices, based on an illusion of the game's own agency. Questioning the anthropocentric rules of the game is proposed here as a necessary condition to think about the future of game AI based no longer solely on computational automation but on the emergent behaviour and hence unpredictability of the system. As I will argue, an implementation of a truly smart AI in fictional settings such as video games, requires a decentralised understanding of what a video game is and what roles human and non-humans play within it. Only by redefining the rules of the game, may we begin to rethink AI.

Play Automation: Bots, Mods, and Self-playing Games

The modern understanding of the term automation, deriving from Greek *autómatos (self-moving)* and of relatively modern 16th century origin, denotes a machine with a self-contained principle of motion (Truitt 2015: 2). A digital computer is in many ways precisely such a machine. Thus, most games, staged within the medium of the computer, involve some level of basic automation, such as calculating gathered props, lost lives, or the player's proximity to an enemy NPC. Unlike in board games, where all such computation needs to be done manually by the human player, in a digital game most of the processes are automated and hidden from the player's view. This type of automation is well known to an average gamer. What is much more mesmerising is the sort of automation bringing the "aesthetics of agency and control (or the loss of these)" (Giddings 2005) onto the representational layer. Many recent examples I will draw upon tend to partially or entirely automate those parts of gameplay, which have been until now reserved for humans. Think about movement-simulating bots, self-acting non-human agents, or game worlds changing without the direct input from the human player. Automation is expressed in the seemingly playful act of the machine.

As I am writing these words, *Everything* (2017) plays itself in the background, demanding from me no more attention and participation than a lazily humming Roomba robot vacuum cleaner. In David OReilly's open-ended simulation, the player can do literally everything and at the same time does not have to do anything at all. On the one hand, the game invites the player to a sandbox-like exploration of its universe, giving them the possibility to get into the shoes of every creature possible. On the other, if left unattended, the game starts playing automatically – "[o]ne might let *Everything* play in the background while doing other things, letting it be an ambient aquarium of universes" (Brewster 2017). This paradoxical practice of not-playing, but watching the game play itself has been gaining a wider attention in

the past few years, partially due to the emergence of such live-streaming platforms as Twitch, and partially due to the ever-changing attention span of the growing player base. However, if we reach beyond the veneer of consumer tastes and media frenzies, in the self-playing games and seemingly living virtual universes we may discover much older tropes of fascination with autonomous non-human agents. To watch *Everything* play itself is a curiosity-arousing experience, even though the game does not represent a true level of artificial intelligence.

Automation of play manifests itself also in the autonomous non-human agents traversing the game worlds. One of the most recent *Fallout 4* (2015) mods, Sim Settlements (2017), provides a very illustrative example of this. The mod makes non-player characters build their own housing, plant their own crops, even work in shops they themselves construct. The human player is welcome to the city-building algorithmic spectacle as a bystander or a delegating agent rather than an active performer. The non-player characters no longer wait for the player to micromanage them; instead, they metaphorically and literally take matters in their own hands, in a similar way to the delegated gameplay model known from god-simulation genres. The game world acquires a life-like dimension. As one of the mod's users emphasises:

> The buildings your settlers construct aren't cookie-cutter affairs: they're all a bit different, right down to the clutter that eventually appears inside them. This means just about every house and store your NPCs build will look unique. I was oddly pleased to see my companion Curie build herself a home out of a trailer rather than a wood or tin shack like everyone else had done. (Livingston 2017)

The mod automatically assigns citizen non-player characters (NPCs) to plots pre-selected by the player (e.g. farming, residential or industrial plots). Automation of gameplay has become a common practice in the modding community. A lot of other games come with mods based on progressive automation. One of them is *Minecraft*, in which the player can excavate the game's environment with the help of automatic miners, set up farms that will plant and harvest crops, or use crafting machines which will automatically craft the contents of the inventory.

Within an established genre of massively multiplayer online role-playing games (MMORPGs) "botting" has become a debatable practice. Many players tend to use the so called bots and macros (third party software) to partially automate gameplay, deskill the players (De Paoli 2013) and alleviate the repetitiveness of tedious tasks necessary in order to level-up the characters more efficiently. In many cases the practice is undesired by the game developers, especially when a game has a status or ranking mechanism built in. Blizzard banns the unfair use of smart bots automating the gameplay of *World of Warcraft*:

> We've recently taken action against a large number of *World of Warcraft* accounts that were found to be using third-party programs that automate gameplay, known as 'bots.' We're

committed to providing an equal and fair playing field for everyone in *World of Warcraft*, and will continue to take action against those found in violation of our Terms of Use. Cheating of any form will not be tolerated. (Blizzard's statement, 2015)

A similar reaction has affected gameplay automation enthusiasts in *Pokémon Go*, a multi-player augmented reality game, in which the players move in the real world in order to locate and capture virtual Pokémon creatures, visible on the screens of their mobile devices. Some players automate this tedious collection process, by using bots and other third-party software to send off alleged GPS locations, while not moving an inch in the physical world. Niantic, the game's developer, has been actively finding ways to eliminate this type of subversive gameplay or cheating:

Starting today, Pokémon caught using third-party services that circumvent normal gameplay will appear marked with a slash in the inventory and may not behave as expected. This is one small part of our continued commitment to maintaining the integrity of our community and delivering an amazing *Pokémon Go* experience. (Hernandez 2017)

Gameplay automation has also evolved into an entire game genre (Fizek 2018). In the so-called incremental ("idle") games, also referred to as passive, self-playing or clicker games, there is minimal or no active engagement required from the player in order for the game to progress. The initial stages of most idle games (e. g. *Automatic RPG*, 2015; *AdVenture Capitalist*, 2015) start with the player performing a simple task of clicking in order to gain more in-game currency (e. g. logs, coins, cookies etc.), which in turn allows them to acquire items or skills that automate most of the gameplay in the future. As the game unfolds incrementally, more options emerge and more tasks are automated. Idle games are semi-automated "ongoing, never-ending affairs" (Bogost 2010). Idle games do not exhibit a "truly" intelligent behaviour; their "liveliness" is based on the calculation of exponential and polynominal growth (Pecorella 2016). And yet from the player's perspective, they deliver quite an interesting experience, in which the game seems to be playing itself, progressing in the moments of the player's absence.

Post-human Player: Rethinking Anthropocentric Rules of the Game

Play automation has become a visible part of the ludic landscape. And although it does not rely on "true" AI, players nevertheless seem to find it quite an astounding experience, especially, if it involves representations of human-like figures, who virtually embody the performing algorithms, producing an illusion of a living agent in a dynamically responding world. The fascination with life-like capacities of virtual spaces resounds in the following words of the player:

> I can't remember when I first saw AI picking fights with each other [...] [but] the first time it happened, it was a minor moment of joy. Not because the enemy of my enemy is my friend, [...] but because it meant the game world wasn't all about me. (Rossignol 2012)

The above words express a moment of ludic epiphany: The game world wasn't all about me! These words open a much-needed discussion on the non-player centric perception of digital play, and the part of the human player within it. Humans are usually depicted as sole meaningful agents, deriving pleasure from control over the game. In most digital games, the role of the human player is to actively participate in gameplay, and that of the machine to enable, sustain, and facilitate play; record its progress and communicate the outcome to the player. In many of the examples mentioned above, the human becomes a witness to the system's alleged agency, and a delegator of play onto the algorithms (bots, mods, ludic system).

Interestingly, despite the growing agential dimension or the simulated "liveliness" of the ludic systems (although still rarely if ever involving "true" AI), the understanding of what digital games are and what it means to play them, still falls back to a large extend on anthropocentric narratives, placing the human player at the centre of the experience. The proverbial state of play in how digital games are perceived and defined reveals a very binary worldview: an active human player versus an acted upon non-human game. It is precisely this alleged subject-object boundary that is transgressed in digital game play as such (Giddings 2005), even more so in automated instances of play.

At a first glimpse, automation of play and "self-acting" AI seem like problematic parts of a puzzling paradox. After all, games have been primarily understood as objects to be actively engaged with, conflicts to be resolved, and meaningful actions to be taken (Huizinga 1949/2002; Caillois 1958/2001; Crawford 1982; Juul 2003; Salen and Zimmerman 2003). They are supposed to be ergodic, requiring a non-trivial effort from their participants, who in turn need to actively interpret the activity as a game for it to be considered one (Aarseth 1997; Aarseth and Calleja 2015). If anything else, games have been described as inherently interactive (Crawford 1982; Ermi and Mäyrä 2005), and oftentimes in contrast to non-interactive or less interactive media such as films or books, however problematic such oppositions may be. In other words, most digital games, staged in the medium of a computer, could be described as "explicitly participational" (Manovich 2001: 71). Of course all the above assumptions are made with regards to human players.

This paradox, however, does not have to express any conflict of interests. It rather opens the category of ludic agency towards non-human entities. Control over the game becomes an act of negotiation between human players and non-human actors, which lies at the core of how we interact with technology. Such a post-human (Braidotti 2013, Ferrando 2013) tone resounds in Alexander Galloway's definition of digital games, according to which they are not only the actions of human operators but equally so, those of machines (Galloway 2006). Even more so, of machines, which do not always act in response to human players, but inde-

pendently of them in the so called "ambience acts" of the machine – the moments when the digital game plays itself while waiting for the player to return and continue where they left off (Galloway 2006). As we have seen in all the variety of examples, the agential dimension of the machine becomes an ever more present part of gameplay. Therefore, it is crucial to take a closer look at such conceptions of agency, which take into account the interplay between the machine and the (human) player (Mukherjee 2008: 235).

By bringing AI-driven automation of play into the centre of discussion, I am following in the footsteps of non-human dimension of digital play, the subject of an extensive debate opened by Seth Giddings a decade ago, when he proposed to recognise technological agency and shy away from the anthropocentric assumption that agency resides solely in the human (Giddings 2005). Video games as instances of everyday techno culture, as such operate within the premises of digitality, technology, simulations and software. The digital and networked nature of the computer calls for a decentralised understanding of the player as an active agent. Post-humanist thought seems to be offering a promising perspective for games research in this respect. The subjectivity of the player is redistributed during gameplay into a post-human network of human and non-human bodies and agents (Stasieńko 2017). The idea of who the player is, is simultaneously shaped and expanded by the game itself – it rests between a technological interface and a represented fictional world (Keogh 2014).

It is an eye-opening act to look at the world from the perspective of a thing as Ian Bogost notices in *Alien Phenomenology* (2012). It is equally fascinating, if not necessary in order to understand digital play, to move beyond the human and look at the phenomena of gaming from the point of view of the game instead (Wark 2009: 223). The very fact that games entail AI, procedural generation, complex agential relations between the player and the avatar, mean that strict divisions into subject and object, activity and passivity need to be rethought. After all, the game's script is put into motion not only by the sheer agency of the human player but also AI scripts (Stasieńko 2017: 42) and the hardware.

Technology is an inseparable part of being human. It is more than a mere tool to achieve goals. This perspective of human-technological interconnectedness, named by Katherine Hayles as *technogenesis* (2011), manifests itself in the way digital games operate as human-non-human ludic entanglements, embodying the agential role of the machine. The digitality of computer games, as I have emphasised with Galloway and Giddings amongst others, turns them into almost unquestionable examples of techno genesis and post-anthropocentrism (Braidotti 2013). The examples of automated gameplay, which I have drown upon in the previous section, make the techno cultural, techno genetic and post-human dimensions even more pronounced. Digital games by their very nature break down the subject-object, organic-inorganic, and player-game dichotomies. They constitute ludic ensembles, "inter-species assemblages" (Dyer-Witheford, 2015) or "biological-technological-informational" collages (Stasieńko 2017: 44).

The post-human player may be thus described as a decentralised assemblage actor, sitting at the crossover of human and machine, with its circuit boards, cables, buttons and triggers, or the game engine's scripts running in the background. This is not to say that all the actors in this network possess the same qualities, motivations or intentionality, or that all of them are epistemologically equal. Human players are driven, immersed, or frustrated. AI and machine just are. And nevertheless, even in their non-intelligent or non-human form, they can shift the perception of our own place within the game.

From Modernist Computation to Postmodern Simulation

March the 9th 2016 marked a pivotal moment in the history of AI. The world held its breath for the longest second in the over 2,500 thousand-long history of the game of Go. The moment opened a seven-day long Google DeepMind Challenge, a human-machine battle, the first one of that kind since the acclaimed 1997 chess match between Deep Blue and Garry Kasparov. Lee Sedol, the world's second best Go player, also referred to as "The Strong Stone", embarked upon an emotionally draining quest to play the algorithm devised by a group of machine-learning scientists at the Google's Deep Blue company. Seven days later the South Korean grandmaster of Go, left the scene defeated by the AlphaGo 4–1.

AlphaGo has been learning from the behavioural patterns of 100.000 amateur human Go players, further replaying itself 30 million times and becoming stronger with every iteration (BBC Newsnight, 2016). This version of the algorithm was a big step in emergent AI, able to win a game, whose complexity far exceeds chess and is said to have more configurations than there are known atoms in the universe. The version, which in 2016 outplayed Lee Sedol, the winner of eighteen international Go titles, has been recently challenged by an even stronger opponent, its second successor algorithm trained by random self-play only, this time with no initial human input. AlphaGo Zero beat AlphaGo Lee 100 to 0. Google's team published their findings in *Nature*, proclaiming AlphaGo Zero as an algorithm achieving "superhuman performance" (Deep Mind). This statement, even when taken with a pinch of salt, is particularly interesting, taking into account the long history of automata, robots, and artificial life. Google's latest Go experiments bring to mind John von Neumann's visions of self-reproducing machines programmed to build themselves without the need of a human intervention (von Neumann, 1966). AlphaGo and AlphaGo Zero epitomise some of Licklider's (1960) speculations that machines may possibly outdo the human brain.

Interestingly, once decoupled from learning based on human performance, AlphaGo Zero developed its own creative strategies, differing from all the known moves played by humans in the last 2.500 years. This encouraged human players to see the Go board with new eyes and learn from the unusual repertoire of the AI's moves. As Andy Okun, the president of the American Go Association notices:

"… it actually may be kind of fun to explore the game with neural-network software, since it's not winning by out-reading us, but by seeing patterns and shapes more deeply" (Sample 2017). So, although historians of science have noticed a certain continuity of thought connecting the automata of Antiquity, Middle Ages and Enlightenment (Truitt 2015, Voskuhl 2013) with the robots of cybernetic modernity or the algorithms of post-modernity, the *modus operandi* behind AlphaGo seems to be resting on a much different presumption. AlphaGo Zero is not a "slavish type of machine" (Cohen 1967: 120–121), like chess-playing IBM's Deep Blue (1997) or Arthur Lee Samuel's Checkers-Playing Program (1959), both of which outplayed their human opponents by sheer force of calculation (relying on the Monte Carlo Search Tree algorithm) and still required the programmer to lay down the general strategy in advance (Cohen 1967: 120–121). AlphaGo and AlphaGo Zero did not need to calculate the moves, they learned how to play the game of Go based on the technique of reinforcement learning. The AlphaGo experiment has marked a cybernetic rite of passage "from modernist computation to postmodern simulation" to interpret it with Sherry Turkle (1996).

Smart Players, Automated Play and the Future of Game AI

Keeping the examples of automated play and AlphaGo in mind, we may ask ourselves whether video games are postmodern simulations or rather simulations in a pre-modern sense, implicating some sort of trickery and fakery (Riskin 2003: 605–606) achieved in most cases by calculation rather than emergent behaviour. Implementing AI capable of learning from the human players in a competition-based scenario could lead to an uneven match much like in the AlphaGo's case. And if AI within the fictitious context of games is designed predominantly to enhance the human player's experience (Lou 2017), too smart an AI could spoil the game. AI capable of learning is closely connected to unpredictability, a characteristic that most game designers would rather avoid. After all, games are understood as closed systems (magic circles if you will) with a finite set of rules and combinations derived from them.

However, as much as AI could potentially disrupt the carefully crafted balance between the human designer, the player and the game, it could also grant games the status of a truly new medium. One, which could summon illusions, not by means of narrative frames and conventions, moving frames, hyper realistic imagery or computed automation, but simulations based on an emergent behaviour of the ludic system.

Currently, such emergent behaviour with reference to video games may be observed for instance in competition-based strategy games. An OpenAI non-profit research company is testing a smart bot player against professional eSport players of *Dota* (2013), a multiplayer online battle arena video game. The *Dota* bot learns from scratch replaying itself, and in the end reached a level enabling it to improvise

in response to unfamiliar situations (OpenAI 2017). In a professional context, the implementation of a smart bot opens new ways of training human eSport teams, which may as a result develop new strategies unknown before, much like in the case of AlphaGo. The OpenAI team is planning to develop a next generation bot, which would be able not only to compete but to collaborate with human teams.

Automated play is a growing phenomenon, but most importantly a complex one. It encompasses a wide range of differing examples, from idling gameworlds, seemingly autonomous NPCs, player-automated characters, to smart self-learning bots. Although all of them illustrate a post-human dimension of digital games, they differ substantially not only in terms of specific AI techniques but more importantly in terms of varied contexts of their usage. And those contexts influence how the implementation of AI in games is perceived by human players. In some cases, in-game bots or automatic characters lead to the players' disappointment. The players who deploy AI in order to gain advantage over the game's system in online multiplayer games, are perceived as cheaters. In yet other cases, human players feel mesmerised by the capacity of the game's world and its artificial inhabitants to "live" independently of their actions, displaying a certain illusion of life (Mateas 1999). Depending on the context, humans either enjoy playing with AI or feel deceived when AI acts in favour of other human players, disrupting rules of fair play. More future work needs to be undertaken on the AI-driven automation aspect in games and virtual environments to find out how we interact with and perceive self-playing systems. These are just some of the daunting questions. Perhaps the automation of play marks an arrival of a new kind of ludic entertainment, placing much control in the hands of an algorithmic operator.

More importantly, the automatic players sketched on the above pages are conjured in the midst of the current ethical and socio-political debates on the automation of the everyday, its implications for society, and the ontological status of autonomous agents. Although games represent and simulate fictional environments, they "… are a key part of the shared culture from which one can begin – as laborious as it is playful – the process of creating a reflective and critical approach to the times" (Wark 2007). Thus, virtual game worlds may provide literally and metaphorically ample space to rethink AI and the modes of human-non-human co-existence and co-play.

Postlude

I would like to conclude with a short paragraph of speculative fiction to come back to the initial contemplations on illusions, fictions and simulations. Let's imagine two game designers, Klapaucjusz and Trurl[2], competing with one another in order to create a perfect simulation indistinguishable from reality; an illusion so close

2 Two inventors from Stanislaw Lem's short story "The Great Spanking" (1964).

to the original that the human players lose themselves in it utterly. Klapaucjusz designs a virtual reality and deceives the player's visual and haptic senses with a hyper-realistic 3D simulation of space. Trurl, emerging into the virtual world built by Klaupacjusz, can barely believe his eyes, his body submerged in an all-encompassing virtual reality. The deception is so precise, he almost fully suspends his disbelief until he realises the world spins all around and for him, displaying no signs of its own intentionality. The veil falls down. Trurl, on the other hand, instead of rendering a realistic depiction of reality, decides to thrust some unpredictability into the game world. Non-player characters learn to traverse the world and interact with it on their own terms regardless of the player's presence. Trurl summons a possible self-governing virtual reality independent of the player's choices, maybe even disobedient at times. Klaupacjusz enters the world and never leaves it. The Cave becomes reality and "if there is a difference, it may not be quite what it seems" (Wark 2007). Welcome to third-level simulation.

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