25

P
AD

—

POST-DOMESTIC
HABITAT

—

003

III. BIOGRAPHIES

MORE-THAN-HUMAN PERSPECTIVES

COHABITATION, TECHNOLOGY, ARTIFICIAL INTELLIGENCE

I

Extractivism, Gendered-Computing and Online Queer Spaces

The case of The Sims and Liquid Nitrogen Overclocking

Cyrus Khalatbari
EPFL, HEAD – Genève (HES-SO)
Orcid id 0000-0001-6976-9289

Guillaume Guenat
Université de Lausanne
Orcid id 0000-0002-7813-4602

Lucrezia Perrig
Université de Lausanne
Orcid id 0009-0007-0379-4693

Abstract
Bridging interior design with our Anthropocene shift and the eco-material implications of digital practices, our contribution focuses on two case studies that inform us about the sociocultural values embedded in technology. At the level of software, we first investigate *The Sims* video game: from its embedded representations around nature to the underlying gendered discourses behind its affiliation as a "girl's game". At the hardware level, we then follow practices of *liquid-nitrogen overclocking*: a form of extreme computer tuning and cooling. These two cases enable us to delve into two main axes we use to shed light on the materially and culturally situated nature of our day-to-day technologies. The first axis connects to the way we perceive and control nature: contextualizing our beliefs around nature as an infinite resource to control inside our software and hardware culture. Going further into the body of hardware/software practices of leisure and play, our second axes then shed light on the genderedness of these technologies. In these case studies, we explore how digital and material infrastructures of technology are not neutral but embody gender dynamics in their domestic and built spaces. Finally, we conclude by providing readers with alternative and queer perspectives on computing as methodological tools to deconstruct and distance ourselves from the gendered technologies we inhabit.

1. Introduction

In contrast to prevailing narratives and tropes surrounding the internet, this contribution explores how nature is controlled and depicted both offline and online. In opposition to ubiquitous "storylines" (Hajer, 1997) and digital metaphors such as the one of the internet "cloud" and "artificial" intelligence, the work contextualizes intersections and frictions between these technologies and our understanding of nature. These frictions are examined through three core aspects of the computing ecosystem: 1) human, 2) digital, and 3) material. Inspired by the open systems interconnection (OSI) model, our first section addresses humans as users and operators of hardware and software in daily life. By highlighting the omission of this cultural layer by the OSI, it sheds light on the politics at play between technology, nature, and gender. Contrary to the cloud metaphor inaccurately depicting computing as a seamless black box observed from afar, it contextualizes how these beliefs and dynamics are embodied within the core of our daily-used technologies. More specifically, it argues for a re-embodiment of our culturally-situated views and biases in the software and hardware ecosystem, approaching them as 'wicked' (Rittel & Weber, 1973) infrastructures inseparable from their culturally situated 'techniques of the body' (Mauss, 1973). The second and third sections introduce two case studies: where both software and hardware entangle with gender and cultural dynamics. In the second section, focusing on software, we delve into *The Sims* life simulation and video game. Dissecting underlying gendered values and dynamics within the game's domestic space, we draw parallels with gender dynamics and cultural views around nature in Western countries.

Transitioning to the physical infrastructure enabling digital activities to occur, the third section zooms in on a community of gamers and hardware enthusiasts known as liquid nitrogen overclockers. By examining their use of liquid nitrogen to competitively cool computer chips, we contextualize their perceptions and views of nature: as an extractive resource for our computational culture. Studying venues and fairs where they compete, we shed light on the gendered dynamics of computing culture and the market in which they operate. Finally, the conclusion guides the reader toward alternative and counter ways to engage with mainstream technologies and outline the importance of a queer culture of technology.

2. From Mainstream Worldviews to a Queer Culture of Computing

Outside of technology as a purely technical, neutral, and artificial set of objects, this first section introduces our digital spaces as culturally-situated apparatuses (Agamben, 2009): embodying specific views about nature and the sociocultural gender dynamics at play inside our western and european societies. In opposition to the ubiquitous metaphors and framing we introduced earlier, we argue that the environments these technologies produce and perform need a comprehensive assessment without dismissing the gendered form of violence they embody. Addressing this political aspect necessitates to recognise the capitalist (Moore, 2016), colonial (Ferdinand, 2019) and patriarchal (Di Chiro, 2017) dimensions of our contemporary globalized relationship with nature. A critical take on our computer and video gaming culture therefore means taking a multi-scalar point of action: think-

ing simultaneously about the degradation of biodiversity and the environment intensified by our extractive technical industries, gendered violence conveyed by screens and its mediated socially-situated technologies and practices (Haraway, 2015); and issues of post-coloniality surrounding the production of electronic waste.

In this paper, we explore the extent to which these computing practices are a salient illustration of our post-domestic revolution. We ask how, from domestic-spaces built across the digital to the physical, nature and its representations are commodified and gendered; inherently linked to the human socio-technical contexts and infrastructures that activate them. Mediating through screens and gestures in video games and in the gaming culture, technology acts as a vector for the production of meaning and subjectivity. Far from merely representing the reality we inhabit, it actively produces and reproduces bodily-gendered dynamics: shaping our relationships to the world and the way we inhibit it. In this infrastructure of practices and built-spaces arise a specific view of nature we argue as extractivist and colonialistic: perpetuating domination and power dynamics through the screen, its mediating interfaces and the body of gestures that it activates.

Drawing from the OSI model, our first point of analysis is the construction and development of synthetic nature in video games. Taking the example of *The Sims,* we shed light on the way the videogame industry reproduces specific gendered-narratives through the production of online domestic spaces.

Figure 1. Screenshot from *The Sims 4*. The sim can search for frogs in the backyard of his newly purchased house.

Figure 2. Screenshot from *The Sims 4*. Once captured, the frog can be exposed in the house, and give a decoration bonus to the sims' player. Source: Guillaume Guenat.

Whereas feminine identities have been socially and historically thought of as having an ontological proximity to nature, the sensitive, the disordered, but also matter as opposed to abstraction (Merchant, 1980). *The Sims* presents a paradoxical image, being simultaneously associated with femininity and portraying the domination of nature within the game. This dichotomy between woman/nature and man/culture is historically responsible for the epistemicide of women's knowledge about nature (Grosfoguel, 2013). It also has contributed to the rise of a Western modernity shaped by the pursuit of capital, colonization, and slavery (Federici, 2004). These characteristics of the Anthropocene are challenged by the dynamics found within *The Sims*. While mastering and controlling the environment as developed in other games like *Minecraft* or *World of Warcraft* appear as more masculine and connect to overall practices of extractivism, domestication of nature is in *The Sims* feminine: due to its aestheticization. The dramatic irony of this game lies in the fact that while it cuts women off from nature, and therefore responds to the patriarchal imperatives of the Anthropocene, women remain devalued (Fig. 3).

This extractivism and take of male-driven games such as *Minecraft* or *World of Warcraft* echoes with other practices of our computational culture located on the other side of the OSI: at the level of hardware. This case is explicit in gaming aesthetics and the world of electronic-sports (e-sports); where domestics spaces such as fairs, gaming arcades and interiors embody aesthetics of maximalism. These are reinforced by key heavily designed objects that are easily recognizable and federating a predominantly white male community: RGB-colored fans,

case mods, gaming chairs, and others. The gendered-nature of gaming domestic spaces is also explicit at the level of the clear division of roles and labor between males and females. With the case of the overclocking, it's complex PC-builds and cooling competitions with males as experts and females as cheering the public and carrying objects promoted by the company (Fig. 6), these practices and spaces contribute to a compartmentalized and deleterious binary distribution of roles that reinforce mainstream gendered-discourses and gaps around technology and its makers.

These iterative performative acts produce gender as a stable category and obscure its fictional dimension (Butler, 1993). The body is always already signified by a context of gender (as well as class and race) that is here both material and conceptual. This context starts from its initial ground: bodies. In the article and through the two following sections, we therefore invite the reader to analyze how bodies of technology are designed, perceived and vectors of a specific social and political order. Through *The Sims* or practices of liquid-nitrogen overclocking, this is represented in the way gamers represent themselves and nature through avatars and computerized graphics, how nature is extracted and used as an infinite resource in the context of cooling, or even how events celebrating our computational culture such as liquid nitrogen overclocking competitions involve a network of gendered physical interaction with computer hardware and the market.

Opposed to these mainstream views and socio technical embodiments of our computation culture, we argue that it is

possible to design and foster alternative representations. We propose then to consider a queer approach to videogames. This takes the form of exploring complex relationships between different species with non-anthropomorphized avatars for example. Drawing from Lehner (2017), we argue that this aesthetic subverts established conventions, helps emancipate the player and introduces spaces for reflection on ecological coexistence. Given that the definition of a game allows players to appropriate and change their objects, the interactivity of video games can implement anamorphic thinking, producing an apparent world of interrelated life forms, animated humans, animals, and plants.

This reflection exemplifies how, drawing from Haraway and her concept of the Chtulucene (Haraway, 2015), which feeds into the Anthropocene as a new dimension, games cultivating multi-species relationships demonstrate the importance of interconnections between humans, animals, and the environment. Moreover, her invitation to think of science fantasy or of games such as Cat's Cradle leads us to analyze how technological products can be complex, collective and open-ended (Haraway, 2016).

Finally, her concept of the cyborg serves as a reminder that the biological world is hybridized by our everyday technologized lives, highlighting the widespread destruction caused by patriarchal technoscience (Haraway, 1991). As it blurs the boundaries between humans and machines, between the public and the private, the cyborg perfectly illustrates the virtual post-domestic environment in which we are constantly immersed.

3. "A Girl's Game". The Case of The Sims

Video games simulate spaces that require interactions between players, game interactions and the game's environment and domestic spaces. In the context of the popular *Mario* video game series for example, turtles that are thrown or mushrooms ingested are all part of this simulated space. Across various games, these environments generally serve the same set of purposes: either used as an aesthetic component contributing to a pleasant experience; or as serving the narrative: such as when using the environment's resources to progress in the game (Chang, 2019). This resource-oriented characteristic of domestic spaces connects, as developed in the next section, to a broader computational worldview: the one of extractivism and maximalism developed by the gaming industry.From purely aesthetics to a more active role inside the game play and narrative, the video game industry develops domestic spaces as central inside the game's procedural authorship (Murray, 1997) and intentions. From Lara Croft's luxurious residence in *Tomb Raider* to *Resident Evil*'s stifling Spencer Mansion, game design is all about the construction of architectural narrative, to paraphrase Henry Jenkins (Jenkins, 2004).

However, two specific positionings of online domestic spaces across the different game genres emerge. The first, such as the Sims, are referred to as "cozy games": focusing on the construction of comfortable homes in an open-ended world and life simulations. The second, like *Minecraft* for example, are framed as "survival games": drawing from "ecocomposition" (Bohunicky, 2014, p. 222) proposing gamers build and grow shelters within resources previously gathered inside the

games' hostile nature and environment. We argue that they connect to broader worldviews of extraction: where nature, mediated through these domestic spaces, is portrayed as an infinite resource to exploit and control.

A seminal example of how simulated digital spaces appropriate domestic space is the series of life simulation video games *The Sims*, designed and developed by Maxis since 2000 and published by Electronic Arts. The four opuses of the series takes the form of "life simulators" where players are invited to create and manage *sims* avatars: creating and furnishing 3D spaces where these *sims* evolve along this open-endedness game. A core aspect structures the simulation: the ability of these avatars to unlock and develop financially and materially using *sims* money: mainly acquired by working, selling goods or activating cheat codes. In addition, players can also spend real money on objects and expansion packs.

The process and evolution of these *sims*' lives is supervised by their respective players, developing the domestic scale parameters of these avatars. By doing so, the game focuses on a 3D camera view from above: allowing players to have access to the real-time activity of their sims, and the in-progress design details of their rooms and households. With the underlying role of the simulation to build beautiful homes, the exterior environment of the house is also a key aspect *sims* can develop and expand on. Especially in the fourth game (Maxis, 2014), nature becomes a commodity players can acquire to expand the living areas of their *sims* and further develop their quest to build the best homes and living environments.

Without dedicated paid expansion packs,[1] however, nature is reduced to the surrounding neighborhood: from plants and flowers they can use to decorate their interiors or in their empty gardens (Fig. 1); to animals, they find next to their houses that they can domesticate as pets and even sell (Fig. 2).

Despite this open-mindedness and level of transgression[2] (Martey, 2022) the game offers, its embedded values and gameplay can be criticized for the way they connect to a capitalist culture that echoes with the white, American suburban middle-class idealized way of life (Sicart, 2003; Triclot, 2017). This embedded ideology is also structured around a specific narrative: the one of the self-made man/woman, starting from nothing and, through hard work and accumulation, rising from a modest dwelling to an opulent and delicately decorated villa. Circling back to the intersections between online domestic spaces and extractivism worldviews, this narrative sits at the core of our capitalistic society: approaching nature from an anthropocentric perspective and as a resource to conquer and optimize.

However, in opposition to the video game genre of survival games that share those characteristics, the Sims series is often referred to as "for girls": implying an *a priori* association be-

---

1   Expansion packs add more complexity to the game mechanics, especially in relationship with nature and the environment. The pack "Seasons" for example mimics the different cycles of our seasons. Other packs include "Cats and dogs" – unlocking pets –, and "Eco lifestyle": adding an eco-footprint around the sims' surrounding air pollution and trash management.

2   The vanguard, transgressive and open-ended nature of the game is tangible in multiple ways. For example, users can decide to kill their sims in the cruelest way possible. The game is also progressive at the level of its views on sexuality and sexual norms: with homosexuality normalized from the first edition and the possibility to embrace transgenderism and queerness in the latest versions of the game.

tween femininity, (digital) domestic environment design, and aesthetic organization of nature. This gender categorization translates into disparities of practices between men and women (Berry et al., 2021) and structures different gaming communities, reproducing *de facto* this categorization.

Hence, some predominantly male communities – especially active in various forums such as Reddit or 4Chan – consider the computer culture as a naturally masculine one (Maloney et al., 2022). In their discourses, they aim to sort and articulate video games around the value of difficulty (Coavoux, 2019) and between two genres: easy/casual and real hardcore. Their logic implies a hierarchy of interests, with feminized casual games being seen as "insignificant, frivolous, and a waste of time and money as opposed to masculinized hardcore games, which are viewed as important, serious, and worthy of investment" (Vanderhoef, 2013, p. 18). These two genres also embody different views and roles of nature. These follow a specific dichotomy: hostile and to domesticate in survival games, or to aestheticize for casual ones.

These gender dynamics created around the level of difficulty also connect to a broader quest for computing power and powerful PC builds, as expanded on in the following section. Here, the cartoonish and non-photorealistic visuals of the game orient a specific value: the one that the Sims, as more feminine, does not need any sophisticated hardware or special technical knowledge of computers. The narrative that the technical and material mastery of computing devices, considered a typically masculine skill (Coavoux, 2019), structures a hierarchy of interests

amongst game genres, is moreover spread around the gaming communities through viral memes such as on *TikTok* (Fig. 3).

The irony proceeds from the supposed inadequate use of the hardware and the software explained by gender. The *cliché* stands upon the game's gender association (girls play casual games) and the idea that gamer girls would not master the technical and material implications of video gaming, specific to "real" gamers. As such, the joke operates as an exclusion process of women from videogame culture by categorizing them as outsiders, or intruders of a masculine, technical, and material world.

Figure 3. Adam McG 8 second Tik Tok gathered more than 5 million likes. Unknown date. "This is the best purchase I've ever made", he says as The Sims 4 music plays. Source: https://www.tiktok.com/@_adammc2/video/7243478380509695259.

This shows how domestic spaces are both political territories and political imaginaries, embedded digitally and materially. The integration of computing technologies into households transforms domestic space in order to welcome new digital content and practices. They support the expression of cultural identities and they convey different postures and representation of the environment, strongly structured and differentiated by gender, blurring the separation between the inside and the outside.

4. Cooling Hardware to Its Limits: LN2 Overclocking

Clicks, comments, likes, upload connect to a hidden and energy-extensive infrastructure of cooling. In opposition to our minimalistic and seamless (Ratto, 2007) platforms overly simplifying how our data transmission performs, shedding light on this cooling infrastructure makes explicit the extractivism-oriented and environmentally-situated characteristics of our online implications. From Meta to Windows, Google and other key corporations of our day to day digital landscapes, these companies' data servers moreover share the same spatial configurations and design: they are surrounded and wired to complex infrastructures of water pipes. These pipes, displacing large quantities of water from often arid areas, have then core functions: maintaining water pools and reservoirs (Hogan, 2015) needed to cool cutting-edge hardwares[3] required to produce, maintain and optimize computing power.

---

3   Here, one object stands out: the graphical processing unit (GPU) accelerator chip. The GPU is, for our platform cultures, the crucial object that unlocks computing power: foundational for our practices of artificial intelligence (AIs), gaming and cryptocurrencies/blockchain.

These inherently eco-material (Taffel, 2022) characteristics of our digital culture echo with practices of hardware and gaming enthusiasts known as liquid nitrogen (LN2) overclockers. This practice extends from the term overclocking: used to describe activities that consist of increasing computers' speed and power. With the aim of overclocking their computers to the limits and starting from the fact that computers produce heat when they compute, this community of gamers explore the role of liquid nitrogen: as one of the coldest available gasses on the market. With liquid nitrogen, they open their machines and build custom-cooling rigs: pouring LN2 on their computer chips to run energy-extensive games and simulations (Fig. 4).
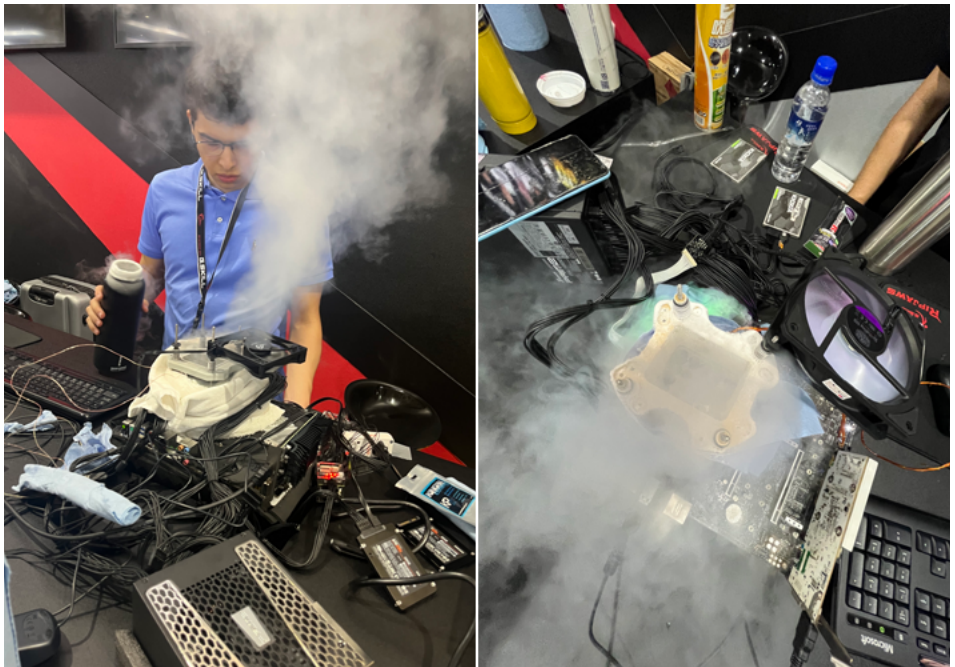
Figure 4. Liquid-nitrogen overclocker competing at the COMPUTEX2023 and pouring liquid nitrogen on the custom cooling rig (image on the right) placed on top of the PC build microchip he intends to cool down. Source: Cyrus Khalatbari.

With this gas one can easily find in specialized shops,[4] these gamers manually overclock their computers: reducing their machine's metal and silicon processes of heating. Liquid-nitrogen overclocking is not a solitary activity: it is a competition practiced in online forums and dedicated spaces. As a competition connected to electronic sports (e-sports), it has its own ranking systems, teams, venues and large amounts of cash-prizes.

With similar views than inside digital technologies and video-games, these practices of overclocking engage with nature in an extractive and minimalistic approach. This means therefore that, such as *The Sims* or *Minecraft* where nature is controlled – whether from a male or female perspective – producing these complex PC builds require nature to be controlled and monitored. This enacts a body of strategies and tools to cool down computer chips. In other words, these practices are not done in and by simply pouring the gas on the silicon; but with the help of a plethora of traditional tools, hacked-technical objects, complex (and sometimes, secret) *know-hows*. This control of nature is tangible at the level of one of the LN2 biggest challenges: condensation. Condensation, the natural process occurring when gas turns into liquid, is unavoidable: as it is produced by the gas that slowly evaporates once it is poured on the computer. Monitoring condensation is therefore of core importance in their builds: as it can quickly damage and even destroy computer's parts or the entire machine.

---

4   Amongst other industries, clockers purchase liquid nitrogen in shops/providers specialized in welding and medical equipment.

Figure 5. Hair dryer inserted by an overclocker into his cooling rig to reset the temperature of his build and avoid condensation. Source: Cyrus Khalatbari.

In order to better control nature and optimize its resources, overclockers then engage with a variety of techniques to make sure their builds. In this context, each overclocker has its preferences. Some, for example, use water-resistant Vaseline: that they put on their electronic circuits to isolate them from moisture. Others use hair dryers (Fig. 5), directly inserted in their cooling rig, as a way to quickly "reset" the temperature during their overclocking rounds. In order to rank their performances, overclockers engage in the same maximalist way with another technology: benchmarks. From *Cinebench* and *3DMark,* these are software they run on their machines to simulate graphically demanding games and sequences in order to output a series of numbers. With these numbers, they can then compare themselves and attempt to win various financial rewards or cash prizes (Fig. 6). Another core aspect of this practice emerges from the fact they compete in teams or *écuries*.[5] Just like Formula One or drag-racing, overclockers are sponsored and grouped by key microchips and GPU manufacturers and vendors - whether MSI, ASUS, or EVGA.

These characteristics make LN2 overclocking a competitive game carried by a spectacular infrastructure that echoes with other contests. Such as sports, LN2 overclocking has its stadium-like spaces: computer fairs where enthusiasts gather and federate. One of these spaces is *COMPUTEX2023.*

---

5   The term *écuries* comes here from French. It is used in Formula One to characterize the various car brands that provide the car and engine. Overclockers' competition have the same structure: with teams gravitating around microchip manufacturers.

Figure 6. Cash-prize of 10,000 US$ given to the winner of the COMPUTEX2023 overclocking competition. The overclocker is here in the middle, surrounded by a brand ambassador from Intel (left), the organizer of the competition (right), and the hostesses (background). Source: Cyrus Khalatbari.

Taking place each year in Taipei (Taiwan), this fair showcases a variety of local and international actors shaping our computing industry and culture: from computer brands to GPU, RGB keyboards, and gaming chair designers. In places such as *COMPUTEX* and others, technology is displayed in a gendered-way. In echo with values embodied in digital spaces at the level of various codes and ways to interact with nature, the spectacular dimension of overclocking is directed towards a male audience. Showcasing their builds and demos on stage, these predominantly male computer makers are celebrated: with large portraits and affiliations as well as broadcasting screens highlighting their various performances.

Figure 7. Hostesses parading in front of the COMPUTEX2023 public, carrying an RGB keyboard (left, in orange) and a GPU cooling device (right, in yellow).

Each time their scores get higher, canon-shaped smoke-machines are activated. In front of them a dozen hostesses dressed in flashy crop tanks and mini-skirts parade in order to keep the show running. Hired by manufacturers, these hostesses welcome visitors with the latest gaming hardware products available on the market (Fig. 7).

5. Conclusion

Queer studies' focus on relations of power and resistance offers an analysis of games as systems, both playful and political.

Rather than limiting itself to the study of a game's narrative and rules, this research interrogates the queer implications of the materiality of its device, its code, as well as the individual experiences of non-normative subjects as they play. Adopting queer analytical tools in games enables us to go beyond both narratological and ludological approaches.

The narratological one is centered on story, thought of *a priori* as a temporal construction of discrete units that are both modal and thematic: different game units (characters, objects, environments, etc.) are designed to function according to different modes, endowed with characteristics, rules and interaction possibilities. And the ludological one is centered on gameplay. Queer tools invite us rather to adopt a meta-hybrid approach that actively deconstructs these methodologies themselves. The idea is not simply to choose between these two approaches, but to challenge and go beyond them to create something new (Burrill, 2017). Thinking of the body and play material as gendered insofar as they mediate a gaming experience and are its very condition of possibility (Bagnall, 2017) enables this overcoming because both are involved in both digital and real-life work, playing a crucial role in the creation, development, manufacturing, distribution, consumption, and dissemination of games and material products.[6] To distance ourselves from unthinking and disembodied masculinity, this contribution on gender and video games

6   Chun (2011) for instance observes that game controllers featuring at least one analog stick inscribe games and players in phallocentric logics and perpetuate the amalgam between the materiality of games and masculinity (as opposed to software and femininity).

firstly examines the technological discourses and practices on nature that contribute to nourishing an androcentric conception, and secondly, how images refer to a feminized nature, the thought of exclusively as a setting and a resource.

References

Agamben, G. (2009). *"What Is an Apparatus?" and Other Essays*. Stanford University Press. (Original work published 2006).

Bagnall, G. L. (2017). Queer(ing) Gaming Technologies. Thinking on Constructions of Normativity Inscribed in Digital Gaming Hardware. In B. Ruberg, & A. Shaw (Eds.), *Queer Game Studies* (pp. 135–145). University of Minnesota Press.

Berry, V., Boutet, M., Colón de Carvajal, I., Coavoux, S., Gerber, D., Rufat, S., Minassian, H. T., Triclot, M., & Zabban, V. (2021). *La fin du game? Les jeux vidéo au quotidien*. Presses Universitaires François-Rabelais. https://books.openedition.org/pufr/20077

Bohunicky, K. M. (2014). Ecocomposition. Writing Ecologies in Digital Games. *Green Letters, 18*(3), 221–235. https://doi.org/10.1080/14688417.2014.964283

Burrill, D. A. (2017). Queer Theory, the Body, and Video Games. In B. Ruberg, & A. Shaw (Eds.), *Queer Game Studies* (pp. 25–34). University of Minnesota Press.

Butler, J. (1993). *Bodies That Matter. On the Discursive Limits of "Sex"*. Routledge.

Chang, A. (2019). *Playing Nature. Ecology in Video Games*. University of Minnesota Press.

Chun, W. H. K. (2011). *Programmed Visions. Software and Memory*. MIT Press. https://doi.org/10.7551/mitpress/9780262015424.001.0001

Coavoux, S. (2019). *Jeux vidéo, sociologie d'un loisir de masse*. La vie des idées. https://laviedesidees.fr/Les-jeux-video-sociologie-d-un-loisir-de-masse

Di Chiro, G. (2017). Welcome to the White (M) Anthropocene? A Feminist-Environmentalist Critique. In S. MacGregor (Ed.), *Routledge Handbook of Gender and Environment* (pp. 487–505). Routledge.

Federici, S. (2004). *Caliban and the Witch. Women, the Body and Primitive Accumulation*. Autonomedia.

Ferdinand, M. (2019). *Une écologie décoloniale. Penser l'écologie depuis le monde caribéen*. Média Diffusion.

Grosfoguel, R. (2013). The Structure of Knowledge in Westernized Universities. Epistemic Racism/Sexism and the Four Genocides/Epistemicides of the Long 16th Century. *Human Architecture: Journal of the Sociology of Self-Knowledge*, *11*(1), 73–90. https://www.niwrc.org/sites/default/files/images/resource/2%20The%20Structure%20of%20Knowledge%20in%20Westernized%20Universities_%20Epistemic.pdf

Haraway, D. (1991). A Cyborg Manifesto. Science, Technology, and Socialist-Feminism in the Late Twentieth Century. In D. Haraway (Ed.), *Simians, Cyborgs and Women*. *The Reinvention of Nature* (pp. 149–181). Routledge.

Haraway, D. (2015). Anthropocene, Capitalocene, Plantationocene, Chthulucene. Making Kin. *Environmental humanities*, *6*(1), 159–165. https://doi.org/10.1215/22011919-3615934

Haraway, D. (2016). *Staying With the Trouble. Making Kin in the Chthulucene*. Duke University Press.

Hajer, A. M. (1997). *The Politics of Environmental Discourse. Ecological Modernization and the Policy Process*. Oxford University Press.

Hogan, M. (2015). Data Flows and Water Woes. The Utah Data Center. *Big Data & Society, 2*(2). https://doi.org/10.1177/2053951715592429

Jenkins, H. (2004). Game Design as Narrative Architecture. In N. Wardrip-Fruin, & P. Harrigan (Eds.), *First Person: New Media as Story, Performance, and Game* (pp. 118–130). MIT Press.

Lehner, A. (2017). Videogames as Cultural Ecology. Flower and Shadow of the Colossus / Videojuegos como ecología cultural. Flower y Shadow of the Colossus. *Ecozon@. European Journal of Literature, Culture and Environment*, *8*(2), 56–71. https://doi.org/10.37536/ECOZONA.2017.8.2.1349

Maloney, M., Roberts, S., & Jones, C. (2022). 'How do I become blue pilled?'. Masculine ontological insecurity on 4chan's advice board. *New Media & Society, O*(0). https://doi.org/10.1177/14614448221103124

Martey, R.M. (2022). The Sims 4. In D. Arsenault, K. Boudreau, B. Perron, & M.J.P. Wolf (Eds.), *Fifty Key Video Games*. Routledge. https://doi.org/10.4324/9781003199205

Mauss, M. (1973). Techniques of the Body. *Economy and Society, 2*, 70–88. https://doi.org/10.1080/03085147300000003

Merchant, C. (1980). *The Death of Nature. Women, Ecology, and the Scientific Revolution*. HarperCollins.

Moore, J. (Ed.). (2016). *Anthropocene or Capitalocene? Nature, History, and the Crisis of Capitalism*. Pm Press.

Murray, J. (1997). *Hamlet on the Holodeck. The Future of Narrative in Cyberspace*. MIT Press.

Ratto, M. (2007). Ethics of Seamless Infrastructures. Resources and Future Directions. *The International Review of Information Ethics*, *8*, 20–27. https://doi.org/10.29173/irie93.

Rittel, H.W.J., & Webber, M.M. (1973). Dilemmas in a General Theory of Planning. *Policy Sciences, 4*(2), 155–169. https://doi.org/10.1007/BF01405730

Sicart, M. (2003). Family Values. Ideology, Computer Games & Sims. In *Digra 03, Proceedings of the 2003 DiGRA International Conference: Level Up, 2.* http://www.digra.org/digital-library/publications/family-values-ideology-computer-games-sims/

Taffel, S. (2023). AirPods and the Earth. Digital Technologies, Planned Obsolescence and the Capitalocene. *Environment and Planning E. Nature and Space*, *6*(1), 433–454. https://doi.org/10.1177/25148486221076136

Triclot, M. (2017). *Philosophie des jeux video*. La Découverte/Poche.

Vanderhoef, J. (2013). Casual Threats. The Feminization of Casual Video Games. *Ada. A Journal of Gender, New Media, and Technology, 2.* https://scholarsbank.uoregon.edu/xmlui/handle/1794/26294

BIOGRAPHIES

Elena Baharlouei
She graduated in Interior and Spatial Design at Politecnico di Milano. She has been Design Intern at Labirint - Laboratory of Innovation and Research on Interiors - Department of Design, Politecnico di Milano. Former Designer at Fluid Motion Architects.
elena.baharlouei@mail.polimi.it

Nicolas Bailleul
Since October 2020, he's a PHD candidate at the AIAC Laboratory (University Paris 8), under the supervision of Patrick Nardin (MCF) and co-supervision with Gwenola Wagon (MCF). Title of the thesis: *The Bedroom. A Space of Contained Creation*. Through the creation of documentary films, installations, and performances, his work is defined by the use, appropriation, collection, and exploration of platforms, virtual worlds, connected spaces, and the web's uncertain logics and geographies. By attempting to concretely depict what unfolds in supposedly unreal, invisible, and inaccessible places, he aims to bring forth contemporary issues related to creation, sociology, economy, and ecology.
bailleul.n@gmail.com

Anna Barbara
She is Associate Professor in Architecture and Interior Design at Design Department, Politecnico di Milano. President of POLI.design; Member of the Board of Directors of the World Design Organisation; Co-founder of the Global Design Futures Network; Scientific coordinator (with Venere Ferraro) of the D\Tank, Design Department, Politecnico di Milano.
Graduated in Architecture at Politecnico di Milano, she taught at Tsinghua University, Academy of Art and Design, Beijing (China); Kookmin University, School of Architecture, interior Design and at Master Brain 21 (South Korea); and in universities in USA, France, Thailand, Brazil, Jordan, UAE, India, etc.
She was Foundation Fellow 2000 at Hosei University in Japan, Special Mention of Borromini Prize 2001, selected by Archmarathon 2018, selected ADI-Index 2019, 2023, Special Mention Fedrigoni Top Award – Large Format Communication, 2023; Eccellenze della Lombardia 2019, 2023.
anna.barbara@polimi.it

Michela Bassanelli
Ph.D., she is an Assistant Professor in Interior Architecture and Exhibition Design at Department of Architecture and Urban Studies, Politecnico di Milano. Her research focuses on domestic interiors, museography and exhibition design, and practices of disseminating collective memory through a multidisciplinary theoretical approach. Among her publications: *Abitare oltre la casa. Metamorfosi del domestico* (ed., 2022); *Covid Home. Luoghi e modi dell'abitare, dalla pandemia in poi* (ed., 2020); *Oltre il memoriale. Le tracce, lo spazio, il ricordo* (2015).
michela.bassanelli@polimi.it

Gerhard Bruyns
He is an architect and urbanist and an associate professor of Environment and Interior Design at the Hong Kong Polytechnic University School of Design in Hong Kong. He is the PhD coordinator, the Deputy Specialisation Leader of Transition Environmental Design, and the Discipline Leader of Environmental and Interior Design.
He holds a PhD and MSc from TU Delft, the Netherlands. His research deals with the aspects of spatial forms and how typologies of use impact behaviour through the formal expression of space. This relates to the societal conditions of cities whose landscapes are compressed by speculation and excess. He has published research in journals, conferences, and edited volumes, with the most recent being a Springer-published editorial collection on Design Commons.
gerhard.bruyns@polyu.edu.hk

Ece Canlı
She is a researcher and artist whose work intersects body politics, design performativities and gendered reproduction of material regimes. She holds a PhD in Design from the *University of Porto* (PT) and is a founding member of the *Decolonising Design Group*. She is currently a full-time researcher at *CECS (The Communication and Society Research Centre)* in the *Cultural Studies* cluster at the *University of Minho* (PT) where she investigates spatial, material and technological

conditions of the criminal justice system, queer incarceration, penal design and abolition feminism. As a researcher and educator, she lectured and published internationally on queer materialities, critical making and penal design.
She is a member of the *Carceral Geography Working Group (CGWG)* (UK), *AtGender* (NL) and SOPCOM (PT) research entities. As an artist, she works with extended vocal techniques and electronics, producing sound for staged performances, exhibitions and films both in collaborations and as a soloist.
ececanli@ics.uminho.pt

António Carvalho
PhD degree in Architecture with a thesis on housing design for older people. Associate professor at Politecnico di Milano, where he teaches how to design inclusive and age-friendly environments. His research interests are age-friendly housing, intergenerational spaces, inclusive environments, shared urban space, universal design, neighborhood green spaces, placemaking. Antonio Carvalho is an awarded practising architect and urban designer who runs his own architectural practice in Lisbon since 1988, with extensive built work in Portugal.
antonio.dasilva@polimi.it

Tianqin Chen
PhD candidate at AUID, Politecnico di Milano, her research interest is focused on the age-appropriate architectural design in Covid-19 era.
tianqin.chen@polimi.it

Veronica Ching Lee
She is a Hong Kong born interior and architectural designer and researcher. With an MSc in Architecture from the TU Delft, and a BA in Environment and Interior Design from The Hong Kong Polytechnic University, her research background and interest lies in urban interiority and the negotiation of territories from an interdisciplinary approach. Her master thesis *The interior is the exterior; the exterior is the interior* deals with the negotiation of territories between the *public* and the *private* in the hyperdense city of Hong Kong, seeking a theoretical approach to redefine and understand the complex relations between inhabitants and the collective urban city. Her PhD research extends the discussion of the master thesis and further challenge the conventional concepts of interiority and exteriority and the public-private dichotomy from a perspectivist approach.
veronica-ching.lee@connect.polyu.hk

Sofia Cretaio
PhD student in Management, Production, and Design at the Polytechnic of Turin. Her research focuses on using data to innovate spatial and organizational dynamics in the workplace, fostering safety and sustainability. She has a Master's Degree in Systemic Design and she is a member of the Innovation Design Lab and the Graphicus magazine.
sofia.cretaio@polito.it

Davide Crippa
He is a senior researcher at Università Iuav di Venezia, where he is also director of the Master in Innovation Design Management. He obtained a PhD in Architecture and Interior Design in 2007 and has taught at the Milan Polytechnic and the New Academy of Fine Arts in Milan. Head of the ADI designer commission until 2012, he writes articles and publishes books on theory and criticism of the project, always projecting his attention towards constantly evolving scenarios.
In 2004 he founded Ghigos studio and, since then, has carried out both theoretical research and projects awarded in international competitions. In particular, he is now investigating the potential of interaction design and new digital fabrication technologies from a circular economy perspective.
dcrippa@iuav.it

Jiarui Cui
He is a PhD candidate, Department of Architecture and Urban Studies at Politecnico di Milano, Italy. With a background in architecture and interior design, Jiarui has pursued academic research and practical projects in both China and Italy, providing a rich, cross-cultural perspective on spatial design and urban development. His primary area of research focuses on the *Pro-*

ductive Environment, specifically exploring the redefinition of spaces designated for production in a contemporary context. Through his studies, Jiarui aims to unravel the complexities of how spatial configurations and urban designs influence, and are influenced by, the evolving nature of production in modern societies. His hands-on experience in architecture and interior design projects enhances his academic inquiries, offering practical insights into the theoretical frameworks he examines. Jiarui's interdisciplinary approach leverages both qualitative and quantitative methods, blending architectural design, urban studies, and sociocultural analysis.

jiarui.cui@polimi.it

Silvana Donatiello

She is a research fellow in Industrial Design at University of Naples Federico II. Her research focuses on ecological transition, with a specific focus on social design, Nature Based Solutions, digital manufacturing and community-based systems. She has a Bachelor's Degree in Architecture and an international Master's Degree in Design for the Built Environment from the University of Naples Federico II. She has been a visiting student at the University of Applied Sciences Fachhochschule Potsdam, Germany.

silvana.donatiello@unina.it

Daniel Elkin

He is a researcher and designer specializing in spatial agency research, agency driven design, and housing science. He is an associate professor and the Deputy Discipline Leader of the Department of Environment and Interior Design at The Hong Kong Polytechnic University School of Design. Educated at Cranbrook Academy of Art (MArch) and the University of Cincinnati (MArch, BSArch), Mr. Elkin's career spans between sociological research, architecture, product design, and activism. Elkin has established scholarship in spatial agency research and housing science, branches of social and spatial research concerned with individual and collective decision making, particularly regarding housing acts and artifacts.

daniel.k.elkin@polyu.edu.hk

Raffaella Fagnoni

She is full professor of Design at Università Iuav di Venezia, where she teaches design laboratories and civic space design. She also directs the PhD school in Science of Design. She has lectured abroad, in Iran and China, and has coordinated local and international research groups, both public and privately funded. Her research topics focus on design for social impact, service design for public interests, social innovation, reuse and recycling, and design for sustainability, with the aim of intervening in emerging issues through active stakeholder involvement and the enhancement of local heritage. She is focused on the ongoing role of design in contemporary society, considering environmental emergencies and the state of alert in which our planet finds itself, working on the circular economy, local territory, waste recovery, and care for people and habitats.

rfagnoni@iuav.it

Mariarita Gagliardi

She graduated with honours in the international master's degree DBE Design For The Built Environment at the University of Naples Federico II. She is currently a full-time research fellow in industrial design at the University of Naples Federico II. She is specialised in the field of digital manufacturing and and parametric design, participating in several international workshops. Her research topics focus on the field of Nature-Based-Solutions (NBS) and IoT (internet of things).

mariarita.gagliardi@unina.it

Vanessa Galvin

She is a lecturer in the Department of Interior Architecture at the School of Design and Built Environment, Curtin University. She completed her PhD in Architecture: History and Theory at the University of Western Australia. Her dissertation is theoretical, and it adopts a Foucauldian approach to the history of the domestic interior. The research extends to questions of inhabitation that include notions of subjectivity and the processes of self-formation as they relate to the built environment. In addition, her research often explores the counter-positioning of fictional and imagined regimes against empirical bases for understanding and managing domestic environments.

v.galvin@curtin.edu.au

Guillaume Guenat

He is a PhD student at the Institute of social sciences at UNIL, where he's working on a thesis about the social History of video games practices in Romandy, directed by Prof. Gianni Haver. Graduated in political science, he focuses his research on the social, political and historical dimensions of leisure, games, media and images.
guillaume.guenat@unil.ch

Cyrus Khalatbari

He is an artist, designer and PhD candidate of the joint program between the Geneva Arts and Design University (HEAD – Genève, HES-SO) and the Swiss Federal Institute of Technology (EPFL). Inside his PhD, Cyrus' bridges ethnographic fieldwork, Science and Technology Studies (STS) with arts and design methodologies in order to address, at the level of the Graphical Processing Unit (GPU), the ecological implications of computing power and the digital.
cyrus.l.khalatbari@gmail.com

Nicholas Thomas Lee

PhD, Architect MAA, he is an Assistant professor at the Institute of Architecture and Design, Royal Danish Academy – Architecture, Design, Conservation. With an academic and professional background in both architecture and design, his research interests occupy the fertile domain between these disciplines, with a particular focus on domestic architecture. He is specifically concerned with *In-between places* within, thresholds between, and the morphology of domestic land-scapes. As a core scholar at *STAY HOME* and the Center for Interior Studies, his post doctorial research project, entitled *Dwelling in a Time of Social Distancing,* examines the unprecedented demands that the Covid-19 pandemic has placed on the private home and its architectural arrangement. He actively works with a *Research by Design* method, whereby architectural installations and exhibitions are central to both knowledge production and dissemination.
nlee@kglakademi.dk

Jacopo Leveratto

PhD Architect, he is a senior lecturer at the Department of Architecture and Urban Studies of Politecnico di Milano, where he focuses his research on radical forms of habitability and posthuman architecture. Local Principal Investigator of the European Research *en/counter/points* (2018-22) and head of Walden Architects during the last Seoul Biennale on Architecture and Urbanism (2021), he is now a coordinating member of the Italian National Biodiversity Future Center (2022-25), and the National Coordinator of the research project PRIN *DT^2* (2023-25).
Besides having authored numerous publications in peer-reviewed journals and edited volumes, he published *Posthuman Architectures: A Catalogue of Archetypes* (ORO Editions, 2021).
jacopo.leveratto@polimi.it

Andrea Navarrete

She recently gained a doctoral degree from the School of Design at The Hong Kong Polytechnic University. Her research focuses on the promotion of autonomy and decoloniality through design. After graduating from a bachelor of Industrial Design in Mexico – where she investigated design's impact and its possible future within a Latin American context – she realized that the role of design in the ruling economic dynamics promotes unsustainable ways of production and con-sumption, leading her to study a MA in Social Design & Arts as Urban Innovation in Vienna.
She has worked with participatory processes through design workshops, creating synergies toward endogenous forms of development, design and autonomy.
andrea.navarreterigo@connect.polyu.hk

Lucrezia Perrig

She holds a Bachelor's degree in philosophy from Saint Louis University, and a Master's degree in political science from Lausanne University. She wrote a dissertation on visual arts students' relationship with politics, and then spent two editions of the feminist festival Les Créatives in Geneva, where she co-wrote a guide to gender equality in culture.
lucrezia.perrig@unil.ch

Vera Sacchetti

She is a Basel-based design critic and curator. She specializes in contemporary design and architecture and serves in a variety of curatorial, research and editorial roles. Recently, she co-founded *Fazer*, a new design magazine in Portugal; co-initiated the *Design and Democracy* platform (2020–); and served as program coordinator of the multidisciplinary research initiative *Driving the Human: Seven Prototypes for Eco-social Renewal* (2020-2023). Sacchetti teaches at HEAD Geneva and Design Academy Eindhoven, and in 2020 joined the Federal Design Commission of Switzerland.
vera.vilardebo-sacchetti@hesge.ch

Paolo Tamborrini

Full professor in Design, in 2015 he co-founded the Innovation Design Lab. He has coordinated numerous research in the field of design and communication for sustainability. He is the director of "Graphicus - designing communication", a magazine that tells the world of communication involving authors of distant but connected disciplines.
paolo.tamborrini@unipr.it

Annapaola Vacanti

She is a junior researcher at Università Iuav di Venezia, where she teaches in design laboratories for the curricula of Product design and Interior design of the master degree design courses. She obtained a PhD in Design at the University of Genoa in 2022. Her research focuses on Interaction Design and the opportunities offered by data-driven tools and Artificial Intelligence for design, exploring the challenges that lie at the intersection between technology, human factors, and sustainability issues. She is working within the iNEST (Interconnected Nord-Est Innovation Ecosystem) project, funded by the National Recovery and Resilience Plan (PNRR). Alongside her academic career, since 2018 she has been art director and organizer of TEDxGenova, an autonomous event operating under official TED license for the local dissemination of valuable ideas.
avacanti@iuav.it

Jingya Zhou

PhD candidate at AUID, Politecnico di Milano, her research interest is focused on curability and impact of architectural space design on depression in older people.
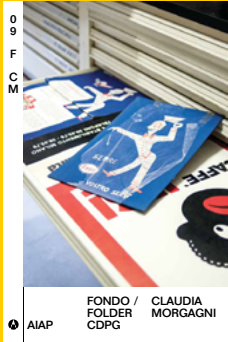jingya.zhou@mail.polimi.it

Progetto Grafico
From 2003, the only Italian magazine totally dedicated to graphic design

AWDA
The International AIAP Women in Design Award

CDPG Folders
Booklets dedicated to the AIAP's Archives Funds and personalities of Design History.

CAMPO GRAFICO 1933/1939
The Birth of Graphic Design

AIAP PUBLISHES BOOKS, MANUALS, POSTERS, A MAGAZINE AND A JOURNAL. GRAPHIC DESIGN, COMMUNICATION DESIGN, DESIGN.

aiap.it/libreria/

AIAP EDIZIONI

MUSEO
DELLA
GRAFICA
AIAP
CDPG

FATE SPAZIO!
STIAMO
PER USCIRE.

Aiap CDPG, the *Graphic Design Documentation Centre*.
Working to collect, catalogue, archive, enhance and promote any documents related to graphic design and visual communication. These documents (originals as well layouts of projects, books, posters, prints, catalogues, correspondence, photographs) help reconstruct the history of graphic design in Italy and support research and educational activities, as it is the CDGP's intention to make these documents widely available.

aiap
CDPG

AIAP
associazione italiana design
della comunicazione visiva