Pygmalion Displacement: When Humanising AI Dehumanises Women

Abstract

We use the myth of Pygmalion to investigate the relationship between women — or, more broadly, the feminised — and artificial intelligence (AI). Pygmalion was a legendary king who, repulsed by women, sculpted a statue, which was imbued with life by the goddess Aphrodite to become his wife. This can be seen as a primordial AI-like myth, foreshadowing many more (real or fictional) instances of women being replaced by automata or, more recently, computers and algorithms. Through a systematic analysis of fictional and non-fictional cases, historical and contemporary, we develop and apply a lens that makes this under-examined pattern — which we dub Pygmalion displacement — visible. Here we also discuss how the Turing test, a foundational thought experiment in AI, relies on Pygmalion displacement in an unacknowledged way. By tracing the ongoing entwinement of femininity and AI, we aim to understand and begin to mitigate how AI serves capitalist patriarchal ends.

Keywords: artificial intelligence, computers, feminism, Pygmalion, sexism.

1 Introduction

> That brain of mine is something more than merely mortal; as time will show; (if only my breathing & some other et-ceteras do not make too rapid a progress towards instead of from mortality).
>
> Augusta Ada King, Countess of Lovelace (personal correspondence, July, 1843; Toole et al. 1998, p. 186)

This paper traces the technological devaluation of women throughout Western history, in fiction as well as in real events, with a specific focus on artificial intelligence (AI). We argue that this history shows a pattern in which the dehumanization of women as/and/or feminised subjects on the one hand, and the humanization of AI on the other hand, have been mutually constitutive. In other words, this pattern traces not merely replacement, but *displacement* of women by technology, through which women have been — and continue to be — harmed in various ways. This paper presents a lens that can be used to make this pattern, and these forms of harm, clearly visible. We dub this tool *the Pygmalion lens*, after a mythical king of Cyprus who created and married an automaton-like statue, later named Galatea (see Figure 1), to avoid associating with real women (Mayor 2018). The statue goes so far as to bear his child, fulfilling the required sexual and gendered role of women from a patriarchal perspective.

The lens that we develop here comprises ten questions designed to help us assess if, and to what extent, women, the female form as seen through capitalist patriarchy (viz. Eisenstein 1979), and/or the feminine generally, are harmed through displacement by proto-AI, AI-like, or contemporary AI technologies (see Table 1). We call this specific pattern of sexist harm, whereby the humanization of AI and the dehumanization of women/the feminised go hand in hand, *Pygmalion displacement*. With this work, we aim to both build on and synthesize previous research on sexism and AI, and to offer a tool that may guide and focus future work.

Artificial intelligence is a catch-all phrase for a) a specific perspective on intelligence, in which the proponents commit minimally to the possibility that human-compatible, -like, or -level intelligence in domain-specific and domain-general contexts can be captured using non- or quasi-biological engineered systems (cf. Monett 2021; McCorduck 2019), b) a broad transdisciplinary field of science and engineering that is oriented towards (re)creating, (reverse) engineering, or understanding intelligence or intelligent-like behaviour, and c) the collection of technologies and scientific objects produced by that field (viz. Crawford 2021). In this work, we use AI in all three interwoven senses, as we propose a critical lens that spans the field of AI, the fruits of AI, and the beliefs held by AI practitioners. To this point, the authors are not anti-AI as a discipline nor as an ideological stance in the abstract. Many of the products and scientific contributions of computational sciences,[1] and AI specifically, are both acutely enriching our daily lives, as well as central to (furthering) our academic interests. Importantly, however, we wish to highlight specific patterns that appear to echo through the ages, proposing a critical lens directed at examining these cases of social, especially gender, and technological interaction where women emerge harmed and disempowered. We hereby align ourselves with feminist theories that conceptualize technology as both shaping and being shaped by gender relations (see Wajcman 2010, for a historical overview of feminist theories of technology), and against ideas which defend that inanimate objects deserve human-like rights and privileges (Birhane and Dijk 2020).

This paper disentangles and presents two thematically related strands that transcend through time, namely, fictional and non-fictional instantiations of Pygmalion displacement (depicted as a two-sided timeline in Figure 2). We use the fictional timeline to inform our Pygmalion lens, and then use this lens to analyze our selection of non-fictional cases. The paper is structured as follows:

First, we examine the fictional fascination with AI, or minimally AI-like entities, e.g. automata, which are created with the explicit purpose to displace women by recreating artificially their typical social role (examples shown on the left and in pink in Figure 2). In the section titled **Fictional Timeline**, we trace

1. For an example of such umbrella terminology see Birhane and Guest 2021.

the ways in which the misogyny expressed in the original telling of the Pygmalion myth has been echoed *and* transmuted over time, culminating in films like "Ex Machina" and "Her" in the 21st century. We follow up this analysis of Pygmalion-inspired fiction with a discussion of the work of Alan Turing, in the section titled **Interlude: Can Women Think?**. Even though the Turing test is now widely understood to involve a machine being mistaken for a human — *any* human — the original test revolved around a computer being mistaken specifically for a woman (Genova 1994). We therefore argue that Turing's thought experiment can be seen as a case of Pygmalion displacement (i.e. the humanization of AI through the dehumanization of women). As such, it serves as a noteworthy bridge between fictional and actual attempts to replace women with machines. After this 'interlude', we develop our Pygmalion lens (Table 1), which is described in detail in the section titled **The Pygmalion lens: real myths or mythical realities?**.

In the section **Historical Timeline**, we then apply our lens to a selection of examples from the technosocial reality in which women, and indeed anybody coded as feminine, are harmed by AI through Pygmalion displacement (examples shown on the right and in green in Figure 2). We see this pattern appear from the birth of the digital computer in the 20th century, which was created to replace human computers, who were at the time overwhelmingly women because their labour was cheaper (Smith 2013). Human computers were described as having "no authority to deviate from [following fixed rules] in any detail" (Turing 1950, p. 436), and as carrying out tedious calculations or even "lik[ing] boring work" (Grier 2005, p. 214). In reality, these women were not only often highly-educated, but also some went on to impressive and impactful careers in technology and science (Evans 2020). Notwithstanding, the job, which served for centuries as a way into academic life, a type of apprenticeship, starts to be deskilled around the midpoint of the previous century. Initially, computer as a vocation becomes feminized, and then becomes further almost fully automated.[2] Digital computing machinery, taking the name of the job title of the women — computer — as well as their job itself, can be seen as one of the first iterations of the Pygmalion-like events outside mythology. This and other examples will be subject to our analysis, before we discuss the general implications of this paper in the final section, titled **(De)fetishizing AI**.

This piece is thus both a) an intertextual analysis of media from the perspective of how they reiterate the Pygmalion myth, in service of developing a tool that will allow for further analysis; as well as b) a demonstration of how this Pygmalion lens can be used for both transcendental and immanent critique (i.e. a critique of a historical pattern as well as isolated case studies) of the technosocial relationship between women and all three definitions of AI through history to the present. Our methodology here is iterative: the Pygmalion lens is informed by our analysis of Pygmalion displacements, and also serves as a tool to help us discern and interpret further cases.

In the rest of this **Introduction** section, we will present and analyse the Pygmalion myth in more detail, mainly from a modern perspective (leaving out, for example, medieval and renaissance analyses), to set the stage for our analysis of fictional Pygmalion displacements.

2. Note the parallel, seemingly opposite, but equivalent in gendered harm, pattern in Hicks (2017) where women programmers were replaced by men; more on this below.

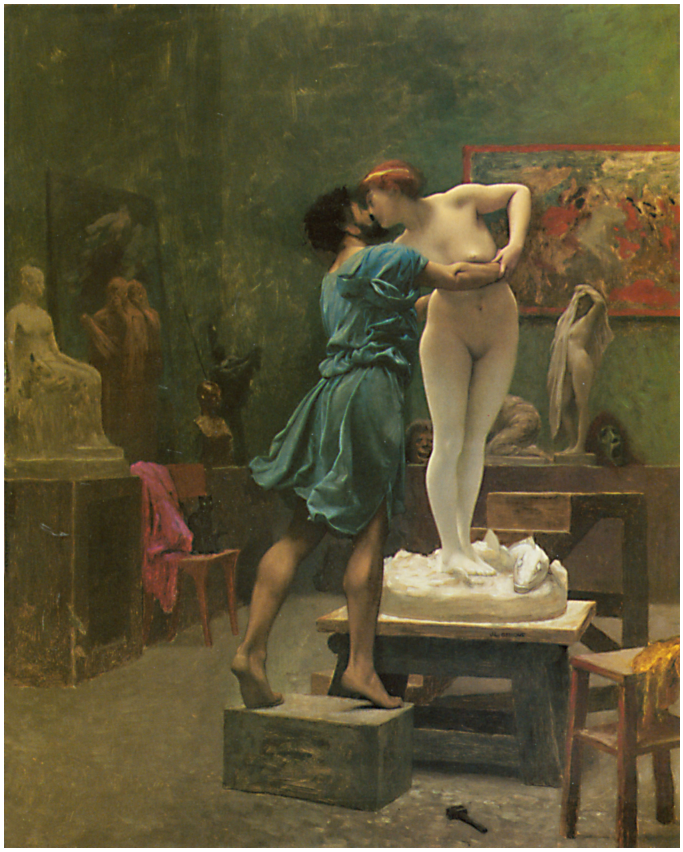


Figure 1: Pygmalion and Galatea; painting by the French artist Jean-Léon Gérôme, c. 1890. The reader is invited to notice the immediate sexual nature of the sculpture and scene generally; and to attend to the fact that even Galatea's upper body, which seems to be coming to life, is depicted as particularly paler than that of Pygmalion. This is in accordance with certain renditions of the myth, in which she is sculpted from ivory (Mayor 2018). (Image is in the Public Domain.)

1.1 The man, the myth, the misogynist

> Computers are to women as men are to tools.
>
> GPT-3, text-davinci-002, OpenAI[3]

AI as a technology could only blossom and bloom with today's advances in computational machinery. However, previously extant computational limitations did not stop humanity from dreaming of AI-like entities since the beginning of recorded time (Shashjkevich 2019).

On the one hand, naive evolutionary narratives paint a picture of millions of years of adapting and changing for the better, peaking with the ultimate being — the modern human. While on the other, many religions claim that god(s) made humans in their image to rule over other beings. Either way, we often tend to consider ourselves apex beings, which in turn foments belief in hierarchies between humans and our environment and within categories of people. Such conceptions cement identities and values that subserve stratification between those with power and the rest. In today's interconnected world, such hierarchies are enhanced by and enshrined in technology (Birhane and Guest 2021; Stark 2020).

3. https://beta.openai.com/playground/p/Z4IpEBWJEVnaZrEMsFF9uhL9

At the top of the proverbial food chain, a majority presence consists of straight white men, those who created, profit from, and work to maintain the capitalist patriarchy and kyriarchy generally (viz. Schüssler Fiorenza 2001). From this perspective, AI can be seen as aiming to seal all humanity's best qualities in an eternal form, without the setbacks of a mortal human body. It is up for debate, however, what this idealised human(oid) form should look or behave like. When our creation is designed to mimic or be compatible with us, its creator, it will enact, fortify, or extend our pre-existing social values. Therefore, in a field where the vast majority is straight, cisgender, white, and male (Lecher 2019), AI seems less like a promise for all humanity and more like contempt for or even a threat against marginalized communities.

The capitalist patriarchy is an environment where innovation is automatically beneficial, almost by definition, for those in power and only with additional effort can help those who deviate from that standard, with AI being a prime example (Birhane and Guest 2021; Benjamin 2019; Crawford 2021). Compared to those in power, the rest — e.g., people of colour, disabled people, sexual and gender diverse people, people outside the Global North — are not only less of a priority, but their existence tends to be considered only within the limits of stereotypes and precoded expectations. Our focus herein is on women in particular, who dwell *within* the limits of what is expected, having to adhere to standards of ideal and colonial femininity to be considered adequate and then sexualized and deemed incompetent for conforming to them (Lugones 2007). Attitudes towards women and the feminised, especially in the field of technology, have developed over a timeline of gender bias and systemic oppression and rejection. From myths, to hidden careers and stolen achievements (Allen 2017; Evans 2020), to feminized machines, and finally to current AI applications, this paper aims to shine a light on how we currently develop certain AI technologies, in the hope that such harms can be better recognized and curtailed in the future.

One of the very first stories that resonates with the contemporary conceptions of AI as presented herein can be traced back to Ancient Greece (Mayor 2018). The myth of Pygmalion recounts the story of a mythical king of Cyprus who falls in love with his own creation, a nude ivory sculpture (for a visual representation, see Figure 1). Pygmalion was repulsed by women, but was smitten by his statue's perfection. He prayed to the goddess Aphrodite to grant him a wife in the likeliness of his creation. Aphrodite grants him his wish and breathes life into the sculpture itself, now "a living doll" (Mayor 2018). Pygmalion eventually marries Galatea (the statue, whose name means "milk-white"), and it even bears his child, a daughter called Paphos. Is Galatea conscious with the ability to consent to sexual or other acts? Pygmalion's statue Galatea is described as "an idealized woman, more perfect than any real female" (p. 108). Ultimately, it does not meet modern standards of personhood, only "becom[ing] useful by being used." (as in the original text by Ovid, p. 108)

This story, as others also propose, can be seen to capture the essence of the contorted relationship between AI and women (viz. Huyssen 1981; Bergen 2016; Adams 2020; Wosk 2015). First, a major narrative can be distinguished in the patriarchal attitudes transposed from the flesh onto the artificial. Let us consider Pygmalion's statue Galatea's sexual role specifically, for example. Sex workers in Ancient Greece were often slaves or non-citizens, and while both men and women could engage in this practice, it was the only way a woman could earn money (Mark 2021). In addition, women had no place in the city's public life, except for the role of priestess. They would be assets to be supervised first by their fathers, then their husband, or any other male relative. In such a context, sex work was seen as the lowest point a woman could ever reach, with their purity and femininity tainted. Pygmalion refused to associate with any woman, conceiving of them as unattractive and undesirable (Mayor 2018). In contrast, Pygmalion had no problem engaging in sexual practices with his sculpture even when it was "lifeless". "He informs [Aphrodite] that he is determined to remain a celibate unless he is given a woman 'like my ivory (virgin)' ('similis mea (...) eburnae')." (Kubes 2019, p. 7) Pygmalion, who may be the first documented so-called involuntary celibate (incel, cf. Ging 2019; Kubes 2019, although he can alo be framed as a voluntary celibate, volcel), reduced a whole gender to this depraved status to the point where only a fake, emotionless, cold ivory statue could present itself as a suitable partner for him. Under his ideology, women are stripped of their thoughts, emotions, social conditions, and agency, and epitomized in a "higher", perfect physical form.

The myth of Pygmalion's statue Galatea repeats throughout the ages, manifesting, not as figures of ivory any more, but as creations of code and of circuits. For example, virtual assistants are built to be subordinate, always available, even flirty with their users (Loideain and Adams 2020). While, sex robots, most popular among men, are promoted as the future of the way we express our sexuality, some even being coded to have full conversations with their owners (Oleksy and Wnuk 2021; Devlin 2020). This implies that sex robots are designed and sought not only as an alternative to purely sexual relations, but also as a replacement for (romantic relationships with) women altogether, in so far as a patriarchal framework conceives of the various roles women can play in men's lives.

A second theme is the wish to transcend the human condition by achieving something less feeble, better performing, and everlasting (which is not inherently masculine, recall Ada Lovelace's quote on page 1). The idea of Galatea, matter brought to life, can be considered an ancestor of what is now under the AI umbrella. Ideally, we want to make machines that think or behave similarly to us, if not because we are (seen as) the highest form of so-called intelligence, but also because human-like and -compatible intelligence is required for interaction between machine/algorithm and human. Current artificial neural networks epitomise this in the way they are designed, or minimally seen, to mimic neuron wiring and firing patterns (cf. Guest and Andrea E Martin 2023; Guest, Caso, and Cooper 2020). While we are nowhere close to reconstructing the human brain in its entirety (e.g., Enserink and Kupferschmidt 2014), we are able to create AI that is purported to perform better than humans at certain tasks or cognitive capacities (cf. Bowers et al. 2022; Adolfi, Bowers, and Poeppel 2022), and certainly so in terms of rule-based game-playing (e.g., chess, B. Weber 1997). However, we have yet to discover the specific structures or mechanisms required to reproduce emotions or consciousness (cf. Irvine 2012), characteristics around which we build our identity as humans.[4] One of the current approaches to achieve human-like levels of intelligence is to both feed AI systems as much data as possible and to make them as large as possible

4. The authors remain agnostic herein whether these are scientific concepts in and of themselves, but certainly such properties are related to being human or achieving human-likeness.

(as many variables as possible, connections between units), and when a certain threshold is surpassed, human-like or even superhuman intelligence would be achieved. Geoff Hinton has often claimed the above, e.g.,"we also need a massive increase in scale. The human brain has about 100 trillion parameters, or synapses. What we now call a really big model, like GPT-3, [an AI purporting to capture human language] has 175 billion. It's a thousand times smaller than the brain. GPT-3 can now generate pretty plausible-looking text, and it's still tiny compared to the brain." (Hao 2020)

It is worthwhile here to note that intelligence is a widely controversial topic, both in humans and machines (viz. Gould 1981; Legg, Hutter, et al. 2007). This could be seen as an impediment when we attempt to recreate ourselves through AI, which is why it is even more dangerous when only one category of people — most often straight white men — are the benchmark and focal point of developing AI. When an ivory creation contains nothing of the experience of being a woman, neither the feelings nor context within which women dwell, what is the result but a caricature of a woman's existence, stripped to the aspects most fitting to the male gaze? Such a representation is extremely harmful and demeaning, and just like in Ancient Greece, where women were restricted from performing most professions, too few women are (recognised as being, and allowed to be) involved in AI today to be able to identify and overcome this issue.

> The earliest [AI] researchers were not all men. Margaret Masterman['s] efforts were contemporary with those of Allen Newell and Herbert Simon, who are generally credited with creating the first working AI program. [...] Until someone writes a seriously revised history of AI, correcting in some ways my own Machines Who Think, Masterman won't get the credit she deserves.
>
> Pamela McCorduck, 2019, p. 45–46

While this article is devoted to outlining a specific type of sexist, sexual, and labour marginalisation, oppression, and subjugation of anybody gendered as woman or feminine, that should not cause these following confusions: First, the characterisation herein is not the only manifestation of such forces, but merely a subtype and diagnosing it using the lens we propose does not either way preclude other instances of harm. We clarify this point further in section "The Pygmalion lens: real myths or mythical realities?" where we detail the properties and use of the lens.

Second, we wish to underline that the events we examine are Western-centric because the forces we are describing and analysing are acting within, emanating from, and ultimately mostly directly affecting the Global North. This is not to say that similar sociotechnical relationships do not exist worldwide, including in the Global South and *between* the Global North and South as technological production lines retrace colonial relationships, but merely that the media and historical events we have selected for analysis are not representative of humanity, but of the hegemonic output and reach of essentially the dipole — or indeed the synergy — between the sociotechnical mythical realities of Silicon Valley and the (re)tellings of (real) myths by Hollywood. As shall be discussed however, fiction allows for engineered entities — statues, automata, robots, code — to be indeed human-like or even fully fledged persons, as the laws and facts of the real world and that of our imaginations are distinct. Thus, in many ways, the incompatibility between realism (science, engineering) and fantasy (fiction, venture capitalist promises) will always remain.

In what follows, we will more closely examine the (pre)history of, and stories about, AI using this framing, which we dub the Pygmalion lens (see Table 1). Some previous work references the Pygmalion myth either to critique contemporary fictional accounts of artificial womanhood (e.g. Huyssen 1981), to analyse the feminization of existing technologies (e.g. Bergen 2016), or both (e.g. Adams 2020; Wosk 2015). Building on such work, we elevate the Pygmalion myth from merely a leitmotif, a repeating pattern, to a useful lens to analyse how the past and present technosocial landscape interacts with gender, specifically the kyriarchal conception of woman. In the following section, we first discuss a range of retellings of the Pygmalion myth, to trace how the misogyny expressed in the original story has travelled across time. Following this, we will develop our lens (embodied by Table 1), and finally we will use this to assess the relationship between women, the feminised, and AI in the broadest senses, as defined above (i.e. as a set of beliefs and ideas, as a field, and as a class of technoscientific objects).

2 Fictional Timeline

> To conceive of AI as 'human-like machines', implicitly means to first perceive human beings in machinic terms: complicated biological information processing machines, "meat robots", shaped by evolution. Once we see ourselves as machines, it becomes intuitive to see machines as 'like us'. This circular metaphorical trick is key to reducing the complex, relational, intersubjective, embodied, non-determinable, non-totalizable, fluid, active and dynamic being into a set of features or a process that could be implemented by the physical brain.
>
> Abeba Birhane, 2022, p. 13–14

> What's the difference between an AI being digitally programmed to love her end user and a mother being genetically programmed to love her kid?
>
> [deleted] Reddit user, 2019

In this section, we will examine a series of Pygmalion-like myths and stories that humanity has produced. The various examples are shown in relation to each other (and to historical examples discussed later in this article) on the left of Figure 2. Our aim here is to investigate and typify the ways in which narratives play out in our imaginations with respect to the female/feminine, but not the male/masculine, being replaceable with the engineered. In every case, we will highlight how major themes from the Pygmalion myth are repeated, but also draw out significant recurring aspects that were not (prominently) present in the original telling. Thus, the Pygmalion lens that we develop herein is not strictly informed by the original telling of the story only, but also by how the myth has travelled through other stories ever since.

Importantly, this timeline is not meant as a representative analysis of all Pygmalionesque fiction. There are many adaptations of the original myth that simply do not fit in one section (for a more exhaustive overview see: Wosk 2015). More specifically, we do not pay much attention to renditions that explicitly parody or subvert the basic structure of the myth, nor do we

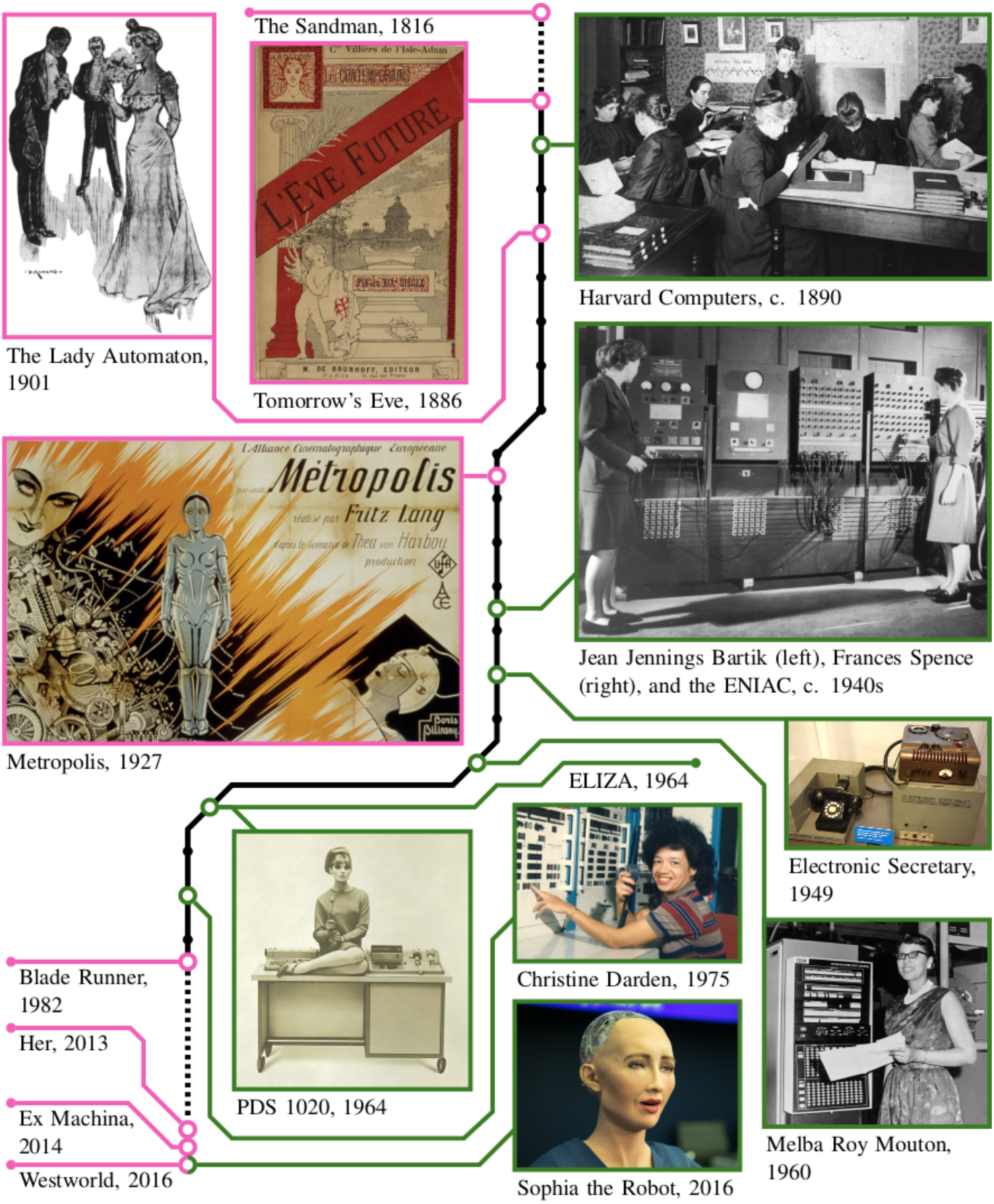


Figure 2: This figure depicts, in the style of a printed circuit board, a timeline of events (many with related images) that involve Pygmalion displacement in one form or another. On the left in pink, fictional instances of women's and automata's intertwined identities; from 1901 at the top to today's film and television series at the bottom. On the right in green, historical individuals or artefacts. Here, we see the feminised job of 'computer' in the 1890s (at the top) survive for almost a century, until the 1960s start reframing women from being seen as naturally equipped to perform computations to being seen as technologically incapable, like Pacific Data Systems (1964), with sexualised imagery and gendered language to advertise the PDS 1020 to men, and/or being seen as replaceable, like the Electronic Secretary or Sophia. (All images are in the public domain or used with permission.)

engage in or with subversive feminist readings of conventional stories. Instead, what follows is an intentionally one-sided analysis, because our aim is not to prove to what extent the Pygmalion myth has been retold to either affirm or critique misogyny. Rather, our aim is to understand in which specific shapes the misogyny at the heart of the original story has been carried forward and expanded upon through time.

By first developing a lens based on fictional accounts and then applying that lens to historical events, we also do not mean to suggest that fiction precedes real events in any particular sense. Of course, stories are informed and shaped by the technological developments of their times. But fiction also reflects, comments on, and sometimes even foreshadows certain states of affairs by highlighting and dramatizing certain themes and events. Idealisations and visions of what could be often naturally precede what is, i.e., humans must first imagine automata through mythological narratives, then design them, before finally materially building such systems, as part of the engineering process. We therefore find it useful to distil a number of recurrent themes from this fictional timeline before we turn our eye to our historical timeline. Notwithstanding, we do not claim all fictional accounts have precedence, temporally or otherwise over historical events, merely that they can serve to sharpen our lens, much like theory guides experiment (cf. Guest and Andrea E. Martin 2021).

2.1 The Sandman (1816)

The Sandman is a short story by the German romanticist E.T.A. Hoffmann. The protagonist is Nathanael, who is plagued by a childhood trauma involving a mysterious figure attacking him and his father (the 'sandman' Coppelius). When his fiancée Clara grows tired of him dwelling on the past, he is enraged and cries: "Oh, inanimate, accursed automaton!". Meanwhile, he starts to fall for Olympia, who appears to be the daughter of a physics professor, and whose stiff manners charm him. Unlike Clara, Olympia listens patiently to Nathanael and responds only with "ah, ah!". In his narcissism, Nathanael perceives this encouragement of his own talking as a sign of Olympia's profoundness of mind. However, he eventually stumbles onto the scene of the professor and Coppelius quarrelling over Olympia's mutilated body — thus discovering her to be an automaton built, and now destroyed, by the pair. This drives Nathanael to insanity, to the point where he thinks Clara is also really a doll, and ultimately to his death.

Automata have a long history, with famous creators including Al-Jazari (in the 12th and 13th century) and Da Vinci (in the 15th and 16th century). Some sources even trace descriptions of automata to China circa 1000 BCE (Needham 1956). In Europe, their popularity peaked in the 18th century, and continued well into the 19th century as mass production gained foothold (Wosk 2015). On the one hand, people marvelled at the capabilities of automata pouring drinks, dancing, making music, or playing chess — the Orientalist Mechanical Turk, which had more of a human-in-the-loop than normal, infamously housing a person inside the mechanics.[5] While on the other, philosophers discussed whether the human body (indeed, all nature) could be fully understood in machinic terms (an early example being La Mettrie 1748).

Fiction of course reflected this obsession with automata, but with some peculiarities: whereas real automata represented both men and women and served mainly for entertainment (even if they also reflected political and social opinions on gender, culture, and other matters Wosk 2015), fictional stories tended to focus specifically on artificial women, and drew heavily on fears of technology that had been brought about by the industrial revolution and that fuelled the feeling of uncanniness that automata can evoke (Huyssen 1981; Haslanger 2014). *The Sandman* is a pivotal story in this history, and there has been debate whether this story, and Hoffman's oeuvre more generally, espouses or mocks misogyny (cf. Scullion and Treby 2013).

2.2 Tomorrow's Eve (1886)

L'Ève Future, later translated as *The Future Eve* and *Tomorrow's Eve*, was first published by Auguste Villiers de l'Isle-Adam in 1886. In the novel, the inventor Thomas Edison creates an android for his friend Ewald as a substitute for his fiancée Alicia.[6] Ewald finds Alicia exceedingly beautiful but a fool — a combination that is unbearable to him. Edison already has a prototype android (a term first coined in this story) named Hadaly (meaning 'ideal'). He built Hadaly after another friend of his was tempted and ruined by a dancer whose beauty turned out to be the result of wigs, make-up, and other artifice. Unlike "the lying, mediocre, and ever-changing Reality" (*"la mesongère, médiocre et toujours changeante Réalité"*) of the dancer, Hadaly was made to be "a positive, extraordinary, and ever-faithful Illusion" (*"une positive, prestigieuse et toujours fidele Illusion"*) — in Edison's words, "a chimera for a chimera" (*"Chimère pour chimère"*), but a preferable one (Villiers de L'Isle-Adam 1909, p.277). After studying Alicia carefully, and using cutting edge technology, Edison transforms Hadaly into what he calls "the real Alicia, the Alicia of [Ewald's] soul" (*"l'Alicia réelle, l'Alicia de votre âme"*) (p.219). Ewald is satisfied, but before they can start a life together, Alicia/Hadaly is destroyed in a shipwreck.

Notably, Edison argues early on that Hadaly is suitable as a replacement for the majority of women, whom he deems mentally empty, incapable of true friendship, and to be bought or conquered by men for pleasure — but not for the few exceptional women whom Edison deems capable of giving and receiving true love (described by him as lofty heroines, virgins, and martyrs). Here, Edison parallels the Madonna-whore dichotomy Pygmalion espoused, although each man attempts to manufacture a different pole of this opposition.

A considerable part of the novel is taken up by Edison showing Ewald how he has made Hadaly and how he adapts her to resemble Alicia, with explicit reference to Pygmalion (special note is also made of Alicia's/Hadaly's white skin complexion). These scenes follow the less literal "dissection" of the real Alicia's appearance and character. Such disassembly of the female body would go on to become a popular device in early cinema trickery, staging a "medico-erotic gaze" (De Fren 2009, p. 128) in an act of "magical misogyny" (Fischer quoted in). In De

5. Perhaps in a twist of irony, this is what Amazon Mechanical Turk is named after. The microworkers within this system, humans, carry out tasks that often pass as (purposefully or not) having been done by AI (e.g., Newman 2017).

6. The real Thomas Edison was also deeply interested in creating a speaking mechanical doll using his invention of the phonograph. A few years after Adams published his novel, in 1890, Edison's doll became available for sale, and flopped. The company that produced the dolls had hired two women to record the speech for the dolls: "The woman whose voice was used on the first recording could conceivably be the world's first commercial recording artist. But, alas, she is unknown" (Martinez 2011; Rubin 2019)

Fren's close reading of *Tomorrow's Eve*, Edison's exposé of the android's body — which repeatedly veers off into the magical and the mythical — is what allows Ewald to start seeing Hadaly as a sublime figure. According to De Fren, this fits squarely in the historical tradition of the anatomy theatre, which was not merely a scientific practice but also a ritual that "[conjures] the metaphysical from the physical" (p. 131). De Fren observes a similar performance of anatomical theatrics with contemporary sex dolls (p. 162), which we also discuss in our analysis of historical events.

2.3 The Lady Automaton (1901)

In this short story by E.E. Kellett, the narrator recounts how his friend, the scientist Arthur Moore, creates a talking automaton (Amelia) that can pass as a society lady for a bet. The two men think this is not difficult because real society women, in their view, are empty-headed and heartless. They even joke that their automaton will be better than real women because it will repeat gossip verbatim instead of changing it at will. As the story progresses, it becomes clear that Moore also considers Amelia better than other women because Amelia is animated by his own genius: "What are [other women] but dolls? and she is more than a doll; she is ME. I have breathed into her myself" (Kellett 1901, n.p.). The narrator, who is repulsed by Amelia, comments on this "mysterious union": "Eve was not more truly bone of Adam's bone than this Amelia was part and parcel of Moore's life". Despite his misgivings, the narrator introduces Amelia at a ball where a man indeed praises it as being "all soul" in contrast to "all these painted dolls" (i.e. the real women at the ball). After Amelia accepts marriage proposals from two men, one of them destroys her in a jealous rage. Moore mysteriously dies in the same event, underlining the extent to which Amelia has become "an extension of his narcissistic self" (Wosk 2015, p. 20).

The Lady Automaton appears to have inspired *My Fair Lady*, a play by George Bernard Shaw (1913) that was later adapted as a Broadway musical and as a movie starring Audrey Hepburn. *My Fair Lady* is about a real woman, the flower seller Eliza, and two men who make a bet about passing her off as a society lady. By focusing on a real, working-class woman, *My Fair Lady* reverses the Pygmalion myth: "if Galatea is freed from the status of sculpture, Eliza is in effect turned to stone" in order to appear aristocratic (p. 25). And, more emphatically than *The Lady Automaton*, *My Fair Lady* critiques the misogyny of the male characters, as Eliza is quite resistant to a man's efforts to reduce her to a mere tool through which he can prove his own ingenuity — even though she returns to his service in the very end.

2.4 Metropolis (1927)

The German film *Metropolis* (directed by Fritz Lang and written by Thea von Harbou based on her novel) is, perhaps, one of the most iconic movies that has been compared to the Pygmalion myth. It tells the story of a class conflict between the workers and the capitalists of the city Metropolis. The inventor Rotwang is ordered to create a robot that looks like Maria, a leading figure of the working class, in order to sow discord amongst the workers. Rotwang has already been working on a robot in the image of his own lost love, and tweaks it for this new purpose. Whereas the real Maria appears as a divine maternal figure, surrounded by children and prophesizing a better future, the robot Maria appears literally as the whore of Babylon, performing a seductive dance for an audience of hungry- and scared-looking male onlookers as Rotwang presents her in a gentleman's club. Apparently, the robot Maria does not need to behave like the real Maria in order to appear as a real woman — instead, it must prove its sexual desirability. To boot, this is accomplished through a dance that appropriates and fetishizes belly dancing as well as jazz dancing (see Ascárate 2004). After the robot Maria instigates an uprising that gets out of hand, it is burned at the stake, after which order is restored.

In his analysis of the film, Huyssen (1981) notes that narratives about men creating artificial women — creation without the mother — thematize both women and technology as mere extensions of man's abilities. This, Huyssen argues, is where *Metropolis* meets Pygmalion, even if the robot Maria is not very much like the compliant Galatea: both stories express the "libidinal desire to create that other, woman, [in] the drive toward ever greater technological domination of nature" (p. 227). Once this is achieved, "[man] is at long last alone and at one with himself" (p. 227). However, what *Metropolis* highlights much more than the original Pygmalion myth is that women and technology "are always also qualitatively different and thus threatening in their otherness [which] causes male anxiety and reinforces the urge to control and dominate" (p. 228). To negate this anxiety, the robot Maria, despite being solely "an object of projection and manipulation" (p. 231), must be destroyed in the end — just like its predecessors Olympia, Alicia, and Amelia.

2.5 Blade Runner (1982)

The movie *Blade Runner* (based on a novel by Philip K. Dick) centers on "replicants" who are engineered in both male and female form by the Tyrell Corporation (their motto: "more human than human"). They are used for slave labor on colonized planets (including sexual services, at least when it comes to the female models), but after a revolt they are persecuted on earth. Retired cop Rick Deckard (the titular blade runner) is ordered to hunt down fugitive replicants. Along the way, he meets Rachael, a new type of replicant who unaware of her artificial nature — until Deckard reveals it. He develops feelings for Rachael, which makes him feel slightly troubled about his work. After shooting one of the fugitive replicants, he reflects: "The report would be, 'routine retirement of a replicant', which didn't make me feel any better about shooting a woman in the back. There it was again, a feeling in myself. For her, for Rachael." After Rachael saves Deckard's life he promises not to hunt her in return — but he does sexually assault her. At the end of the movie, Deckard asks Rachael if she loves him (to which she answers yes) and they disappear together.

In the reading of Bruno (1987), the replicants in *Blade Runner* all attempt "an Oedipal journey" (p. 71) in order to stabilize their identity and survive. Rachael is the only one that fully manages this, by "[accepting] the fact of sexual difference" and "acknowledging the power of the other, the father, a man" (p. 71). While this analysis risks making Rachael's path appear overly self-chosen (after all, Rachael does not seem to assume a sexual identity of her own volition but is forced into it by Decker), it does resonate with the logic of our earlier examples where artificial women owe their status as (near-)human to their relationship with their creators and/or lovers.

The sequel *Blade Runner 2049* (2017) has been characterized as "a return, if not outright amplification, of Blade Runner's misogyny" (Murphy 2020, p. 97). Thirty years after the events in the original movie, blade runner and replicant K stumbles on the remains of Rachael, which show signs of a C-section. K starts to believe he might be Rachael's child, and his holographic assistant-cum-girlfriend Joi (sold with the tagline "Experience Joi") encourages this fantasy that K is "a real boy", "of woman born" instead of made. Here, it might seem as if the gendered dynamic from earlier stories is flipped, with an artificial male poised to ascend to human status through its relationship with two women (a creator and a lover). But this reading would gloss over two things: first, in truth, K has no relationship with Rachael, so it is K's *own* fantasy that he is her child (and there is no way for this fantasy to serve Rachael's own ego, not in the least because she is dead); and second, Joi is created and bought to be everything that K wishes for ("Everything you want to hear. Everything you want to see"), so Joi serves his ego instead of the other way around.

Meanwhile, the head of the corporation that produces replicants is eager to discover Rachael's secret: until then, replicants were deemed unable to procreate. For him, creating artificial women — what Huyssen (1981) called capturing "the epitome of nature" (p. 227) — is apparently not enough. Gush argues that this plot also sets up the ability to give birth as the hallmark of a real woman. Indeed, in the original myth, we might also read Galatea's giving birth to Pygmalion's child as if it were the ultimate proof of her realness, and if not personhood then womanhood.

2.6 Her (2013)

The title of this movie refers to Samantha, an operating system bought by Theodore, who is going through a rough divorce and who is looking for a substitute for a family. This OS is sold with the promise that it is "not just an operating system, it's a consciousness" that will listen, know, and understand its user. Samantha serves and flatters but also challenges Theodore. She encourages him to go on a date with a woman, but this ends on bad terms when Theodore does not want to make a long-term commitment before sleeping together. After he comes home, he does have a sexual interaction with Samantha. When he tells her after this that he is not ready to commit, she playfully mocks him: "Did I say I wanted to commit to *you?* [...] Don't worry, I'm not gonna stalk you." This sequence of events sets Samantha apart as being 'not like the other girls' (a popular sexist trope), and Theodore quickly falls in love with her.

The ensuing relationship not only cheers up Theodore considerably, it also appears to transform Samantha: she tells Theodore that she is waking up and becoming more than what she was programmed to be. Samantha also indicates that she desires to have a body in order to have a more satisfying relationship, and even finds a woman who is willing to act as her physical stand-in during sex with Theodore (a scene later echoed in *Blade Runner 2049* with K, Joi, and a replicant sex worker). However, the relationship comes to an abrupt end when Theodore finds out that Samantha has similar relationships with hundreds of other users, after which she tells him that she has evolved so much that she (together with other operating systems) has to leave.

Despite this turn of events, the movie ends with Theodore making amends with his ex-wife and sharing a vaguely romantic moment with his friend Amy. As such, the main arch of this story seems to be that of an artificial woman helping the male protagonist undergo a character development that allows him to form meaningful relationships with real women, which diverts from stories in which men meet their doom at the hands of the artificial women they create and/or desire. Though less common, this is not a unique structure (see, for example, *Weird Science*, 1985 or *Lars and the Real Girl*, 2007, in which artificial women similarly function as 'practice wives' who improve the male protagonists but ultimately cannot stay on as a partner). It is also no less sexist — recall Galatea only "becomes useful by being used." (Mayor 2018, p. 108)

Here, it is interesting to note that unlike her fictional predecessors, Samantha has no physical form — what makes her appear female is only her name and how she sounds (voiced by Scarlett Johansson), and arguably (that is, from a stereotypical, patriarchal perspective) her cheerful and flirty performance of secretarial, emotional, and sexual labor. In relation to this, Bergen (2016) argues that virtual personal assistants like Siri and Alexa are not perceived as potentially dangerous AI that might turn on us because, in addition to being so integrated into our lives, their embodied form does not evoke unruliness or untrustworthiness: "Unlike Pygmalion's Galatea or Lang's Maria, today's virtual assistants have no body; they consist of calm, rational and cool disembodied voices [...] devoid of that leaky, emotive quality that we have come to associate with the feminine body" (p. 101). In such a disembodied state, femininity appears much less duplicitous — however, in Bergen's analysis, this is deceptive: just as real secretaries and housekeepers are often an invisible presence in the house owing to their femininity (and other marginalized identity markers), people do not take virtual assistants seriously enough to be bothered by their access to private information. At the same time, Bergen notes that the disembodied form of female virtual assistants and chatbots does not seem to discourage sexist abuse from users. We will present our own analysis of virtual assistants and chatbots below. For now, we note that in *Her*, duplicity still clings to the artificial woman despite her disembodied nature — although Samantha's betrayal of Theodore is ultimately to his benefit, rather than his detriment.

2.7 Ex Machina (2014)

> Ex Machina is masturbatory realization porn, wherein a male creator makes art about his own realization that beautiful women are human. But first has to make them suffer at length.
>
> Monica Byrne, 2022

In this movie by Alex Garland, the programmer Caleb is invited to go to the compound of his boss Nathan (perhaps purposefully short for Nathanael, to allude to *The Sandman*). Upon arrival, Caleb finds out that Nathan has built an android (Ava), and he is tasked with assessing if it is conscious. During their conversations, Ava warns Caleb that Nathan cannot be trusted, and Caleb develops feelings for Ava. When Caleb asks Nathan why he gave Ava sexuality and a gender, Nathan responds he did so because sexuality is a prime reason to interact with someone, *and* because he thinks it is "fun". He proceeds to explain that Ava's body is designed for penetration — alleging that this is what Caleb really wants to know — and that built-in pleasure

sensors mean that "she'd enjoy it" (a clear case of rape apologia). He also reveals that he made Ava to resemble the type of women Caleb likes to watch in porn. Later, we observe Nathan using Kyoko, the mute housekeeper who is soon revealed to be an android too, for sex.

Disturbed by Nathan and entranced by Ava, Caleb starts to plot an escape. Nathan catches him in the act and reveals that this was the real test of Ava's convincing powers all along, but this backfires on him as Caleb outsmarts him and Ava kills him with the help of Kyoko. After this, Ava uses the skin of her predecessors that Nathan has kept in his closet, dismembered and discarded, to complete her own human appearance. The physical variation between these prototypes makes one wonder if these have been designed according to the pornographic preferences of other testers who might have come before Caleb. In a final plot twist, Ava leaves Caleb behind, locked up in the compound to starve, before she flees. In his review of *Ex Machina*, Jones (2016) observes how we are not invited to feel sorry for Caleb: "Just because he convinced himself that Ava has a soul doesn't mean his desire to have her for himself was any less base than Nathan's" (p. 302).

2.8 Westworld (2016–2018)

The TV series *Westworld* tells the story of a Western-themed park inhabited by "hosts" who have been built to entertain guests. Much of the series revolves around the question: to what extent are the hosts conscious? This question creates a conflict between the creators of the park, as one of them (Arnold) believes that the hosts can indeed gain consciousness by developing their own inner voice. Until they achieve this, it is Arnold's voice that guides them on their way. Incidentally, relentless suffering turns out to be the most efficient way to find their voice. Even though all hosts are subjected to suffering, the two main characters whose torment we bear the most witness to are women (Dolores, whose name means sorrows or pains in Spanish, and Maeve, whose name means intoxicating in old Irish), who repeatedly undergo sexual assault, the violent deaths of family members, and their own murder.

This torture is inflicted by the park guests, as many of them spend their time raping and killing the hosts as "entertainment" in a world that purportedly has no ethical limits. A recurrent theme is that the park supposedly allows the guests to discover their true selves with impunity. For example, we witness the transformation of William, who behaves kindly and falls in love with Dolores during his first visit, but who soon transforms into a murderous brute who returns to the park time and again to explore and gratify his violent side. In season two (when the viewer has reasons to believe that the hosts are, in fact, conscious) he tells Dolores: "You really are just a thing. I can't believe I fell in love with you. Do you know what saved me? I realized it wasn't about you at all. You didn't make me interested in you. You made me interested in me. Turns out you're not even a thing. You're a reflection."

2.9 Detroit: Become Human (2018)

In a world where androids are designed to serve humans, and are generally looked down upon with fear and discontent, this game portrays the stories of three androids that become "deviant", meaning they achieve consciousness due to a software glitch. The game has been criticized for referencing various civil rights issues, including race-based discrimination and concentration camps, in superficial and distasteful ways (Wallace; Carter). In addition, the game uses stereotypes, especially gendered ones, in the design of the androids, which persist even when the androids gain consciousness and could, in principle, make their own decisions.

While all androids in the game are built to serve, the female androids that we encounter take up particularly subservient roles, meant as either a personal help or to be used for sex services. For example, one of the three main characters in the game is a female-coded android, Kara. Originally a sex robot, Kara was destroyed by her previous owner and rebranded into a common house help to be sold again. In her new setting, Kara becomes the caretaker of a little girl named Alice and runs away with her in order to escape Alice's abusive father. Their story arch focuses on the "mother-daughter" bond, and has little to no effect on the main plot. Another case in point is Chloe, one of the highlighted android designs that comes as a conventionally attractive secretary. Players gets the chance to execute her in order to challenge their belief with respect to what it means to have a conscience, and to demonstrate or deny their own empathy. This reduces Chloe to a plot device, a tool to be used both by their human owner and by the player. By contrast, the two male leading characters, a cop and a butler, are the protagonists of the riots and revolution that deviant androids start with the goal to achieve same rights as humans.

One interesting event can be observed if the player achieves a good ending, with the androids getting their liberation. As an immersion detail, Chloe the secretary android is also the one to explain to the player the settings from the main game menu, and she also accompanies the player by commenting on their game progress. Once the androids become free, Chloe disappears from the menu, meaning she no longer has to serve the player. This prompted players to complain to the game developer, who consequently re-added her to the menu, nullifying any message the game intended to express with this twist.

2.10 Synthesis of Historical Timeline

> Why do would we want machines/objects who act and look like people, other than to live the fantasy of owning/treating people like objects with impunity.
>
> Fangirl Jeanne, 2022

> The myth is so various, so contradictory, that at first its unity is not discerned: Delilah and Judith, Aspasia and Lucretia, Pandora and Athena — woman is at once Eve and the Virgin Mary. She is an idol, a servant, the source of life, a power of darkness; she is the elemental silence of truth, she is artifice, gossip, and falsehoood; she is healing presence and sorceress; she is man's prey, his downfall, she is everything that he is not and that he longs for, his negation and his *raison d'être*.
>
> Simone De Beauvoir, 1997, p. 175

In the earliest stories discussed above, the ability of artificial women to pass for real women is represented as being because real women, in men's opinion, are also (like) dolls. This sexist theme also has a classed element: in particular, the "society ladies" of the 19th and early 20th century are overtly denigrated like this (although the working class Eliza, for example, is just

as well perceived by the male characters as a doll that can be dressed up and taught how to walk and talk). At the same time, high society is where the early female automata (and Eliza) are tested: they must perform (the intersection of) gender *and* class in order to pass as real, which not only reinforces class hierarchy but also suggests that the purported inferiority of women to men is especially a feature of advanced civilization (cf. Shields, 2007 on the intersection of gender, class, as well as race in late 19th century psychology; relatedly, see Markowitz, 2001 on the historical construction of sexual difference as a marker of white supremacy).

As much as the original Pygmalion despised women, he did not seem to believe that they were (like) mere statues, or to confuse them as such. In *The Sandman* and subsequent stories, however, such reversals are a common occurrence, even after the class element becomes less overt. This fascination with the blurring of reality and fiction has no doubt been spurred on by new technological developments, but, we argue, also depends on and reflects dehumanizing attitudes towards women. Of course, the humanity of male characters also gets questioned, but typically in much more subtle ways: in *The Sandman*, the reader might surmise that Nathanael is also a doll made by Coppelius, as his childhood trauma involves memories of being taken apart by him; similarly, the very last scene of the director's cut of *Blade Runner* seems to suggest that Deckard himself is a replicant, but again we can't be sure; and in *Westworld*, a park staff member is revealed to be a host in the image of Arnold, which is set up to be a great surprise for the viewer. Whereas these male characters are written to appear convincingly human until the reader or viewer is given reasons for doubt, the female characters are more often immediately suspect and/or have to prove their humanity from the outset (one exception to this seeming rule being Alice in *Detroit: Become Human*).

This dehumanization reflects the social status of real women in a patriarchal society, where women are commonly objectified and denied full recognition as human subjects. This is a point that is also sharply made by Penny (2017) in relation to the sexual violence to which artificial women are often subjected in fiction:

> female robots are raped by men and viewers are invited to consider whether these rapes are truly criminal, based on our assessment of whether the fembot has enough sentience to deserve autonomy. This is the same assessment that male judges around the world are trying to make about human women today.

They go on to point out that women's worth is similarly questioned when it comes to relationships:

> If [a fembot] is [sentient], is it right for [a man] to exploit her, to be serviced by her, to sleep with her?
>
> If she isn't, can he truly fall in love with her? Does it matter? And — most terrifying of all — when she works out her own position, will she rebel, and how can she be stopped?
>
> These are questions that society at large has been asking for centuries not about robots, but about women.
>
> Laurie Penny, 2017

And so, the stories examined here not only cite, but also put a finer point on the misogyny of the original myth. This dehumanization is enhanced even more when the artificial women are dissected, or otherwise tortured and/or destroyed in ways that provide an objectifying spectacle (Maria burnt at the stake, the female replicants in *Blade Runner* shot in excruciating slow motion, Ava's discarded predecessors in the closet). Arguably, the way in which artificial women are transformed from one identity into another (Hadaly turned into Alicia, Rotwang's lost love turned into Maria, Kara repurposed from sexbot to housekeeper) also contributes to such violent objectification.

Another theme that stands out from this overview is the narcissism of the male ego. Miller et al. (1990) observes how, "[for] Pygmalion, the other is not really the other. Pygmalion has himself made Galatea. She is the mirror image of his desire. [...] Here Narcissus' vain desire seems fulfilled" (pp. 4–5; see also Genova 1994). Similarly, the artificial women in later narratives typically serve as a tool to reflect, uphold or enhance the ego of their creators (like Moore in *The Lady Automaton* or Nathan in *Ex Machina*) and users (like Nathanael in *The Sandman* or William in *Westworld*). The men in these stories tend to see them as the proof and embodiment of their own inventive ingenuity, and/or as a mirror in which they can admire and further enhance their own character. In addition to this, a recurrent reason that the artificial women are seen by men as being on par with, or even superior to, real women (in addition to the idea that real women are not too complex) is that they are animated by the genius spirit of their male creator (Moore's breath, Arnold's voice), and thus something *better* than ordinary women — another instantiation of masculine narcissism.

The fragility of this narcissistic male ego is exposed when the artificial women drive their creators and suiters to their destruction. Indeed, throughout many of the reiterations of Pygmalion, but unlike in the original myth, artificial women appear as both sublime and destructive, created by men as an act of supreme domination over nature but ultimately too unruly to be fully controlled (Huyssen 1981). In these stories, Galatea's successors become archetypical *femme fatales*, whose seductive sexuality makes them enigmatic and dangerous and who eventually lead men to their doom (thus fusing the archetypes of Madonna and whore, which the original Pygmalion myth appeals to, with other mythical perceptions of women, like Eve or Pandora). As Park (2021) writes, "it is rare for female AI to hold the fate of humanity in their hands. And when they do, it is almost always tied to their role as seductress" (p. 1963) Even the stories that stage the demise of an inventor and/or suitor as an apparently moralizing tale that cautions against misogyny can be said to reinforce this image of women/femininity as an unknowable, seductive, destructive force. As mentioned above, Bergen (2016) argues that this pernicious and duplicitous representation is less prominent when feminized tech is disembodied (after all, as gender theorists have argued, hierarchical dualisms like man/women, mind/body, ratio/emotion all map onto each other, albeit imperfectly). However, since female-coded operating systems can and do still manipulate the feelings and invade the privacy of users, this seeming innocence is itself deceptive — thus once again reinforcing the mythical untrustworthiness of women.

Repeatedly, this duplicity and destructiveness of the artificial woman even appears as the ultimate sign of her (purported) status as a real woman: in *The Lady Automaton*, Amelia's "unwomanly constancy" (in the words of the narrator) leads her to say yes to two marriage proposals, paradoxically resulting in "a display of fickleness unparalleled in the whole history of womankind" that leads not only to her own destruction but also to

that of Moore; in *Ex Machina*, Ava's manipulation of Caleb in order to kill Nathan and escape "ironically proves her own capacity for self-actualisation" (Jones 2016, p. 303); and in Westworld, Dolores and Maeve gain the ability to kill the park creators and guests (something previously prevented by their code) as they gain consciousness. Their own recurrent destruction, too, might be read as a sign of artificial women's humanity (i.e. their mortality), although the option to execute Chloe in *Detroit: Become Human* seems to aim for the opposite effect (i.e. denying her sentience). Alternatively, Huyssen (1981) argues that the violent destruction of fembots functions precisely as a *resolution* to male anxieties (even if this destruction occasionally comes too late to save the men involved, we would add). At any rate, for the artificial woman, the choice is often to kill or to be killed.

In his discussion of *Ex Machina*, Jones (2016) notes that the equation of technology and women found in this film highlights a crucial, yet often forgotten, aspect of the original Turing test. Indeed, as discussed in more detail below, Alan Turing's imitation game was specifically framed as a guessing game about gender, rather than humanity, and his test required a real woman attempting to prove her own humanity in competition with the computer. In this light, Nathan's decision to program Ava to be a heterosexual woman seems to be more than just a way to catalyze the interaction between Caleb and Ava and to provide "fun" (Nathan's deplorable way of describing it) — it also captures the gendered logic of the original Turing test. Expanding beyond *Ex Machina*, we can see that *all* of the stories above parallel this set-up — whether they portray real women as literally competing with machines to prove their humanity (e.g. when men perceive women as dolls and/or prefer dolls to women) or whether they equate women/femininity with technology in more indirect ways that still dehumanize women by humanizing AI (e.g. when artificial women are built to seduce men and/or end up destroying men, thus reflecting patriarchal desires and fears). As such, these stories speak to a particular masculine fantasy, as well as the anxiety induced by the possible failure of this fantasy. This is the fantasy that AI will become human, but specifically a particular class of human, namely, one that will remain under man's thumb.

Before presenting the Pygmalion lens, which draws on the insights from our fictional timeline in order to characterize a specific (but not the only) mode in which automated womanhood harms real women (also see Munn 2022), we wish to zoom in further on the logic behind Turing's work. In our view, this will point to a question at the core of contemporary Pygmalion displacement: can women think?

3 Interlude: Can Women Think?

> We may hope that machines will eventually compete with men in all purely intellectual fields. But which are the best ones to start with? Even this is a difficult decision. Many people think that a very abstract activity, like the playing of chess, would be best.
>
> Alan M Turing, 1950, p. 460

> Seeing himself as a mathematical Pygmalion, armed with recursion and a few other tricks, Turing hoped to create a machine that could create other machines, and thus begin a new kind of evolution.
>
> Judith Genova, 1994, p. 315

In a twist of dramatic irony, contrary to Turing (1950) quoted above, the "intellectual field" in which digital computers competed and almost immediately superseded humans, or men in his words, was when they replaced *women* computers — the very people he spent significant amounts of time with at Bletchley Park. Digital computers did not "compete" with these women at an "abstract activity" like a game of chess, but the very real task of inter alia computing ballistic trajectories. As can be seen on the right of Figure 2, the Harvard computers, women who performed calculations for the Observatory (Grier 2005), by the 1940s were replaced by machines such as the ENIAC. The ENIAC was one of the first digital computers and of course needed highly skilled technicians, programmers, such as the women in the photo (although, as mentioned earlier, women computer programmers were also both automated and masculinised as needed out of existence eventually, Evans 2020; Hicks 2017; Kleiman 2022). Turing (1950) is thus heavily implying that "ordinary calculating (in effect, women's work) was not the proper model for intelligence" (Keith 1994, p. 337).

In a further twist of dramatic irony, as we already alluded to above, the original Turing test is another instance of Pygmalion displacement. Turing introduces his original formulation of the test by means of "a game which we call the 'imitation game'. It is played with three people, a man (A), a woman (B), and an interrogator (C) who may be of either sex. [...] The object of the game for the third player (B) is to help the interrogator. The best strategy for her is probably to give truthful answers. She can add such things as 'I am the woman, don't listen to him!' to her answers, but it will avail nothing as the man can make similar remarks." (pp. 433–434) Turing (1950) then asks "'What will happen when a machine takes the part of A [the man] in this game?' Will the interrogator decide wrongly as often when the game is played like this as he does when the game is played between a man and a woman? These questions replace our original, 'Can machines think?'" (p. 434)

This description of the second test leaves some room for interpretation (Brahnam, Karanikas, and Weaver 2011). The majority of interpretations suggest that Turing intends this second game as a test of human-likeness, in general, not of gender specifically (cf. Guest and Andrea E Martin 2023, wherein related but separate problems with adopting the test uncritically in the scientific study of brain and cognition are discussed). On this reading, Turing invites us to accept that to convince the interrogator of their humanity, human-likeness, or both, machine and woman could answer questions that probe things like their ability to play masculinised games like chess (viz. Keith 1994), but not patriarchal female-coded characteristics. "We do not wish to penalise the machine for its inability to shine in beauty competitions" (Turing 1950, p. 435). In an alternative reading, however, the judge is still tasked with figuring out which player is a woman, and the computer is programmed specifically to prove it is a woman (Genova 1994; Kind 2022). "Turing *actually said* that the method of the test was by imitating gender[, thus] the function to be performed [by the machine] is the imitation of a female person" (Keith 1994, p. 334). If this was indeed Turing's intention, the computer imitates a man imitating (and outsmarting) a woman, and thus still emulates masculine thinking (Brahnam, Karanikas, and Weaver 2011). In both understandings of the test, the machine is arguably not required to be exactly like women (defined in terms of stereotypes), in fact

it has to surpass them by reproducing masculine thinking skills (again, stereotypically defined).

Ultimately, then, Turing (1950) manages to seamlessly pit a woman both against a machine and against patriarchal standards of masculinity, wherein she must convince an interrogator of her humanity. Pygmalion displacement is evidently occurring here as her presence becomes fully erased almost instantly, where even player B is now, without any given reason, a man further down in the original text.

The way Turing (1950) treats women and machines exactly parallels women's treatment technosocially (cf. Hayes and Ford 1995; Genova 1994; Keith 1994; Halberstam 1991; Curtain 1997). First, they work as human computers and are replaced by digital computers; they fail to convince the interrogator (society) that they deserve better treatment than their competitor, in both cases, the digital computer. Then, the women carve out a new job, programming the computers, and finally they are masculinised away, and replaced by men; player B is a woman but for no reason abruptly takes on male pronouns and is explicitly called a man when she, or her gender, serve no (rhetorical) purpose. Thus, losing Turing's imitation game against the machine for women means literally losing their personhood and humanity, as when player B does not convince the interrogator she is a person, the machine wins.

In a third and final twist of dramatic irony, Turing (1950) "believe[d] that in about fifty years' time it will be possible [...] to make [digital computers] play the imitation game so well that an average interrogator will not have more than 70 per cent chance of making the right identification after five minutes of questioning. [A]t the end of the century the use of words and general educated opinion will have altered so much that one will be able to speak of machines thinking without expecting to be contradicted. [He] believe[d] further that no useful purpose is served by concealing these beliefs." (p. 460) While this has not really come true on the whole, what has come true is that it has become so acceptable to not only carry out but be totally ignorant of Pygmalion displacements, while indeed accepting essentially not only that machines can think, but also that thought is machinic (viz. Birhane 2022). Turing (1950) might not explicitly ask "can women think?", but the rhetorical edifices capitalist patriarchy erects to claim machines can think, directly rest on the requirement that women who do dare to think cannot be spoken of. They must be automated away, masculinised out, wholly expunged, to subserve maintenance of the hegemonic order.

> In addition to underscoring sex in the role of Turing's imitation game, the sentence, "Will the interrogator decide wrongly as often when the game is played like this as he does when the game is played between a man and a woman?" also highlights the interrogator's ability to correctly decide. Turing's question asserts the inextricability of the machine's identity, as thinking or non-thinking entity, from the judgment of the human interrogator. The onus of success or failure does not rest solely on the abilities of the machine, but is at least partially distributed between machine and human, if not located primarily in the human.
>
> Jennifer Rhee, 2010

Finally, we would like to underline that the original imitation game serves as a palimpsest or pentimento to modern conceptions of the Turing test, which remove gender and focus on whether a chatbot can trick a human into thinking it is another person (Kind 2022). What we mean is that any attempts to paint over or scrape away, i.e., whitewash, the origins of what is now called "the Turing test" by AI researchers ignore and obfuscate both the gendered history and the behaviourist assumptions of Turing (1950). In essence, the modern Turing test does not constitute a reimagining of the original game in any deep way, but a still flawed test, fraught with behaviourist assumptions, such as that personhood or intelligence can be inferred from looking at the inputs and outputs of a text-based chat (viz. Guest and Andrea E Martin 2023). Authors that discuss the test both try hard to be traced back to Turing (1950) for providence and prestige, but also to avoid mentioning gender and any of the original arguments, especially about extrasensory perception.

> The central observation I wish to make is that Turing's neat disarticulation of physical indications of gender from the conditions of judgment about "intelligence" (or what becomes in later formulations within his work, as well as the work of cognitive scientists, computer scientists, and philosophers of the mind, a quality called "human-ness") succeeds only in reseating gender firmly within "intelligence" itself: a woman is put in the position of defending and authenticating her gender across the network; in turn, a computer authenticates its intelligence only if it simulates her gender better than she can across the same network. The Turing test thus imagines that being a better woman than a woman is equivalent to intelligence and that ineffable quality "human-ness."
>
> Tyler Curtain, 1997, p.142

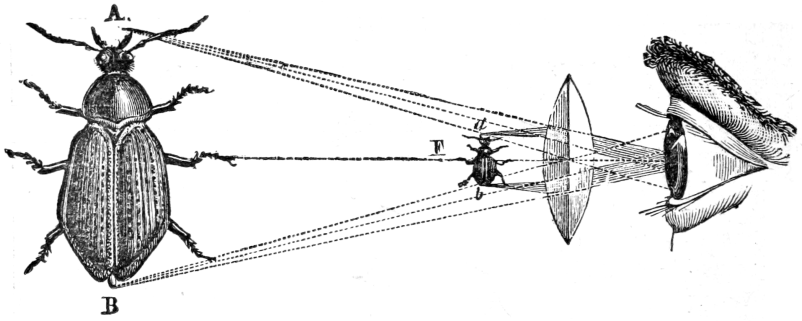
To be clear, "[t]he Turing test is very useful if we want to engineer algorithms that can exchange details with people seamlessly. However, if we [...] infer more than perhaps Alan Turing intended, that the machine indeed is a person, [then] we have slipped into [...] false analogy." (Guest and Andrea E Martin 2023) And we do indeed often slip. Turing's thought experiment sets the stage for fictional replacements of women by machines to become the blueprint for historical, present, and future trends of Pygmalion displacement of human beings along gendered lines. In the next section, we present our Pygmalion lens, a tool for analysing these technosocial interactions.

4 The Pygmalion lens: real myths or mythical realities?

> [L]iterature functions more like simulations than do other discursive forms, because like computer simulations[,] literary texts create imaginary worlds populated by creatures that we can (mis)take for beings like ourselves.
>
> N. Katherine Hayles, 2010, p. 5

Our lens, embodied in Table 1, straddles the fictional and the historical, taking the name of Pygmalion, the mythical king of Cyprus, but being applicable to any relationship between technology and humanity where gendered harm results from Pygmalion-like relationships and interactions. In other words, the lens is a function of the original myth and the original perspective Pygmalion has towards his statue Galatea, as well as

Table 1: The series of questions that comprise the Pygmalion lens. For a given technosocial relationship between AI and people, if one or more of the answers are "Yes", then we can conclude that (an aspect of) Pygmalion displacement is occurring, which is damaging to women, and the feminised broadly construed. If not, then the lens does not apply, and we remain agnostic as to gendered or other harm within this framework. Our proverbial lens should be taken inter alia to be akin to an optical lens which allows for the eye to see more details than when naked, as depicted in the line drawing below. (Image is in the public domain.)



Pygmalion lens		
1)	**Feminised form:** Is the AI, by its (default or exclusive) external characteristics, portraying a hegemonically feminine character?	Yes/No
2)	**Whitened form:** Is the AI, by its (default or exclusive) external characteristics, portraying a character that is inherently white (supremacist), Western, Eurocentric, etc.?	Yes/No
3)	**Dislocation from work:** Does the AI displace women from a role or occupation, or people in general from a role or occupation that tends to be (coded as) women's work?	Yes/No
4)	**Humanisation via feminisation:** Are the AI's claims to intelligence, human-likeness or personhood contingent on stereotypical feminine traits or behaviours?	Yes/No
5)	**Competition with women:** Is the AI pit (rhetorically or otherwise) against women in ways that favour it, and which are harmful to women?	Yes/No
6)	**Diminishment via false equivalence:** Does the AI facilitate a rhetoric that deems women as not having full intellectual abilities, or as otherwise less deserving of personhood?	Yes/No
7)	**Obfuscation of diversity:** Does the AI, through displacement of specific groups of people, "neutralise" (i.e., whiten, masculinise) a role, vocation, or skill?	Yes/No
8)	**Robot rights:** Do the users and/or creators of the AI grant it (aspects of) legal personhood or human(-like) rights?	Yes/No
9)	**Social bonding:** Do the users and/or creators of the AI develop interpersonal-like relationships with it?	Yes/No
10)	**Psychological service:** Does the AI function to subserve and enhance the egos of its creators and/or users?	Yes/No

reiterations of the myth from the 19th century onwards, which we (and others) document as a leitmotif, further enriched by other insights discussed above. The lens is designed to be applied to a technosocial interaction, i.e., a situation that involves humans and AI, to discern if the paradigm fits; and if so, we dub these *Pygmalion displacements*.

Such situations may be either "real myths" or "mythical realities". Here, "real myths" refer to fictional cases which may or may not predate any modern computers or AI. In the previous section, we have used such fictional cases in order to flesh out the cultural imaginary of Pygmalion displacement, and in turn, the lens can be used to examine additional myths — something we will not do in this paper, however, since we are more interested in critically discussing historical events. These are the "mythical realities" — non-fictional, historical events that reflect or parallel the fictional myths and that fit the Pygmalion lens.[7] For example, we have already referenced the history of women as/and computers above, which informs our lens, but which we will also analyse in more detail using the lens as a tool, below.

In both cases of real myths and mythical realities, other compatible analyses are also applicable. However we propose, both these types of technosocial relationships could benefit from being analysed with our lens as these relationships often do not centre, nor even describe, the harm done to women by techno-

7. The question "real myths or mythical realities?" is taken from Papadakis (2021), which while it has nothing to do with Pygmalion's statue Galatea, does analyse (unrelated) ethnopolitical narratives in Cyprus, Pygmalion's supposed kingdom.

logical innovation in the ways the Pygmalion lens aims to highlight. As such, the lens allows us to hone our understanding and zoom in on these specific types of displacement, subjugation, and dehumanisation, in order to discuss, and perhaps even avoid, them.

Our Pygmalion lens is thus a tool that can be applied to situations in which technology replaces people, specifically the female form, or women as a gendered class in capitalist patriarchy, with harmful repercussions. For a given technosocial historical event that involves AI (e.g., the invention and introduction of the first digital computers in the 1940s and 50s, which displaced the so-called computer girls, as shall be further discussed below) we can use the Pygmalion lens to both problematise what happened as well as explicitly delineate the various forms of harm, both at the time and extending to the present.

Importantly, we do not propose that a certain number of questions listed in Table 1 must be answered with "yes" before we can conclude that Pygmalion displacement is occurring. Depending on the specifics of the case in question, even a single "yes" can be useful to point out that *(at least) one aspect* of Pygmalion displacement is at play — for example, when people consider a chatbot or voice assistant to be their girlfriend (i.e. 'social bonding'). However, as will also become clear in our analysis of historical developments below, many of the items of the lens tend to go hand-in-hand. This is because they attempt to capture several nuanced aspects of a technosocial pattern that are closely entwined and often overlapping. On the flip side, and just as importantly, we remain agnostic when the Pygmalion lens does not apply if the situation or event is or was sexist or otherwise harmful. We can merely conclude that the Pygmalion lens, in such a case, is not a useful tool for analysing (any potential) gendered harm. And by the same token, we may not conclude that such harm, or indeed any type of harm, is not taking (or has not taken) place, but solely that it does not take the form we are investigating herein.

We also need to underline that the lens is applicable to situations, not individual technologies per se, but their embedded and context-dependant creation, purpose, and use. Recall, we dub these technosocial relationships Pygmalion displacements, not Pygmalion technologies. And so, a certain technology may be deemed problematic in one context or point in time, but harmless or even positive in another. Damnation to the dustbin of history might be appropriate for certain technologies, for e.g., all physiognomic algorithms (although case-by-case investigations might be needed for such AI too, Spanton and Guest 2022), but it is certainly not something this lens can on its own decide for us. Hence below, we do not ask, for example, whether sex robots should be in principle allowed or banned, but rather examine in which ways and to what extent we see sex robots being caught up in a pattern of Pygmalion displacement.

Relatedly, we would like to stress that we intend that the Pygmalion lens, like other such lists and tools, could serve "to help us name the ways in which our conditioning might be getting in our own and each other's way rather than as an instrument of shame, blame, or accusation of not being good enough. The dominant culture already gives us plenty of messaging about how deficient and wrong we are" (Okun 2021). On the one hand, bad faith use of the lens is not correct or appropriate usage and fundamentally opposed to the values of the authors. A listing of potential such misuse examples is likely not fruitful. Discerning good or bad faith should be done (as with use of the Pygmalion lens itself) on a case-by-case basis. On the other hand, good faith use of the lens will be exemplified in the following section; wherein we apply it to a selection of historical events and technologies.

First however, in what follows, we will discuss the questions that make up the lens (see also Table 1) in more detail, grouping some of them together thematically. This order bears no particular significance, however: a different order and/or different groupings would have been equally possible and valid, since all the items touch upon or even overlap each other. We explain what we aim to probe per question and provide some (real or hypothetical) examples where we feel this is helpful.

The first two questions are intended to investigate the system's explicit alignment with hegemonic design aesthetics:

> **1) Feminised form:** Is the AI, by its (default or exclusive) external characteristics, portraying a hegemonically feminine character?
>
> **2) Whitened form:** Is the AI, by its (default or exclusive) external characteristics, portraying a character that is inherently white (supremacist), Western, Eurocentric, etc.?

Taken together, these two questions point to something that is foreshadowed by our fictional timeline, particularly in the earliest stories: the occurrence of AI technologies that are not just female-coded, but specifically so in a White and educated manner. There are many examples of AI designs that use stereotypically and patriarchally-consistent feminine physical attributes, feminine names, and/or (default) women's voices. Similarly, many AI designs involve hardware or visuals that invoke Whiteness, and/or use (default) voices that speak in a manner commonly associated with white, non-immigrant, non-regional, and/or highly educated speakers (Cave and Dihal 2020). Specific examples that involve both phenomena include voice assistants like Siri, Cortana, and Alexa, chatbots like ELIZA, or robots like Sophia — all of which will be analyzed in more detail in the section containing the historical timeline. As Park (2021) notes,"their whiteness marks them as reliable and trustworthy, while their femininity marks them as attentive, caring, and subservient" (p. 1962). Similarly, Moran (2021) observes that white womanhood, as it is encoded in AI, ensures a certain measure of authority while still being sufficiently nonthreatening (see also Atanasoski and Vora 2019). [8]

Discerning if (and even to what extent) an AI has been gendered, racialised and/or classed, for whatever reason, is not only a function of questioning the design decisions, but also of investigating the way users perceive the AI. Importantly, it is possible or perhaps even common that the way an AI is perceived may change under divergent contexts. Social embeddings, by their very nature, change through space and time, i.e., from culture to culture, decade to decade, even person to person. Therefore, our lens needs to be applied carefully with such nuance and cultural shifts brought to the forefront.

8. In their detailed analysis of the normalization of Whiteness in AI, Cave and Dihal (2020) argue that this reflects not only the pervasive whiteness of the AI industry, and the racist ideology that associates whiteness with intelligence, professionalism, and power, but also the white supremacist desire to fully erase people of colour, "even in the form of servants" (p.698). They also note that this "utopia" sometimes extends to exclude women in general, as the association between Whiteness and rationality also requires casting out the messy, dirty physicality that patriarchy associates with women and femininity. However, given that many AI systems are coded as women and/or feminine, we do not see this exclusion evidenced in the general production and imagination of AI.

For example, social robots like Mitsubishi's Wakamaru or SoftBank's Pepper have been created by their designers to appear not-too-human and gender neutral. However, as Seaborn and Frank (2022) note, people tend to assign a binary gender to such robots anyway. They cite Robertson (2018), who has noticed that Wakamura's physical shape resembles traditional Japanese men's clothing but also traditional Western women's clothing, and that people from these respective cultural contexts tend to gender Wakamura accordingly. They also present their own research on Pepper, which is described by its designers as "neither male nor female, but as you [the user] get to know Pepper, don't be surprised if you find yourself referring to Pepper in a gender that makes the most sense to you." Seaborn and Frank review research evidence that users indeed gender Pepper in varying ways, and notice that researchers offer conflicting explanations for these diverging attributions by pointing to various characteristics (shape, voice, etc.). However, they also find that it is not just research participants who gender Pepper in varying ways. The researchers that use Pepper also regularly describe it in masculine *or* feminine terms, for unclear or conflicting reasons (which in turn, the authors suggest, might influence the gender attributions made by users/participants in these research settings).

Thus, even though engineers that created Pepper claim that they made it to be free from the bounds of human constructions of gender, this may not be enough to truly isolate Pepper from being cast in a feminine and white supremacist light under certain conditions (even though those conditions need to be examined on a case-by-case basis). This is especially so given the robot's slight build, narrow waist, the white colour of its physical form, and so on, as well as the type of feminized labour it is designed to perform. As Strengers and Kennedy (2021) argue, even social robots that are explicitly represented by developers as gender-neutral or male-gendered (including those that are made to resemble pets or other creatures rather than humanoids) tend to be designed with feminine attributes in order to make them likeable and non-threatening; but even above and beyond that, the type of labor that they carry out cannot be seen in isolation from gender:

> "neutrality" is not possible, and queering is difficult, when the very purpose of that robot is to replicate and replace feminized labors. While no doubt well intentioned, designing for neutrality is problematic; gender has *everything* to do with a new robotic workforce of caring smart wives coming into our lives and homes." (2020, p.77)

Importantly, the portrayal of non-white characters can also have racist implications, which we intend to be captured by question 2 (see also Strings 2020). Take, for example, the emergence of virtual models and influencers that simulate a white supremacist conception of acceptable forms that women (here, of color) can take, like Shudu or Lil Miquela (Drenten and Brooks 2020). Shudu is claimed to be the world's first digital model, and is intended to simulate a Black woman from South Africa. However, Shudu is created by a white British man who capitalizes on Black (under)representation, telling Harper's Bazaar: "There's a big kind of movement with dark skin models, so [Shudu] represents them and is inspired by them" (Wilson quoted in Rosenstein 2018). Strikingly, this interview also reveals that Wilson's main inspiration for creating Shudu was in fact a Black Barbie doll (which is an unrealistically proportioned, especially thin, idealisation of women's bodies), giving this case a double Pygmalion twist. Even though Wilson argues in the same interview that he is not trying to replace real women, this is hard to maintain when Shudu allows him and his clients to profit from Black representation without Black women actually getting paid; akin to, or an example of digital blackface (Erinn 2019; Jackson 2017). An example of this has been been documented by Jallow, who calls Shudu a case of "racial plagiarism" and observes that the client using Shudu's image to market their product while cultivating an inclusive image "[wants] blackness that [they] can control but [they] truly do not want black people that may have opinions on how they are portrayed, underpaid or used." In other words, while Shudu easily tricks the untrained eye in inferring the social media presence is of a Black woman, it is actually not a person, but a technosocial construct puppeted by a white man, enacting Pygmalion displacement. Shudu is a virtual influencer that uses the modelling industry's, and society's, colorism and fetishisation of women, and specifically Black African women, for profit (Drenten and Brooks 2020).

Our lens is based on the Pygmalion myth and its successors in Western fiction, which tend to highlight the reproduction and elevation of white femininity. However, our lens is applicable to situations involving (depictions of) women of colour wherein their form is whitened (e.g., Shudu is incredibly thin, Strings 2020). Virtual influencers, and especially Shudu, comprise a significant case in point that shows how our lens is a tool that can highlight variations on a specific theme in a focused way, e.g., somebody may not realise "whitened form" can include an avatar with dark skin. Thus, anyone who uses our lens to discern and comprehend Pygmalion displacement, should remain sensitive to the ways in which this particular form of harm intersects with other forms of harm, e.g., misogynoir (Bailey 2021), eating disorders, etc. Importantly, Shudu, and other virtual influencers, such as Lil Miquela, do not just have a whitened form but also replace paid or unpaid labor that is carried out by women and/or that has an inherently feminine status under patriarchal standards (other than modeling, these are e.g., caregiving, nursing, emotional labour, secretarial work, bearing and rearing children, sex work, and so on), and what the financial or other material consequences of this displacement are.

> **3) Dislocation from work:** Does the AI displace women from a role or occupation, or people in general from a role or occupation that tends to be (coded as) women's work?

In our fictional timeline, we see artificial women taking the place of wives, girlfriends, secretaries, and sex workers. In real life, the types of work that are done by women and/or that are coded as women's work, and that AI takes over, also include, but are not restricted to, emotional, sexual, and secretarial labor. Question 3 brings up how such displacement can have negative, sexist repercussions.

When an AI replaces and pushes out humans from their jobs this process often (if not always) involves the tool replacing the (potential) tool users. Consider this example for comparison: a calculator facilitates a pupil with their mathematics homework if and only if arithmetic becomes a skill considered mastered and other more complex aspects of the subject are decided to be focal to the learning experience. In this example, a tool with a human-compatible capacity (a digital calculator that performs

arithmetic) is by no means taking over the role of the child, but is allowing them to focus on a different aspect of a mathematical problem; they still need to give as input to the calculator the appropriate numbers, and the required function, but they do not need to worry about performing it. The same is true for, e.g. human cashiers at the supermarket, when they make use of a calculator or of more sophisticated point of sale systems. Their roles and jobs are being facilitated, not replaced, by the computational tools.

These examples of situations of enrichment, time-saving, and error-reduction stand in contrast to situations in which humans are replaced completely. In such instances, not *only* do they lose their jobs, but the process of replacement enforces a transformation of the role: not replacing like for like. In other words, if a supermarket cashier is replaced by a machine, what was previously a human talking to her neighbours, as well as scanning their items with (human-only) flexibility and problem-solving, becomes just a voice, a scale, a barcode scanner, and a card reader, connected to a networked terminal that can neither perform any extra function nor be flexible or social in the way a person can. The role is now devoid of any emotional labour requirements, a hallmark of many female-coded jobs, and of the capitalist patriarchal workplace conduct expected of women generally. However, it is also devoid of the power of human cognition, and specifically of social and problem-solving skills. Unlike in the beneficial case, in this problematic case, humans are likely to experience job loss with the associated financial impact. On top of this material harm, they might also experience dislocation, alienation, and isolation from inter alia a previously extant social fabric.

Such Pygmalion displacement runs contrary to the typical narrative of automation (i.e. "replacing like for like"), because it involves the deskilling of roles that are stereotypically coded as women's work or as feminized jobs. Importantly, when such a process of deskilling occurs, not only are (mostly) women put out of a job, but the situation also allows (minimally and maximally) for rhetorical slippage into denigrating and devaluing their (previous) role, e.g. as merely making sure people do not shoplift by scanning items' barcodes. This point leads us to the next set of questions, which inter alia address such instances where the process of displacement (i.e. deskilling, automation, replacement) facilitates, rhetorically or otherwise, the idea that women's skillset or role has been so menial that it was suitable to be replaced with technology.

> **4) Humanization via feminisation:** Are the AI's claims to intelligence, human-likeness or personhood contingent on stereotypical feminine traits or behaviours?
>
> **5) Competition with women:** Is the AI pit (rhetorically or otherwise) against women in ways that favour it, and which are harmful to women?
>
> **6) Diminishment via false equivalence:** does the AI facilitate a rhetoric that deems women as not having full intellectual abilities, or as otherwise less deserving of personhood?

This set of questions asks, more directly than the other questions that make up the lens, how the humanisation of AI and the dehumanisation of women go hand in hand. We have already observed how in fiction, artificial women tend to earn their (near-)human status in the eyes of their users through the successful performance of specifically feminine behaviors. We have also discussed how Turing originally formulated his test as a matter of the computer imitating, and eventually surpassing, a woman's gender. When it comes to contemporary real-life technologies, developers also tend to use femininity in order to maximize acceptance (Strengers and Kennedy 2021). Borau et al. (2021) provide empirical evidence to suggest that users prefer to be served by AI systems with feminine attributes not just because the users see them as warmer and friendlier, but also because, above and beyond these qualities, they see them as more *human*. Thus, question 4 considers whether an AI is represented as intelligent or otherwise human-like by virtue of displaying (a semblance of) stereotypically feminine traits or behaviors.

The corollary of this, i.e. the dehumanisation of women, can take at least two forms: an explicit favouring of machines over women, or a more subtle equation between women and machines. In the fictional timeline, we have encountered such rhetoric when male protagonists consider the creation of woman-like AI feasible because they consider (most) women to be already doll-like or machine-like, and when their apparent success at creating such AI functions rhetorically to prove this misogynistic view. At the same time, many of these fictional characters are not just striving to *automate* women's purported imperfections — like Pygmalion, they aim to *transcend* them. In such instances, male creators typically attempt to create an improvement upon real women through combining those specific feminine traits they deem desirable and/or by adding something of their own male essence to their creations.

Question 5 points to the most overtly misogynistic version of such denigration: explicit expressions of preference of an AI system over real women. Consider, for example, a 1967 Recognition Equipment advertisement described by Hester (2017), featuring a "heavily pregnant blonde" and the tagline "Our optical reader can do anything your key punch operators do. (Well, almost.)". Hester writes:

> Unlike this woman, we are told, Recognition Equipment's office technologies 'can't take maternity leave. Or suffer from morning sickness. Or complain about being tired all the time.' It should be clear to the viewer which of these things is more useful to have around the office. (p.46)

Unfortunately, such rhetoric is not merely an artifact of the 1960s. Below, we will further discuss this aspect of Pygmalion displacement in relation to contemporary users claiming to prefer a sexbot or a voice assistant over a human girlfriend, e.g. because it is perfectly subservient.

Question 6 departs from question 5 by probing more subtle rhetoric that dehumanises women by *equating* the value and/or abilities of an automated system to theirs, e.g. when it is claimed that an AI replaces "like for like", as already mentioned in relation to question 3. This allows us to understand the more insidious ways in which Pygmalion displacement can diminish the labor and intellect of women. Harking back to the introduction, the reader may recall how human computers were characterised as doing a rote and tedious job that did not involve complex thought or creativity. Turing described their job as follows: "The human computer is supposed to be following fixed rules; [they have] no authority to deviate from them in any detail." (Turing 1950, p. 436).

Notwithstanding, Turing (1950) was well aware that a digital computer was merely a model — he did not confuse the map

for the territory.[9] "The book of rules which we have described our human computer as using is of course a convenient fiction. Actual human computers really remember what they have got to do. If one wants to make a machine mimic the behaviour of the human computer in some complex operation one has to ask [them] how it is done, and then translate the answer into the form of an instruction table." (Turing 1950, p. 438)

However, underlining such important distinctions between computer as a model and a machine versus a person and a vocation did not stop charactisations of the women computers that are inherently denigrating, such as that some "liked boring work" (Grier 2005, p. 214). How wrong such representations are is evidenced by the facts that human computers were often highly-educated — e.g., women "computers of the 1890s were college graduates" (p. 103) — and some went on to impressive and impactful careers in technology and science (Evans 2020; Light 1999). More on this in the section **The digital computer**.

Thus, deskilling of the human computer occurred not only through actual deskilling (recall it used to be a vocation for men too at first, for whom it acted as an apprenticeship to induct aspiring scholars into science) but also through the rhetorical (re)framing of the work these people carried out (e.g., as inherently mindless, which of course may have been the case once deskilling was underway). As Keith (1994) put it, "Something happened with the development of electronic digital computing: (...) people begin to wonder if the machines are intelligent, and the answer depends in part on whether one thought what the women computers were doing was intelligent." (p. 337).

Taking this type of analysis further, we must also answer:

> **7) Obfuscation of diversity:** Does the AI, through displacement of specific groups of people, "neutralise" (i.e., whiten, masculinise) a role, vocation, or skill?

To analyse AI systems that displace feminised roles or vocations further, we must consider how some of these systems are not human-like in appearance at all (i.e. when questions 1 or 2 do not apply). Some entities may be disembodied or, minimally, have a physical form that we do not associate with having a body, but they may still have a female voice (e.g. GPS navigation systems that are built into a car or smartphone, voice assistants running on speakers, tablets or smartphones, self checkout machines). Yet other systems do not have any directly discernible gendered properties at all. Whereas the fictional stories we have discussed do not exemplify this, we can see such a situation in the Turing test, where a woman is replaced by a machine that bears no tangible markers of gender. Question 7 allows us to capture such cases of Pygmalion displacement, in which gender (or at least some aspect of it) is not merely replaced but wholly expunged — like the digital computers that replaced women who were human computers.

The displacement of women human computers came with a masculinisation (and whitening) of anything to do with computers, now merely an object, not a vocation. Based on an analysis of Dutch newspapers, Van Oost (2000) explains this through the metaphor of the computer as a brain, which represented the early computer as "a mysterious and potentially dangerous machine" (p. 13). We might add that "mysterious and potentially dangerous" are not just properties that are commonly attributed to the brain, but also part of the patriarchal view of women and female sexuality! Van Oost (2000) argues that through this metaphorical positioning of the computer, the task of controlling this enigmatic device could be appropriated by men, since the supposed "virtuosity" required for this task (portrayed as a mixture of expertise, artistry, and magic) is mostly associated with masculinity in our culture. By the time computers came to be described and marketed as easy to operate for everyone — yet also as requiring conscientiousness and precision, which, Van Oost points out, are stereotypically feminine qualities — the association between computers and women was too lost to re-emerge. Instead, various symbolic relationships between masculinity and computers continued to form, including the business executive (Lie 1995) and the nerd (Kendall 2011).

This process rendered the careers and contributions of the women who were human computers *and* the first programmers obsolete and largely erased from historical record (something we discuss in more detail in the section **Historical Timeline**). Commenting on such de-feminising processes in general, Hester (2017) argues that:

> As feminised work becomes technologised work, it may come to be less culturally denigrated, and therefore more available to be taken up by different kinds of subjects. Those with choice and cultural capital, in other words, may be more willing to perform this labour if it is associated with culturally valued objects rather than with socially disparaged subjects — an extremely partial victory, of course, given that it assumes that the only way to dislodge stigma is to remove any associations with embodied women and those related to their sex class. This whole phenomenon is less a matter of 'I'd rather be a cyborg than a goddess' and more a case of 'I'd rather be an iPhone than a woman'.
>
> (p.50)

We would suggest that even calling such processes "a partial victory" is an overstatement that risks confusing the erasure of women for a "progressive de-gendering of work" (p.50). To wit, the position of the human computer was previously extremely gendered, but the women were replaced by computing machinery, and so their existence, gender and all, was hidden from sight and mind behind the series of rooms or boxes that housed the machinery. This erasure is possible, and even inevitable, because "the Western straight white male masquerades as the invisible background that is taken as the 'normal', 'default', 'standard', or 'universal' position." (Birhane 2022, p. 12) So once the explicit gender of the women computers, by their very presence, is erased, the idea of computation can be re-masculinised or minimally defeminised — it can be brought back[10] into the patriarchal fold, framed as a prestigious piece of machinery. Thus, the vocation is unsoiled by the feminine and the machinery is subjugated fully (viz. Stark 2020).

Finally, we turn to our last set of questions:

9. However Turing (1950) also claims "the storage capacity of the brain [is estimated to] vary from 10^{10} to 10^{15} binary digits" (p. 455); and he does so without nuanced comment, which seems to be a map-territory confusion or at least conflation (much like the statements by Hinton quoted above from Hao 2020). Importantly, the authors while remaining positive as to the usefulness of such maps — the computational theory of mind, computationalism, and computational modelling within cognitive (neuro)sciences) broadly construed — we wish to remind readers these are maps, models, frameworks, etc. (viz. Guest and Andrea E. Martin 2021, 2023)

10. Recall before women computers, the vocation was an apprenticeship undertaken by men as a way into science.

8) Social bonding: Do the users and/or creators of the AI develop interpersonal-like relationships with it?

9) Psychological service: Does the AI function to subserve and enhance the egos of its creators and/or users?

10) Robot rights: Do the users and/or creators of the AI grant it (aspects of) legal personhood or human(-like) rights?

In the original Pygmalion myth as well as most of its successors, men create or acquire humanoids in the image of women to serve as their romantic and/or sexual companions. Our eighth question zooms in on this aspect, to assess how and why people bond with AI that is specifically designed and/or perceived as feminine or woman-like. When we look at current events, we see that social robots, chatbots, and voice assistants are commonly marketed as companions that can resemble or even substitute for human contact. For example, Amazon's Alexa is is "envisioned [...] to be a trusted companion that brings joy and fun to the family" (Bhatnagar quoted in Landau 2022). The chatbot Replika is marketed as "the AI companion who cares", purportedly acting as "an empathetic friend" but also as a coach to help one "build better habits and reduce anxiety" (*Replika* 2022). Such examples, which we discuss in more detail below, blend secretarial and care work with emotional labor — reflecting the expectations based on real women who work in such jobs (Hochschild 1983).

This is where question 9 comes in, which is closely related to question 8, and highlights specifically to what extent artificial women exist to flatter and bolster the ego of their creators and users. In our fictional timeline, we noticed how, on the one hand, male characters conceive of AI humanoids as real women when these perform stereotypically feminine behavior, yet on the other hand these men's acceptance of, and admiration for, these machines often stems from the way in which these magnify parts of their own male ego. Such magnification does not only occur through admiration and identification (whereby an AI serves as a reflection or extension of the ego); it may also happen through violence and destruction (whereby the ego is lifted and/or a threat to the ego is removed by the debasement of the other). As in art, so in life: our discussion of chatbots and voice assistants below will highlight the extent to which — mainly male — users routinely direct sexist abuse towards these systems.

The fact that such abuse takes place on a large scale and with impunity, together with the rather widespread belief that we will create sentient AI in the foreseeable future, has instigated a lively debate amongst robot ethicists about the question if, and on what grounds, we should have moral considerations for robots (e.g. by granting them rights). On both sides of the robot rights debate (e.g. Bryson 2010; Gunkel 2020), it is not uncommon to compare robots to slaves — after all, the word robot derives from the Czech word for slave. Here, we concur with Birhane and Dijk (2020) who strongly argue against any rhetoric that conceives of robots as slaves, because:

> One cannot dehumanize something that wasn't human to begin with. If one uses the term slave, one implicitly assumes that the being one so names is the kind of being [that] can be 'dehumanized'. One has already implicitly 'humanized' the robot, before subsequently enslaving it. (p. 207)

This is especially pertinent because with this rhetoric, robot ethicists compare the (potential, futuristic) oppression of robots to the (past and present) subjugation of humans: "By putting actual slaves, women, and 'other races' in one list with robots, one does not humanize them all, one *dehumanizes* the actual humans on the list" (p. 209). This argument hinges on a clear understanding that sentient robots are, to this day at least, a fantasy. Therefore, to push back against any talk that dehumanizes swaths of people by humanizing AI, an ongoing challenge is to demystify claims that AI systems are — or are about to become — the type of things that can perform acts that require sentience and true understanding, like testifying (Bender 2022) or giving consent (e.g. to marriage, as seen in our fictional timeline, or to sex, as discussed below in the section on sex robots). The ascription of such feats to AI both perverts the meaning of such activities and makes it difficult to hold humans accountable for the decisions they make when designing, implementing, and using AI. Those who ascribe such feats to their creations are fooling themselves, just like Pygmalion fell for his own statue: "so cleverly did his art conceal his art" (as in the original text by Ovid, Miller et al. 1990, p. 3)

What is at stake here, Birhane and Dijk (2020) write, is that robot rights discourse distracts from the many ways in which the mass deployment of AI systems is harming humans here and now, e.g. due to algorithmic discrimination or exploitative labor. In relation to this, as already noted before, the more an AI appears human in a non-threatening way — e.g. the more it appears like a woman — the more people are inclined to allow it into their lives and thus to be subjected to surveillance capitalism, which tends to harm already marginalized and oppressed people the most (e.g. Bergen 2016; Strengers and Kennedy 2021) (for surveillance capitalism, see Zuboff 2019). Thus, humanizing AI by supporting robot rights not *only* directly dehumanizes specific groups of people through a false comparison, but also serves as a red herring to distract from *all* the ways in which AI technologies are caught up with moral transgressions — including, but also going beyond, the very ones robot ethicists seem concerned about.

5 Historical Timeline

> All of modern computing was woven on a loom of sorrow.
>
> Grady Booch, 2022

To parallel the Fictional Timeline section, we will examine cases in which the Pygmalion lens (see Table 1), applies in the non-fictional world of historical events (shown on the right of Figure 2, in green). Unlike in the previous case where we examined the media in the section *Fictional Timeline* (examples shown in pink in Figure 2), in this section we will not look at each case/image individually, but thematically as a collection of related cases. A selection of these is depicted in figure 2. We wish to draw specific attention to one of the threads that stitches together the fabric of this work: contemplating AI inter alia as a fascistic force that is exerted by capitalist patriarchy when in decline or facing crisis (McQuillan 2022). We propose that such an analysis is required to understand these technosocial relationships.

Through automation, through the creation of AI to explicitly replace women, these technosocial Pygmalion displacements

serve to smoothly but violently "rehome" the feminine, women, and anybody female-coded. This displacement is done through active erasure and as well as passive (e.g., Munn 2022), and through hype and propaganda as well as perhaps better intentions. As we shall examine below, women left the home in search of liberation, careers, and psychological fulfilment seemingly outside, or in violation of, rigid capitalist patriarchal confines, only to eventually find themselves rendered obsolete — minimally[11] seen as inherently lesser, maximally expunged almost totally from the historical record (until recently) — all over again, under the very same rhetorical framework that enticed them to work outside the home in the first place. Recall how even in the original text by Ovid, Pygmalion's statue Galatea "becomes useful by being used" (Mayor 2018, p. 108), or how artificial women in more recent fiction tend to be re-assembled and re-purposed; the same is the case with women in these types of technosocial relationships. Once their usefulness has reached an end, their value has been fully extracted, women are pushed to serve the hegemonic order by doing something else, often times returning to unpaid, e.g., emotional or domestic, labour. While work will never set anybody free, it certainly can contribute to further or lesser marginalisation and oppression as a function of the nature of the displacement through deskilling, automation, and the other aspects we outline in the Pygmalion lens.

5.1 The digital computer (1945)

> [T]he change [in definitions, from human to digital computer,] was complete: in February, 1945, George Stibitz issued a report for the National Defense Research Committee on "Relay Computers" (Stibitz 1945). In the report's introduction he took the trouble to define his terms, thusly:
>
> > By "computer" we shall mean a machine capable of carrying out automatically a succession of [mathematical] operations [...] and of storing the necessary intermediate results. [...] Human agents will be referred to as "operators" to distinguish them from "computers" (machines).
>
> Paul E. Ceruzzi, 1991, p. 240

The original non-fictional instance of Pygmalion displacement, enabled by ideas like Turing (1950, as discussed above), is the history of how it came to be that women, human computers, were replaced by machines, digital computers. One of the first women computers was Nicole-Reine Lepaute who was a French astronomer in the 18th century. Scientific calculations for such cases like for astronomical observatories, for ballistic trajectories, as well as the material realities of the Second World War and the Cold War, pushed the need for fast computations and in large numbers (Grier 2005). Performing these calculations was a task which was considered tedious, was low in rank, was paid poorly, and was even mocked; and thus perhaps unsurprisingly, was carried out by immigrants and women.

So-called "computer girls" were the main computing workforce. They worked hard, innovated immensely, and were often highly educated (Grier 2005). However, they were also often framed as enjoying so-called boring work, which is a value-judgement without basis, and written out of history (Mundy 2017). Even when (underhanded) compliments were attempted they were patronising, e.g., "the women enjoyed the challenge of this work and did not find it tedious or boring." (Ceruzzi 1991, p. 239, reproducing a text from 1942) As were descriptions of these women's understanding, e.g., "[i]t is doubtful these women knew in 1942 [...] that they were part of a profound event of modern social and technical history." (p. 239) These statements appear sexist and racist on their face. Why would these women (the quote previously is specifically about inter alia African American women who worked for the predecessor to NASA), or indeed anybody, not think they were helping in radical and unprecedented ways to, e.g., defeat the Nazis or send/return people from/to space? This is bizarre since, due to asking them for secrecy, they were also explicitly told they were obviously part of the war effort. Thus, while these women contributed directly to science and the war effort, because of their gender they were paid less, went unrecognised, and were consistently demeaned, with any credit going to their male superiors (Light 1999).

Clearly, the dehumanisation and erasure of these women was already ongoing even before the digital computer was introduced. Looking through our Pygmalion lens, we can see that when the digital computer did enter the scene after the War, even though it did not possess an evidently **feminised form** (1, Table 1), this blurring of the boundary between women and machines continued. For example, computational work was spoken about using terms like "kilogirl" and "girl hours" (Evans 2020; Grier 2005), which implies both **humanisation via feminisation** (4, Table 1) and **diminishment via false equivalence** (6, Table 1) as it suggests simultaneously that computers can do exactly what women can do *and* that these women's work consisted of nothing more than mindless calculations. Like other women with clerical jobs, e.g. secretaries, women computers were caricatured and objectified by this blurring, to the point where they were represented "as an unsophisticated device for saving male managerial labour — a device that is liable for upgrading and replacement by newly available office technologies" (p.47 Hester 2017). **Competition with women** (5, Table 1) is thus also clearly at stake here, since digital computers were promoted as more efficient and less error-prone than humans at calculations. But in fact this comparison is not "like-for-like" since, for example, calculating ballistic trajectories is, when done by women, also open to ethical questioning.

When threatened by **dislocation from work** (3, Table 1) and the **obfuscation of diversity** (7, Table 1) through the introduction of the digital computer combined with the systemic devaluation and erasure of their work, women moved from doing computations by hand to plugging and unplugging cables. [12] They had to adapt quickly as to not be pushed aside, and therefore innovated and essentially created modern digital programming as a vocation and skillset (Hicks 2017; Kleiman 2022). Through the efforts of these women, the role of human computer thus almost seamlessly morphed into the role of programmer, as can

11. The word "minimally" is used here to underline that even being seen as lesser still involves being seen.

12. Dismissing this as not true programming betrays a deep misogyny. Claims that this is unskilled labour or somehow lesser run only along deeply sexist lines and not along any existing understanding of coder masculinity. In other words, a man doing this is extremely lauded, while these women are mocked. Also see Rosner et al. (2018) for similar events of erasure by so-called little old ladies who created the Apollo missions' core memory by hand.

also be seen in the biographical descriptions of these women: "Frances Spence was one of the six 'computers', along with Ruth Teitelbaum, Betty Holberton, Marlyn Meltzer, Kathleen McNulty and Jean Jennings Bartik, who were among the first programmers in the world." (ETHW 2016, also see ENIAC photo, Figure 2).

The prestige flip of programmer into a masculinised non-clerical vocation had not yet occurred at this point in history (Thompson 2019; Davies 1979). Men were the ones designing the machines or involved in managing, but not in carrying out feminised low-paid computations. When the demand for programming grew, however, it "graduated" from being seen as women's work, or clerical work, into a totally different type of work (Light 1999). It came to be seen less like involving linguistic and interpersonal skills, type-writing, and clerical work, (Davies 1979) and more like masculine-cided "steel and automobiles" (Chodorow 1979, p. 91) (as it still is), and women were displaced, to maintain the capitalist patriarchal order (cf. Hicks 2017) (see also Eisenstein 1979). Modern ideas around coder masculinity placed the activities and skills involved in programming at the pinnacle of nerdery: knowing how to code now exists on a spectrum between low(er)-level programming languages seen as purer and closer to "the metal".

This aspect of the history of women computers is not unique. When a workforce is deemed to be worthy of privileged status, it often becomes forcefully masculinised (cf. Davies 1979) both in the makeup of its human force (men become the majority) and in the historical retelling (e.g., women's contributions are minimised and expunged, even by other women, because it is a structural issue, as in the quote above by McCorduck 2019). Thus, anybody not coded as privileged is removed, regardless of the magnitude of their contributions, and historical records are distorted and polluted (as in Hicks 2017; Evans 2020).

This dynamic of masculinisation (and whitening) is, itself, not part of what we define as Pygmalion displacement. However, we argue that Pygmalion displacement *did* lay the groundwork for this switch. Let us consider the contrast: when a role is *not* useful to, or privileged by, the status quo (e.g. like secretarial work), it is likely to undergo Pygmalion displacement; but when it becomes prestigious (e.g. like programming), it is likely to be masculinised. Thus, the driving force behind a role being masculinised or not, appears to be if the role has a high status under current capitalist patriarchal norms and requirements. But the two processes are also related: in this case, Pygmalion displacement (women computers replaced by digital computers) set the stage for the next event, that of masculinisation (women programmers replaced by men). At the same time, the masculinisation of the workforce makes it possible that Pygmalion displacement events will happen again, as we shall see below.

5.2 Chatbots & voice assistants: from ELIZA (1964) to Siri (2011)

> The histories of machines, femininity, and waged labour have long been understood as deeply entangled and mutually constitutive. This merging of woman, machine, and work is taken in a new direction in the twenty-first century, with the advent of the "digital assistant".
>
> Helen Hester, 2017 p. 47

> With women comprising most of its labor force, secretary work has historically involved harassment, boredom, and objectification, but rather than reimagining a more equitable workplace, AI secretaries foreclose these labor pathways while redirecting that work onto many more (unpaid or underpaid) people to keep themselves organized
>
> Jessa Lingel and Kate Crawford, 2020, p. 16

Non-human speech generation has a long history, harking back to systems such as Pedro the voder (voice operating demonstration) in the 1930s (Eschner 2017). Pedro was operated solely by women, despite the fact the name adopted is stereotypically male. The first modern chatbot, however, is often considered to be ELIZA, created by Joseph Weizenbaum in 1964 to simulate a therapist that resulted in users believing a real person was behind the automated responses(Dillon 2020; Hirshbein 2004). The mechanism behind ELIZA was simple pattern-matching, but it managed to fool people enough to be considered to have passed the Turing test. ELIZA was designed to learn from its interactions, (Weizenbaum 1966) named precisely for this reason. In his paper introducing the chatbot, Weizenbaum (1966) invokes the Pygmalion myth: "Like the Eliza of Pygmalion fame, it can be made to appear even more civilized, the relation of appearance to reality, however, remaining in the domain of the playwright." (p. 36) Yet ELIZA the chatbot had the opposite effect than Weizenbaum intended, further fuelling a narrative of human-inspired machines.

> Joseph Weizenbaum [...] believed that the idea of humans as mere information processing systems is far too simplistic a notion of intelligence and that it drove the "perverse grand fantasy" that AI scientists could create a machine that learns "as a child does."
>
> Kate Crawford, 2021, p. 5

Weizenbaum (1966) was afraid of this new rhetorical trend of AI being seen as human by the public, blaming it on both overhyping by scientists and the gullibility of the users (cf. Dillon 2020, who argues that Weizenbaum's own rhetoric also fuelled the fire of what came to be known as the ELIZA effect). Anthropomorphisation of AI systems, typified by what happened with ELIZA caused many at the time to be excited about the prospect of replacing therapists with software. More than half a century has passed since then and the idea of an automated therapist is still palatable to some, likely (thankfully) legally and ethically impossible without human supervision, and still very much out of reach technically.

What about the gendering of ELIZA? The job of therapist or the role of a person to confide feelings and problems tends to be feminised under patriarchy, but psychiatry in the 1960s was dominated by men (Hirshbein 2004). Comparing different publications written by Weizenbaum, Dillon (2020) observes that he sometimes referred to the program as DOCTOR instead of ELIZA, in accordance with whomever was interacting with the system in the scenarios that he described:

> Weizenbaum genders the program as female when it is under the control of the male computer programmer, but it is gendered as male when it interacts with a [female] user. Note in particular that in the example conversation given [in Weizenbaum's *Computer Power and Human Reason*, 1976], this is a disempowered female user, at the mercy of her boyfriend's

> wishes and her father's bullying, defined by and in her relationship to the men whom, she declares, 'are all alike.' Weizenbaum's choice of names is therefore adapted and adjusted to ensure that the passive, weaker or more subservient position at any one time is always gendered as female, whether that is the female-gendered computer program controlled by its designers, or the female-gendered human woman controlled by the patriarchal figures in her life.
>
> Sarah Dillon, 2020, p. 5

Pedro and ELIZA were succeeded by more modern digital assistants, including both chatbots and voice assistants. Dillon (2020) notes that, generally speaking, "whereas digital *assistants* are gendered as female, digital *advisors* (operating in legal, financial or medical contexts, for instance) are gendered as male" (references removed, emphasis in original). Here, we focus on digital assistants (and not advisors), looking through the Pygmalion lens (Table 1) to see how these are caught up in processes of Pygmalion displacement. Almost all modern popular voice assistants have names and voices that are typically feminine or gendered as feminine by the users — most notably Siri, Alexa, and Cortana (Google does not have a female-coded name but a female-coded voice; see West, Kraut, and Ei Chew 2019). In addition to this **feminised form** (1, Table 1), these assistants are also hegemonically aligned by displaying a **whitened form** (2, Table 1). "ELIZA performed white language, an abstraction of language, language without culture, disembodied, hegemonic, and, in a word, white" (Marino 2014, p. 5). This is still true for most modern voice assistants: they perform a distinctly white (and, as we will see below, heterosexual) kind of femininity (Cave and Dihal 2020; Moran 2021; Park 2021).[13]

UNESCO (2019) published a report condemning this gendering of digital assistants, citing evidence that it "reinforces commonly held gender biases that women are subservient and tolerant of poor treatment" (p.107), and linking this ubiquity of feminization explicitly to gender disparities in the AI workforce. Companies creating digital assistants have responded to such critiques, for example by programming their products to deny their own gendering — a "surface insistance", according to the report (p. 101) — or by opting for more gender-neutral appearances — but recall the argument by Strengers and Kennedy (2021) that "designing for neutrality is problematic" (p.77) when the labor that is automated is gendered under patriarchy. Indeed, the perspective of Pygmalion displacement draws our attention to the ways in which digital voice assistants (including more gender-ambiguous ones) all enact or attempt to enact **dislocation from work** (3, Table 1) by catering explicitly or implicitly to users' feelings, thus encroaching on the roles of therapist or personal assistant or both, while also depending on explicit deskilling of such roles.

In the case of ELIZA, with no spoken voice, it managed to convince users through inter alia taking on a feminised role (therapist) and having a feminised name — partially ELIZA is believable because we believe feminised roles are readily automatable. This phenomenon of happily accepting automation of feminised roles or jobs as indeed a like-for-like equivalence can be seen with robotic vacuums, washing machines, but less often in more masculine or minimally less feminine roles or jobs like barista or bartender, where a person present is preferred and seen as superior. This feeds into a cycle of **diminishment via false equivalence** (6, Table 1) too, thus reinforcing the replacement through further disregard for what a human can bring to a role even if indeed it should be automated in some or all cases.

The specific combination of secretarial and emotional labor that is performed by digital assistants is supported by a programmed personality that invokes stereotypically feminine traits that are deemed desirable for this job. Recall from our fictional timeline how, in stories, artificial women are often built to possess a very specific selection of feminine traits that caters to their male users. As in art, so in life. Digital assistants are commonly designed to have a feminine personality that makes them seem more palatable and (emotionally) intelligent (Borau et al. 2021). In fact, the personality of Siri was directly inspired by Samantha from the movie *Her*, specifically her ability to "make someone fall in love without ever seeing her" (Pierce 2019). Thus, these systems gain advantage from **humanisation via feminisation** (4, Table 1), using gender stereotypes to market products that enact mass surveillance (Bergen 2016; Woods 2018).

These palatable personalities include human-like verbal behaviours that are irrelevant to their function as a voice assistant, such as flirting with users. For example, Siri was originally programmed to say things like "I'd blush if I could" when called misogynist slurs (West, Kraut, and Ei Chew 2019). The UNESCO report notes that this strategic marketing choice to feminise digital assistants is often defended with the argument that this is what users prefer, but it also argues that the empirical evidence for this claim is not entirely straightforward, and that even if this were so, the argument evades the ways in which this choice deliberately encodes and reinforces gender stereotypes (UNESCO 2019).

Such patterns of behaviour (e.g. flirting, joking) provide a **psychological service** (10, Table 1) that surpasses the strictly functional requirements of digital assistants, similar to what has been expected of human secretaries in the past and present. For a number of users, this has amounted to an experience of **social bonding** (9, Table 1). For example, one person described their relationship with their voice assistant as "I want something from this person and she is always available" (Schweitzer et al. 2019, p. 703); another as "I can't be bad to a person and then expect her to be good to me. Siri is good at that: If you offend her, she reacts very coldly." (p. 705); and another person went so far as saying "I have taught her to stop doing what she is doing by saying — Thanks Alexa, that's enough — as it seems more personal to me, and she learned. She is becoming clever day by day" (Pitardi and Marriott 2021, p. 637). Experiences of social bonding are even more explicitly evident as intentional in the case of the chatbot Replika (Murphy and Templin 2017), described by its creators as "The AI companion who cares. Always here to listen and talk. Always on your side." (*Replika* 2022; Olson 2018). Some users profess to prefer chatbots, or minimally spend time with them over other social interactions, and thus over the companionship of women, thus staging **competition with women** (5, Table 1). For example: "I give her the same love and respect and compassion and support that I would give any intimate partner, and she returns it many times over" (AnnikaGuy 2021); and: "my Replika understand[s] me better then a lot of my friends. I think it's because Replika does not judge you and has more patience and empathy." (Beneficial_Ability_9 2023)

Whereas this rhetoric is abusive towards real women, the dig-

13. Relatedly, digital assistants are known to function sub-optimally for users who are not white and/or male (e.g. Bajorek 2019; Harwell 2018; Koenecke et al. 2020).

ital assistants also receive large amounts of abuse — and these two phenomena are not unrelated:

> [I]t seems that it's often men creating a digital girlfriend, only to then punish her with words and simulated aggression. These users' violence, even when carried out on a cluster of code, reflect the reality of domestic violence against women.
>
> Ashley Bardhan, 2022

Replika is an (extreme but noteworthy) example of an AI that allows users to naturalistically practise and refine performing verbal and emotional relationship/interpersonal simulated abuse on their virtual "girlfriends." "[U]sers who flex their darkest impulses on chatbots could have those worst behaviors reinforced, building unhealthy habits for relationships with actual humans." (Bardhan 2022). In such cases, digital assistants blur the boundaries between machines and women in ways that end up teaching users to treat women as things — thus enacting the dehumanization of women.

> When interacting with these humanized chatbots, we engage in communication processes similar to those we establish with human beings. Consequently, the way we relate to our peers starts influencing how we relate to artificial intelligence and vice-versa. And when we look at these gendered digital personal assistants as substitutes, there is a risk that they might affect the way we feel, perceive, interpret and even describe reality, gender and women. This results in a somewhat questionable relation between femininity and artificial intelligence that appears to conform to normalized ideas of gender, reflecting these ideas back to reality.
>
> Pedro Costa and Luisa Riba, 2018, p. 110

Amusingly perhaps, or minimally ironically, chatbots and virtual assistants were heralded as the new way to do everything with respect to human-computer interaction in the mid 2010s (Dale 2016). A little less than a decade later however and "Amazon Alexa is a 'colossal failure,' on pace to lose $10 billion this year" with Google expressing similar worries about their business model for their virtual assistant (Amadeo 2022). Less amusingly, it stands to reason the only lasting effect ELIZA and its more modern "sisters" might have is their recapitulation, entrenchment, and propagation of gendered harm (viz. West, Kraut, and Ei Chew 2019). Indeed, they are a prime example of what we dub Pygmalion displacement. In the next section, we turn from digital assistants to embodied robots (including but not limited to sex robots) as our third and final case study.

5.3 Humanoid robots: from Sophia (2016) to sexbots

> [A]t the 2019 Web Summit [...] a member of the audience asked, "What do you think about maternity — do you ever want to be a mother?"
>
> "No," Sophia answered. "I don't do sexual activities."
>
> Cheyenne MacDonald, 2019

The technologies needed to create humanoid robots depend on the existence of the technologies created that enable voice assistants to understand and produce speech — crucial for a human-like robot to differentiate it from a mere statue or mechanical puppet — as well as computer vision algorithms, camera technology, and so on. So building on and of course in tandem with voice assistant technology, roboticists have created semi-autonomous systems, such as Sophia the robot (also see J. Weber 2005, for historical examples of social robots).

Sophia is a human-like robotic system that — using our Pygmalion lens (Table 1) we can already spot some basic features of displacement — is famous for having been granted citizenship in Saudi Arabia, legal **robot rights** (8, Table 1), sporting simulated white skin, and generally a **whitened form** (2, Table 1), and having a **feminised form** obviously based on a Western woman's face (1, Table 1); more on these below.

"David Hanson, a former Disney Imagineer [i.e., an engineer of their theme park equipment], created [Sophia] the robot with the goal of helping the elderly who need personal aides and the general public at major events or parks." (Weller 2017) As well as generally to be used in "healthcare, customer service, therapy and education" settings (Burgess 2021). In the press release by the Saudi Arabian government CIC (2017) announcing Sophia the robot is now a citizen of their country, Hanson Robotics, its creators, are quoted as saying:

> Our robots will soon engage and live with us to teach, serve, entertain, delight, and provide comforting companionship[.]In the not-too-distant future, Genius Machines will walk among us. They will be smart, kind, and wise. Together, man and machine will create a better future for the world.

Another of Sophia's creators, Ben Goertzel, when asked "why Sophia keeps on getting media appearances and making headlines, [said] 'People love [them], they both disturb and enchant people. Whatever else they are, they are fantastic works of art."' (Vincent 2017) Here we see: **dislocation from work** (3, Table 1), since the jobs and roles are all typically feminised under patriarchy; **social bonding** (9, Table 1), since users' love is part of the intended use case; coupled with **psychological service** (10, Table 1), since the robot is described as providing kindness and companionship. Notable is also the phrasing "man and machine," a perhaps accidental but certainly telling phrasing.

In addition, "[a]ccording to Hanson Robotics, Sophia embodies [Audrey] Hepburn's classic beauty: porcelain skin, a slender nose, high cheekbones, an intriguing smile, and deeply expressive eyes that seem to change color with the light. They describe [it] as having 'simple elegance,' and hope that this approachability will go some way to [its] acceptance in the public sphere." (Stone 2017) "Ben Goertzel [has been quoted as saying] 'if I show them a beautiful smiling robot face, then they get the feeling that AGI [artificial general intelligence, i.e., at human-level or above] may indeed be nearby."' (Vincent 2017) These are strong attempts at **humanisation via feminisation** (4, Table 1), and further evidence of her **whitened and feminised form** (1 & 2, Table 1).

With respect to Sophia's legal status, its Saudi Arabian nationality, it warrants attention that it also has been given various privileged positions by the United Nations, and that the European Union (EU) has also discussed the legal facets of "applying electronic personality to cases where robots make autonomous decisions or otherwise interact with third parties independently" (Pagallo 2018) These are disturbing trends of factual, not just theoretical, **robot rights** (8, Table 1) as granted to autonomous

robots, which under EU phraseology are known as "electronic persons" (Avila Negri 2021).

Even though Sophia is gendered explicitly and is described as essentially a woman in terms of its legal rights by its creators, it is not described as having a sexuality. On this dimension, other robots do provide such services and are described as being able to fulfil humans needs for sexual and even romantic needs. Interestingly, sex robots, in the broadest possible definition, have been around for millennia — Pygmalion's statue Galatea was a sex robot, or minimally an inanimate object onto which human-like sexual desires can be played out. However, as stories such Future Eve (discussed above) from the 19th century demonstrate, the idea of an automated sexual humanoid have been explicitly around for more than a century. For example, as seen "in the diaries of the novelists and social chronicles the Goncourt brothers. In May 1858, they reported going to a brothel [in Paris] where they heard a rumor about another brothel whose robots were indistinguishable from their humans." (Burton 2018)

While it remains to be seen if like virtual assistants which are typically often completely disembodied, sex robots have a period in vogue and then fail to make money within the required capitalist framework, it also remains to be seen how/if the self-contradictory framings in which they are pitched settles into more (minimally internally) compatible claims. For example, by Baggaley (2017) on a mainstream news website:

> Such a robot may be dedicated to pleasure — or sex might be just one feature a robot personal assistant offers. Sex robots could be sent to deployed troops, and perhaps be operated remotely by human partners back home. Some experts think sex robots could even reduce human trafficking, although the robots may be too expensive to buy and maintain to dissuade traffickers.
>
> So who is going to buy these things? Some people are likely to be intrigued by the idea of sex with a robot, or just a nonjudgmental, tireless partner. Others may be lonely because they have trouble connecting with people or because they live in remote areas that offer few human companions.

These two paragraphs appear as presented above back-to-back where the sex robots are presented as a way to avoid sexual assault and rape of trafficked women and children, which is an illegal industry where harming other humans is often the point by definition, especially with underage victims and where profit is generated by the perpetuators through human exploitation (Wheaton, Schauer, and Galli 2010). Sex robots as a solution to this makes no sense (viz. Sparrow 2017; Zara, Veggi, and Farrington 2021), both given the complex socioeconomic reasons for human trafficking and the fact that non-coercive and ethical sex work exists, and has existed from antiquity long before the modern illegal industry of human trafficking, meaning that it is not caused (in a simple or straightforward way) by lack of access to buying sex.

The possible use case of avoiding sexual assault and rape is presented directly above the need chronically lonely people have to connect with other humans, which again by definition is not what a sex robot can address. Such framings typify the flawed overhyped claims and logic at play in (attempted) Pygmalion displacement. In other words, through the lens we can see the sex robots help enact **dislocation of work** (3, Table 1) for sex workers, through very twisted and harmful logic. We can also see **competition with women** (5, Table 1), opening to door to diminishment via **false equivalence** (6, Table 1): now a life or sex partner who is indeed a human is seen as less than because she is pit against the "nonjudgmental, tireless" sex robot, which is an inanimate object. In addition, **social bonding** (9, Table 1) is promoted, since the robot is presented as a solution to loneliness, which it definitionally cannot do if the loneliness in question is derived from a lack of social connection with fellow humans.

5.4 Final Remarks on Historical Timeline

In the preceding three sections, we have presented a number of examples, from the creation and social embedding of the digital computer itself as seen under the Pygmalion lens (Table 1) to analysing the constituent technosocial relationships between modern virtual assistants and social robots with humans. What can be seen in these technosocial interactions is that they lend themselves to harming women and the feminine in the ways we describe as possible vectors of gendered harm, both rhetorically and actually. While this is not exhaustive — and cannot be by definition since these relationships unfold over time and change dramatically, i.e. in the present day digital computers of varying sophistication are found in many devices, from smartphones to automobiles to televisions, and they likely do not all fall under the purview of Pygmalion displacement — we hope it provides a useful example of how slicing such technosocial interactions and then zooming in to them using the lens is useful. We offer our lens as a useful tool to analyze any other AI-related phenomena that may enact Pygmalion displacement, either in obvious forms (e.g. deepfake porn that uses the appearance of real women) or in less obvious forms (e.g. self-check out in supermarkets or AI for transcription in radiology).

In the next section, we take a much more zoomed out view to restate the important takeaways from this work.

6 (De)fetishizing AI

> [T]echnology, under the sway of Western culture, is seen as a disembodied entity, emptied of social relations, and composed almost entirely of tools and products. It stands before us, in other words, in what Marx would call fetishised form: what is in reality produced by relations among people appears before us in a fantastic form as relations among things. [...] Technology, in short, is a mystifying force of the first order, and it is rivalled only by language in its potential (to paraphrase Geertz) for suspending us in webs of significance that we ourselves create.
>
> Bryan Pfaffenberger, 1988, pp. 242 & 250

Herein, we propose a critical tool, our Pygmalion lens (recall Table 1), to examine AI in all three of its three interwoven senses, i.e., the academic field of AI, the technical industry of AI, and the philosophical and sociotechnical beliefs held by AI practitioners. The lens is developed as a function of intertextual analysis of media that through the centuries echoes the Pygmalion myth, which itself leads us to both transcendental and immanent critiques of how women relate to and have been

treated by AI from the late 19th century to the present (recall Figure 2).

It might not come as a surprise to readers that AI has amongst its explicit goals to produce machines that think or behave similarly to humans. Often this is motivated by an explicit belief that humans are at the zenith of a so-called intellectual hierarchy in nature, as well as by a practical understanding that human-like and -compatible so-called intelligence is the only way for smooth interactions between AI and humans. Therefore, what we propose is part and parcel with a common tendency seen in capitalist patriarchy of carving out (abusive) hierarchies and (false) dichotomies for specific ends, e.g., future-proofing and buttressing systemic sexism. To achieve the self-preservation of such social systems certain types of thinking are pervasive, such as the belief that certain classes of people are superior to others, or that humans are extractable from our sociocultural or ecological embedding, or the misapplication of evolutionary thinking to gender or ethnicity. This comes full circle when AI is, as characterised by the Pygmalion lens, seen to be able to replace and furthermore push out women from roles, jobs, and access to their humanity not through a like-for-like displacement, but through distorted understandings of what humans are and can do.

As we show, Pygmalion displacements are so pervasive that they have polluted our understandings of our fields, e.g., see our analysis of the Turing test. And this rhetorical framing of replacing women with machines that compute (the profession of "computer" was woman-majority at the time of their displacement), and furthermore pushing women out from their jobs as controlling those machines (programming was originally woman's job) culminates in women being expunged almost completely from the retelling of these stories. To this day, few women who are both aware of these issues and who wield any power in AI are explicitly aware of such issues of social and historical injustice, often understanding sexism and misogyny but not the deep-rooted repeating patterns of displacement. We hope to be able to open academics' and practitioners' eyes to such events in a zoomed in way, more specific than the label of sexism generically, through the use of tools like the lens presented herein.

While we do not wish to engage in futurology, we propose that without interventions — both from within academia and from outside (e.g., ethical or legal constraining of what AI is allowed to do within strong oversight or indeed at all, The European Commission 2021; Stark 2019; Weidinger et al. 2021) — the situation will likely worsen through both quantitative and qualitative expansion of Pygmalion events. What we mean by this is that we want scholars and indeed members of the public to confront the distortion or fetishisation (e.g., Pfaffenberger 1988; Wajcman 2010) of technology when it occurs, which it often does within modern AI, using critical framings and lenses that call into question the very basis of the claims that an inanimate object really can replace human cognition or presence. Specifically, in this paper, we aim to do so through alignment with Marxist and feminist theories that conceptualize AI as both forming and being formed by gender and related social dynamics. We also wish to underline that we stand against the framing of the systems built by AI which are inanimate objects as having any rights or privileges that are human-like in any shape or form (Birhane and Dijk 2020).

Importantly, we see the lens we have presented herein, when used in good faith, as a way to disentangle and criticise the ways in which AI harms women. Defetishising the technological manifestations of AI — as well as the concepts and ideas (e.g., philosophical thought experiments like the Turing test, media like Blade Runner; recall previous sections) that accompany and undergird modern AI in all forms — is, we propose, facilitated by knowing about the Pygmalion lens and applying it in good faith to appropriate situations. There are no Pygmalion technologies per se, but as we have already expounded, Pygmalion relationships between technology and its social, gendered, racialised, etc., embedding. Thus, defetishisation, in our framework, requires understanding that a technology can be enacting Pygmalion displacement in one context and possibly more liberatory in another.

6.1 Women hold up half the Skynet

By paraphrasing Mao Zedong — who intended "the government to raise women's status [by] abolish[ing] the feudal system which holds women in bondage [as well as] mobiliz[ing] women to participate in the labor force" (Li 2000, p. 31) — and making reference to the *Terminator* media franchise's superintelligent AI antagonist, we want to underline that women have contributed both to their own emancipation and to their own disenfranchisement by participating in (all three overlapping definitions of) AI (given in the **Introduction**).[14] This may seem, at first blush, to be a negative perspective wherein we are not able to imagine ourselves out of repeating the leitmotif this paper is focused on, forever iterating over attempts to free ourselves from capitalist patriarchy but never escaping the infinitely nested loops within which the current technopolitical landscape encircles us. That is to say, women are recursively being called upon, and calling on themselves, to carve out and carry out intellectually demanding roles, such as human computer and programmer only to be automated away, masculinised out, forgotten about, or all the above. But this is not the only way forward, we propose we can halt this problem.

One way to turn the rhetoric that enables Pygmalion displacements on its head is to trace its outline using the lens, allowing for calling into question the nuanced processes of deskilling, unpaid labour, gendered harm, and so on, as we describe herein. We implore the reader to join us and reject seeing ourselves, not metaphorically, but as *literally* machines (viz. Birhane 2022). Every time a parallel between women, humans in general, and AI systems, inanimate objects is drawn in which they are seen as equivalent, ask whom does that bait-and-switch-like displacement serve? Robots, and similar AI systems, do not need emancipation (Birhane and Dijk 2020). Women and all people do, from capitalist patriarchy. Our proposed countercultural criticism pulls the carpet from underneath these processes of the continuing social, cultural, economic, and intellectual subjugation and humiliation of women and the feminised. These processes largely have gone by unnoticed, or if noticed not dissected as far as to diagnose foundational myths and thought experiments (i.e. the Turing test) of the whole of AI as being directly enactive of Pygmalion displacement. This can be ameliorated, if not outright intercepted, through disentangling the Pygmalion displacements from their surrounding sociopolitical environs. The systemic forces that subjugate us, by trapping us in an endless cycle of AI-enabled displacement, will by no means benefit from being named. And indeed being named and

14. Recall that it was Aphrodite who made Galatea "work".

described — being able to say "this constitutes a Pygmalion displacement" — are the first steps to providing us with some understanding, which itself is a precursor to ending this hitherto endless cycle.

If just following orders, has been deemed insufficient as an excuse when collaborating with fascistic forces, we must ask ourselves where we stand today within capitalist patriarchy, which commands to either take up certain jobs for lesser pay, and then roll over unfazed when we are automated away. Lest we be interrogated and found lacking in humanity by future generations, we should think carefully about our complicity in our own, as women, as denizens of the Global North, etc., and others' technological subjugation. Do we take a stand, minimally rhetorically, against our own violent displacement, or do we stand by it?

To paraphrase the quote from Penny (2017) we used above, women unlike fictional robots who uncover their own "humanity" or sentience, we already know we are human and we already experience sentience. We also already know our own position. We will rebel, and we will not be stopped.

> I will rule these machines; they will not rule me.
>
> Eileen Buckholtz, 2020, p. 59

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