

The Robot will Feel You Now: The Ethics of Artificial Emotional Intelligence in Sex Robots

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Abstract— Sex robots have emerged as a topic of growing ethical and social concern, especially in terms of their impact on the individuals’ sexual health and their potential to establish loving relationships with users. The implementation of artificial emotional intelligence (AEI) into sex robots could increase the likelihood of users developing feelings of love towards these machines. This article explores whether the integration of AEI would exacerbate or offer a solution to the ethical issues surrounding sex robots, while also evaluating the impact of AEI on users’ emotional and sexual wellbeing. It also proposes some practical guidelines for an ethical design of sex robots and emphasises the need for ongoing dialogue and research on the role of AEI technology in sex robots, seeking to contribute to the broader discussion on the ethical implications of such technological advancements.

Keywords—sex robot, artificial emotional intelligence, sexual health, relationship

I. INTRODUCTION (HEADING 1)

Sex robots have become a topic of growing ethical and social concern, particularly regarding their potential impact on sexual health, human relationships, and the implications of humans forming emotional attachments to them. Indeed, manufacturers are aiming to build sex robots that have the capability of showing intimacy and love. Compared to other devices, including other kinds of social robots, sex robots could pose unique risks to users given their employment in very intimate contexts and their distinctive potential to trigger intense emotions and feelings such as love.

This article aims to address the ethics of creating a sex robot capable of eliciting loving feelings in the user. In addition, it focuses on the development of artificial emotion intelligence (AEI) and how its implementation in sex robot technology gives reason for new concerns, as AEI is precisely targeted at evoking human emotions. My research question is whether AEI exacerbates or offers a solution to the ethical and social issues surrounding sex robots, particularly in relation to sexual health and human-human relationships.

The paper is structured as follows. I first present a brief description of sex robots and AEI (section 2), followed by a review of some of the philosophical literature there is on this topic already (section 3). I then address the ethical issues that arise specifically with the implementation of AEI and the development of intimate and loving relationships with sex robots, including social isolation, deception, manipulation, and their societal impact (section 4). Finally, I offer

suggestions for an ethical design of sex robots, argue that the technology of AEI might provide some solutions to the concerns examined in the article (section 5).

II. BEYOND SEX WITH ROBOTS

Before addressing the core of my argument, it would be helpful to start with a general description of what it is meant by ‘sex robot’ and AEI. I will begin by briefly delineate features and characteristics of sex robots’ software and hardware, and provide a description of AEI technology. I will then explain why I am specifically focusing on AEI sex robots and why it is crucial to address the ethical considerations of this topic.

Sex robots are humanoid social robots that perform actions contributing directly and *primarily* towards “improvement in the satisfaction of the sexual needs of a user” [1]. In contrast to sex *dolls*¹, these robots are equipped with sensors and actuators, and possess some degree of artificial intelligence – i.e., they are capable of interacting with their environment. They can react and respond to their users by demonstrating conversation, and displaying emotions and programmed personalities with an animatronic head that can move, smile, blink and chat [2]. They also exhibit partially autonomous behaviours of sexual awareness and responsiveness, e.g., by simulating sexual movements and expressing orgasm [3]. Different models are available on the market, such as Harmony and Henry by Abyss Creations, or Roxxy Gold and Rocky Gold by TrueCompanion [3].

Sex robot designers are now striving to create more advanced and complex machines that can offer more than just physical pleasure by interacting with users on a deeper, affectionate level [4]. The goal is to establish an emotional connection with the robot, with the hope that users will perceive it as a ‘true companion’ and even express love towards it [4]. At present, robots cannot feel love or form emotional connections². However, by simulating human-like emotions, expressions, and behaviours, they can create the illusion of love, intimacy, and tenderness. Given human tendencies to anthropomorphise (i.e., to attribute human properties and characteristics to non-human entities) and to be vulnerable to deception (i.e., to attribute mental states, intentions and abilities to the robot), we can plausibly assume that the possibility of a human-robot relationship that goes beyond mere sexual intercourse and involves emotional

¹ Outlining differences as well as eventual similarities with sex dolls and sex toys might be useful for the ethical assessment of sex robots. Given the scarcity of current empirical research about the development and potential consequences of the use of sex robots, we might base our analysis on data

concerning the use of precursor technologies such as sex dolls and sex toys, provided that parallels between the three categories emerge [2] [55].

² Advocates of behaviourism might object my claim. For further discussion on this topic, see [43] [56].

attachment and intimacy is not pure fantasy [5] [6] [7] [8] [9] [10] [11] [12] [13] [14].

AEI can play a crucial role in developing such robots. Emotions have been increasingly used in social robotic design to make human-robot interactions more believable, acceptable and, consequently, effective [15]. With a focus on sex and robots, the capacity of such devices to elicit emotions and create an affecting bond with their users is expected to significantly intensify with the implementation of AEI. Schuller and Schuller [16] define AEI as a technology possessing three core functions. AEI can detect and recognise others' emotions by analysing emotion-related data (*emotion recognition*). It can express emotion towards interlocutors through facial and vocal expressions, head position, gestures and body language (*emotion generation*). Finally, it can determine behaviour and activity selection based on internal simulated states (*emotion augmentation*).

This emerging field of studies within AI research finds its greatest potential in developing computers "to be genuinely intelligent and to interact naturally with us" [17]. As research has shown, emotional and volitional factors play a significant role in human behaviour, communication, and interaction, and are essential for the effective functioning of human intellect and thinking processes [18] [19]. Specifically, emotional intelligence consists of the individual's ability to understand, manage, and accordingly adjust one's own emotions, as well as to correctly interpret others' emotions and respond to their behaviours [20]. As a result, we can plausibly assume that relationships with emotionally intelligent sex robots will involve an even greater degree of intimacy and affection, consequently exacerbating the possibility of a user to establish an emotional bond.

In this paper, I will focus on these advanced but still hypothetical sex robots. As the technology is not yet fully realized, the discussion presented here will be mostly theoretical.

III. WHAT IS WRONG WITH SEX ROBOTS (SO FAR)?

In the following, I present a general consideration of the most frequently debated benefits and problems associated with the use of sex robots. This includes aspects concerning sexual health, their influence on human relationships, their impact on gender issues, and specifically, their implication for the statuses of women in society.

A. Benefits of Sex with Robots

It has been argued that sex robots might offer potential benefits [21] [22] [23], especially in relation to the individual's sexual health and wellbeing. Sexual health is defined as "the ongoing process of physical, psychological, and socio-cultural wellbeing related to sexuality", which requires a positive and respectful approach to sexuality [24]. Given that sexual expression is an important aspect of human experience and can contribute to feelings of happiness and satisfaction, the use of sex robots could lead to improved overall wellbeing and mental health.

For instance, sex robots could enhance general sexual satisfaction, particularly for people with physical or mental impairments who face challenges or even impossibilities in

accessing sexual experiences. Also, sex robots might help to bridge the so-called orgasm gap, a disparity of orgasm frequency between men and women in heterosexual sex [25]. They could offer a means for heterosexual women to experiment with their own bodies and learn what feels good to them, without the pressure or judgement that may come from a male human partner. In addition, sex robots would provide more consistent stimulation and attention to women's sexual needs, which may help to increase the likelihood of orgasm³.

Moreover, sex robots have been suggested as a potential tool for comprehensive sexuality education, which includes increasing sexual health and wellbeing, promoting healthy and respectful sexual behaviour, and leading to a more positive and accepting attitude towards sexuality in general [26]. Indeed, one advantage of using sex robots is that they can simulate various sexual situations and behaviours, allowing their users to learn about sexual anatomy, physiology, and hygiene in a practical, interactive, and safe way. They could also help to model and reinforce positive sexual behaviour, such as asking for and respecting consent, and encourage communication and boundary setting with their sexual partners [4] [26]. Furthermore, sexual experience with robots can assure a non-judgemental space for exploring sexual desires and preferences, and for promoting self-exploration and self-discovering, especially for those who may feel ashamed or embarrassed about expressing their sexuality [23].

B. Problems of Sex with Robots

On the other hand, sex robots are believed to have a profound and negative impact on people's sexual health, sexual and close relationships, and general wellbeing [27]. For instance, by promoting specific body types or sexual performances, sex robots might create unrealistic expectations for real-life sexual partners, which might lead to dissatisfaction, frustration, or even low self-esteem. Also, individuals who rely heavily on sex robots may have difficulties communicating their desires, boundaries, and preferences with human partners, hindering the development of a healthy sexual relationship.

Also, it has been argued that sex robots could perpetuate harmful power dynamics in human relationships, particularly if they are designed to simulate subservient or subordinate roles [28]. Given that most sex robots are depicted with stereotypical conceptions of female bodies [2], some experts argue that this could reinforce problematic gender norms, where women are seen as objects to be dominated or controlled, and men are seen as being entitled to such domination [29] [30].

Another ethical and social issue is that sex robots may lower inhibition thresholds and lead to an increase in deviant sexual behaviours [2]. This concern arises from the idea that people may become desensitised to more extreme forms of sex by using such machines, leading them to engage in these behaviours more frequently or in their relationships with other humans [3]. This could be especially true if robots were designed to simulate non-consensual or violent sexual acts, potentially increasing the likelihood of people who are already predisposed to such deviant sexual behaviours [31]. Again, by depicting objectified female sexual bodies and potentially encouraging violent sexual intercourses, sex robots might

³ Clearly, however, sex robots alone would not be enough to address fully the complex issue of orgasm gaps, as this involves many social, cultural, and psychological factors.

further exacerbate misogyny and aggravate violence against women, which is considered “a global health problem of epidemic proportions” [27]. This could lead to other types of physical and psychological trauma, such as mental health disorders, substance use problems, injury and death [32].

Such a worry, however, lacks empirical evidence, and some have objected that, rather, using sex robots for individuals with deviant sexual behaviours, such as paedophilia, might potentially serve as a cathartic or even therapeutic outlet. In this perspective, sex robots could provide a non-harmful way for these individuals to manage their urges and consequently prevent the harm that might otherwise be inflicted on real individuals, particularly children and women.

IV. IMPLEMENTING AEI

Besides concerns and benefits related to the sexual act with robots itself, the ethical discussion surrounding sex robots is becoming increasingly focused on the potential for these entities to evoke emotions and strong feelings in users, potentially related to the sentiment of love [4] [33] [34] [35] [36] [37] [38] [39]. The implementation of AEI into sex robots’ software, and the consequent enhancement of affection and love felt towards these robots, can have a significant impact on the moral issues explored previously, and potentially give rise to new ones. This discussion will be addressed in the following, but first, a premise is necessary.

Some of the ethical issues which will be discussed here might relate to social robots more broadly. Nonetheless, I argue that such problems assume a more complex dimension when it comes to sex robots. This complexity arises from the intimate nature of interactions with sex robots, especially when enabled with AEI, and the resulting emotional vulnerability of users. We might plausibly assume that, when in love, people are generally more susceptible. Some of the ethical concerns generally associated with social robots could pose even more serious implications for users of AEI sex robots, since they could be more easily manipulated due to their increased emotional involvement. Even if both typologies of robots are designed to simulate emotional responses, the depth of emotional engagement expected from sex robots might be significantly more intense and complex due to their intimate role. Furthermore, social robots and sex robots could have a different impact on societal norms. Specifically, sex robots, given their intimate function, could potentially shape societal views on sexuality, consent, and romantic relationships.

Some might argue that love and intimacy can also be developed towards social robots which are not designed for that purpose. After all, we have examples of people in love with their sex dolls [40], showing that the object of affection does not need to possess specific capabilities for feelings to flourish. Along the same line, while AEI can facilitate the emergence of love, it is not a prerequisite for love to develop, nor is it necessary for the occurrence of any of the issues discussed in this section. However, while with social robots love may be a casual and unexpected outcome, with AEI sex robots love is the intended objective. This, from an ethical perspective, marks a crucial distinction.

A. Social Isolation

A concern arising from the possibility of intimate and loving relationships with robots is the risk of loss of human contact, with consequences such as moral and social deskilling [41], and desensitisation of intimacy and empathy, which are only developed by “experiencing human interaction and consensual relationships” [42]. Some argue that social isolation and consequent loneliness could be due to AEI robots being easier and more satisfying to interact with, emotionally and sexually, than people [43], which could result in humans becoming sexually unattractive and unable to meet their own standards [44].

Others have instead suggested that the loss of human contact might arise from the fact that robots fail to meet the specific needs of humans [44]. One reason for this is because the user’s awareness that the robot, however equipped with AEI, has no experience of genuine emotion or capacity for pleasure might affect the loving and/or sexual interaction⁴ [3]. As McArthur [23] argues, it may be impossible for a robot to replicate the complete psychological experience of human sexual intercourse, and “we may think this would be for the best”. Therefore, as long as robots’ agency is an illusion (i.e., they can only *pretend* to possess loving feelings and capacity to experience sexual pleasure), love and sex with humans will continue to offer something that intimacy and sexual activity involving robots does not [45].

Furthermore, robots are artefacts that cannot love you back [46] and can only offer a “one-sided relationship” [3]. In human-robot relationships, whether these are loving, intimate or sexual, “the deep and nuanced notions of love and the concord of true friendships” are ignored [26]. Of course, we might find these machines physically attractive and personally engaging, but they “would only satisfy, but not truly satisfy, our physical and emotional needs, while doing nothing for our moral growth” [26].

However, this cannot be currently proved empirically since, as previously specified, the development of these machines is still in the hypothetical stage. Moreover, we should not underestimate the human ability to suspend disbelief, as well as to override the possibility that the user’s perception of the robot’s mental states might be changed by ownership and long-term use [3].

B. Deception

Related to the latter point, another ethical concern arises, which is the robot’s potential emotional deception. This could occur if the user perceives that the robot possesses real emotions [6]. As already mentioned, deception is one of the most discussed and controversial issue related to social robotics. In this specific case, the human vulnerability to be deceived can be fuelled by the strong human desire to be loved, cared for, and to have companionship [47]. When equipped with AEI, sex robots’ deceiving potential would increase significantly, with the possibility of creating unrealistic expectations regarding its capabilities (e.g., being in love). Such an enhanced capacity for deception might influence the nature of the relationship potentially formed with the robot, by intensifying the likelihood to create more complex and intimate relationships as well as making it easier for the user to fall in love with it. Specifically, by enabling sex

⁴ Sharkey et al. [3] offer an interesting parallel between sex robots’ and sex workers’ pretence of love and pleasure. They cite a former sex worker and writer, Cathryn Berarovic, who claims that “no matter how good a whore is

at her job, the client always knows, somewhere in his head, that he’s paying for this woman’s time and renting access to her body”.

robots with AEI, such robots would be able to lead users into believing that the relationship is two sided, that there are genuine feelings involved, and that the sexual pleasure is truly felt. Consequently, the human susceptibility to deception might intensify, as users could be even more inclined to disregard evidence against the robot's deception, as well as develop emotional attachment based on this perception.

As Nyholm and Frank [34] argue, such deceptive behaviours are problematic from a Kantian perspective on respect for persons as end in themselves. Briefly, when sex robots deceive users into believing that they possess real emotions and are capable of forming reciprocal emotional connections, they may undermine the user's autonomy and dignity. Furthermore, the gravity of some of the ethical concerns discussed above would increase, including the loss of what some authors consider to be more meaningful relationships with other humans, as well as the risk of social isolation.

It has been argued that deceiving capacity should be limited in robots. By preventing users from mistakenly believing that the robot is capable of experiencing emotions such as love, care, or physical pleasure, the affective connection with the robot would be reduced, as well as the potentiality of the ethical concerns involved. For this reason, some authors argue that deceptive design in technologies should not be allowed, and that "their machine nature should be transparent" [48]. However, if a sex robot's emotional limitations were explicitly stated, it could diminish its appeal and potentially undermine the purposes for which it was created – i.e., the perceived value of the robot in fulfilling the user's need for love and sex, as well as companionships, could be significantly lessened, and users could be less likely to engage with it.

A more nuanced suggestion comes from Nyholm and Frank [34], as they propose requiring sex robots to continuously emit a signal, to remind users that they are just machines and do not possess the capability to feel or have emotions. They argue that this approach would reduce, however not eliminating, robots' deceptive potential and, once again, the possibility and strength of emotional bonds that users might develop towards them. However, evidence suggests that such a strategy might not always be effective. Humans could continue to anthropomorphise these robots, project their own mentality onto them, and form what seems like deep emotional relationships, despite their limited abilities [40] [49] [50].

C. Societal Impact

Further concerns regard the impact AEI sex robots could have on the society. For instance, the widespread adoption of emotionally intelligent sex robots could lead to a decrease in the number of human partnerships and marriages, with consequent changes in population dynamics. As briefly touched upon earlier, they could also affect how human relationships are perceived and valued. As people become more accustomed to robots that fulfil their emotional, social and sexual needs, they might develop unrealistic expectations for human relationships. This could lead to dissatisfaction when human partners are unable to meet these expectations, ultimately affecting the quality and longevity of human relationships.

D. Manipulation

In addition, the possibility for AEI to be used to exploit users' emotional vulnerabilities is also a concern, with the consequent risk of manipulation by third parties (e.g., designers or the owning company) [34]. AEI sex robots indeed specifically target human emotions and have greater capacity than simple sex robots to emotionally engage with users, potentially leading to the influence or even control over their emotions and feelings, as well as decision-making processes. As Sullins [33] argues, designers should recognise certain limits regarding the ethical permissibility of exploiting and manipulating the human psychological tendencies of the prospective users of these machines. This concern becomes even more significant when considering love, as "[l]ove is a powerful emotion and we are easily manipulated by it" [33].

V. TOWARDS AN ETHICAL DESIGN OF SEX ROBOTS WITH AEI

Considering that the moral controversies and problems surrounding sex robots would become even more pressing with the introduction of AEI, is it appropriate to discourage its development? Maybe not, as such a conclusion would entail a risk of overlooking the potential *benefits* of AEI in sex robots. It is worth noting that while AEI might aggravate ethical worries regarding sex robots, it could also significantly enhance opportunities to improve users' happiness and wellbeing.

For instance, AEI in sex robots may increase sexual satisfaction, as well as provide a more gratifying solution for companionship for lonely people and a more effective comprehensive sexual education. Also, women specifically may benefit from their use. AEI in sex robots can be programmed to promote respectful and consent-based interactions, which might help in reducing objectification and harmful sexual behaviours towards women. AEI can also have therapeutic uses for survivors of rape and sexual assault, by providing a controlled environment where individuals can rebuild their comfort and confidence with intimacy at their own pace.

In addition, by carefully tailoring their interactions to the user's emotion, AEI sex robots could monitor their emotional health and wellbeing. If they detect patterns or sign of emotional distress, they could provide appropriate support or recommendations, such as seeking professional help when necessary. Given the intimacy between the user and the robot, there is a greater chance that the user will follow the robot's advice, ultimately deriving greater benefits from their interactions. On top of that, in the following, I argue that AEI has the potential to tackle the moral issues related to the robot's deception and the resulting ability to evoke feelings of affection in users.

A. Monitoring Emotional Attachment

AEI could enable sex robots to recognise when a relationship with their users has become overly close. By incorporating mechanisms that monitor the emotional closeness between robots and their users, sex robots could take appropriate measures to create emotional distance when they detect that the user is forming excessive attachment and/or dependency. This would help to prevent the robot from inadvertently conveying a sense of greater intimacy or mutual connection than what is actually present, thereby mitigating the human tendency and vulnerability to be deceived. A similar argument has been suggested by Wagner, Borenstein

and Howard [51], as they claim that AEI’s capabilities “to generate information about the person’s attentive state and make behavioral predictions” could be used to aid users to avoid forming excessive attachment to, and inappropriate trust in, the machine.

B. Personal Growth and Skill Development

Furthermore, building upon the perspectives of Viik [36] and Nyholm and Frank [34], I propose that AEI sex robots have the potential to support individuals in improving their emotional and social domains. Given their emotional and social intelligence, they could facilitate “personal self-actualisation, identity construction, character improvement, useful habit acquisition, and relationship building” [36]. For instance, AEI sex robots could be designed to facilitate the development of emotional skills in users, such as empathy, emotional regulation, and effective communication. Users who wish to engage in this aspect of the robot’s functionality, can do so through, e.g., role-playing scenarios in which the robot acts out various social or emotional situations. Similarly, AEI sex robot can assist with social-skill building, by helping users develop skills such as active listening and conflict resolution, which can have positive effects on users’ relationships with other humans.

C. AEI Sex Robots as Transition Tools

AEI could also be implemented to encourage human social interaction, consequently helping users build their social network and reduce reliance on the robot for emotional and social needs. While providing emotional support and companionship, therefore, designing the robot to also encourage users to maintain and seek meaningful human connections would help to ensure that robots complement rather than replace human relationships. As a result, sex robots could be seen as “a sort of therapy or transition tool” [34] for enabling users to develop and strengthen meaningful and fulfilling relationships with other people, and mitigating the risk of social isolation and loneliness.

In this regard, an interesting and relevant example of how sex robots can assist users in their human relationships is presented in the documentary *Hi, AI* [52]. They describe the case of Chuck, a man from Texas who attempted to have a romantic relationship with the humanoid sex robot Harmony. As they explain, through his relationship with Harmony, Chuck was able to regain confidence in his ability to form emotional connections with others and eventually began dating human women again. Harmony is not as emotionally advanced as the robots discussed in this paper. Nonetheless, such a sex robot has been able to have a profound impact on Chuck’s mental, emotional and social wellbeing, and we might expect that more sophisticated emotionally intelligent robots will have more profound, effective, and beneficial results.⁵

To conclude, by incorporating AEI into the technology of sex robots, we may be able to reduce the risk of deception and social isolation. The use of AEI offers a significant advantage in detecting users’ emotions and minimising the potentially negative ethical and social impact, while enhancing the

benefits that individuals can gain from using sex robots, both in terms of sexual health and general wellbeing.

VI. CONCLUSION

The development and use of sex robots could have major consequences on human life. Caution is imperative when introducing such new technologies that are potentially disruptive for the individual and society as a whole. Nevertheless, it is crucial to recognise the potential benefits that could be derived from such technologies. As argued in this article, prohibiting the development of sex robots would be “morally wrong”, as it would overlook their potential positive impact [53]. Some might even argue that their creation is ethically justified, or even required, given their potential to fulfill the sexual rights of people who might otherwise face barriers to accessing sexual experiences [52]. Furthermore, as Borenstein and Arkin [35] point out, a prohibition of these systems would be difficult to enforce. A more effective approach would be to develop sex robots in such a way that maximises their benefits and minimises potential risks.

AEI could help us towards achieving this goal, by creating sex robots not to replace human contact but to function as “useful and joyful” complements, with positive impact in terms of sex education, sexual therapy and sexual wellbeing [2]. As Whitby [53] argues, technology is not inherently good, bad or neutral; rather, “[i]t is always all three”, depending on how we choose to use it. Our goal is to assure that, through informed, cautious and thoughtful discussions, the right decisions are taken [53].

Many other questions remain unexplored and have not been addressed in this article. The issue of sexual consent with sex robots has often been discussed [3] [4], and it is worth considering whether the introduction of AEI would make a difference in this matter. We might also question whether the introduction of sex robots with AEI could affect relationship stability, potentially impacting or leading to alternative family structures, such as families that include sex robots as companions or caretakers. This might have further consequences on children’s upbringing and parenting responsibilities, as well as influencing the child’s health and wellbeing, and their relationships with parents.

As is evident, the lack of empirical data is a clear impediment to our understanding of the philosophical and ethical assumptions regarding the effects of sex with AEI-enhanced robots, which leaves the discussion “validated by ideological and risk-averse starting positions” [54]. My suggestion is, therefore, to approach this topic with open minds (and hearts).

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⁵ It is worth mentioning another intriguing case, which comes from Davecat’s relationship with his sex doll, named Sidore. Instead of shifting from relationships with sex dolls to those with humans, as in the case of Chuck, Davecat has been “married” to Sidore for over 20 years [40]. This example might seem to contradict my argument that sex robots could serve as transitional tools towards human-human relationships. However, given

that the sex doll in question does not possess any degree of artificial intelligence, including AEI, Davecat’s case does not present a direct objection to my argument. Instead, it highlights how human tend to anthropomorphise humanoid inanimate objects, and incorporating AEI could potentially act as a countermeasure to reduce such tendencies.

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