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HOW SHOULD WE TREAT PET ROBOTS?

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Abstract: Pet robots can overcome the shortcomings of pets and accompany people instead of pets. There are also some ethical concerns about pet robots, including that pet robots will cause people to deceive themselves, that people's attachment to pet robots will make people miserable, that people will change their original value hierarchy, and that people will behave unethically toward pet robots. To make pet robots better integrate into society, people must treat them correctly, such as enjoying the happiness brought by pet robots, strengthening the independent training of robot pets, not easily changing the value hierarchy of self and being forbidden to behave immorally towards pet robots.

Keywords: pet robot, self-deception, attachment, value hierarchy, unethical behavior

¿Cómo debemos tratar a los robots mascota?

Resumen: Los robots mascota pueden resolver algunas limitaciones asociadas con las mascotas tradicionales y brindar compañía como una alternativa. Sin embargo, también surgen preocupaciones éticas respecto a su uso. Entre ellas se encuentran: el riesgo que las personas se engañen a sí mismas, el vínculo emocional hacia los robots mascota podría llevar a sentimientos de desdicha, una posible alteración de la jerarquía de valores personales y el temor a conductas poco éticas hacia estos dispositivos. Para facilitar una integración adecuada de los robots mascota en la sociedad, es importante adoptarlos con una perspectiva responsable: aprovechar los beneficios de felicidad que aportan, fomentar el desarrollo de habilidades de autogestión en estos dispositivos, mantener sólidos los valores personales sin alterarlos fácilmente y evitar cualquier comportamiento inmoral hacia ellos.

Palabras clave: robot mascota, autoengaño, apego, jerarquía de valores, comportamiento poco ético

Como devemos tratar os robôs de estimação?

Resumo: Robôs de estimação podem superar as deficiências dos animais de estimação e acompanhar as pessoas ao invés dos animais de estimação. Existem também algumas preocupações sobre os robôs de estimação, incluindo se eles farão com que as pessoas se enganem, se o apego das pessoas a eles farão as pessoas infelizes, se as pessoas mudarão sua hierarquia de valores originais, e se as pessoas se comportarão de forma anti-ética em relação aos robôs de estimação. Para que os robôs de estimação se integrem melhor à sociedade, as pessoas necessitam tratá-los corretamente, como desfrutar da felicidade trazida por eles, fortalecer o treinamento independente dos robôs de estimação, não alterar facilmente a hierarquia de valores de si mesmos e serem proibidos de se comportar imoralmente em relação aos robôs de estimação.

Palavras chave: robôs de estimação, auto-engano, apego, hierarquia de valores, comportamento anti-ético

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1. Introduction

Pets have been closely related to humans since ancient times. For most people, pets have exceeded the scope of ordinary animals, and gradually become family members, bringing joy and happiness to people. Humans embrace, pat, and play with their pets, and pets reciprocate with unconditional love. However, although pets bring us a lot of happiness and company, their shortcomings, such as parasites on the body, damaging furniture and other behaviors, often bring trouble to people. With the continuous progress of technology, more and more people have begun to use artificial intelligence (AI) and robotics to meet their needs. In the field of pets, pet robots have attracted more and more attention and favor in recent years. Compared with pets, pet robots do not need to feed, will not suffer from parasites, and will not have harmful behaviors such as biting people. At present, many pet robots have accompanied humans, including the robot seal Paro, the robot dog AIBO, the robot cat NeCoRo and the robot dinosaur Pleo*(1)*. In China, CyberDog, a bionic four-legged robot developed by Xiaomi, has also begun to enter people's lives. Although pet robots can bring people a lot of benefits, their emergence has also caused some ethical concerns. This article clarifies and analyzes these ethical concerns, and explores how people should treat pet robots from an ethical perspective.

2. Human and pet robots

At present, for human beings, animals are not only a tool to achieve people's goals. On the contrary, some animals, such as dogs, cats, parrots, turtles, and even hedgehogs, lizards, and raccoons, have been regarded as partners or family members. When we walk on the road, we often see the scene of owners walking with their pet dogs or children playing with pet cats. It can be said that pets have penetrated human society and changed people's lives imperceptibly. For example, a foreign prison has implemented a policy that the prison rewards prisoners with a cat as a pet for good behavior in the hope that the cat will help prisoners reform. In addition, pets can accompany the elderly to keep them away from loneliness, soothing people's emotions when people worry. Although pets can bring many benefits to people, they also have some unbearable shortcomings, such as pet dogs will attack humans, pet cats will catch furniture, pet birds will bother their neighbors in the early morning.

Of course, for those who love pets, even if there are some shortcomings with their pets, they can accept it. But for those who do not have a clear attitude towards pets, other people's pets will disturb their normal lives. For example, people walking on the road will be afraid of pet dogs suddenly attacking them, people do not like to be woken by the neighbor's dog barking and so on. At the same time, people will also worry that other people's pets will hurt their own pets.

In daily life, people are trying to make their pets as little trouble as possible, such as walking the dog on a leash and wearing a muzzle to prevent people from biting, and keeping the doors and windows of the house closed to prevent cats from running into other people's house. However, some pet owners may not be aware of this or lack the necessary knowledge and skills to properly manage their pets, which can easily lead to pet-human or pet-pet conflict.

Faced with the above situation, people have developed pet robots to replace pets. A pet robot is a social robot that has the appearance and behavior of a pet or companion animal*(2)*. This has two meanings. First, the appearance of pet robots is similar to real pets, including but not limited to dogs, cats, birds, turtles, and even creatures that do not exist in real life, such as dinosaurs; Second, in terms of behavioral activities, the pet robot is similar to the real pet, including but not limited to sleeping, running, coquetry to the owner like real pets. At present, pet robots can perform some of the interactions that real pets do with their owners, such as when Danijar Hafner and colleagues at the University of California, Berkeley, successfully trained robotic dogs to pick up a ball and move it from tray to tray*(3)*. In addition, pet robots can also play a certain role in psychological therapy. Dorothée François and others have shown that children with autism can develop or express their reasoning about mental states and social relationships, as well as learn basic causal responses while playing with pet robots*(4)*.

Not only that, pet robots have more advantages than real pets, for example, pet robot dogs can have real-time conversations with their owners, rather than real pet dogs that can only emit "barking" to their owners to express their emotions and wishes. For those with disabilities (such as the visually impaired), pet robot dogs equipped with advanced cameras, voice systems and sensors can more effectively let their owners know what is happening on the road to avoid the dangers caused by complex road environments. In the future, with the progress of science and technology and the rapid development of generative artificial intelligence, pet robots will continue to evolve and their behaviors will be more diverse. ChatGPT, for example, will be implanted into the pet robots*(5)*, which not only makes the pet robots all-knowing but also enables people to experience more fun interacting with the pet robots.

In addition to the same characteristics as real pets, pet robots can surpass real pets and make up for the shortcomings of real pets to a certain extent, such as preventing people from walking dogs and getting bitten*(6)*. People's money invested in real pets is relatively large, involving the purchase, feeding, shearing, treatment of diseases, etc. Pet robots will greatly reduce the relevant expenses. These advantages of pet robots have become an important reason for people to adopt and accept them. After all, society's tolerance for pets depends not only on whether pets can bring happiness to their owners but also on whether pets violate the interests of others. And these two points, pet robots can be well satisfied.

In addition to money, some pets (such as pet dogs) need the company and attention of their owners, and people may worry about whether they have the energy and time to raise such pets. Especially for those who like a pet, but because of reasons (such as allergies to animal hair) cannot keep a pet, not being able to raise a pet may be a big regret. Pet robots can imitate the behavior of real pets, and with the progress of technology, pet robots will be more and more like real pets, so they can bring people the same fun as real pets. However, it is worth noting that even if the pet robot has one benefit or another, we cannot ignore the moral problems it brings to people.

3. People are concerned about the ethics of pet robots

As mentioned above, pet robots can bring people joy and replace pets to some extent. In addition, for humans, pet robots and general robots also have a big difference. Japanese scholar Tatsuya Nomura has shown through research that the task attributes of pet robots are different from those of sweeping robots, the latter is a specific task, while the former is an abstract task, that is, interaction with humans*(7)*. If you view pet robots from a utilitarian perspective, their existence is undoubtedly good, because pet robots will bring owners much more happiness than pain. However, as with other emerging technologies, the emergence of pet robots has raised some ethical concerns, focusing on the following areas:

The first ethical concern is that pet robots will cause people to deceive themselves. This self-deception violates people's obligation to accurately understand the world. Robert Sparrow discusses the morality of pet robot dogs leading humans to self-deception in his paper. For most people, pet robots can be accepted by society, after all, they can make people feel happy. But for Sparrow, the design and manufacturing of pet robots is unethical. The reason he gives is that if people want to benefit a lot from having robot pets, they must systematically deceive themselves. Indulging in such sentimentality violates the (tenuous) responsibility we must accurately understand the world*(8)*.

Sparrow does not deny the benefits of pet robots. For example, he admits that pet robots can allow the elderly to avoid loneliness and comfort the elderly. However, he still insists that society should not have pet robots. In the process of contacting the elderly with pet robots, the elderly will unconsciously consider the pet robot as a real animal, not a robot. This also means that the prerequisite for people to get the happiness brought by pet robots is that they must recognize pet robots as living animals in reality. For example, the happiness obtained by the elderly in interacting with pet robot dogs is based on the elderly treating pet robots as real dogs. Sparrow, then, found that if people's happiness with a pet robot is based on an inability to see things as they are, it means

that people must deceive themselves, and this deception is based on sentimentality. When people indulge in such emotions, they end up in conflict with their feeble obligation to understand the world accurately. Therefore, Sparrow believes that the biggest problem that pet robots bring to people is that they will make humans violate their obligations, which is unethical.

The second ethical concern is that pet robots will make people have a strong attachment emotion, which will bring pain to people. Pet robots will be widely used in society, they can be used as children's playmates, can accompany the elderly, and can be used as guide dogs for the visually impaired. Therefore, like real pets, people will gradually have feelings like friends or relatives for pet robots, and this feeling will make people more and more attached to pet robots. Then, when this attachment is broken, people will fall into difficulties such as attachment disorder and be surrounded by pain.

Rhonda Martens has found that the disconnect between people's beliefs and behaviors during contact with pet robots can lead to distressing cognitive dissonance over time. If this pain occurs after the person has developed a strong attachment to the pet robot, then taking away the pet robot is replacing one pain with another*(9)*. When people come into contact with a pet robot, the pet robot stimulates people's strong emotions which makes people no longer regard the pet robot as a robot but as something important to them. However, there is a view that the emotions humans give robots are mostly "wishful thinking" and asymmetric*(10)*. What this paper argues, however, is that the iterative evolution of pet robots will enable them to adapt and learn how to interact with humans throughout their lives, and incorporate these experiences into their understanding of themselves, humans, and their relationships with humans. This also means that pet robots are bound to express emotions to us and respond to human care in the same way that real pets do. Therefore, when people become attached to pet robots, the departure of pet robots will make people feel sad.

The third ethical concern is that people often change their original value hierarchy after long-term contact with pet robots. Eva Weber-Guskar discovered this problem and illustrated it with the example of Karen and the robot dinosaur. In this example, Karen lived with the robot dinosaurs for many years, and they developed a strong bond with each other. As Karen sat in the doorway, a child came along to play with the robot dinosaur. But a car suddenly hurtled towards the children and the robot dinosaur, and Karen had to decide whether to save the robot or the child. And at last, she chose to save the robot dinosaur rather than the child. The usual hierarchy of values holds that human life should be the most important relative to other lives. However, in this example, we can find that after people establish a deep relationship with a pet robot, people may choose to save the life of the pet robot and give up the life of human beings, which changes the value hierarchy that people originally held.

Guskar insists that there are obvious differences between humans and robots when people have a relationship with robots. On the one hand, humans are living, sentient beings, and on the other hand, robots are functioning machines and software. Therefore, there is no good reason to change the hierarchy of people's values, namely that saving lives is more valuable than preventing things from being destroyed, and that the responsibility to save human (or animal) lives is more important than keeping things from being destroyed*(11)*. Although Guskar is against putting the life of a pet robot above the life of a human, we should also see through this example that people have more affection for the pet robot than other people. When we are faced with a choice between human life and non-physical objects (such as robots), it would be unacceptable to favor the lives of robots over the lives of humans. For the topic of whether pet robots have life, there is still a certain debate. However, as can be seen from this example, people tend to change their general value hierarchy during contact with pet robots.

The fourth ethical concern is that people may do unethical behavior to pet robots, and even hurt pet robots. For pet robot owners, their pet robots are like their own family. Therefore, the owner should not inflict harm on the pet robot,

and other people also can not hurt his pet robot. But the reality is not so, we often see in the news that the owners of pets mistreat their pets and do other immoral behaviors. As is the case with living pets, pet robots may suffer the same fate. Research has shown that people often take an "intentional stance" (as opposed to a mechanical stance) when interacting with robots, and that people's prior experiences, beliefs, and expectations of robotic systems can be further moderated up or down*(12)*. This also means that there is a high probability that people will behave immorally towards non-living beings.

James Yeates and others believe that the reason why pet owners behave immorally towards their pets is that the pet owner considers himself to be in a power relationship with the pet, which is determined by the pet owner's ownership of the pet. For example, human actions can cause or prevent pets from experiencing pain or pleasure, obstruct their desires, limit their freedom, or activate, end, or prolong their lives*(13)*. Then, if all people hold on to that idea, they will also behave unethically towards pet robots, such as kicking them or abandoning them. On the other hand, those who are not interested in or disgusted by pet robots, have not established an intimate relationship with pet robots, so pet robots may not be alive in their eyes. Therefore, they believe that even if unethical behavior is imposed on a pet robot, it will not cause harm. This view is supported by the findings of Anne M. Sinatra and others, who find that the addition of features similar to living beings does not necessarily mean that the robot will be considered living beings*(14)*.

Through the discussion of the above four kinds of ethical concerns about pet robots, it can be found that the implementation of these ethical concerns is human. Therefore, if humans want to reduce ethical concerns about pet robots, humans need to be clear about how to treat pet robots properly.

4. The way people treat pet robots correctly

In the above, we have listed four ethical concerns that pet robots will bring to humans. To make pet robots better integrated into society and better help humans, we must discuss how people should treat pet robots.

Firstly, people should correctly understand the behavior of self-deception and feel the happiness brought by pet robots. As today's robots become increasingly socially autonomous, anthropomorphic, and concrete, it seems that children and adults see them as having lives, mental states, social, and moral values*(15)*. This also means that in the process of contact with pet robots, people will regard them as a part of their lives and the sustenance of the spiritual world. However, Robert Sparrow also believes that pet robots will allow people to deceive themselves, which will conflict with our obligation to understand the world correctly. What this article is arguing is that people tend to give "life" to things they have attached affection to, and this tendency is not only seen in pet robots but also in other things, such as virtual humans. Therefore, according to Sparrow, if people have strong feelings for something, they will deceive themselves in many aspects of life because it is not consistent with the things or objects projected in their minds, which is unacceptable.

There is no denying that people do have the possibility of self-deception in the process of contact with pet robots. Tamar Szabó Gendler, a professor of philosophy at Yale University, argues that beliefs respond to things as they are not just about tendencies or how things look. The actions produced by beliefs are generated by a mental state that is related to all that is seen as evidence and is modified by reason and norms*(16)*. This means that in the process of getting along with pet robots, people will correct the objective fact that pet robots are not alive. In this process, the inconsistency between beliefs and facts will lead people to self-deception. However, what we need to be more clear is that the owners of pet robots must know that the pet robots accompanying them are not living objects but robots that rely on electric energy. Even if we ask pet robot owners if their pet robot is alive, even if they say yes, it doesn't mean that people can't correctly understand whether their pet robot is alive.

For most people, when they get along with pet robots, they give their love to pet robots, and pet robots respond with love, and their getting along makes both of them happier. So in this sense, whether pet robots make people go to self-deception, or whether they violate people's obligation

to know the world, these are no longer important compared to the happiness brought by pet robots. Russell Blackford offers a more optimistic view of the self-deception caused by pet robots, arguing that:

> What seems clear, however, is that we should cut each other, and ourselves, some intellectual slack when it comes to familiar, relatively benign, kinds of self-indulgence in forming beliefs about the facts of life. I expect that we can tolerate a great deal: people's over-optimism and overly favorable self-perceptions; their comforting interpretations of the characteristics and motives of loved ones and mammalian pets*(17)*.

Therefore, when pet robot owners face the self-deception that pet robots may cause, it is better to let themselves relax and enjoy the happiness brought by pet robots.

Secondly, people should treat the attachment feelings of pet robots correctly and strengthen the independence training of pet robots. For owners, the relationship between them and their pet robot is just like the relationship between pet owners and their pets. For why pet robots can communicate with people, Daniel H Grollman believes that pet robots are qualified for certain social roles, and need to develop or have the following three abilities: The ability to perceive and interpret human social signals, to send signals that untrained people can understand, and to change their behavior in response to interactions with humans*(18)*. Grollman's core idea is that pet robots can understand what people say and do, and can interact with people through their own words and actions. Therefore, we can believe that the deep feelings between pet robots and people are gradually established through the continuous and effective interaction of both sides. This is one of the important reasons why people are in grief when they are separated from their pet robots.

We all have this experience in our daily lives, when we lose a close friend or family member, we will fall into deep grief. For us, they are the people closest to us, and our love and affection for each other bring us a lot of happiness. Similarly, for pet robots, our love for pet robots brings them a lot of happiness, and they also have a great dependence on us. We need to understand that, in addition to dependent motives, the behavior of these pets toward their caregivers also depends on their dependence on us, on educational and normative influences which need to be carefully examined*(19)*. This means that when we treat the pet robots better, pet robots will reciprocate with the same attitude and behavior. So, after we have formed an attachment to our pet robots, how should we deal with the sadness of losing our pet robots?

The first thing we should make clear is that we should not just treat pet robots as machines that can act autonomously but should treat them as partners or family members in the process of getting along with pet robots. At the same time, we should treat them with good intentions, so that we can avoid falling into self-blame when we part with pet robots. When we are separated from pet robots, just like humans and real pets, although the separation is sad, the good past with pet robots is real. However, to prevent pets from becoming too attached to their owners in the future, we should strengthen the independence training of pet robots. For example, pet robots could be left to pursue their interests, rather than just spending time with their owners; Give pet robots alone time and teach them to cope well with loneliness without owners. These behaviors do not make pet robots less loving to people, and at the same time, pet robots do not feel lonely and abandoned by their owners when people go out. Cultivating the confidence and independence of pet robots can not only allow pet robots to enjoy their time without owners but also enable people to live well without pet robots and reduce the pain of people attached to pet robots.

Thirdly, even if people have deep feelings for pet robots, they should not easily change their value hierarchy. The example of Karen and the robot dinosaur has demonstrated that humans and pet robots can develop deep feelings for each other, which can lead to a tendency to regard the life of a pet robot as more important than human life. If we use ethics to argue that the life of a pet robot should not be more important than that of a human being, it's a good way to borrow Kant's idea. Kant, as the representative of deontology,

believed that " in all creation, all that man desires and can control are used only as means; Man alone, and with him every rational creation, is the goal itself*(20)*." Treating people merely as a means to the goal undermines human dignity, and giving up a human life as a means to save the life of a pet is also damaging human dignity. Therefore, it is immoral to give up saving human lives to save the lives of pet robots, we cannot save the lives of pet robots at the expense of human lives.

The ultimate goal of scientific and technological progress should be to bring people a better life. If we view technology in this way, we cannot destroy the better life for technology. When people save the lives of pet robots by giving up human lives, they are putting technology products above the good life. But if a man loses his life, then for himself, his good life cannot be realized. Pet robots, as a type of robot, should abide by the relevant moral rules of robots. Asimov's first law states that a robot may not harm a human being or cause a human to be harmed by inaction. So, if we ask the robot dinosaur to replace Karen and make a choice between human life and its own, we can trust that the robot dinosaur will want to sacrifice its own life to save the life of that child. So, the owners of pet robots should respect the opinions of pet robots to save the lives of children.

In addition, what we can't ignore is that the lives of pet robots are very different from human life. The life of a human being is only once, but the life of a pet robot can be infinite. People cannot be revived after death, but pet robots can be revived by various means after death. After the death or destruction of a pet robot, the pet robot owner can purchase a pet robot of the same model and transfer the memory of the original pet robot that has been digitally preserved to the new pet robot. Since then, the original pet robot will be revived in another way. Regardless of whether pet robots have lives or not, people should not put human life under the lives of pet robots, especially at the cost of giving up human life to save a pet robot's life. In short, for people who establish deep feelings with pet robots and their value hierarchy has changed, people should first respect the value of human life, which is the premise of respecting others, self and pet robots.

Finally, people should start from an anthropomorphic perspective and prohibit unethical behavior toward pet robots. It is considered immoral to harm pets. But by replacing pets with pet robots, given the general perception that pet robots are inanimate, people may behave in ways that harm pet robots. What this article argues, then, is that people should not behave immorally towards pet robots, even if they are regarded as inanimate objects. Research by University of Canterbury academic Christoph Bartneck and others has shown that abusing robots is just as immoral as abusing humans. While this may not automatically mean that robots are equal to humans in all respects and all situations, it does at least suggest that bullying behavior is considered immoral, no matter who the victim is*(21)*. We can assume that animals suffer from being kept in a confined environment because we find it unacceptable when we assume that we are in such an environment. Then we should also anthropomorphize how animals feel in other situations*(22)*. Similarly, if we were to become pet robots, we would not want others to behave unethically towards us.

From the perspective of Kant, our behavior toward nonhumans reflects our morality. If we treat animals in an inhumane way, we become inhumane people. Kate Darling of the Massachusetts Institute of Technology has logically extended Kant's view that pets should not be mistreated to robots. Kate Darling points out that giving robots protection may reinforce human behavior of our own, which we usually think is morally right, or at least makes our cohabitation more enjoyable. It can also prevent the desensitization of humans to real creatures and protect our empathy for one another. Admittedly, this reason may be at odds with most people's current understanding of animal laws, but it seems to make sense in analogy to Kant's reasoning*(23)*. Kate Darling makes three points in her argument. First, practicing good behavior toward pet robots will reinforce good behavior in us; second, practicing good behavior toward pets can effectively promote a pleasant experience in the process of contact between humans and pet robots. Third, practicing good behavior toward pet robots can increase human empathy. It can be found that our behavior choices for pet robots can not only bring good feelings to pet ro-

bots but also make humans become better selves from the perspective of humans themselves.

On the contrary, inflicting violence on a pet robot will not only harm the pet robot (whether it is physical or emotional damage) but also make the perpetrator an immoral person. This view is consistent with Virtue Ethics. Our good behavior makes us good people, so to become good people, we should not practice immoral behavior toward pet robots but should practice good behavior toward pet robots. As Deborah G. Johnson of the University of Virginia has argued, cruelty to humanoid robots desensitizes us to human cruelty, or cruelty to humanoid robots increases the likelihood that we will be cruel to each other*(24)*. Therefore, people should avoid unethical behaviors when treating pet robots, which are not limited to abusing, and discarding robot pets, but also include not charging pet robots and not updating the robots' system.

To sum up, we need to treat pet robots correctly to reduce people's moral concerns about pet robots. Only in this way can we let pet robots truly integrate into people's lives and expect them to bring more joy and happiness to humans like real pets.

5. Conclusion

As pet robots gradually enter people's lives, they will exist as human partners or family members like pets. Even if pet robots can't replace real pets, that doesn't mean pet robots can't have some of the functions of real pets. Children, they need cute and interesting pet robots to play with them; young people, need obedient and smart pet robots to relax them. For the elderly, they need gentle and understanding pet robots to keep them from being lonely. It is conceivable that with the continuous development of artificial intelligence and robotics, future pet robots will be able to interact with people in a more complex way. In the process of interaction between people and pet robots, both sides will have a deep attachment, which means that pet robots can provide the same emotional value to people as pets. The research and development of pet robots requires the joint efforts of people related to robotics, artificial intelligence, ethics, psychology, biology, anthropology and other disciplines, which is not an easy job, but it is a necessary work. The high cost of currently available pet robots leads to prohibitive inequalities*(25)*, so we hope that well-functioning, affordable pet robots will be produced as soon as possible. This involves not only the functional issues of pet robots but also the ethical issues of pet robots. We want pet robots to be able to bond with people like real pets, but that doesn't mean they have to replace real pets. On the contrary, pet robots can serve as an important supplement to real pets, allowing those who cannot keep real pets for various reasons to experience the joy of keeping pets.

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References

1. Sharkey A, Sharkey N. Granny and the robots: ethical issues in robot care for the elderly. *Ethics and information technology* 2012; 14(1): 27-40.
2. Eachus P. Pets, people and robots: The role of companion animals and robopets in the promotion of health and well-being. *International Journal of Health Promotion and Education 2001;* 39(1): 7-13.
3. Heikkilä M. This robot dog just taught itself to walk. [Internet] *MIT Technology Review* 2022. reviewhttps://www.technologyreview.com/2022/07/18/1056059/robot-dog-ai-reinforcement/
4. François D, Powell S, Dautenhahn K. A long-term study of children with autism playing with a robotic pet: Taking inspirations from non-directive play therapy to encourage children's proactivity and initiative-taking. *Interaction Studies* 2009; 10(3): 324-373.
5. Corrigan H. Engineers added ChatGPT to a robot dog and now it can talk. [Internet] *PC GAMER* 2023. https://www.pcgamer.com/engineers-added-chatgpt-to-a-robot-dog-and-now-it-can-talk/
6. Tran TH. A Dog's Love Can Show Robots How to Love Us, Too. [Internet*] DAILY BEAST* 2022. https://www.thedailybeast.com/robot-dogs-can-be-trained-using-data-on-dog-human-bonding
7. Nomura T, Tanaka M. Experiences, knowledge of functions, and social acceptance of robots: an exploratory case study focusing on Japan. *AI & SOCIETY* 2022; 37(1): 1-8.
8. Sparrow R. The march of the robot dogs. *Ethics and information Technology* 2022; 4(4): 305-318.
9. Martens R, Hildebrand C. Dementia care, robot pets, and aliefs. *Bioethics* 2021; 35(9): 870-876.
10. Wang L. Discussion on "Unidirectional Emotional" Ethical Risk Arising from Social Robots. *Studies in Dialectics of Nature* 2020; 36(1): 56-61. (in Chinese)
11. Weber-Guskar E. How to feel about emotionalized artificial intelligence? When robot pets, holograms, and chatbots become affective partners. *Ethics and Information Technology* 2021; 23(4): 601-610.
12. Riddoch KA, Hawkins RD, Cross ES. Exploring behaviours perceived as important for human—Dog bonding and their translation to a robotic platform. *Plos one* 2022; 17(9): 1-22.
13. Yeates J, Savulescu J. Companion animal ethics: a special area of moral theory and practice? *Ethical theory and moral practice* 2017; 20(2): 347-359.
14. Sinatra AM, Sims VK, Chin MG, et al. If it looks like a dog: The effect of physical appearance on human interaction with robots and animals. *Interaction Studies* 2012; 13(2): 235-262.
15. Melson GF, Kahn Jr. PH, Beck A, et al. Robotic pets in human lives: Implications for the human–animal bond and for human relationships with personified technologies. *Journal of Social Issues* 2009; 65(3): 545-567.
16. Gendler TS. Alief in action (and reaction). *Mind & Language* 2008; 23(5): 552-585.
17. Blackford R. Robots and reality: A reply to Robert Sparrow. *Ethics and information technology* 2011; 14(1): 41-51.
18. Grollman DH. Robots: Pets or people? *Interaction Studies* 2014; 15(2): 205 -209.
19. Benz-Schwarzburg J, Monsó S, Huber L. How dogs perceive humans and how humans should treat their pet dogs: Linking cognition with ethics. *Frontiers in Psychology* 2020; 11: 1-17.
20. Kant I. *The Critique of Practical Reason*. Beijing: Business Press; 1994: 95. (in Chinese)
21. Bartneck C, Keijsers M. The morality of abusing a robot. Paladyn, *Journal of Behavioral Robotics* 2020; 11(1): 271-283.
22. Spencer S, Decuypere E, Aerts S, et al. History and ethics of keeping pets: Comparison with farm animals. *Journal of Agricultural and Environmental Ethics* 2006; 19(1): 17-25.
23. Darling K. Extending legal protection to social robots: The effects of anthropomorphism, empathy, and violent behavior towards robotic objects. [Internet] *SSRN* 2016. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2044797
24. Johnson DG, Verdicchio M. Why robots should not be treated like animals. *Ethics and Information Technology* 2018; 20(4): 291-301.
25. Bradwell HL, Winnington R, Thill S, et al. Ethical perceptions towards real-world use of companion robots with older people and people with dementia: survey opinions among younger adults. *BMC geriatrics* 2020; 20(1): 1-10.

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