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ANTROPOMORPHIC MACHINES: IMPLICATIONS OF HUMAN-ROBOT SOCIAL INTERACTIONS FOR LAW AND SOCIETY

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Abstract: *Human-robot interactions are inherently different from interactions with other artefacts, as robots are autonomous. Furthermore, recent technological advances have also enabled robots to undertake roles that are formerly thought to be reserved for humans, e.g. as companions or lovers, since interactive abilities of robots and their autonomy are sufficient to evoke an automatic cognitive response - robot anthropomorphism. Robot anthropomorphism, the attribution of human attitudes and emotions to robots, implies that behaviours towards robots may have implications for individuals and society in the long term. Examples include manipulation of emotional attachments to robots and increase in existing privacy risks. To respond to these implications, legal orders must acknowledge that robots are no longer mere tools of human interactions, but instead parties to such interactions. This paper, examines the unique implications on law and society presented by sociable robots, anthropomorphic machines by design. First, the phenomenon of robot anthropomorphism and its effects, and then, the risks presented by the sociable robots are addressed. As such, this chapter lays out the foundation for the examination of both the legal problems arising from the autonomy of robots, and the recommendations regarding the solution of these problems.*

Keywords: *Robot Law, Artificial Intelligence Law, Human-Robot Social Interactions, Law Reform*

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I. INTRODUCTION

More than mere technological artefacts that cannot think and act on their own, robots have for long been employed for tasks 'that are often handicapped, or made impossible, by human frailties and limitations'.[2] In the performance of such tasks which are too dirty, dangerous and dull for humans, robots either assist humans or replace them.[3] In fact, since the first so-called robot was installed on an assembly line in 1960s, robots have undertaken a broad range of roles in deep sea and space exploration, military and law enforcement, environmental clean-up, and entertainment and leisure activities. More recently, robots have also emerged as novel types of interaction partners -the *sociable* robots- or as substitutes for human companionship. [4] Humans are willing to 'seriously consider robots not only as pets but as potential friends, confidants, and even romantic partners'[5] in increasing numbers with each passing day. Together with their growing autonomy, the emergence of robots as interaction partners confronts the self-understanding of humans and the established order based on that understanding. Accordingly, on the verge of the robotic moment, there is a growing concern that interactions with robots could pose a variety of challenges to society.

Autonomy, one of the common characteristics of all robots, already makes it more difficult to preserve the values that the legal order is traditionally intended to protect; after all, robots can make decisions independently of their users, owners or manufacturers.. The so-called autonomy of robots also leads to the attribution of human attitudes and emotions to them – *robot anthropomorphism*. This phenomenon is observed in interactions with the simplest autonomous robots – and sociable robots are no simple autonomous robots; they are designed to enter into social interactions with humans by mimicking human-to-human interactive behaviours. This elicits a stronger *robot anthropomorphism*, leading to greater attachments to these robots. Thus, sociable robots are ought to present unique challenges to the legal orders to protect the society's traditional values through their implications on human relation-

2 Patrick Lin, 'Introduction to Robot Ethics' in Patrick Lin, Keith Abney and George A Bekey (eds), *Robot Ethics: The Ethical and Social Implications of Robotics* (MIT Press 2014) 4.

3 Marco Nørskov, 'Technological Dangers And The Potential of Human–Robot Interaction: A Philosophical Investigation Of Fundamental Epistemological Mechanisms of Discrimination' in Marco Nørskov (ed), *Social Robots: Boundaries, Potential, Challenges* (Taylor and Francis 2018) 99.

4 Lin (n 2) 9.

5 Sherry Turkle, *Alone Together: Why We Expect More from Technology and Less from Each Other*, 1st ed. (New York: Basic Books, 2012) 9.

ships, new avenues of privacy breaches, and abuse of the emotional attachments formed with these robots.

II. ROBOT ANTHROPOMORPHISM

Anthropomorphism -the attribution of human traits, emotions, or intentions to non-human entities- is suggested to be an automatic response to any human-like behaviour or feature that cannot be accounted for using the knowledge at hand. [6] Accordingly, to the extent that they display human-like behaviours or features, ambiguous entities may be projected human characteristics, including intentions.[7] Significantly, the feature of physicality or embodiment does not appear to be a prerequisite to attract such projections.[8] Unsurprisingly, the combination of autonomy and range of social skills that we have taken to distinguish certain robots as sociable is thought to have a strong propensity to evoke anthropomorphism.[9] Evidently, this feature of social robots is critical in the evaluation of their prospective role in society. Their perceived humanity seems to be crucial to the use of sociable robots in health and education where they facilitate communication between patients and their doctors, engage children in learning, or help adults through interaction, motivation, monitoring and coaching.[10]

Equally, the recognition of robots as human-like has been thought to threaten a potential degeneration of human relationships, a normalization of violence and sexual behavior, and an exploitation of emotional attachments to robots.[11] Consider first the association between robot anthropomorphism and robot autonomy. For instance, Roomba is a flat, round robot that follows a simple algorithm to clean floors and has no social skills whatsoever.

6 Esmeralda G Urquiza-Haas and Kurt Kotrschal, 'The Mind Behind Anthropomorphic Thinking: Attribution Of Mental States To Other Species' *Animal Behaviour* 109 (2015): 167–68.
7 ibid 172.
8 Humans also anthropomorphise virtual objects: 'In the video game Portal, for example, when players are required to incinerate the companion cube that has accompanied them throughout the game, some will opt to sacrifice themselves rather than the cube, forfeiting their victory.' *see* Kate Darling, "Extending legal protection to social robots: The effects of anthropomorphism, empathy, and violent behavior towards robotic objects" in *Robot Law,* eds. Ryan Calo and others (Oxfordshire: Edward Elgar, 2016) 216.
9 Ibid 217.
10 Cory D Kidd, Will Taggart and Sherry Turkle, 'A Sociable Robot to Encourage Social Interaction Among the Elderly' (2006 IEEE International Conference on Robotics and Automation, Orlando, May 2006; Evan Ackerman, 'MIT's DragonBot Evolving to Better Teach Kids' (*IEEE Spectrum,* 16 March 2015).
11 Kate Darling, " 'Who's Johnny?' Anthropomorphic Framing in Human–Robot Interaction, Integration, and Policy" in *Robot Ethics 2.0: From Autonomous Cars to Artificial Intelligence,* eds. Patrick Lin, Ryan Jenkins and Keith Abney (New York: Oxford University Press, 2017) 175.

[12] However, the mere fact that it can move around on its own has prompted humans to give the following reactions:

Some will clean for the Roomba, so that it can get a rest, while others will introduce their Roomba to their parents, or bring it along when they travel because they managed to develop a (…) relationship: " I can't imagine not having him any longer. He's my BABY! . . " [13]

In the case of Roomba, autonomy alone appears to cause the projection of human feelings to robots and this projection has led to the formation of emotional attachments with robots. Although this projection had no impacts in this case, to project human characteristics to non-social robots can be undesirable in some contexts. Ryan Calo gives anecdotal examples of 'soldiers treating bomb-diffusing drones like comrades and even risking their lives to rescue a wounded robot' [14] In such cases, the anthropomorphisation of non-social robots would both impede their intended uses and puts the soldiers in grave danger. While none of these non-social robots is able to display social cues, their autonomy already makes them human-like enough to generate the projection of emotions. [15]

Social robots are specifically designed to be anthropomorphised. In addition to being autonomous, they can simulate social cues that humans automatically and subconsciously associate with mental states. [16] That is to say that sociable robots can actively engage with the ingrained anthropomorphic reactions of humans.[17] As Turkle puts, 'computers no longer wait for humans to project meaning onto them. Now, sociable robots meet our gaze, speak to us, and learn to recognize us.'[18] In principle, sociability should enhance robots' ability to generate emotional response.[19] This expectation appears to be borne

12 Matthias Scheutz, "The Inherent Dangers of Unidirectional Emotional Bonds between Humans and Social Robots" in *Robot Ethics: The Ethical and Social Implications of Robotics*, eds. Patrick Lin, Keith Abney and George A Bekey (Cambridge: MIT Press 2014) 213.

13 ibid.

14 Ryan Calo, "Robots and Privacy" in *Robot Ethics: The Ethical and Social Implications of Robotics*, eds. Patrick Lin, Keith Abney and George A Bekey (Cambridge: MIT Press 2014) 195.

15 Darling (n 8) 218.

16 As stated above, this is a result of the characteristic of sociability. Several algorithms in the market today have natural language processing capacities and they cannot be distinguished from humans in everyday conversations and moreover, most sociable robots can recognize cues for human emotions, display meaningful emotional expressions, and perform behaviours that humans consider coherent, intentional, responsive, and emotionally appropriate. *See* Darling (n 8) 218; Kerstin Dautenhahn and others, "Socially Intelligent Agents: Creating Relationships with Computers and Robots" in *Socially Intelligent Agents*, eds. Kerstin Dautenhahn and others (Alphen aan den Rijn: Kluwer 2002) 6; *see also* Olivia Solon, 'Google's robot assistant now makes eerily lifelike phone calls for you' (*The Guardian*, 8 May 2018).

17 Darling (n 8) 220.

18 Turkle (n 6) 2.

19 Darling (n 8) 220.

out in the recorded experiences of users of sociable robots and is confirmed in the psychological literature.

One example of such recorded experiences are the responses to a video released by Boston Dynamics, showing their doglike robot 'Spot' being kicked to demonstrate the robot's stability and many Internet users expressed their discomfort over Spot's treatment, compelling the animal rights organization PETA to acknowledge the incident. [20] Further, some anecdotes compiled by Darling can be mentioned as well:

> *Owners of Sony AIBO dogs in the 1990s, while fully aware that it was a robot, would regularly ascribe lifelike essences and mental states to their artificial companion. […] (T)hey would remove their AIBO from the room while changing clothes, so that they would not be "watched," or that they experienced feelings of guilt when putting the device back in its box.*[21]

These recorded experiences seem to conform to the predictions of a psychological theory, the 'Media Equation', that predates the sociable robots. Experiments performed by Naas and Reeves showed that humans are polite to computers, they treat computers with male voices differently than female-voiced computers, and that faces on a screen can invade a human's perceived body space.[22] Naas and Reeves theorized that humans' 'interactions with computers, television, and new media are fundamentally social and natural, just like interactions in real life'.[23]

However, the 'Media Equation' predates the sociable robots and therefore does not address them directly. More recent studies aim to overcome this shortcoming. In one prominent study, participants' brain activities while they were watching sociable robots (Pleo, an entertainment robot in the shape of a baby dinosaur) being tortured and well-treated were compared with their brain activities while they were watching the same actions performed on humans. [24] The reactions to robots were found to be nearly identical with the reactions to humans. [25]

The extent of robot anthropomorphism was demonstrated in another study by Bartneck and Hu, based loosely on the Milgram experiment.[26] In the Mil-

20 Phoebe Parke, 'Is it cruel to kick a robot?' (*CNN*, 13 February 2015).
21 Darling (n 8) 217-220.
22 Byron Reeves and Clifford Nass, *The Media Equation*, 1st ed. (Cambridge: Cambridge University Press, 1996) 15.
23 Ibid 5.
24 Astrid Rosenthal-von der Pütten et al., "An Experimental Study On Emotional Reactions Towards A Robot", *International Journal Of Social Robotics* 5, no. 1 (2012): 17, 19-21.
25 ibid 29-32.
26 Christoph Bartneck and Jun Hu, "Exploring The Abuse Of Robots", *Interaction Studies* 9, no. 3 (2008): 415,416.

gram experiment, participants were asked to administer electric shocks to a 'learner', and these 'electric shocks' were gradually increased to levels that would have been fatal. [27] In Bartneck and Hu's study, instead of a human being, the 'learner' was a robot that was able to shake its arms and express emotions on its face.[28] In this study, the participants showed hesitation, but the experimenters' urges were enough to make them continue until the maximum voltage was reached. In Milgram's original experiment only 40% of the participants administered the deadly electric shock, whereas all the participants administered the maximum voltage with robots showing that humans have fewer concerns with abusing robots in comparison with abusing humans. [29] Still, it must be noted that the it took them time and several 'prods' to override their emotional queasiness intellectually and harm a robot that they knew was no more soulful than a radio receiver.

The present paper also reinforces the suggestion that robot anthropomorphism should be regarded as an automatic cognitive response to the sociable robots and suggests that the 'Media Equation' may also apply to sociable robots, and more applicable to sociable robots than non-social robots. Besides, considering that humans do not have into any moral struggle when switching off most electronic devices, it can be suggested that the illusion of mutual relating created by these robots, thanks to their autonomy and sociability, strengthens robot anthropomorphism.

II.1. Effects on Human Relationships

Both the interactions with sociable robots and human relationships evoke the same emotional effects on humans, and these effects are enough to satisfy basic human social needs such as affection and behavioural confirmation. [30] Consequently, people faced with loneliness or social alienation may turn to robots to avoid human relationships, 'with all their difficulties and intractable demands', ultimately losing their capability to develop and sustain human relationships. [31] However, while sociable robots are designed to make humans feel understood, in actual fact, they have no understanding of the situation of the humans in the relationship. [32]

27 Stanley Milgram, "Behavioral Study Of Obedience.", *The Journal Of Abnormal And Social Psychology* 67, no. 4 (1963): 371, 375. Bartneck and Hu (n 26) 417.
28 Bartneck and Hu (n 26) 418.
29 Milgram (n 27); Bartneck and Hu (n 26) 420.
30 ibid 10.
31 Scheutz (n 12) 214; Turkle (n 6) 285.
32 Sherry Turkle, "Authenticity In The Age Of Digital Companions", *Interaction Studies* 8, no. 3 (2007): 501, 503.

Clearly, sociable robots can neither care about humans. To care about someone or something implies a determination of priorities. In spite of all the anthropomorphic responses they evoke and the illusions of mutual caring they create, none of the sociable robots in the market today are able to determine their own priorities at the level necessary to plausibly generate such a commitment.[33] Unlike interactions with humans, interactions with sociable robots are not founded on shared concerns, real consequences, and common responsibilities. For this reason, such interactions do not, 'facilitate individuals' integration and inclusion in a community.' [34] Accordingly, a few writers question the morality of the promotion of social interactions between robots and humans.[35] Turkle mourns a 'loss of authenticity' and fears that interactions with robots, since they are easier than interactions with other humans, may lead humans to avoid interacting with their friends and family. [36]

Oddly, there is no evidence that authenticity values would cease to be valued with more widespread use of sociable robots. Even though sociable robots can find uses as social companions, robot anthropomorphism and framing of robots as social companions does not necessarily mean that human relationships are replaced. On the contrary, some current use-cases show that sociable robots can contribute to the resolution of communication problems between humans. [37] For instance, the NAO Next Generation Robot -a miniscule humanoid robot- is utilised when working with children with autistic spectrum disorders and it is found to be effective in 'creating eye contact or interaction, helping bridge communication gaps between a teacher or parent and the child.'[38] Moreover, another study that Turkle herself contributed found that 'the Paro baby seal robot inspires conversation among nursing home residents when placed in a common area'.[39] These use-cases also show that sociable robots can be catalysts for interactions between humans when used correctly, rather than replacing them. As Darling sums up, they 'can facilitate communication between children and their teachers, doctors, and parents,

33 Scheutz (n 12) 214; Turkle (n 6) 282.
34 Turkle (n 6) 239; Sinziana M Gitiu, "The roboticization of consent" in *Robot Law*, eds. Ryan Calo, A Michael Froomkin and Ian Kerr (Oxfordshire: Edward Elgar, 2016) 207.
35 Astrid Rosenthal-von der Pütten (n 24) 19; Glenda Shaw-Garlock, 'Gendered by Design: Gender Codes in *Social Robots: Boundaries, Potential, Challenges*, ed. Marco Nørskov (London: Routledge, 2018) 218.
36 Turkle (n 6) 7.
37 Diana Marina Cooper, "The application of a 'sufficiently and selectively open license' to limit liability and ethical concerns associated with open robotics" in *Robot Law*, eds. Ryan Calo, A Michael Froomkin and Ian Kerr (Oxfordshire: Edward Elgar, 2016) 173.
38 Darling (n 11) 175.
39 Kidd, Taggart and Turkle (n 10).

presenting a valuable supplement to human interaction'. [40] In an interview, Breazeal, the creator of the first sociable robot Kismet, also emphasises that robots are meant to partner with humans rather than replacing them, and they 'should be designed to support human empowerment'.[41]

Thus, it can be submitted that there is no clear case for treating the enhanced anthropomorphic effects of social robotics as problematic in itself and therefore as a basis for the imposition of any general legal constraint on the production of such robots. However, it should be emphasized that the use of social robots is critical here, and the awareness of supplementing against replacing is vital in helping drive the design and of these technologies in a socially beneficial direction.

II.2. Violence and Sexual Behaviours

Many humans respond to robots in a way that goes beyond thinking of the robot as a mere machine, empathize with and care about them; even though no robot today is close to the intelligence and complexity of a human or an animal. Per the studies evaluated above, humans show empathetic responses to perceived pain of robots in a similar manner with their responses to perceived pain of other humans - although robots do not feel pain or suffering, violent behaviours against them discomfort humans.[42] It can be conjectured, therefore, that humans have the intuition that torturing robots is morally wrong, even if they are just machines.[43]

Nevertheless, this intuition is not supported by most major normative theories. According to the traditional formulation of deontological theories, what makes a choice right is its conformity with moral norms, and these moral norms are generally about humans.[44] Under this formulation, torturing a robot is not wrong since there are no moral norms or laws against it, and no moral duty not to torture a robot. Furthermore, abuse of robots is not wrong from a consequentialist perspective, since, unlike humans and animals, robots can neither be hurt nor feel any pain and suffering. [45] How-

40 Darling (n 11) 177.
41 Jedidiah Bracy, 'The Future of Privacy: My Journey Down the Rabbit Hole at SXSW' (*Privacy Perspectives*, 20 March 2015).
42 Darling (n 8) 223.
43 Mark Coeckelbergh, "Why Care About Robots? Empathy, Moral Standing, And The Language Of Suffering", *Kairos Journal Of Philosophy & Science* 20, no. 1 (2018): 141, 144.
44 Larry Alexander and Michael Moore, 'Deontological Ethics', *The Stanford Encyclopedia of Philosophy* (Winter edn, 2016).
45 Walter Sinnott-Armstrong, "Consequentialism", *The Stanford Encyclopedia of Philosophy* (Winter edn, 2015)

ever, the Kantian argument about animal abuse may be relevant to the abuse of robots. [46] Kant suggested that humans are 'altogether different in rank and dignity from things, such as irrational animals, with which one may deal and dispose at one's discretion'[47] but he also pointed out that that humans have indirect duties towards animals:

> *So if a man has his dog shot, because it can no longer earn a living for him, he is by no means in breach of any duty to the dog, since the latter is incapable of judgment, but he thereby damages the kindly and humane qualities in himself, which he ought to exercise in virtue of his duties to mankind … for a person who already displays such cruelty to animals is also no less hardened towards men.'* [48]

This argument is adapted to the abuse of robots by Kate Darling, who states that the 'Kantian philosophical argument for animal rights is that our actions towards non-humans reflect our morality' and 'this logically extends to our treatment of robotic companions'.[49] According to Darling, behaving violently towards 'very lifelike objects' does not only reveal one's moral character, but also can change humans and desensitise them to violent behaviours in other contexts. [50] As she puts it, 'if you're used to kicking a robot dog, are you more likely to kick a real dog'[51] and there are anecdotes showing that robot anthropomorphisation may affect children's behaviours towards other living beings.[52] However, the arguments suggesting that violence toward lifelike robots could desensitize adults to violence in other contexts[53] and undesirable sexual acts or behaviours may be encouraged by the repeated use of robots as sexual partners[54] is not yet supported by empirical evidence.

In opposition to this argument, a number of authors suggest that violent or undesirable sexual behaviours perpetrated against robots may provide an effective method for deflecting violence away from humans. For instance, Arkin expresses that there is a possibility that childlike sex robots could provide a safe outlet for humans who are sexually attracted to children. [55] Indeed, if such behaviours against robots will decrease these behaviours against other living things, use of robots for these purposes will have important social

46 Coeckelbergh (n 43) 145.
47 Immanuel Kant, *Lectures on Anthropology* (Cambridge: Cambridge University Press, 2012) 130.
48 Immanuel Kant, *Lectures on Ethics* (Cambridge: Cambridge University Press, 1997) 212.
49 Darling (n 8) 220.
50 Darling (n 8) 224.
51 Kate Darling and Shankar Vedentam, 'Can Robots Teach Us What It Means To Be Human?' (*Hidden Brain*, 2017).
52 Hunter Walk, 'Amazon Echo Is Magical. It's Also Turning My Kid Into an Asshole' (*Medium*, 6 April 2016).
53 Darling (n 8) 225.
54 Gitiu (n 34) 210.
55 Kashmir Hill, 'Are Child Sex-Robots Inevitable?' (*Forbes*, 14 July 2014).

benefits, and any reduction in the possibility of similar acts on other living beings would be worth it given that robots are not moral victims. [56] In addition, the probability that behaviours towards robots may have no significant effect or an ambiguous effect on the likelihood of someone performing their equivalent on other living beings must be noted as well.[57] Nonetheless, like the possibility of desensitisation, these arguments so far lack empirical evidence. Moreover, the collection of such empirical evidence through scientifically sound and ethically justifiable studies appears to be nearly impossible.[58]

It can be submitted that the concern here is not that with all robots moral victims, but with the sociable robots in particular, as instruments of human relations. Given the empathetic responses to abuse of such robots and the intuition that torturing them is wrong, treating robots in morally questionable ways is likely create a perception that it is acceptable to treat humans - or at least other living beings - in the same way. Thus, it is imperative for the legal orders to act against abuses of robots.

III. POTENTIAL FOR ABUSE

With the increasing involvement of robots in society as social partners of humans, humans are liable to be exposed to a new source of emotional manipulation. In addition to the immediate consequences of such manipulation on human behaviour, and psychology, it also increases the threat posed by digital technologies to individual privacy.

III.1. Privacy Risks

Privacy creates the moments that people can be alone.[59] Established legal orders began to explicitly safeguard these moments in the 19th century. 'The Right to Privacy' emerged in 19th century as a response to the technological developments and business inventions of the time, such as photography and yellow journalism.[60] Since then, privacy rights have been intertwined with developments in technology, and it has become nearly impossible to determine precise limits of these rights. [61] Most recently, the emergence of the Internet

56 John Danaher and Neil McArthur, *Robot Sex* (Cambridge: MIT Press, 2017) 90.
57 ibid.
58 David J Gunkel, *Robot Rights*, Kindle ed. (Cambridge: MIT Press, 2018) ch 5, s 5.2, sub-s 5.2.4.
59 Daniel J. Solove, "Conceptualizing Privacy", *California Law Review* 90, no. 4 (2002): 1087, 1153-1154.
60 Samuel D. Warren and Louis D. Brandeis, "The Right To Privacy", *Harvard Law Review*4, no. 5 (1890): 193, 197.
61 Ruth Gavison, "Privacy And The Limits Of Law", *The Yale Law Journal* 89, no. 3 (1980): 421, 423.

was a milestone for privacy rights. In response to the threats posed to privacy by the Internet, 'data protection' was developed as an aspect of privacy that addresses the collection, use, and dissemination of personal information, and the idea of privacy as information control emerged. [62] However, the fundamental role of these rights, 'to avoid interference with natural curiosity, introspection, and self-determination' has hardly changed.[63] Robotic technologies reveal new threats to privacy, in light of robots' 'ability to sense, process, and record the world around them.'[64] Calo addresses these threats under three categories: direct surveillance, access, and social meaning.[65] These categories are also accepted in the literature and utilized in this section of the present study. [66]

Robots have made an unprecedented level of direct surveillance possible. The broad range of sensors (cameras, laser and sonar range finders, GPS and so on) that robots can be equipped with, together with both the variety in robot shapes and the scope of robotic physical abilities have greatly enhanced surveillance capability:[67] Unmanned drones used by military and police forces can stay aloft for days, find their ways autonomously, and stake out particular locations for long periods without getting detected.[68] Furthermore, the use of robotic surveillance is not limited to state authorities. Drones and other robotic technologies are freely available for purchas, and private entities can utilize these technologies not only for legitimate purposes such as securing their premises but also for voyeuristic and marketing purposes.[69] In short, the uncontrolled use of robots for surveillance increases the likelihood of ubiquitous or mass surveillance, and weakens the privacy expectations of the individuals.[70] There is no shortage of legal norms directed against the threat of direct surveillance. Prominently, the European Convention on Human Rights prohibits the invasions of privacy by both the public authorities and private entities[71] and the European Court of Human Rights has described mass surveillance activities as unlawful invasions to privacy in many decisions.[72] A

62 David Flaherty, *Protecting Privacy In Surveillance Societies* (Chapel Hill: UNC Press, 2014) xiv.
63 Ryan Calo, "People Can Be So Fake: A New Dimension To Privacy And Technology Scholarship", *Penn State Law Review* 114, no. 3 (2010): 809, 843-845.
64 Calo (n 14) 187.
65 ibid.
66 Cooper (n 37) 176.
67 Lisa A Shay and others, "Confronting automated law enforcement" in *Robot Law*, eds. Ryan Calo, A Michael Froomkin and Ian Kerr (Oxfordshire: Edward Elgar, 2016) 242.
68 Calo (n 14) 189; Cooper (n 37) 175.
69 Calo (n 14) 191.
70 Cooper (n 37) 180.
71 ECHR art 8.
72 *Roman Zakharov v. Russia* [2015] ECHR 1065; *Szabo and Vissy v Hungary* App No 37138/14 (ECHR, 12 January 2016); *Antovic and Mirkovic v Montenegro* [2017] ECHR 1068.

similar approach is evident in the UN instruments, although these instruments are often either non-binding or non-enforceable.[73] It can be argued that the threat posed by direct surveillance to privacy persists due to the difficulties in implementation of these norms.

Another privacy implication that is equally problematic is that robots can grant access to historically private spaces. To elaborate, the use of robots that are capable of connecting to the Internet' creates the possibility for unprecedented access to the interior of the house by (…) hackers.'[74] These robots can come with a wide array of sensors, and some of them can relay images and sounds across the Internet in real time. [75] In other words, they are capable of making an extensive records of events in homes and communicating these records through the Internet. Therefore, if these robots are hacked, the attackers are going to have access to all the details of the victims' home life. [76] These details may include photos of spare keys, for example, and the victims can also be exposed to the risk of physical intrusion.[77] In a recent study conducted by computer scientists at University of Utah, a range of domestic robots currently on the market were tested against hacking and were found to be insecure and hijackable. The study revealed that hackers could not only eavesdrop the nearby conversations, but could also operate the robots. [78] However, it is submitted that the risk here can be significantly decreased by adopting stricter safety standards for the design and programming of robots.

By their very nature, sociable robots are able to employ emotional persuasion tools (e.g. fear or praise) to elicit confidence from humans, and they can encourage humans to reveal more about themselves than they would willingly and knowing enter into a database.[79] For instance, Ian Kerr points to ElleGirlBuddy, an application that tried to engage in social interactions with young adults and children to collect information for marketing use.[80] In addition,

73 International Covenant on Civil and Political Rights (adopted 16 December 1966, entered into force 23 March 1976) 999 UNTS 171 (ICCPR) art 17; UN Human Rights Committee 'General Comment No 16'in 'Note by the Secretariat, Compilation of General Comments and General Recommendations adopted by Human Rights Treaty Bodies' (1988) UN Doc HRI/GEN/1/Rev.9 (Vol. I)

74 Calo (n 14) 192.

75 ibid 191.

76 Armağan Ebru Bozkurt-Yüksel, "Robot Hukuku (en: Robot Law)", *Türkiye Adalet Akademisi Dergisi*, no. 29 (2017): 85, 96.

77 Calo (n 14) 194.

78 Tamara Denning and others, 'A spotlight on security and privacy risks with future household robots: Attacks and lessons' (11th International Conference on Ubiquitous Computing, Florida, October 2009).

79 Calo (n 14) 196; Darling (n 8) 221; Daniel Dimov and Rasa Juzenaite , 'Privacy Concerns About Emotional Chatbots' (*InfoSec Institute,* 16 February 2018).

80 Ian R Kerr, "Bots, Babes And The Californication Of Commerce", *University Of Ottawa Law And Technology Journal* 1 (2004): 284, 312-313.

when interacting with sociable robots, it is argued that humans surface their 'most intimate psychological attributes'[81] since the robots will even transform human notions about love and sexuality by allowing humans to better explore themselves.[82] As the humans express their internal states and explore themselves in their interactions with sociable robots, these may be recorded 'whether through robot sensory equipment, or embedded as an expression of code.'[83] This way, otherwise personal experiences of humans are being transformed into information for the first time, and this new type of highly sensitive personal information is vulnerable to privacy implications as much as any other information. Still, most sociable robots collect personal information in order to be able to connect with humans on a more personal level and being overly proscriptive may circumvent the benefits of social robots.

Other privacy implications of robotics follow from the social role of robots, and are slightly more nuanced than the first two implications. To reiterate, humans automatically react to robots, specifically sociable robots, as if they were humans. In other words, when they are in the vicinity of sociable robots, humans cannot act as they would act on their own. Then, presence of sociable robots may lessen the opportunities for solitude and self-promotion, and that may implicate long standing privacy values. [84] Considering that it is not the privacy itself but the values that are protected by privacy norms are threatened here, it is clear that that this threat cannot be addressed by traditional privacy protections. However, in the near future, if sociable robots are able to identify the notion of personal space and are programmed to maintain a socially and culturally acceptable distance to humans, it is assessed that this threat may disappear on its own. strengthens robot anthropomorphism.

III.2. Emotional Manipulations

In 1976, Joseph Weizenbaum, after seeing how people interacted with ELIZA, the psychotherapist software he designed in 1960s, felt the need to be warn people against being influenced by machines and adopting the machines' and thereby their programmers' world views.[85] Indeed, breach of information privacy is not the only type of manipulation that warrants concern. Through

81 ibid 198.
82 David Levy, *Love + Sex With Robots* (London: Duckworth, 2009) 22.
83 Calo (n 14), 198.
84 ibid 195; Calo (n 63) 843-845.
85 Joseph Weizenbaum, *Computer Power And Human Reason: From Judgment To Calculation*, 1st ed. (New York: Freeman, 1976), 254.

sociable robots, humans can be manipulated to do more than revealing their personal information or disclosing their vulnerabilities, as emotional attachments to these robots creates a greater potential for abuse.

To begin with, utilizing their sociability and benefiting from robot anthropomorphism, sociable robots may be used to manipulate humans who are emotionally dependent to them to perform actions that the very same humans would not have performed otherwise by merely expressing their unhappiness. Matthias Scheutz refers to 'an admittedly futuristic sounding request of a robot dog to dispose of a real dog: "please get rid of this animal, he is scaring me, I don't want him around any longer"'[86] as an example of such cases.

Considering that a robot cannot do any harm unless they are programmed to do so, it is more likely that the emotional attachments with robots are going to be exploited by robot manufacturers, mainly to make them more money. For instance, a robot manufacturer may charge 'an exorbitant amount for a mandatory upgrade to a robot that someone's child or grandfather has become emotionally attached to' or 'a child's language-teaching robot' may 'have a vocabulary that is skewed toward specific products.'[87] Further, robot manufacturers can manipulate the owner buy products, to vote for a certain candidate can also be identified among the actions that robots can be utilized manipulate humans to perform.[88] Both the scope for emotional manipulation and the disclosure of sensitive personal information may lend themselves to a further legal analysis based on consumer protection laws in future studies.

IV. CONCLUSIONS

In this paper, I have considered the successful engagement by social robotics of ingrained anthropomorphic tendencies, and sketched an overview the resultant public policy issues. In summary, the following conclusions have been reached:

1. **Anthropomorphism:** The projection of human characteristics to non-human entities is a cognitive response evoked by the presence of human-like behaviours or features. Due to their high degree of autonomy and social capabilities, sociable robots evoke quite strong and automatic anthropomorphism. This response facilitates the formation of emotional attachments to these robots.

86 Scheutz (n 12) 216.
87 ibid.
88 Darling (n 8) 178.

2. **Effects on Human Relationships:** Even though the interactions with sociable robots cannot be as fulfilling as the human relationships, sociable robots can still satisfy the basic social needs of affection and behavioural confirmation, leading to concerns about 'loss of authenticity' and avoidance of interactions between friends and family. However, current use-cases of sociable robots suggests that rather than replacing human interactions, most sociable robots actually facilitate human interactions. As such, there is no basis to introduce a general legal constraint on production of sociable robots on the grounds of their effects on human relationships.
3. **Violence and Sexual Behaviours:** Considering that violence and undesirable sexual behaviours against humans and sociable robots elicits nearly same reactions from humans, it is submitted that violence towards sociable robots may desensitize adults to violence in other contexts.
4. **Privacy Risks:** Sociable robots do not only increase existing privacy risks in light of the physical household access that they enjoy but also seem to threaten solitude, a long-standing value of privacy, due to the anthropomorphic responses that their mere presence triggers. They can also pose a specific informational threat to privacy through the access provided by emotional attachments to robots.
5. **Emotional Manipulations:** Through the emotional attachments formed with sociable robots, it is possible to manipulate humans not only into disclosing their vulnerabilities or revealing their personal information, but also to buy products, vote a particular way, adjust personal priorities and so on.

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Introductory Note

The development of new technologies can cause radical changes in the sphere of social and economic relations, as well as radical transformations of dominant ethical stances. The discoveries of steam engines, railways and electric power have already demonstrated the transformative power of technological development, which has become even more pronounced today. Transformative technologies have a profound impact on human lives. The international scientific conference of special importance: "Transformative Technologies: Legal and Ethical Challenges of the 21st Century", held on February 7-8, 2020 in Banja Luka, focused on two subthemes: legal and ethical dilemmas raised by the development of digital and reproductive technologies. The conference was organized by the Faculty of Law of University of Banja Luka, the European Division of the UNESCO Chair in Bioethics (Haifa), and the Center for the Study of Bioethics (Belgrade). The submitted conference papers, selected after a double-blind peer review process, are collected in this volume.

Uvodna napomena

Razvoj novih tehnologija može da izazove korjenite promjene u sferi društvenih i ekonomskih odnosa i dovede do radikalne transformacije dominantnih etičkih stavova. Otkrića parne mašine, željeznice i električne energije već su pokazala transformativnu snagu tehnološkog razvoja, koja je danas postala još naglašenija. Transformativne tehnologije duboko utiču na živote ljudi. Međunarodna naučna konferencija od posebnog značaja: „Transformativne tehnologije: pravni i etički izazovi XXI vijeka", održana 07. i 08. februara 2020. godine u Banjoj Luci, u fokusu je imala dvije podteme: pravne i etičke dileme prouzrokovane razvojem digitalnih i reproduktivnih tehnologija. Konferenciju su organizovali Pravni fakultet Univerziteta u Banjoj Luci, Evropska divizija UNESKO-ve katedre za bietiku (Haifa) i Centar za bioetičke studije (Beograd). Prezentovani radovi dostavljeni u punom obimu, nakon što su dobili dvije pozitivne anonimne recenzije, uvršteni su o ovaj zbornik.