Jurnal Filsafat, ISSN: 0853-1870 (print); 2528-6811(online)
Vol. 33, No. 2 (2023), p. 202 – 224, doi: 10.22146/jf.87121

SHOULD ROBOTS BE LIKE HUMANS? A PRAGMATIC APPROACH TO SOCIAL ROBOTICS

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Abstrak

Artikel ini mendeskripsikan aspek-aspek instrumentalisasi robot sosial yang kemudian memunculkan istilah robot sosial pragmatik (RSP). RSP, berbeda dengan humanoid, memiliki ciri yang ditentukan melalui aspek-aspek instrumentalisasinya yang terdiri dari bahasa, keterampilan, dan kecerdasan buatan. Aspek-aspek instrumentalisasi inilah yang membawa kita pada kecenderungan untuk mengatribusikan sifat kedirian pada RSP atau antropomorfisme. Secara teoretis, antropomorfisme dapat menimbulkan masalah, terutama ketika RSP kemudian diposisikan ke dalam sistem-sistem pekerjaan. Melihatnya sebagai individu yang cukup diri akan memunculkan permasalahan tanggung jawab dan ontologis relasi-relasi manusia-teknologi. Konsekuensinya, antinomi muncul dalam penelitian dan pengembangan RSP, karena tujuannya adalah untuk menggapai keserupaan dalam kapasitasnya menyelesaikan pekerjaan. Seiring dengan hal tersebut, penulis mengajukan relevansi instrumentalisasi intuisi. Intuisi dapat membentuk kecerdasan sosial pada RSP dengan mengacu pada fungsinya untuk menggapai pengetahuan. Sebagaimana yang diajukan oleh Henry Bergson dan Efraim Fischbein, intuisi melampaui kapasitas analisis logis dalam penyelesaian masalah. Robot-robot harus seperti manusia, dalam artian memiliki aspek-aspek instrumentalisasi yang memenuhi kriteria nilai dari keterampilan sosial manusia.

Kata kunci: *Robot sosial, Instrumentalisasi, Antropomorfisme, Intuisi Buatan*

Abstract

This paper describes the instrumentalizing aspects of social robots, which generate the term pragmatic social robot. In contrast to humanoid robots, pragmatic social robots (PSRs) are defined by their instrumentalizing aspects, which consist of language, skill, and artificial intelligence. These technical aspects of social robots have led to the tendency to attribute a selfhood characteristic or anthropomorphism. Anthropomorphism can raise problems of responsibility and the ontological problems of human-technology relations. As a result, there is an antinomy in the research and development of pragmatic social robotics, considering that they are expected to achieve similarity with humans in terms of completing works. How can we avoid anthropomorphism in the research and development of PSRs while ensuring their flexibility? In response to this issue, I suggest intuition should be instrumentalized to advance PSRs' social skills. Intuition, as theorized by Henry Bergson and Efraim Fischbein, overcomes the capacity of logical analysis to solve problems. Robots should be like humans in the sense that their instrumentalizing aspects meet the criteria for the value of human social skills.

Keywords: *Social robots, Instrumentalization, Anthropomorphism, Artificial Intuition*

Received: July, 20 2023 | **Reviewed:** July, 20 2023 | **Accepted**: August, 21 2023

INTRODUCTION

Leonardo da Vinci may have been the first to design a humanoid robot. Leonardo's humanoid was discovered in a sketchbook containing drawings of his automatons in 1950. It is an armored humanoid, The Mechanical Knight, designed to sit, stand, and move hands. Despite the fact that it was more of an artistic design than a technical design, it was created for public demonstration, the drawings have inspired modern robotics researchers. Mark E. Rosheim, a roboticist who studied Leonardo's automaton drawings, rebuilt the Mechanical Knight and developed the mechanical structures that drive its arms and hands for outer space robots (Rosheim, 2006).

Robotic technology has historically been developed based on human practical interest. For example, in the manufacturing industry, robots perform tasks that require strength, speed, and accuracy. Robots are defined by their ability to perform autonomous functions to complete tasks in the industrial world. In contrast to humanoids, which are not created to serve human practical interests or fulfill the pragmatism principle, ASIMO (Honda humanoid), Atlas (Boston Dynamics), and Ameca (Engineered Art), for example, are not pragmatic robots. Their robotic abilities are comparable to those of the Mechanical Knight, created for demonstration in front of rulers during the medieval period.

The question then becomes whether the human body was not created based on pragmatism principles, thus rendering attempts to create a humanoid futile. The anatomy of the human body is obviously pragmatic, given that we cannot survive as living organisms without it. Nonetheless, humanoid robots have technical designs yet to meet the pragmatic principles of the human body. If this is the case, how do we explain the existence of social robots that are now being used for human practical interests?

In this paper, I explain the instrumentalizing aspects of social robots which then generates the term pragmatic social robots. Language, skill, and artificial intelligence are three technological aspects describing pragmatic social robots (PSRs). I am referring to John Searle's philosophy of consciousness as a methodological framework for the instrumentalizing aspect of language. According to Searle's Chinese Room Argument, machines have different modes of understanding, which makes machinic consciousness impossible (Searle, 1997: 11). Language, according to Searle's Chinese Room Argument, can be robotized using a set of rules.

In order to compare human and robot skills, Hubert Dreyfus' phenomenology of skill acquisition (Dreyfus, 1985: 16) will be elaborated. Social robots are designed to possess human, animal, and natural skills characterized by human intelligence. The question is whether they outperform humans in terms of skill. If we refer to Dreyfus's phenomenology of skill acquisition, robots cannot become experts because their skills are based on instructions. However, even if they are programmed to be limited to certain skills does not make them less skilled (Dreyfus, 1985: 108).

Artificial intelligence is one of the aspects that make social robots pragmatic. AI can direct humans into a new mediated world. I elaborate on Don Ihde's philosophy of technology that describes latent telics in instruments. According to Ihde, latent telics are how technology tends to have its technical telos (Ihde, 1979: 42). For example, the use of AI in the public sphere has created a new type of social reality.

The second section examines anthropomorphism in social robotics followed by the ethical problem of responsibility and the ontological problem of human-technology relations. Current AI ethics discourse explains anthropomorphism can raise ethical concerns. The anthropomorphism problems of PSRs are examined through the lens of Ihde's phenomenology instrumentation and Gilbert Simondon's philosophy of technology. Ontological problems of human-technology relations originate from our perception of technology as a symmetrical other that has power over humans.

Finally, I discuss the significance of instrumentalizing intuition by considering the work of Efraim Fischbein (intuition as a cognitive quality) and Henry Bergson (intuition as a method). In their philosophical reflections, intuition takes precedence over reason in terms of its ability to generate knowledge. For example, intuition for mathematical thinking activities (Fischbein, 2002) and intuition used by experts to solve problems (Dreyfus, 1985).

WHAT MAKES SOCIAL ROBOTS PRAGMATIC?

Social robots are now used to mediate human actions. However, the term "social robot" does not always imply a pragmatic robot. In what ways are social robots pragmatic? In this section, I describe the instrumentalizing aspects of social robots that make them pragmatic and their ethical significance. Only by reflecting on the philosophical implications of these instrumentalizing aspects can we discuss the anthropomorphism problems of social robots, which I elaborate further in the second section.

1. **Language**

Social robots are defined by their ability to interact in natural language. Do robots actually comprehend language? If they do comprehend, we can say that they may be conscious to some extent. The symmetrical human-robot interaction through language, therefore, gives rise to hermeneutical problems. According to John Searle's philosophy of consciousness, machines cannot have consciousness because it is programmed to understand through syntax only. Thus, it has a different mode of understanding. Words are not limited to their forms (syntax) but also their meaning (semantics). Searle elaborated this idea through what he calls the Chinese Room Argument, which explains how humans, like machines, respond by following a set of rules. This argument describes how a person in a locked room who does not understand Chinese characters can answer questions from outside the room as if he or she does by understanding them as symbols through a set of rules. The purpose of this argument is to demonstrate the impossibility of machine consciousness (Searle, 1997: 10).

Consider Eugene Goostman, a chatterbot created by a group of programmers that behaves like a 13-year-old boy. This chatterbot passed the Turing test in 2014, convincing 33% of competition judges that it was not a machine (Schofield, 2019). As a result, if we speak with Eugene, we may not realize it is a computer program. Eugene, according to Searle's Chinese Room Argument, does not actually understand a language. Its machinic intelligence can only comprehend syntactic forms of language. Eugene's response is based on a program that contains a set of rules. If he had passed the Turing test, it would have demonstrated one aspect of human intelligence.

The ability of social robots to interact using natural language, which results in a hermeneutical problem of human-machine interactions, can be elucidated through Martin Heidegger's hermeneutics. Heidegger's dictum that says language is the house of being that makes it possible for human existence explains why it becomes a hermeneutical problem. Understanding, or the act of interpretation, is the fundamental ontological mode that unlocks the possibilities of being. Thus, understanding serves as the foundation for more complex and scientific interpretations. Subjectivity must be viewed as a hermeneutic activity. In Heidegger's terms, existence, or facticity, is a form of understanding; "being is meaning" (Heidegger, 1973: 195). The hermeneutical problem in robotic social intelligence stems from how the world is understood in Heideggerian hermeneutics—given that a robot, through a program, appears to understand the world.

Heidegger's hermeneutics raises problems concerning the construction of a robotic self-identity through language. Machines appear to be conscious because they are thought to comprehend the world through language. Social robots are programmed to be capable of making 'discourse' through signifiers in the Heideggerian sense. Just as in Searle's Chinese Room Argument, we may appear to understand Chinese Room by following a set of rules, so a machine that follows a set of rules appears to understand a language.

However, the robotic mode of understanding provides an inauthentic mode of understanding because its use of language is limited to a logical system of meaning. For Heidegger, language is more than a logical system of meaning; it is a condition of the possibility of being. According to Heidegger's hermeneutics, understanding resides in the meaningfulness of language, which exists beyond syntax and semantics, much like poetry (Palmer, 1969).

Based on Heidegger's hermeneutics, pragmatic social robots (PSRs) should be designed to comprehend language as a condition of possibility of being. If it is limited to a logical system of meaning, it is superficial and yields only functional forms of understanding. For example, the use of virtual assistants or chatbots to answer customer questions is based on instructions programmed for specific practical interests. Chat Generative Pre-trained Transformer (ChatGPT), now available on the Internet, represents another robotic mode of understanding. ChatGPT generates natural language text responses using a deep learning language process based on information learned from the internet. ChatGPT differs from other virtual assistants in that it can think through AI based on the data it collects.

If PSRs understand language in the Heideggerian sense, their comprehension certainly will improve. While requiring them to have a pre-understanding is technically difficult, if not impossible, especially in light of Searle's Chinese Room Argument, language should be regarded as being inherently complex. According to Heidegger, it has an infinite structure of meaning and necessitates contexts that are temporal, intentional, and historical (Palmer, 1969: 140). Language is always situated in and speaks from a specific context.

We can use Heidegger's example in the sentence, "this hammer is too heavy" (Heidegger, 1973: 200). The meaning of this sentence does not present an objectification of the hammer on a semantic level; rather, the word hammer is understood as a ready-to-hand or instrument to complete work. As a result, it indirectly conveys another meaning, namely, that we must replace it with a hammer that is not too heavy (Heidegger, 1973: 200). In short, the instrumentalization of language must be understood within the context of the social framework of human-technology relations.

2. Skill

Robots are designed to have skills that resemble humans, animals, and nature—associated with human intelligence. Are their abilities superior to those of humans? To answer this question, I compare human and robot skills using Hubert L. Dreyfus' phenomenology of skill acquisition. Dreyfus classified the process by which the human body masters a new skill into five stages (Dreyfus & Dreyfus, 1985). These five stages are as follows: (1) novice: learn from experience based on rules; (2) advanced beginner: learn from experience based on rules; (3) competence: learn more skills from involvement experience; (4) proficient: problem-solving through reasoning; and (5) expertise: problem-solving through intuition. As a result, the skill progresses from a conceptual framework to embodied intuitive intelligence.

In Dreyfus' phenomenology of skill acquisition, PSRs would be classified as beginners because their skills are based on a program that contains a set of rules. In the beginner stage, skills are learned by following a set of rules without using previous experience as a point of reference. We can expand on Dreyfus' arguments regarding the limitations of expert systems designed to make expert-level decisions. Expert systems are programmed to make decisions based on a set of rules. Consequently, it is difficult for expert systems to become experts because experts do not follow the rules. According to Dreyfus, an expert understands skills in terms of *know-how* rather than *know-that* based on rules (Dreyfus & Dreyfus, 1985: 108).

Nonetheless, PSRs are now being used because they outperform humans in certain tasks, such as efficiency, determination, and precision. Although the PSRs' designs are limited to specific skills, it does not imply that they are less skilled. For example, self-driving cars have the potential to reduce traffic accidents. Research on self-driving cars on public roads shows that they cause only minor accidents, all of which are caused by human error. There would be no traffic accidents if everyone used self-driving cars (Crew, 2015). This finding is interesting, considering that self-driving cars operate based on programs that are phenomenologically categorized in the beginner stage.

What makes a programmable skill, such as that of a self-driving car, which is phenomenologically at the beginner stage, safer than a manual car? The answer can be elucidated based on Searle's Chinese Room Argument, robotic skills are a program that can be upgraded and redesigned until it reaches perfection. If the self-driving program becomes more advanced, with the extensive use of machine learning, it will be difficult to recognize robot drivers on the roads. Thus, the complexity of the program can be used to determine the robotic skills level. Although it appears to be an expert, its skill is still at the beginner stage. Similar to the Chinese Room Argument, a person who does not understand Chinese can read Chinese using a set of rules. As it becomes more complex, the person inside the locked room will appear as an expert or native when answering questions.

Dreyfus' phenomenology of skill acquisition explains how increasing the level of people's driving skills may reduce traffic accidents. At the expert level, people should be able to avoid accidents. However, it is difficult to imagine that everyone must reach an expert level in their driving skills. It is possible that driving skills will evolve until everyone becomes an expert, but this is not a practical solution for reducing problems caused by insufficient driving skills. Transforming transport systems into robotic systems such as self-driving cars, buses, and trains can be a solution to create a safe and secure traffic environment. The automatic vehicle projects being studied for public implementation, for instance, provide insight into how PSRs will take over transportation in the future.

PSRs are designed to have the skills to improve the quality of human life. Despite the fact that the nature of robots is to mediate skills that cannot be performed or to perform certain skills better, human bodily skills continue to be a good technical model. In the field of art, human skills are certainly better than those of robots because they generate meaning, differences, and originality.

3. Artificial Intelligence

Instrumentalization of AI enables PSRs to analyze problems and make strategic decisions. They can even recognize their surroundings through AI technologies such as facial and speech recognition, measure and recognize human body structures (biometrics), and learn directly from experience (machine learning algorithms). AI, as a branch of computer science, has an impact on society not only in terms of practical things but also in terms of how we perceive our human nature.

Online transportation applications are an example of how AI is now being instrumentalized in the public sphere. However, the instrumentalization of AI can also generate ethical reflections. Without online applications, it is impossible to order public transportation; meanwhile, in the Indonesian context, traditional or offline public transportation, such as taxis and motorbikes, is declining. This condition eventually requires everyone to use online applications to order public transportation.

AI has created a new form of social relations. This form of social relations is a phenomenon transformed technologically by what Don Ihde calls latent telics in instruments, a condition in which technology generates an invariant mediated world (Ihde, 1979: 42). This inclination makes instrumental mediations, by virtue of the amplification and reduction they produce, have a transformational character that can lead to a specific type of mediated world. Latent telics inclination in AI (in this context, a robotic process in online transportation), for example, has its own benefits and challenges. Work is made more efficient through AI, but it is reduced to mechanical and instructional actions.

The efficiency of AI has provided many benefits; thus, negating its existence would be considered irrational. Efficiency is believed to be the core of the rationality of modern technology. However, the meaning of efficiency is not necessarily ethical. We may apply the criticisms of Critical Theory philosophers to modern technology, particularly Herbert Marcuse's notion of technological rationality (Magnis-Suseno, 2013: 273). According to Marcuse, the efficiency of modern technology is a manifestation of the efficiency of a capitalist economy. The efficiency provided by modern technology necessitates more production, which eventually leads to an irrational desire for consumption. The latent telics of AI can produce not only a mechanized world but also a new form of exploitative-oriented mode of production.

Despite its ethical implications, the propensity to be directed by AI has resulted in the formation of new social relations. However, in Ihde's philosophy of technology, it is not irreversible technological progress or a state of determinism. Ihde distinguished his idea of latent telics from hard technological determinism, which emphasizes the power of technological progress over human freedom.

ANTHROPOMORPHISM IN SOCIAL ROBOTICS

The instrumentalizing aspects of social robots have predisposed us to anthropomorphize PSRs. Anthropomorphism can be defined as the attribution of human forms or figures to animals and objects, especially those considered sacred in religion and mythology. According to Simon Penny, anthropomorphization is essentially an expression of human culture. In the history of art and automata, for example, it was common for artists to anthropomorphize their works (Penny, 2018: 3). One could argue that human culture has shaped the tendency to anthropomorphize robots or to create and perceive robots as human-like.

Social robotics discourse on anthropomorphism revolves around whether it is ethical to anthropomorphize robots. For instance, Mark Coeckelbergh classified two general theories, naïve instrumentalism and uncritical posthumanism, both of which fall short of addressing the issue of anthropomorphism (Coeckelbergh, 2021). Näive instrumentalism tends to view robots as nothing more than instruments or tools. People must be aware that robots are merely technologies designed based on mechatronics and artificial intelligence. Consequently, naïve instrumentalism holds that we should not design PSRs that resemble humans in order to reduce ethical concerns that come from anthropomorphism, particularly because human-like PSRs might conceal their nature as a tool.

The second approach, uncritical posthumanism, has a diametrically different view from naïve instrumentalism. Uncritical posthumanism believes that human-like PSRs will eventually displace the idea that humans are the center of the world. Anthropomorphism in social robotics is proof that posthumanism is not merely a theory. However, according to Coeckelbergh, it becomes uncritical because it rejects the fact that PSRs can produce ethical issues. He then suggests a third option: we have to be critical that robots cannot be viewed as merely a tool and also at the same time self-sufficient agent, and we have to see the relationality dimension of robots in the realm of sociotechnical systems. The difference with other technologies is that PSRs can have a name that eventually becomes part of the narrative of human social practice through the process of meaning-making. Coeckelbergh is more optimistic than pessimistic regarding the idea of whether we have to anthropomorphize robots.

Meanwhile, Johanna Seibt, Christina Vestergaard, and Malene F. Damholdt (2020), social robotics researchers, criticize anthropomorphism in the context of human-robot social interactions. They contend that sociomorphing is more prevalent than anthropomorphizing in human-robot social interactions. According to Seibt et al., "since sociomorphing is the direct perception of actual characteristics and capacities that may resemble the characteristics and capacities of human social agency to a greater or lesser degree, sociomorphing can take many form" (Seibt et al., 2020). Sociomorphing then generates a form of social interaction with PSRs as non-human agents with all their capacity to interact. Instead of anthropomorphizing, for instance, seeing robots as though they are human, we sociomorph them by perceiving them directly as non-humans through their robotic mode of interaction. We sociomorph robots as non-humans as if we sociomorph our friends.

The idea of sociomorphing focuses on human-robot social interactions from the perspective of users rather than designers. If we refer to Coeckelbergh, the use of PSRs in a broader context will produce the act of anthropomorphizing, since the designer tends to make their robots as human as possible. For example, robots in healthcare are designed to communicate humanly with patients to avoid uncanny experience. Sociomorphing then opens up a way for PSRs to be viewed from an uncritical posthumanist perspective. It must also be emphasized that PSRs are not simply machines, as naïve instrumentalism claims.

In response to the debate over whether or not we must accept anthropomorphism, I would say that it depends on the type of robot we make. For instance, in the research and development of humanoids and androids, anthropomorphizing robots is essential; otherwise, it becomes pointless. In this context, uncritical posthumanists may be right to say that we will eventually have to believe in the otherness of robots. However, this otherness ethically is possible only through human-robot interaction in the context of sociomophing. If we apply it to PSRs, for example, it can become problematic whether or not they can be responsible. The otherness of PSRs (i.e., the existence of robots in a work system context) should also be analyzed in the context of the ontology of human-technology relations. In the next section, I discuss anthropomorphism based on the problems of responsibility and the ontology of human-technology relations.

ANTHROPOMORPHISM PROBLEMS IN SOCIAL ROBOTICS

The main objective for which pragmatic social robots (PSRs) have been developed is to perform activities in services context. Despite their modest technological prowess, their autonomous characteristic requires a philosophical reflection. Most people, for instance, tend to assign selfhood charateristics or view them as anthropomorphic entities. Aside from robot fiction movies, the cultural aspect that influences how we perceive (as user) and create (as designer) robots in human images is their proclivity to replace mechanical tasks that previously performed by humans.

Anthropomorphizing PSRs can become problematic.[1] Attributing a selfhood characteristic, for example, can theoretically lead to responsibility problems, particularly when social robots are integrated into work systems. For example, Joanna Bryson, an AI ethics expert, investigated how AI should be used and emphasized the importance of implementing human-centric AI. Although it has been widely used, making it human-centric in some ways, there are some situations in which we rely entirely on AI's decision-making ability. Anthropomorphism contradicts human-centric AI since it presupposes autonomy, which can cause responsibility problems. Bryson argued that applying the law to PSRs, that is, when they are assumed to be a legal person, will not be effective since it can be used as a mere shield for people who conduct businesses that contain ethical risks (Bryson & Theodorou, 2019). According to Bryson, design ethics are necessary so that the capacity of AI may be identified and always under human control.

According to the human-centric approach, PSRs should be positioned as nothing more than instruments. However, in the context of actor-network theory (ANT), as theorized by STS scholars such as John Law and Bruno Latour, the world is a network of relations consisting of humans and non-humans (actants), both of which can be defined as actors of social phenomena (Law & Hassard, 1999). If AI theoretically equals other non-human actants such as animals, ideas (or writing), and non-autonomous technologies, they also must be made responsible. How can a human-centric approach be applied to non-human actants other than AI? This is clear for technology, there is the ethics of technological mediation, but not for other non-human actants. If making responsible AI is as significant as making responsible other

[1] Anthropomorphism problems were discussed by Joanna J Bryson in The Moral, Legal, and Economic Hazard of Anthropomorphizing Robots and AI and Simon Penny in What Robots Still Can't Do (With Apologies to Hubert Dreyfus) or: Deconstructing the Technocultural Imaginary in their keynote lecture in Robophilosophy/TRANSOR 2018 conference at the University of Vienna, Austria.

non-human actants, it would become a great task since they all must be ethically human-centric.

Mark Coeckelbergh in his book AI Ethics (2020) also offers how to create a responsible AI. According to Coeckelbergh, the AI black box problem is an ethical issue of AI that must be resolved (Coeckelbergh, 2020:119). If Bryson focuses on how to create a human-centric AI through design processes, Coeckelbergh suggests a solution to the relevance of AI being designed to explain why it makes certain decisions. Because of its ability to justify its decisions, AI may be viewed as a self-sufficient moral agent, which then may lead to anthropomorphism. However, this mechanism can be instrumentalized to help us understand complex problems. For example, there is an interpretable machine-learning model that allows one to understand why AI makes certain decisions and predictions.

Responsibility is one of the reasons why anthropomorphism has become problematic. From a professional ethics perspective, responsibility is not only a matter of skill but also how to deliver moral virtues. There are universal professional ethics principles that must be adhered to by professionals, such as loyalty, respect for others, obedience to the law, and honesty. Therefore, it is not the case that AI that makes mistakes will make it irresponsible, but that AI should be made based on experts' professional ethics. The limitation of expert systems, as theorized by Dreyfus, needs to be understood from this perspective; know-how includes values beyond technical expertise. Despite knowing how to solve problems, due to the unboundedness of skill problems, an expert is not always able to make correct decisions. This eventually provides a space for professional ethics to play a role. If PSRs understand how to implement professional ethics, anthropomorphism problems will follow. However, professional ethics will broaden the definition of responsibility to include more than just skill.

Anthropomorphism also causes the ontological problems of human-technology relations. PSRs have generated a type of relationship to technology as a quasi-other, which Don Ihde (1990:

97) refers to as alterity relations. In alterity relations, PSRs are positioned not as an object and, at the same time, not as the other that is not in human-technology relations, such as the otherness of animals or supernatural powers. Because it is ontologically in the context of human-technology relations, it is difficult to perceive it as a separate entity. Human-robot interactions are interactions that presuppose pragmatic relations to technology.

The philosophical concept of alterity originates from Emmanuel Levinas's existentialist philosophy. This philosophical concept explains the existence of the face to the Other, which ontologically cannot be known or bridged; as a result, it must be followed by the ethics of responsibility. Levinas' dictum that ethics precedes ontology wants to reverse the subject-centered worldview (egology) in the history of Western philosophy. In his philosophy, we have already been a hostage to the Other in the sense that we have moral responsibility (Lanur, 2000). From Levinas' non-subjectivist worldview, seeing technology as symmetrical will eventually shift AI ethics from human-centric to technology-centric. This of course becomes anthropomorphic since moral responsibility must be upheld, as if technology has the face of the Other. The alterity relations to autonomous technology, in this case, PSR, opens up the possibility of this form of human-technology ethical relations.

The ontological problem of anthropomorphism can be also described based on Gilbert Simondon's philosophy of technology. Simondon defines technical objects as technical individuals because of the recurrent causality of their technical elements (or what Simondon calls associated milieu). PSRs are technical individuals not because of their self-sufficiency, but because of their technical elements relations, including also relations with their environment (or nature). Simondon's analogy to these modes of relations is a musical ensemble. Individualization is only possible through a technical ensemble (Simondon 1990: 68). In AI-based technological systems such as online public transportation applications, technology designed by human seems to be like a conductor, as it controls the user's behavior, which then creates a mechanism. Anthropomorphism produces an ontological problem of human-technology relations in the sense that we make them have power over humans. Meanwhile, technical ensemble presuppose individualization in the realm of human-technology as technical individual relationship.

In Simondon's philosophy of technology, anthropomorphism originates from the way we see ourselves as tool-bearer or play the role of technical individuals (Combes, 2012: 59). Therefore, when technological objects evolve into self-organized objects such as machines and PSRs, it is as if we lose control over them. We can argue that technology as technical individuals cannot be positioned as something ontologically a fragment of humans in the sense of human as tool-bearer and vice versa. In terms of technical function, human beings and technical objects, particularly machines, are symmetrical. Technical individuals that create technical ensembles explain that technology functionally has always been a technical individual since its first creation. Thus, these relations eliminate a technology-centric perspective in which AI has the capacity to replace humans (as a conductor) in its literal sense, such as making decisions.

The problem of responsibility and the ontological problems of human-technology relations are the reasons anthropomorphism has brought antinomy to the idea of pragmatic social robotics. Therefore, pragmatic social robotics research and development to achieve a humanistic vision may become somewhat irrelevant. For this reason, we need to devise a philosophical way so as not to fall into anthropomorphism, which is supported by uncritical posthumanism, as well as the inflexibility of machines as the ideal proposed by naïve instrumentalism.

INSTRUMENTALIZATION OF INTUITION

The value of utilizing intuition to enhance robotic social intelligence is addressed in this section. The term "intuition" usually refers to a belief in something that does not arise from conscious rational thought. There is no logical process behind intuitive decisions. Intuition may also cause emotion, desire, and empathy, which eventually can lead to moral contradictions. Because of this, many people consider intuition less valuable than rational thought.

Research shows that intuition plays a significant role in mathematical reasoning. Efraim Fischbein, the math education expert, formulates that intuition is part of the human cognitive quality used to guess, give meaning, and make conclusions in mathematics. Intuition stimulates creativity in the process of mathematical thinking. Fischbein compared the way intuitive thinking works to how we use sense perceptions. The difference is that intuition perceives something meaningful, which underlies more complex thinking activities. Through intuition, mathematical assumptions were made prior to the logical analysis process. Fischbein categorizes four forms of intuition that are used to solve mathematical problems: affirmatory, conjectural, anticipatory, and conclusive intuition (Fischbein, 2002: 71). Thus, intuition, which is often considered scientifically undesirable, plays an important role in scientific practice.

The overpowering influence of intuition over reason in knowledge acquisitions is also put out by Henri Bergson. Bergson's ontological conceptions of experience, such as duration and memory, provide the foundation of the way intuition works. Intuition plays a significant role in the acquisition of knowledge through what he refers to as "intellectual sympathy" (Bergson, 1955: 1). Following Gilles Deleuze's interpretation of Bergson's philosophy, intuition then evolved into a philosophical method (Deleuze, 1991). In contrast to the modern way of thinking, which tends to seek solutions to problems, intuition as a method questions how they come to being.

According to Deleuze, intuition, a intuition as philosophical method, is used to determine true and false problems (Deleuze, 1991: 13). False problems, such as non-existent problems, as explained by Deleuze, are how our mind operates in the realm of *differences in degree* rather than *differences in kind*. In this mode of thinking, we incline to think in terms of more and less. For example, the idea of disorder, non-being, and possibility precedes order, being, and reality, respectively. The tendency to see disorder, non-existence, and possibility is how we see problems in terms of differences in degree. Consequently, according to Deleuze, we confuse the idea of the more that exists in reality (order, being, and reality) with the less (disorder, non-being, possibility). Bergson criticizes the act of generalizing or homogenizing, especially in science and metaphysics. In short, knowledge derived from non-existent sources will result in false problems. The truth lies in the way things are perceived in the differences in kind which is intuitively more 'empirical'.

Bergson's philosophical theory that proposes intuition takes precedence over reason can be corroborated by Dreyfus' phenomenology of skill acquisition. The highest stage in Dreyfus' phenomenological classification is the capacity for intuitively resolving skill problems. An expert can overcome problems at hand without needing to use a logical thinking process to determine the course of action. Expert drivers will intuitively decide the appropriate course of action without using a rational process when they come across difficulty in a specific situation (or duration). Expert-level intuitive thinking can be explained by using intuition as a method, proving that it does not merely happen randomly. Being an expert means understanding problems in the category of *differences in kind* (or not 'rationally constructed'), which is possible through intuition.

If intuition plays a significant role in knowledge acquisition, both theoretically and practically, it should be utilized as part of robotic intelligence. The question is to what extent can intuition be applied to PSRs? Artificial Intuition (AN) is now being developed to enhance logic-based AI. Monica Anderson, a computer scientist, for example, describes how AN can solve problems induced by what she calls "bizarre systems" (Anderson, 2018). She categorizes four bizarre systems that can only be solved by AN: 1) chaotic systems, 2) systems that require a holistic viewpoint, 3) systems with ambiguity, and 4) systems dealing with emergent properties. The conventional logic-based AI appears incapable of solving these bizarre systems. Through the instrumentalization of AN, PSRs have an infinite capacity to respond, thus making them appear as if they have consciousness.

A good example of how AN improved a computer program at playing the game of Go—a strategic board game popular in East Asian nations—is AlphaGo Zero. A more recent version of AlphaGo, AlphaGo Zero, created by Google's DeepMind, surpasses expert Go players who rely on intuition to win games. Only AlphaGo Zero (and the most recent AlphaZero), using artificial intuition through computer self-learning, can defeat AlphaGo in a game of Go (Tabora, 2018). AlphaZero learns how to make intuitive decisions by playing the game with itself millions of times using a deep learning model. The AlphaZero's success proves that robots can develop their own brand of intuition through self-play experience. Through self-learning experience, deep learning schema transforms how AI perceives a talent from *know-that* to *know-how*.

Despite the fact that AN overcomes the rule-based mode of understanding and thus cannot be criticized by Searle's Chinese Room Argument, it is limited to a particular instrumentalization. The goal of AN to comprehend the world at a semantic level (i.e., AI singularity) cannot be seen in the same way that intuition is used as a method. The ultimate possibility of AN achievement is that PSR will return to a state of human nature that is essentially cultural. Even if it can be created artificially through a computation, as in the game of Go, the nature of intuition is essentially determined by chance. The main distinction is that it has more capacity to create and learn from experience. This is the reason intuition as a method is understood beyond the goal of AN.

Based on Bergson's philosophy, we can say that the goal of intuition-based AI would be to end up in a state where the world of experience is understood as duration. Intuition as a method is only possible through duration as the ontological foundation of more complicated intelligence. As described by Deleuze, intuition becomes a philosophical method through seeing the world in terms of *differences in kind* and in terms of duration or a real experience. The goal of intuition-based AI can also be compared to Heidegger's concept of pre-understanding, which enables the facticity of human existence and thus opens a more complex understanding of the world. Interestingly, the goal of intuition-based AI is to achieve something that cannot yet be considered intelligence.

CONCLUSION

A philosophical framework needs to be formulated to elucidate the emergence of social robots. The research and development of humanoids and androids indicate that not all social robots are pragmatic. Social robots being implemented in various forms indicate that it is essential to define their instrumentalizing aspects. However, these aspects must be philosophically examined to improve robotic social skills capacity. For example, robotic understanding should be designed based on Heidegger's hermeneutics, PSRs must also achieve an expert level of skill based on artificial intuition, and there must be AI ethics to avoid adverse effects and technological determinism.

Philosophical discourse on pragmatic social robots has provided insights into the significance of developing robots that can perform human social behavior. However, this can also lead to anthropomorphism. It follows that PSRs research and development must consider the role of the social sciences and humanities. In designing and implementing morally responsible PSRs, roboticists must collaborate with other scientific disciplines such as the philosophy of technology approach discussed in this article.

Finally, there must be a shared objective in developing pragmatic social robotics, such as addressing global issues, such as climate change, health, conflict, and poverty. AI can be instrumentalized, making it possible to assess problems on a global scale through machine learning, big data, and remote sensing. Responsible AI cannot be limited to socio-ethical discourse in the context of AI implementation but can also instrumentalize AI to reduce existing global problems.

REFERENCES

Anderson, M. (2018). *Artificial Intuition*. Artificial Intuition. https://artificial-intuition.com/

Bergson, H. (1955). *Introduction to metaphysics* (2nd edition). Bobbs-Merrill. The Little Library of Liberal Arts.

Bryson, J. J., & Theodorou, A. (2019). How society can maintain human-centric Artificial Intelligence. In M. Toivonen & E. Saari (Eds.), *Human-Centered Digitalization and Services*, 19, 305–323. Springer. https://doi.org/10.1007/978-981-13-7725-9_16

Coeckelbergh, M. (2020). *AI ethics*. The MIT Press Essential Knowledge Series.

Coeckelbergh, M. (2021). Three responses to anthropomorphism in social robotics: towards a critical, relational, and hermeneutic approach. *International Journal of Social Robotics*. https://doi.org/10.1007/s12369-021-00770-0

Combes, M. (2012). *Gilbert Simondon and the philosophy of the transindividual*. MIT Press.

Crew, B. (2015). *Driverless cars could reduce traffic fatalities by up to 90%, says report*. https://www.sciencealert.com/driverless-cars-could-reduce-traffic-fatalities-by-up-to-90-says-report.

Deleuze, G. (1991). *Bergsonism*. Zone Books, New York.

Dewey, J. (1998). *The essential Dewey, volume I: pragmatism, education, democracy* (L. A. Hickman & T. M. Alexander, Eds.). Indiana University Press.

Dreyfus, H., & Dreyfus, S. E. (1985). *Mind over machine: the power of human intuition and expertise in the era of the computer*. The Free Press: A Division of Macmillan, Inc.

Fischbein, E. (2002). *Intuition in science and mathematics: an educational approach*. Springer Netherlands.

Heidegger, M. (1973). *Being and time*. Oxford Basil Blackwell.

Ihde, D. (1979). *Technics and praxis*. D. Reidel Publishing Company.

Ihde, D. (1990). *Technology and the lifeworld: from garden to earth*. Indiana University Press.

Lanur, A. (2000). *Aku disandera – aku dan orang lain, menurut Emmanuel Levinas*. https://www.berandanegeri.com/

Law, J., & Hassard, J. (1999). *Actor Network Theory and after*. Blackwell Publishers.

Magnis-Suseno, F. (2013). *Dari Mao ke Marcuse: percikan filsafat Marxis Pasca-Lenin*. Penerbit GPU.

Rosheim, M. E. (2006). *Leonardo's lost robot*. Springer Berlin, Heidelberg.

Schofield, J. (2019). *Computer chatbot "Eugene Goostman" passes the Turing test*. https://www.zdnet.com/article/computer-chatbot-eugene-goostman-passes-the-turing-test/

Seibt, J., Nørskov, M., Andersen, T., & Gebhard, P. (2018). Five principles of integrative social robotics. In M. Coeckelbergh, J. Loh, M. Funk, M. Seibt, & J. Nørskov (Eds.), *Envisioning robots in society – power, politics, and public space* (pp. 28-36). IOS Press. https://doi.org/10.3233/978-1-61499-931-7-28

Seibt, J., Vestergaard, C., & Damholdt, M. F. (2020). Sociomorphing, not anthropomorphizing: Towards a typology of experienced sociality. In J. Seibt, M. Nørskov, & S. Schack Andersen (Eds.), *Culturally Sustainable Social Robotics: Proceedings of Robophilosophy* 2020 (pp. 48-59). IOS Press. https://doi.org/10.3233/FAIA200900

Searle, J. (1997). *The mystery of consciousness*. New York Review Books.

Simondon, G. (1990). *On the mode of existence of technical objects*. University of Western Ontario.

Tabora, V. (2018). *Artificial intuition and reinforcement learning, the next steps in machine learning*. Becoming Human. https://becominghuman.ai/artificial-intuition-and-reinforcement-learning-the-next-steps-in-machine-learning-6f2abeb9926b.