CHAPTER 2

From Robots to Humanoids: Examining an Ethical View of Social Robotics

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Abstract Technology enables robots to have a voice, interact with humans, and execute a series of commands through artificial intelligence (AI) and human–robot interaction (HRI). The notion that robots can surpass humans implies that they can become conscious through five human senses along with ethics as the sixth sense. The sixth sense of ethics in robots can produce an efficient and versatile humanoid. Therefore, the

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key concept that emerges in our chapter is the ethical dilemma of artificial intelligence (ED-AI) and addresses the question whether the sixth sense can play a role in the robotic paradigms and perform relationship-building behaviors with a positive interaction.

Keywords Artificial intelligence · Consciousness · Human–robot interaction · Robots · Robotic systems · Ethical dilemma of artificial intelligence (ED-AI) · Technology governance · Sixth sense

Introduction

John McCarthy, an American scientist in 1950s, is considered a co-founder of the field of Artificial Intelligence (AI) (Computerhistory.org, 2016). Since then, AI has come a long way and for many years scientists have been developing robots that could behave like humans. The twenty-first century seems to be fulfilling the desire of the previous generations to make our world more futuristic. For many years, scientists and philosophers have been debating about the nature of brain and its relationship with the mind. This leads to some fundamental issues including claims about new futurist robots that do not care about the importance of what it is to be a human, the necessities to build conscious machines, or its implications (Boada et al., 2021; Signorelli, 2018). Smart speakers, such as Amazon's Alexa, a virtual personal assistant, which is a wireless device with artificial intelligence can be activated through voice command. Through such AI algorithms, senses of these devices can measure up to some attributes when information is processed. AI enabled voice assistants can service an individual based on commands and accomplishments of input and output experiences. Some virtual assistants can understand human speech and respond via manufactured voices . Consumers can ask their virtual assistants to manage calendars, to-do-list, and emails.

Marx's dialectical theory propagates that every phenomenon must have two sides. When enjoying a positive influence, one cannot ignore its negative influence, especially in the development of science and technology (Ma et al., 2018). Since Marx's conception theories are to be understood as representations of socially regulated experience, theoretical critique here echoes Hegel's remark that dialectical consciousness is not "peculiarly confined to the philosopher," so that it "would be truer to say

that dialectic gives expression to a law which is felt in all other grades of consciousness, and in general experience" (Hegel, 1892, pp. 149–150). Computers with their vital components such as AI have evolved into super-machines. One of the essential principles of Marx's dialectical theory shows the negative and positive impacts caused by all elements. In artificial intelligence, people enjoy positive interactions and at the same time, face the potential of taking over human intelligence. In voice, the merits of the theory include flexible interfaces for communication that are challenged by the ease of cyber-attack. The ethics field allows the anthropomorphisms of robots, but it is set back by the dilemma of giving our inventions human identities. This paper is an exploration of the Ethical Dilemmas of Artificial Intelligence (ED-AI). Modern legislation is not yet prepared to face the reality of artificial intelligence developments, and there is no guarantee that people will be fully secure in the brand-new world. There is a dearth of research in the field of social robotics, voice assistants, robot ethics, and sixth sense (Ma et al., 2018; Signorelli, 2018; Smith, 2018; Harrison, 2018; Boada et al., 2021). To bridge the gap, this research has the following objectives.

- Examine a framework that would allow conscious machines to meet and surpass human intelligence and capabilities;
- Investigate the kinds of AI interactions that feel more natural and lead us in our progression from chatbots to avatars to humanoid robots with voice, gaze, sixth senses, and other anthropomorphic qualities; and
- Examine how the law and a set of HRI regulations develop ethics to protect humans and impute liability for the limitations and failure of artificial intelligence.

This research consists of four sections. First, we focus on defining and describing artificial intelligence and how AI interacts with humans through voice assistants, displaying consciousness using sixth sense. Second, we examine how AI has impacted and continues to influence consumer behavior through robot ethics, consciousness, and anthropomorphism. Next, we utilize the Ethical Dilemmas of AI (ED-AI) framework to explore the benefits and risks associated with using the ethical approach in AI and social robotics. While there are always risks associated with social-ethical robotics, ED-AI has become an essential

key to success today. Finally, we discuss the positive influences that ED-AI (through the utilization of social robotics) framework will have on business-to-business relationships, as well as business-to-consumer relationships.

Theoretical Background

AI still needs a considerable leap to reach the level of human intelligence. Aspects, such as autonomy, reproduction, and morality, make modern machines different from humans (Signorelli, 2018). It is necessary to understand how the human brain works and what our moral boundaries are to compare humans to AI. On the other hand, some researchers argue that AI is capable of all human activities, even those involved in creativity and interaction. Smith (2018) describes the world of Alexa robot, like a real human that can perform tasks people are not able to do. Machines take the shortest route between data input and output (Ma et al., 2018; Coeckelbergh, 2022). The human brain tends to follow a sequence of steps before arriving at the desired outcome.

AI has some limitations and deficiencies especially in the context of situations involving ethical dilemmas where human lives are endangered. In such instances, humans are replaced by machines to achieve efficiency (Ma et al., 2018). New technology has discovered that ethical (sixth sense) robots are a revolutionary way to engage and interact with humans. According to Horningold (2019) and Coeckelbergh (2022), new technology often involves new arrays of sensitive material and machine learning algorithms to fill in the gaps. However, cloning this sophisticated sense can pose a challenge for robots. Researchers at a Swiss University created a bionic hand that gives amputees a "close to nature touch" that reproduces the feeling of proprioception (Nichols, 2019). The device stimulates nerves that provide sensory feedback in real-time. Though the challenge was to have similarities with human sense, the development of using the model is observed to provide a solution through the senses. Robots are machines capable of sense, plan, and act with human interaction. Robots need sensors to mimic social abilities and enhance their task. When robots have sensors, this allows them to reach and explore beyond human capabilities.

Artificial Intelligence and Social Robotics

Marx's dialectical theory is one of the critical theories that is applicable and relevant in the domain of social robotics. In essence, this theory is concerned with the multifaceted nature of the phenomenon in all life aspects and the need to consider all these when engaging with fellow human beings and the more recent trend of artificial intelligence. Specifically, in relation to artificial intelligence, there are various inherent positive and negative facets, and it is essential to consider both dimensions to develop a balance (Walker, 2012). While there may be the benefit of better analytics and augmented functions, there is also the ethical conundrum of application.

Social Robotics and Voice or Sixth Sense

Humans have an innate tendency to anthropomorphize surrounding entities and have always been fascinated by the creation of machines endowed with human capabilities and traits (Hudson & Mankoff, 2014). The example of the hierarchy paradigm below consists of gathering and processing data received through a robot's sixth sense sensors. The processed data are used to demonstrate the human and robot interaction. The model established a set of symbols collected by predictions that can be operated by a logical system with humans to robotic machines. Once a suitable set of actions has been made, this helps executes the effect by changing a high-level command (voice) to mid-level (sense) into low-level commands (act) using a robot cognitive system. The process is repeated continuously until the primary goal of human interaction and AI has been achieved. The goal is to create robots that can interact with humans and move around in unity while understanding the series of voice, sense, and act.

Further, the testing of human–robot interaction through social behavior has been analyzed to be natural and familiar. The "voice, sense, and act" (see Fig. 2.1) provide a communication channel through which action can coordinate and control any information distributed from humans to robots. According to researchers at Nanyang Technological Institution in Singapore, after interpreting the voice command (voice), a series of control data for performing tasks are generated (sense), and the robot finally performs a task (act) (sciencedirect.com). In the later sections, an AI machine named "Alexa" is described that can function

Fig. 2.1 Hierarchy Paradigm based on Voice, Sense, and Act

and communicate with humans through voice, sense, and act processing systems.

Social Robotics and Anthropomorphism: Exploring Robotic Consciousness

As AI gradually bridges the gap with human intelligence, it is necessary to explore significant aspects that raise ethical dilemmas associated with it Robotic consciousness is the ability of robotic machines to interpret and to analyze data similarly to human beings. Since humans develop artificially intelligent systems, this essentially translates to an ultimate situation whereby robotic intelligence fully surpasses that of humans. This characteristic is further established by the recent unconscious wave of the anthropomorphism of robots.

In past cases, artificially intelligent robots that were programmed with languages initially began to communicate, but it was sometimes impossible to decode by human developers. The study had to be stopped immediately with questions arising on the limitless competency of robots (Kiggins, 2018). Since limitations, such as human control and reliance on human intelligence, are currently dictating the course of robotics, robots are still under the control of humans. However, equipped with so many limitless capabilities, it is a case in point that it might take only a few years before robots completely surpass human capabilities. The consciousness of robots remains a dilemma in the technology field due to the frequent upgrades of these systems to make them as close to human as possible. Strong illustrations include Sophia, a robot equipped with machine learning program (Knox el at., 2019; Belanche et al., 2021; Coeckelbergh, 2022). Sophia was made the first robot citizen of Saudi Arabia, giving her probably more rights than local women. Along with her, Bina48, Philip, and Han are famous humanoids from Hanson Robotics located in Hong Kong. They are preprogrammed to hold a conversation using machine learning, natural language processing, and animated robotic software, even if they don't fully understand the

meaning of everything. These inventions are almost better than the average human teacher. Along with characteristics of competence and diligence, these systems might gradually be absorbed, hence, negating the need for human tutors completely.

Conceptual Framework

Advancements in science and technology have led to the use of artificial intelligence that has impacted human lives. Innovations such as smart speakers and smart robots use artificial intelligence to conduct their duties. Ethical dilemmas surrounding the use of artificial intelligence revolve around consciousness, ethics, voice, and sixth sense.

There are concerns as to whether positive moral thinking can be achieved by improving learning algorithms or computational capability. These improvements may not necessarily make a machine conscious (Signorelli, 2018). Attempts to develop sentient machines are a wrong approach, as is trying to make them surpass humans. According to Signorelli (2018), futurists talk of super-machines that exhibit human characteristics without pausing to think about what it entails to be human. It is preposterous for science to emphasize anthropogenic presumptions or compare the intelligence of humans and robots.

Questions may arise on who will bear the responsibility for damages caused by the robots. A self-driving car and a surgical robot may cause a road or a medical accident, respectively. The law may regulate these incidents after they have occurred, but the damage will have been done. The deficiencies in the use of artificial intelligence may put the lives of people at risk. The use of smart speakers such as Alexa may expose the financial and personal information of people to hackers.

The voice of a social robot or a personal assistant in a smart speaker may be hard for listeners to understand. It may happen to persons who come from non-English speaking countries. There is also a chance that some listeners may feel offended by the accents or dialects adopted by the personal assistant on smart speakers.

Ethical Dilemmas of Artificial Intelligence (ED-AI)

The Ethical Dilemmas of Artificial Intelligence (ED-AI) framework (see Fig. 2.2) supports Marx's dialectical theory. Robots are vital elements of

the scientific and technological fields that have proven their various irreplaceable positive influences (Walker, 2012). These include the consciousness of robots and the ease of anthropomorphism due to their similarity with real humans, such as voice and physical attributes. The dilemmas are levied by the limitless power of robots that can be consciously harmful in ethical terms. This observation means that the disadvantages might eventually outweigh the benefits.

The idea of Artificial Intelligence (AI) has been developed to a miscellany of controversial viewpoints regarding the current challenges of Human-Robots Interaction. A significant quantity of successful projects, already allowing the implementation of smart applications to optimize routine work, has proven that despite a range of capabilities machines afford, the measurement of their interference into real life is a complex riddle on the crossroads of scientific fields. Social interaction with robots should be discussed in the perspective of ethical challenges. For example, a self-driving car possessing consciousness is programmed to optimize the route in certain traffic conditions, although it could be challenging to measure the legal responsibility of a machine in case of a traffic accident. The human factor of immediate decision-making enables people to mentor robots, not vice versa. A sensor of a smart robot, which possesses certain anthropomorphic qualities, cannot be treated the way human senses are. Thus, artificial intelligence remains an object of direct human control. On the contrary, the evaluation of actual capabilities of the brain of robots enables people to optimize and automatize routine duties to such extent, that several jobs will be transferred to machines only. Curious management issues may be proposed here for negotiation: How is it possible to teach a machine the difference between human unemployment and robot leisure? Perhaps, the machine learning to generate human preferences through cases (algorithms for robot understanding) may be experimentally practiced as a precondition to effective mutual understanding. Therefore, a direct co-operation, and, consequently, communication with subjects of artificial intelligence have already become the crucial challenge people have ever had in management.

There is no doubt the numerous advantages of the successful implementation of smart technologies should not be underestimated. Nevertheless, the exploitation of artificial intelligence will lead to pending ethical problems regarding the future of human–robot coexistence: partial unemployment, inequality, behavioral dependency, insecurity, legal regulation, and original creativity (Bossmann, 2016). The management of AI

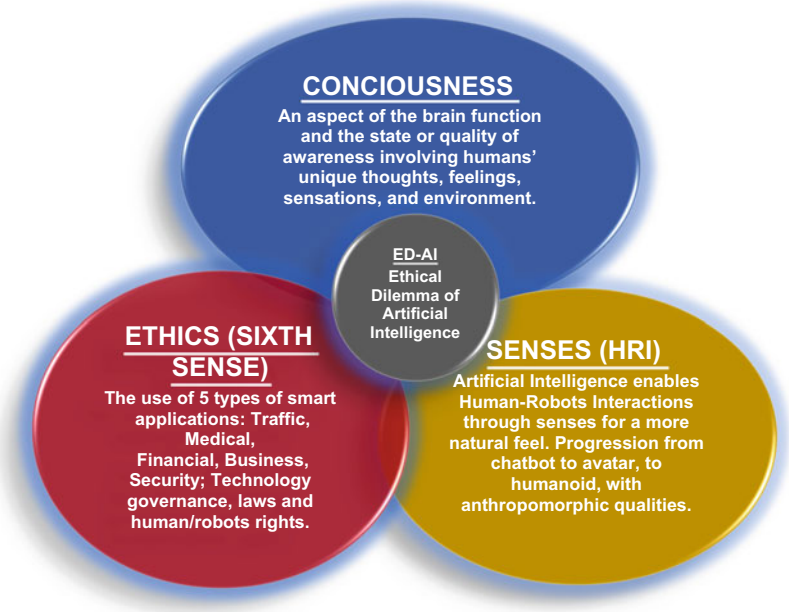

Fig. 2.2 ED-AI Framework in Social-Ethical Robotics exploring Sixth Sense: How "Robot Ethics" impacts "Robotic Consciousness / Anthropomorphism" and "Voice"

performance is currently a scantily investigated topic, which integrates a range of approaches and sciences. Therefore, an immediate need for a human–robot relationship solution remains the key point of modern ethical studies.

Voice Assistants, Consciousness, and ED-AI

There are various aspects of social robotics that need to be evaluated to achieve the envisioned objectives as enshrined by AI. In essence, a scenario where technological advancements, including social robots and smart speakers, can be programmed to adhere to ethical standards, they manifest consciousness that can enhance human–robot collaboration (Ma et al., 2018; Belanche et al., 2021). However, the concept of voice assistants is

characterized by various ethical dilemmas that are inherently attached to their functionality. Thus, we offer the following proposition.

Proposition 1: *When technological advancements such as smart speakers and social robots follow ethical standards, they exhibit consciousness for better human–robot interaction.*

ED-AI: Relationship to Robotic Anthropomorphism and the Sixth Sense

Social robots are considered an entertainment relationship with anthropomorphism and have evolved into social interaction with humans. For example, supposedly, the paradigmatic shift emphasized the role and importance of the body and the environment in the cognitive competence of robotic agents, that leads to giving more considerable attention to the social environment as a fundamental factor in cognitive capabilities and development. Therefore, the goal is not merely to artificially reproduce the social intelligence of human agents but centralize personal information with social robots (Belanche et al., 2021; Damiano et al., 2015). Additionally, the idea is to actively include users in the social performances and presence of a robot by controlling robotics agents that inspire users to feature human feelings and mental states to robots, which should enhance and encourage social interactions. Thus, we offer the following proposition.

Proposition 2: *When machines/robots are considered as intelligent, humans anthropomorphize robots due to a robot's association to voice and consciousness.*

Ethics and ED-AI

Ethics are correlated with the ethical dilemma of AI in many ways. As AI systems move toward attaining human intelligence, discussions, and laws are recognized and pushed for the robots' rights like the citizenship of robots. While this is a feasible appreciation of robotic qualities, it is vital to understand the massive progress that the field continues attaining (Belanche et al., 2021; Kiggins, 2018). By allowing robots with this kind of power, a dilemma arises, whereby total robotic consciousness is a factor that can provoke human oppression. Thus, we offer the following proposition.

Proposition 3: *When machines/robots are considered as intelligent, humans begin to recognize robot laws/rights and ethical standards for robots and other robotic systems.*

Discussions

Companies worldwide need to understand and utilize social-ethical robotics so they can thrive in the new age and reach maximum consumers**.** Our research can guide this task by explaining AI, social robotics and ED-AI, and illustrating why companies will need new strategies and actions in this new ED-AI era, especially dealing with social robotics, sixth sense, and AI. Business managers can use this information to differentiate themselves from their competitors. Taking into consideration the fact that advanced machines already exist, it can be inferred that robots may develop a better communication process with humans over time. Machines' interactive abilities allow them to take on the position of a professional advisor. Humans develop trust only if an object is in proximity and capable of maintaining eye contact. Such robots are more efficient in targeting the advertisement and search for the best option when it comes to investments, shopping, or travel planning.

The interaction of the Ethical Dilemma of AI and Voice has positive impacts, such as better communication and the ease of user access; however, the negative impact is ease of hacking and data breach. Better communication means consumers can use the intelligent systems to maximum potential, while also dealing with data security problems. The lack of ethical standards is challenging for everyone who uses social robots such as Alexa at home or at their workplace. Users become accustomed to a machine for so long that they can suffer separation anxiety or psychological trauma when the perceived emotional support is no more. It is dangerous to move too soon or too late as for the implementation of robot ethical rules. Sometimes the laws can obstruct creativity in technology. On the other hand, pushing for laws at a late stage of technology development can make those laws outdated too soon since the world of technology progresses at a rapid rate.

Both consciousness and anthropomorphism relate to ethical dilemmas by presenting merits, including cognitive computing that are hindered by the insecurity that this feature brings. Although computers enhance processes by learning from inputs, this enlightens programmers to their ability to surpass human intelligence. Ethics explores the probability of

AI systems to execute smart applications in hospitals, traffic regulation, and business settings. An emerging issue is the exploration of the citizenship of robots, a factor that might negate the control of humans over robots. The US IEEE standard is a global initiative that mandates that all things robotics should have protocols regarding security and privacy issues (IEEE, Robotics and Automation Society, 2019).

Modern AI machines still are not on the same level as humans. For example, Tailor Brands can develop unique logo designs based on the customers' preferences for a low price, which is a perfect solution for low-cost startups and shows that AI really can perform creative tasks learning from itself and people, which is called cognitive computing. The creativity of the system is limited to algorithms that evaluate the customer's descriptions and choices. As a result, the outcome may not evolve into a successful and outstanding logo, which is the main goal of designers (Avery, 2018). There is also no guarantee that such assimilation of machines into our daily lives will be safe in terms of rights. For example, if the machine advisor makes a mistake, there may be no one responsible. The existing legislation does not presuppose such cases. Thus, the probable solution depends on the ethical dilemma of artificial intelligence, which considers whether machines are treated as humans, which is still an unresolved issue. The British Standard guide to the ethical design and application of robots and robotics systems allow roboticist and designers to perform an ethical risk assessment of these artificial agents (Villaronga, 2019).

Sophia is AI in its infancy stage, heading to artificial general intelligence (AGI) (full human intelligence), which has not yet been achieved. At this stage, robots will be able to communicate with each other while sharing data through the AI mind cloud. Hanson is raising Sophia like a safe and good AI child. Some are against it and call her a puppet and a deceiver. Others think she may be doing more harm than good. The ethics lines are blurred, so there is a push for responsible foresight in the AI industry. There is a rising wave of AI ethicists dedicated to seeing AI and technology develop responsibly. If the desire is to make robots in such a way that there is reciprocal love or a human connection, people might be setting themselves up for disappointment. Nevertheless, Hanson said if we do not humanize robots and make them part of our family, the future might be frightening.

AI with sixth sense will have a more significant impact in the following decades. Researchers in Poland have developed AI with a sixth sense:

giving the ability to tell the difference between iris scans from living and dead people with a 99 percent accuracy (Harrison, 2018). Such advancements can potentially be the new algorithm for futuristic tools. The common-sense rule is that AI will not fully operate without human interaction. AI should not be treated as a single system; instead, it should be integrated with different solutions and capabilities (Stancombe, 2018). There should be a plan to have all five senses working together if humans want to replicate human intelligence in AI machines, along with development of sixth sense in intelligence automation.

At this point, research has demonstrated that AI still could not surpass humans in many areas. Its implementation is limited to human assistance rather than performing independent tasks. AI still has a massive potential in HRI. The higher the measure of consciousness, the higher the value. Although it may be harmful as there is no legislation securing human rights with the involvement of machines, taking control of the work of AI will eliminate the margin of error, hence the implementation of technology governance. Otherwise, it may cause much harm to humans. Cognitive and mental simulations can enhance robot's resilience to errors/failures (Boada et al., 2021; Bongard et al., 2006; Coeckelbergh, 2022; Vanderelst & Winfield, 2018).

Conclusion

As the world advances toward full adoption of artificial intelligence in its various forms, including voice assistance, consciousness, ethical dilemma, and sixth sense, there is a need to consider all the factors surrounding the phenomenon. Artificial intelligence is a significant aspect of the development of computers due to the range of merit it has generated. In essence, this is based on Marx's dialectical theory, which seeks to establish the various dimensions of the positive and negative aspects of AI. Ethical standards are imperative in the making of conscious and anthropomorphic machines and in the interaction of humans and robots. We shed light on a new generation of ethical robots and their technological governance. The robotics industry and the laws that govern them have some ground to cover because there is no consensus on how to legislate and regulate the robotic social sphere. There are many reasons to be cautious, as well as be hopeful in the progression of AI development. Therefore, designers/programmers must take control to ensure that Artificial Intelligence works toward generating more benefits than provoking

harm. This research can go further and has the potential of adding the conjunction of emerging sophisticated ethical machinery with transferable human to robot interaction. The desire to invent a sixth sense robot has been emerging quickly. The advancement of technology has engineered a milestone in the development of sixth sense technology. The advancement of sixth sense technology integrated with other intelligent systems will usher in a new era in human–robot interaction.

References

Avery, J. (2018, August). Tailor Brands: Artificial Intelligence-driven branding. *Harvard Business School* Case 519–017.

Belanche, D., Casaló, L. V., Schepers, J., & Flavián, C. (2021). Examining the effects of robots' physical appearance, warmth, and competence in frontline services: The Humanness-Value-Loyalty model. *Psychology & Marketing, 38*(12), 2357–2376.

Boada, J. P., Maestre, B. R., & Genís, C. T. (2021). The ethical issues of social assistive robotics: A critical literature review. *Technology in Society, 67*, 101726.

Bongard, J., Zykov, V., & Lipson, H. (2006). Resilient machines through continuous self-modeling. *Science, 314*(5802), 1118–1121.

Bossmann, J. (21 October. 2016) *Top 9 Ethical Issues in Artificial Intelligence*. World Economic Forum. https://www.weforum.org/agenda/2016/10/top-10-ethical-issues-in-artificial-intelligence/

Brockman, B. K., Rawlston, M. E., Jones, M. A., & Halstead, D. (2010). An exploratory model of interpersonal cohesiveness in new product development teams. *Journal of Product Innovation Management, 27*, 201–219.

Coeckelbergh, M. (2022). The Ubuntu Robot: Towards a Relational Conceptual Framework for Intercultural Robotics. *Science and Engineering Ethics, 28*(2), 1–15.

Computerhistory.org. (2016). John McCarthy Computer History Museum. [online] Available at: http://www.computerhistory.org/fellowawards/hall/bios/John,McCarthy/ [Accessed 15 August. 2016].

Damiano L., Dumouchel P., & Lehmann H. (2015). Human-robot affective co-evolution. Int.j.Soc. Robot.77–18. [Cross Ref]. [Google Scholar].

Glaser, B. G., & Strauss, A. L. (1965). Discovery of substantive theory: A basic strategy underlying qualitative research. *American Behavioral Scientist, 8*(6), 5–12.

Harrison, L. (2018). Research develop AI with a sixth sense. Retrieved: www.govtech.com

Hegel, G. W. F. (1892). The Logic of Hegel, the encyclopedia of the philosophical sciences. (W. Wallace, Trans.). Oxford University Press. https://doi.org/10.1037/12966-000

Hornigold, T. (2019). Sensors and Machine Learning are Giving Robots a Sixth Sense. Retrieved: www.singularityhub.com

Hudson, S. E., & Mankoff, J. (2014). Concepts, values, and methods for technical human–computer interaction research. In Ways of Knowing in HCI (pp. 69–93). Springer.

Kiggins, R. D. (2018). *The political economy of robots: Prospects for prosperity and peace in the automated 21st century*. Palgrave Macmillan.

Knox, J., Wang, Y., & Gallagher, M. (2019). *Artificial Intelligence and Inclusive Education: Speculative Futures and Emerging Practices*. Springer.

Mabert, V. A., Muth, J. F., & Schmenner, R. W. (1992). Collapsing new product development times: Six case studies. *Journal of Product Innovation Management, 9*, 200–212.

Nichols, Greg (2019). A robotic hand that gives sixth sense back to users. *ZDNet.com*

NY. IEEE Robotics and Automation Society. (2019). IEEE Transactions on Robotics.

Sciencedirect.com (2003). *School of Electrical and Electronic Engineering*, Nanyang Technological Institute. Retrieved: 8 July. 2021.

Signorelli, M. C. (2018). Can Computers become Conscious and overcome Humans? *Frontiers in Robotics and AI, 5*, 121.

Silverman, D. (2000). *Doing qualitative research*. Sage Publications.

Smith, K. T. (2018). Marketing via smart speakers: what should Alexa say? *Journal of Strategic Marketing*, 1–16.

Stancombe, C. (2018). Is Cybersecurity the sixth sense of AI? Retrieved: http://www.capgemini.com

Vanderelst, D., & Winfield, A. (2018). An architecture for ethical robots inspired by the simulation theory of cognition. *Cognitive Systems Research, 48*, 56–66.

Villaronga, E. F. (2019). Robots, standards and the law: Rivalries between private standards and public policymaking for robot governance. *Computer Law & Security Review, 35*(2), 129–144.

Walker, G. E. (2012). *Toward a dialectic of philosophy and organization*. Brill.

Weller, C. (2017). Meet the first-ever robot citizen—a humanoid named Sophia that once said it would 'destroy humans. *Business Insider*, 7–10.