

AI AND ETHICS FOR CHILDREN: HOW AI CAN CONTRIBUTE TO CHILDREN'S WELLBEING AND MITIGATE ETHICAL CONCERNS IN CHILD DEVELOPMENT

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ABSTRACT

Along with the development of Information and Communication Technologies (ICTs), new genres of the tech industry have been fueled by the prospect of the emerging need. Especially artificial intelligence (AI) makes it possible to enhance machines' ability to support caregivers in many occasions. For example, one of the emerging genres drawing people's attention is high-tech for childcare and family life, so called 'baby tech' or 'family tech'. We see that children use mobile phones, tablets and computers as daily commodities everyday. In addition, high-tech companies develop and release social robots for children and family currently, such as Pepper and Jibo. Actually, both children and parents enjoy the many different functions of social robots. However, social robots bring us classic and novel ethical issues behind great benefits. In this study, we focus on social robots for children and family, and explore how AI can contribute to child wellbeing whereas there are ethical concerns for child development.

KEYWORDS: Artificial Intelligence, Ethics, Social Robot, Child Wellbeing.

1. LIFE IN AI SOCIETY

When the prediction by Frey and Osborne was announced in 2013, people stirred up strong fear of losing jobs in the near future. They pointed that highly advanced technologies, especially Artificial Intelligence (AI) technology, would promote rapid innovation in business, and many human workers would be replaced to AI technology and lose their jobs in 10 to 20 years (Frey and Osborne 2013; Frey, Osborne and Citi 2015). After Frey and Osborne's analysis, the report about employment and technology was also published by World Economic Forum in 2016 (World Economic Forum 2016). These researches show people who engage in non-skilled or manualized work would face a great risk of losing their jobs in the future, worse some of jobs might be totally eliminated from the earth. On the other hand, new jobs would be created in order to support AI-based society and more job opportunities would open for workers with high-skill or creativity. Our life including both working life and private life would be influenced by technologies regard- less of whether we like it or not.

Once AI takes over our jobs and we get more free time, how do we use free time? Some people might expect to have much more time with their families and take more care of their children. However, AI and high technologies are deployed and equipped for daily use at home, and take

over household work and daily chores. Moreover, social robots with AI stay with children, play together and entertain them at home. The question of how to nurture children, those are expected to maintain and support society in the future, in the environment deployed highly advanced technology everywhere, is a kind of vital and important social task for the future. How do we use AI for childrearing, and also how do we live with AI?

In high-tech society, we take technologies as given commodities and suppose to make life more efficient and effective by utilizing them. However, children need inefficient and ineffective processes and matters in order to develop themselves. Whereas AI supports us in any aspects of our daily lives, injudicious and strong dependence on AI could dehumanize life and evoke classic yet new ethical dilemma: how we live and what is good/right. This study explores how AI affects our daily life from the perspective of information ethics, especially focusing on parenting with social robots at home.

2. CHILDCARE AND SOCIAL ROBOT

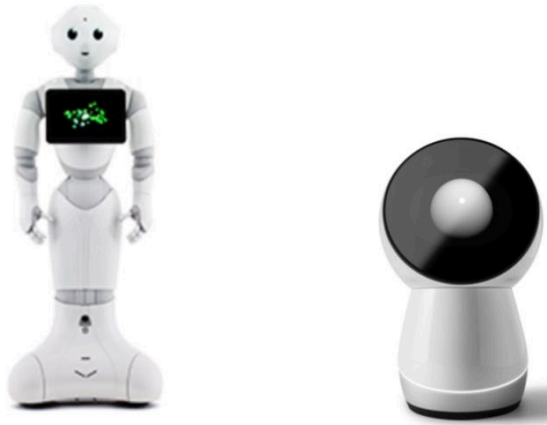
Rapidly evolving reproductive technologies support human reproduction greatly. However, recreating human beings needs to use human beings, at least sperms and eggs. Human beings cannot be replaced by any intelligent robot at the moment. If we human beings want to keep “humanism” or “humanity”, we cannot hand over our position in the earth to any other creation. It is necessary for us to reproduce human beings for the future. And in order to exist in the future, we need to think about the way to use highly advanced technology for childrearing, not only from the perspective of efficiency and profitability but also the ethical perspective.

In the research report by Frey and Osborne, school teachers are not listed as a job which would be taken over by technology in the future. Rather, the school teacher’s job would be very important to educate children, and require teachers to have creativity and high ability to cooperate with others. On the other hand, child’s learning processes and plays show a strong affinity for technology. Thus, many companies and researchers have been working on developing software, digital contents and robots for children (Nesset and Large 2004; Yamamoto et al 2004; 2005; Cangelosi and Schlesinger 2015). In the near future, these technologies targeted for children is supposed to be introduced into schools in order to improving efficacy of education activities, and the number of school teachers would be reduced (The Economy, Trade and Industry Ministry 2013). That means children would study and learn with the support of the greatly deployed technologies and the limited number of teachers. In this situation, childcare at home would be more important to learn social life with others and establish themselves as a social existence.

In June 2015, Softbank robotics which is the subsidiary company of a major telecom company in Japan has released “Pepper” in the mass market. Pepper is “the first robot designed to live with humans” and has a human shape and the ability to read/express emotions (Emotion Engine), and communicate with human beings. Pepper is supposed to be our companion to stay together, entertain us, and make human life happier, not help housekeeping or bringing a heavy box. Pepper is equipped with many traditional communication functions as computers have offered, such as taking pictures, mediating email exchanges, reading texts with voice and so on. Moreover, Pepper can recognize users’ face expressions and voice tones beside them, and show reactions or talk to them in response to their feelings. Bruno Maisonnier, who is Aldebaran robotics CEO and the responsible of Pepper project, explained that“(t)he most important role of robots will be as kind and emotional companions to enhance our daily lives, to bring happiness,

to surprise us, to help people grow" (Guizzo 2015). Currently more than 200 companies have joined software development to move Pepper, and even some companies use Pepper in the business occasion.

Figure 1. Left: Pepper (<http://www.softbank.jp/robot/consumer/products/spec/>), Right: JIBO (<https://www.jibo.com>)



Source: Left: <http://www.softbank.jp/robot/consumer/products/spec/>, right: <https://www.jibo.com>

And also, Cynthia Breazeal, who is the roboticist at MIT's Media Lab, announced she would launch the social robot JIBO in 2015. JIBO has "skills" to recognize emotions and "is designed as an interactive companion and helper to families, capable of engaging people in ways that a computer or mobile device aren't able to" (Guizzo 2014). JIBO is also equipped with core applications, which is called as "skill," and users can set up JIBO's role at home depending on the expected usage environment by users. The characteristics of JIBO are the robot is 1) caring for users' emotion and 2) able to improve the communicating attitude through the interaction with users.

Both robots, Pepper and JIBO, are designed to communicate and interact with humans continuously and AI equipped on both robots learns about users through updating users profiles and favors constantly. And eventually both robots aim to be a member of family or a friend of users. Because of this purpose, both robots suppose to have users who don't acquire enough media literacy or computer skills, such as small children.

Family robot, such as Pepper and JIBO, are categorized into "personal service robot" according to the categorization by International Federation of Robotics (IFR) and International Organization for Standardization (IOS) 2. Generally, "personal service robot" is used for a personal task, not for a commercial task, for example automated wheelchair, and personal mobility assist robot. Users can customize a robot in accordance with the intended use, their wish and taste. In terms of family robot, the robot aims to be recognized as social existence through communication and interaction with users, rather than helping users daily life practically. Therefore, family robot is called as "social robot," "sociable robot" and "social intelligent robot" (Breazeal 2002; 2003; Fong et al. 2003; Dautenhahn 2007).

However, the research and argument about how robots recognize and judge human emotions correctly and properly are still on-going and very controversial. Even in philosophical and moral

studies, “mind-body” problem or “mind-brain-body” problem are not solved yet, rather those problems are getting more complicated reflecting to the development of AI. Generally, emotions are necessary to make human beings social existence (Evans 2001). In this sense, emotion is a critical factor for social robot to be recognized as social existence by users. At the moment, social robots cannot feel emotions autonomously and voluntarily. The way in which social robots “have” feelings is to use the corrected data via interaction with users and show suitable reactions to them.

When it comes to an emotional function and social robots, the most impressive phenomenon is that social robots can stimulate users’ emotions and make them form a strong attachment to their own robots. What makes a robot as a social robot or social existence is our emotions, not the emotional function of a social robot. We human beings give a robot a social meaning. In other words, social robots cannot exist without developing the technology to detect and judge users’ feelings correctly.

3. FAMILY LIFE WITH SOCIAL ROBOT

3.1. Basic functions of social robot

Social robots as family robot or friend robot equip generally three basic functions (Asai 2017).

- a) Entertainment function: singing, dancing and playing game
- b) Security function: monitoring through webcam, talking from a distance via Internet
- c) Facilitation and revitalization of family communication: providing family a trigger of conversation

Although social robots cannot clean the house or cook foods, they can sing a song with children, read a book for children before going to sleep, or check children and house via webcam when parents are absent at home. In light of definitions of “care robot”, social robots could function as a caretaker (van Wynsberghe 2016; Vallor 2016). When social robots are seriously recognized as a member of a family at home, how do childrearing and childcare change? And what kind of ethical concerns is caused? According to Whitby, serious ethical problems are hidden in the invisible part when social robots perform tasks (Whitby 2012).

3.2. Ethical concerns in the use of social robot

Generally there are three basic ethical concerns in the use of social robots including care robots.

- a) There is a risk which users get socially excluded or socially isolated because of too much attachment and emotional connection to social robots. The social relationship is superseded by the relationship with social robots (Sparrow and Sparrow 2006; van Wynsberghe 2016).
- b) Privacy and integrity of users (caretakers) might be damaged by social robots (Vallor 2016).
- c) Social robots might generate new inequality between “robot-have”/“robot-not-have” or skilled users/unskilled users, based on age, income level, the development level of

countries and societies and so on. Or, existing disparities might be amplified by the use of social robots (Asai 2017).

Although there are some ethical risks, social robots would bring positive effects to our daily life. For example, social robots would have a great possibility to support parents and families in childrearing. Especially working mothers in gendered society might reduce their workload and stress of taking care of children by using social robots. And its monitoring function could give parents a secure feeling while they are absent for work and children stay at home alone. Furthermore, when social robots improve functions to communicate with users and take care of childrearing or household more and more in the future, people who currently live in obedience to gender norms might be able to be free from their gender roles.

Social robots constantly collect and store the enormous amount of personal information, connect to cloud data and update their abilities. For users, giving their own information to social robots is necessary to improve their robots' functions (IBM Japan 2014). Once social robots are recognized as a family member by users and stay together all the time, the robots can gather various kinds of personal information including sensitive information. While a huge amount of personal information improves the usability of social robots better and better, we need to be aware of ethical concerns behind it.

3.3. Ethical problems in operating social robot

There are three typical ethical concerns in operating social robots (Asai 2017).

- a) As long as social robots function based on our personal data, there is a risk to breach privacy or leak personal information.
- b) In order to manipulate social robots, we need to use a kind of "robot infrastructure" to operate cloud AI and robot OS for collecting and analyzing data. On the other hand, social robots are operated with the collaboration and cooperation of various technologies by various companies. How and who manage and control the robot infrastructure is critical to protect our privacy and personal data.
- c) Social robots are customized for particular users through the interaction and communication with them. Each social robot is made up by the collaboration of robot designers, engineers, vendors, operators and users, and its function is differentiated depending on users. In this context, is it possible to consider a customized robot as intellectual property? If so, who is allowed to own the robot? And also if your customized robot compose a beautiful song or do a painting nicely, who can own the intellectual property right of those creations?

When thinking about ethical concerns in the operating process, we need to see and check the problems from legal and political aspects as well as from an ethical aspect. However, in real, technology develops very rapidly, and legislation and politics sometimes cannot catch up on the development of technology. Or, laws and policies are not suitable for the reality and get to be outdated because new technology changes society. When laws and politics don't function properly, ethics has a great possibility to work as "social coordination technology" (Sakamoto 1974). In other words, ethics could contribute to coordinate or manage the fluctuated situation

based on morals and values that people have inside. In AI age, ethics is needed more and more to solve the chaotic social situations.

4. INVISIBLE ETHICAL CONCERNS

Once ethical problems cause in the operating process, those problems would be recognizable for users. In the worst case, social robots might stop functioning because of those problems. However, more serious ethical problems with social robots for childcare use are hard for users to see and recognize. First of all, as previous researches have already shown, it is very difficult to be free from embedded values in designing and developing technology (Friedman et al. 2006; Nissenbaum 2011). Recently a Japanese big ICT company NTT (Nippon Telegraph and Telephone) has developed AI to search and offer picture books for children and children's parents. This AI-based searching system can choose picture books suitable for children's age, interest, taste, and so on based on enormous book data. Especially for children's parents, it would be a great help to find "good" books among thousands books. It might bring a chance to know a nice book which they have never read before. However, it is very difficult for children and their parents to know how the algorithm works and finds proper books for them. Worse, we don't know if the book which the system offers is really proper or good. Social robots can select and read nice books for children. However, picture books selected by the robot might have influence on their thoughts and lifestyles without noticing.

Second, generally technologies including social robots are utilized to reduce our work-load and improve efficiency in daily life. Increasing interaction between children and family robots might decrease communication between children and parents. The typical example is that family robots read a book for children before going to sleep, instead of parents. Indeed, the absence of parents could be complemented by social robots and parents could feel less stress and have more free time. Luckily family robots basically don't say "NO" to children and don't deny them. Children enjoy freedom for doing what they want to do under the robot supervision. However, they need to learn to be independent through experiences of holding and refusal by parents (Okonogi 1992; Winnicott 1988). Especially no one takes the role of denying children (the role of "father") any more. Having a faithful companion for children might interfere the process of developing children's independence.

And thirdly, technologies intervene the childrearing environment and dehumanize or artificialize childrearing. Dehumanized environment where is managed by technologies could be more reasonable and rational in correspond to well-calculated and well-programmed algorithm, when comparing to the environment controlled by human. However, we are sometimes overwhelmed by the irrational and unreasonable situation. Generally we have learned how to deal with and solve problems in perverse situations through experiences since childhood. Of course we have to learn the way to handle the difficult situation until we die. The dehumanized but well-programmed environment inhibits children from developing the ability to get along with difficult situations when things don't go as they wish. When we try to make a decision, values, independence, and problem-solving skills are key elements to reach a better decision. If social robots tame children to be depend heavily on support from social robots, they lose chance to acquire skills and develop abilities in order to solve problems and make a better decision.

Furthermore, children's experiences via virtual technology or social robots could be completed inside themselves without thinking about any others around children. It would change the quality of experiences. They don't experience something in person or in direct, but they can feel

and see something very similar to the real without any struggle or conflict. That means children can live without communication with other humans, and cannot recognize and share any feeling among others and position own existence and identity in society (Ichikawa 1992). This is not pessimistic prediction. We have already started to adjust ourselves to the current technological environment to enjoy efficiency and benefits. While we adjust ourselves to technology, we exclude ourselves physically and mentally from the high-tech society and make ourselves 'others'.

In general, technology could be used for dual- or multi- purposes, and sometimes it is used for unexpected purpose. Social robot is no exception in this regard. Although benefits from social robot are remarkable and attractive for us, we need to recognize how we use social robot and see how it influences on our lives from the ethical perspective.

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