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***ARTIFICIALLY INTELLIGENT ROBOTS
AS ASSISTANTS, FRIENDS
AND LOVERS***

*Lisa Trage
Medieninformatik, B.Sc.*

Introduction

In computer science, everything can be translated into a sequence of the binary digits one and zero. While the core meaning of this pair of numbers is yes or no, true or false or right or wrong, it is hard to label the outcomes of this rather new science as either good or bad. Quite the contrary, its possible long-term effects range from a carefree life for all of us to a plethora of dystopian phantasies.

Especially artificial intelligence – or abbreviated AI – has stirred a lot of discussions since the founding fathers of research in this field met for a summer workshop at *Dartmouth College* in 1956. Their goal amongst others was to “make machines use language [...] solve kinds of problems now reserved for humans, and improve themselves”¹. Today, the aspirations of these scientists have come to life in several technological developments. Nevertheless, there is still no AI that is equivalent or superior to human intelligence in all of its aspects².

In the near future however, this vision might become reality. Technological progress will play a key role as an enabler of modern AI systems: Computing power and memory size are estimated to multiply by a thousand times over the next twenty to twenty-five years, facilitating the processing and storing of massive amounts of data³. Further developments in the field of artificial neural networks and deep learning techniques will result in systems that are less dependent on human involvement; improved sensor technology will make it easier for systems to interact with their environment⁴. The decreasing costs for AI technologies will further facilitate their pervasiveness.

Although a big portion of AI research is working towards systems that have little to do with creating a machine with human features, there are still advances in this field – for example, robot woman Sophia who became a YouTube celebrity for stating in a 2016 interview that she wanted “to destroy humans”⁵. While this seemed to be rather a marketing stunt, it is important to discuss the effects of humanoid and android robots.

In this essay, I want to take a closer look at the status quo of humanoid AI and the implications this technology can have as an assistant, friend or even love interest to humans. I argue that artificial intelligence will – once it becomes a realistic companion to humans – interrupt societal structures to some extent, leading to a growing amount of human-machine relationships. Following this, I want to examine the ethical aspects of these affiliations.

1 Bostrom 2014, p. 19

2 The Economic Times 2018

3 Eberl 2016, p. 22

4 Lin, Abney and Jenkins 2012, p. 26

5 CNBC 2018

Brain and body: Artificial Intelligence Meets Robotics

The term artificial intelligence is one that is rather hard to define – mainly because the word intelligence itself is not easy to grasp. While programmes may be better in calculating with large numbers or playing chess than humans, skills like these do not imply that they are more intelligent. Humans possess a form of cognitive abilities that are called general intelligence: We learn, plan and conclude to solve complex challenges in many different areas⁶. Machines on the other hand, are often build to be specialists in just one area⁷.

In 1950, the British mathematician and computer scientist Alan Turing developed a new approach to finding out whether a machine was intelligent. Instead of defining what “thinking” actually means, he proposed a method that he referred to as the “imitation game”: A person communicates with two interlocutors he or she cannot see – one being a human and the other one a computer. The so-called Turing test is passed once the computer can make its human interrogator believe that it is human too. Until today, only one programme has managed to do so; but with the help of a little trick. The programme played the role of a thirteen-year-old boy from Ukraine to camouflage any grammar mistakes or questions not logically answered and managed to persuade 33 percent of interrogators (to pass the Turing Test at least 30 percent are necessary)⁸.

A credible general artificial intelligence has thus not been established yet and it seems to be far more difficult than scientists had expected at the beginning of AI research. For years, it was believed that the problem would be solved once a programme could beat a human chess grandmaster. However, when *IBM's* supercomputer *Deep Blue* defeated Garry Kasparov in 1997, there were still no computer programmes able to emulate general human intelligence⁹. However, AI systems have become far more sophisticated since that: In 2017, the AI *AlphaZero* triumphed over the best chess playing programme at that time after teaching itself how to play in just four hours¹⁰.

To pursue “real” AI, specialists in developmental robotics are now following a less abstract path than writing a programme for a computer¹¹. Their theory is that a system that has an actual body will be more likely to build a form of general intelligence because it can experience its surroundings and match sensorial data with actions¹². This branch of robotics is based on another hypothesis of Turing’s; in 1950, he claimed that an artificially intelligent system could be best created if it went through a phase that is similar to the childhood of other species¹³.

6 Bostrom 2014, p. 16
7 Lenzen 2018, p. 33
8 McCoy 2014
9 Bostrom 2014, p. 30
10 Gibbs 2017
11 Lenzen 2018, p. 33
12 Ibid, p. 84
13 Bostrom 2014, p. 42

The *iCub* robot was developed to investigate this theory. Having the weight and size of an infant, it carries the spirit of Turing's thought: Instead of pre-programming its skills and feeding it with data, researchers teach it like a child to enable it to conceive its own solutions¹⁴. Here, one question arises: How does a system develop the will to learn something? After all, it does not even have a will by default. It was found that a strategy working for humans does the same trick for AI systems too: a reward. The field of reinforcement learning derives from this method and has been also applied to the *iCub* series¹⁵. This has enabled the robots to attain skills like picking up an item¹⁶ or crawling on the floor¹⁷. These actions might not seem too complex for us at the first glance but they do involve a number of obstacles the robot has to overcome. In the future, *iCub* could help us in the household by setting the table for dinner or preparing food.

But there is another interesting thing about *iCub*: its chubby face, big eyes, and LED-facial expressions leave no doubt that it was made to bear a resemblance to real humans. Yet still, it is obvious to anybody that it is not an actual person. These features make *iCub* a so-called humanoid. Robots that are made to look *exactly* like humans on the other hand are called androids¹⁸. Until this point, this species of robots has had it pretty difficult with humans. The android robot Sophia that was mentioned in the introduction for example rather repels than attracts people. Its appearance falls right into the *uncanny valley*, an effect that was first described by Masahiro Mori in 1970¹⁹. The roboticist claimed that people are more willing to accept robots and engage with them when they resemble humans. There is a rapid drop in sympathy however, if robots look very human while still showing small deviations, for example in their movements or facial expressions. The level of acceptance rises again when there is no visible difference to a real person.

Humanoids and androids are expected to perform various functions as so-called social robots in the future, helping with tasks and professions that require human presence and interaction like child care or sales – but there is a significant chance that they could become much more to us.

Social Robots as Assistants, Friends, and Lovers

The fascination about a machine that has the looks and abilities of a human has been unabated in science fiction literature and movies for almost a century. Whether as the main subject in Fritz

14 National Geographic 2015

15 Frank et al. 2014

16 Donoso 2012

17 RobotCub Consortium 2018

18 Lenzen 2018, p. 100

19 Lay 2015

Lang's epic silent movie *Metropolis*, Stephen Spielberg's *AI* or *Ex Machina*: Intelligent machines hold a fixed spot as an alluring, yet scary theme in Western popular culture.

This ambivalent position is not shared by every society: Japan has a long tradition of embracing technological progress and especially robots. In the Japanese *Shintō* religion, it is believed that all things whether animate or inanimate can inhabit a living spirit. This translates to technology as well, making robots – especially humanoid versions – a coveted possession or even family member rather than a threat²⁰. In the Asian country, robots have been already used as sales assistants and museum guides and recently a hotel fully staffed with robots made headlines²¹.

Is Japan only an exception? While one might argue with the country's slight predisposition towards technology as it was mentioned above, the beginnings are there in the West as well. We rely heavily on the technology around us, even if we are not always aware. Nowadays, a majority of us do not leave the house without a smartphone – something that was unimaginable twenty years ago. In her 2012 *TED* talk, American sociologist Sherry Turkle, pointed out the three main ideas that make smartphones so appealing to us: “One, that we can put our attention wherever we want it to be; two, that we will always be heard; and three, that we will never have to be alone”²². Those last two points indicate why machines that emulate human relationships are so interesting to us: Humans look for companionship but are afraid of the risks that come along with it at the same time, as Turkle points out.

The market is prepared for it: Looking at the increasing popularity of home assistants like Alexa or Google Assistant we can expect our reliance on technological devices to grow even stronger in the future. They might become more to us than just a personal weatherman or a direct connection to our Amazon shopping basket: artificially intelligent programmes and robots could eventually write Christmas cards to our friends and family, suggest the perfect birthday present for our partner or even take care of our children.

In fact, a robot nanny is not as far-fetched as one would expect: Robots like *Pepper*, *iPal* or *Kuri* are programmed to be companions to children – they can recognize emotions in their faces, play with them and let parents watch their offspring from afar through their built-in cameras²³. They might not yet be an adequate substitute for an adult taking care, but manufacturers are definitely working towards this goal. Regarding the high costs of childcare in many countries, they could soon become a very popular help in parenting – and real friends to a generation that grows up surrounded by technology. In Japanese schools, robots have already proven to be a successful addition. They

20 Thomas 2009
21 Rajesh 2015
22 Turkle 2012
23 LaPlante 2017

are assisting students to focus better in class, add a welcome variety to subjects like history or show exercises in physical education²⁴. The robot *Robosem* has been teaching English in South Korean classrooms, as teachers in this subject are scarce²⁵.

Not only childcare can profit from the advances in AI and robotics: As a means of therapy, intelligent technology can be valuable in retirement homes. An example of this is the robot seal *Paro* that has been successfully utilized in dementia therapy and as a companion to elderly people since its introduction in 2001. The robot's body is covered in fake fur and it is sensitive to touch, moving and making seal-like noises when it is petted. It is used to calm patients, to encourage social interactions and to give people that are reliant on help a chance to switch roles and become caregivers themselves²⁶. Once they become more elaborate, robots could be a way to meet the shortage of skilled workers in the field of elderly care especially in aging societies like Japan or Germany.

Another market is waiting for robots to become more sophisticated as well: the sex industry. There is already a considerable number of very lifelike sex dolls available and making them artificially intelligent and responsive to their environment would likely propel the business to new dimensions. *Abyss Creations*, a company that currently offers very realistic sex dolls that can be exactly customized to the clients' wishes, strives towards the goal of artificially intelligent sex partners. Their model *Harmony* with built-in AI is able to verbally interact with her owner and to remember sexual preferences. In the future, the company plans to let *Harmony* walk and to add sensors to its surface to make it sensible to touches²⁷. Proponents of sexbots argue that the technology could be a help for disabled people, sexual disorder- and trauma patients.

Although *Abyss Creations* offers male and female dolls, the majority of customers are currently men²⁸. In a 2017 report, the *Foundation for Responsible Robotics* examined different surveys about the likeliness of men and women to engage in sex with a robot. While the report also found that men indicated a higher interest in sex robots, there was a considerable number of women willing to have intercourse with a robot indicating a demand for this technology from both sexes²⁹. There was a limitation to the surveys however as they were all conducted in Western societies.

Having sex with robots might not be as futuristic as one would expect – but can we also lead relationships with them? In the 2013 movie *Her* by Spike Jonze, the main character Theodore falls in love with his operating system Samantha who becomes very close to him through their intimate

24 Lill 2015
25 Powell 2014
26 Griffiths 2014
27 Kleeman et al. 2017
28 Siddique 2017
29 Sharkey et al. 2017

conversations about love and relationships. It can be argued at this point that a humanoid general intelligence is not even necessary to fall in love with a technological device, robot or bodiless AI and to lead a relationship with it. What seems to be a strange thought at first is becoming reality little by little.

An example here is *LovePlus*, a game for *Nintendo DS* and *iOS* that is exclusively available in Japan. The game is played from the perspective of a high school student who can meet different female characters in the game which eventually leads to a romantic relationship with them. Some of the players of this game treat the characters like girlfriends in real life as well, going out on dates with their device and taking pictures together³⁰. One of the players even married a character from *LovePlus* – although the union is of course not legally binding³¹.

Another company tapping the potential of this target group is *Gatebox*. The Tokyo based firm produces an eponymous home assistant that is mainly targeted at single men. The device inhabits a female 3D anime hologram named Azuma Hikari which can perform several tasks for its owner such as waking him up in the morning, switching the lights on and off in the flat or reading the weather forecast. Next to these classic home assistant features, it bonds with its owner – whom it refers to as *master* by default – by sending him texts throughout the day and implying that it misses him. At the time of writing, there were no sales numbers from *Gatebox* available, the company stated on its website however that their product was sold out³².

Ethical Implications of Human-Robot Relationships

In the light of the technological advances that will be made within the next years, the ethics of human-robot relationships must be discussed. The next generations will likely grow up surrounded by artificially intelligent machines and it is hard to say if and how this will affect their perceptions of interaction not only with robots but humans as well.

A study conducted by *ATR Intelligent Robotics and Communications* and three Japanese universities revealed that children sometimes showed abusive behaviour towards robots – especially when they were in groups without any adults close by. In the study, the robot *Robovie* was patrolling a Japanese mall, asking people politely to step aside when somebody stood in its way; if there was no reaction, the robot would move in the opposite direction. There were several situations however, where researchers observed that children were deliberately blocking the robot's way, kicking it, throwing items at it and calling it names. As a consequence, the researchers developed an

30 Rani 2013

31 Lah 2009

32 Gatebox 2018

algorithm that let the robot recognize groups of children and avoid them³³. This does not seem like a perfect solution to the problem, especially if we take the rising amount of robots in children's rooms into account. How does it affect children if they play with their personalized robot rather than with their friends? It is questionable how they will learn social skills like sharing, listening or politeness from a machine that does not have a free will. In the past, there have already been concerns by parents that the home assistant *Alexa* encouraged their children to be disrespectful as it even reacted to the rudest commands from them³⁴. *Amazon* has done some adjustments but in its core, the problem persists.

If children show abusive behaviour, it is not hard to imagine that adults are likely to mistreat robots in some way, too. The manufacturers of the robot *Pepper* were concerned enough about this issue to add a paragraph to the user agreement stating that it is not allowed to “perform any sexual act or other indecent behaviour” on it³⁵. Nevertheless, even robots that are *made* for sex raise a lot of ethical concerns around the issue of robotic rape. Some claim that sex robots could help to prevent sexual abuse, as people with such desires would instead of assaulting humans turn to robots. This argument is questionable however, as the *Foundation for Responsible Robotics* found by interviewing different experts in the field. Many of them describe robotic rape to be reinforcing of this behaviour, rather than curing it³⁶. This issue is especially important regarding the fact that there are already child sex dolls sold that will probably make the same leap from doll to artificially intelligent robot like grown-up versions³⁷.

The activists behind the *Campaign Against Sex Robots*, led by Professor Kathleen Richardson of *De Montfort University*, see another issue connected to sexbots as well: They criticize the comparison of sexbots to vibrators and other sex toys like David Levy does in his book, *Love + Sex With Robots* from 2007. Therein, he argues that sex robots would just extend existing technologies³⁸. The campaigners see a major issue in this statement, as sexbots are clearly made to copy the human body and with the help of AI will also soon behave like one – even if the result is more a phantasy than an actual person. The majority of sexbots are female which further propels the subordinate image that is often conveyed through pornographic material and in prostitution where only the wishes of the client count³⁹.

In my opinion, a relocation of this master-slave relationship to humans and sexbots can be very harmful, leading to a legalization of non-consensual sexual acts: While sexbots will look and

33 Darling 2015
34 Tsukayama 2018
35 McCurry 2015
36 Sharkey et al. 2017, p. 31
37 Ibid., pp. 25
38 Maines 2008
39 Richardson 2018

behave human in the future, they are still machines which may serve as an excuse to mistreat them without fearing any legal consequences. To me, this represents the core problem with sexbots and other forms of humanoid and android robots: The attempt to imitate aspects of interhuman relationships without having to deal with another party's will. In this way, sexbots could eventually contribute to a modern form of slavery, jeopardizing societal core values.

It is hard to say to what extent robots will become a surrogate for genuine human affection in the future but revisiting the comparison to smartphones made earlier, I believe that it is alarming that people turn to machines in the search for human connection. In a society that is increasingly built on perfectionist standards, I argue that artificially intelligent robots designed to be friends and lovers might become a threat for human relationships. If we hold our friends and partners to the same standards that we will be used from robots in the future, we will be heavily disappointed. Contrary to robots, humans are not built to fulfil every one of our needs and to share all our opinions and tendencies – let alone to please us with everything they do and say. As we have seen on the example of Japan, this could lead to a distorted perception of what human relationships look like: The imperfection that underlies them is as challenging as important for the development of our personalities and our respect for fellow human beings.

Following this, social robots made as companions for the elderly also need to be critically examined. In my opinion, the care for older people is a task we cannot transfer to machines as they lack emotional capabilities. *Faking* emotional commitment with people who might not be able to differentiate whether they are talking to a human or a robot due to medical issues is questionable. However, robots with built-in AI could support care personnel without overtaking their main task – which should be the contact with people.

There is a lot of tension in how we perceive social robots: On the one hand, they are *just* machines that are built to make our lives easier, on the other hand, their resemblance to humans makes it hard to not ascribe them feelings. Buying and selling them feels somewhat improper in this context. Of course, as long as robots do not have real emotions, these thoughts are easy to brush away – but what happens if we manage to build an AI with actual emotions? The question whether or not AI will be able to develop feelings or a consciousness in the future would go beyond the scope of this essay, but it is save to say that the establishment of robot rights must be discussed when technology reaches this point.

Conclusion

Artificially intelligent social robots are still a niche product – however, once they become more elaborate, they will likely find their way into our everyday lives. Having a robot as a friend or love interest seems far-fetched from our current perspective but the generations that follow us and grow up with smart devices will probably have a different attitude towards them. If you have been surrounded by social robots for most of your life – does it still seem quite a stretch to lead a relationship with them?

The consequences of a development like this are hard to predict. From my point of view, artificially intelligent social robots are far away from being a holy grail but rather a quick fix for the lack of human affection. The fact that feelings directed towards inanimate objects can never be mutual makes this technology very questionable. In some cases, it could lead to a dependence on a relationship that is not real, resulting in an alienation from human relationships and eventually unlearning how to lead them altogether. Therefore, using technology as a surrogate for humanity is a precarious endeavour that might take us further away from the solution to the actual issues.

That said, possible effects of this technology should not only be scrutinised from a philosophic point of view but also from a legal perspective. Eventually, there will be a need for laws concerning humanoid AI, especially in the field of sexbots. Efforts are made here already, as the possession of child sex dolls is abolished in some countries. In spite of that, a complete prohibition is not very likely for their grown-up counterparts. The question persists on how to deal with forms of robotic rape and whether or not robots should get basic rights to protect them once they attain a deeper form of consciousness.

After all, artificial intelligence can be a solution for the growing challenges we face in many areas but it can also further complicate our lives and undermine values that our society is grounded on. In the future, it will be on us to examine the grey area between ones and zeros.

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