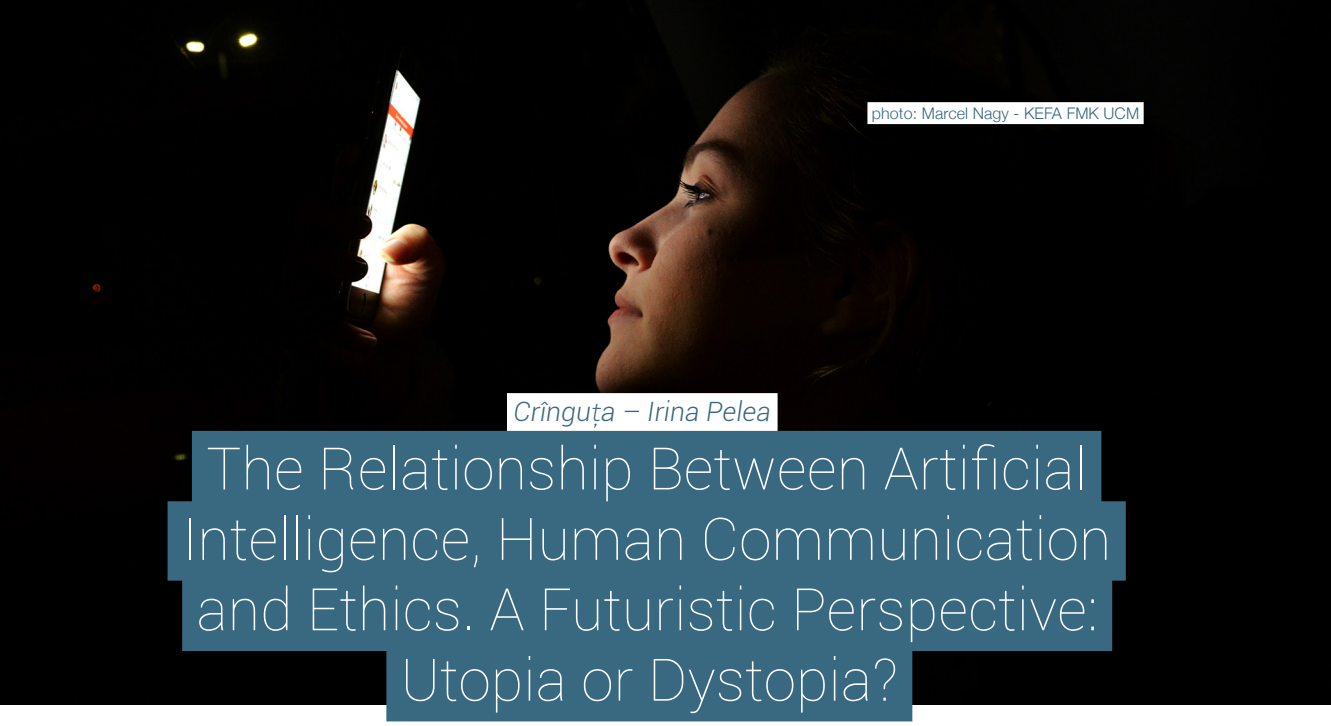


photo: Marcel Nagy - KEFA FMK UCM

Crînguța – Irina Pelea

The Relationship Between Artificial Intelligence, Human Communication and Ethics. A Futuristic Perspective: Utopia or Dystopia?

ABSTRACT

In today's society, Artificial Intelligence is continuously evolving, with remarkable speed and it has a considerable impact on the community as a whole, starting with medicine, education, industry, and it affects communication in human relations. Once one can no longer deny this technological advancement with many implications on our lives, a new topic of discussion and academic research arises: to what extent will it be necessary to redefine the parameters of communication and the relationships between the individual, the group, the society, and the Artificial Intelligence. The present research tackles several problematic aspects related to AI in the present and some that may arise in the near future when robots will probably become a commodity. First, the author will investigate the communication relationship between AI and the individual, now, given the fact that the excessive use of technology recalibrates and reformulates the way one perceives and envisages the harmony and the efficiency of the communication process. Second, the connection between AI and ethics is another topic of high interest now, and even though the flourishing development of AI supposedly has as a mission the benefit of humankind, many ethical dilemmas keep arising and feed collective social anxiety, while no satisfying and consistent solutions seem to be found. Globalisation and technological progress mark another turning point for contemporary society, which witnesses an unforeseen academic impasse of knowledge, meaning that it is prone to reconfigure stable academic disciplines and to estimate the emergence of new ones, dictated by post-contemporary global necessities. For example, the ethics of robots or AI has high chances to become a well-established academic discipline soon, given the present turbulent and dynamic technological context, constantly shaping humanity's life. Considering the future implications of ethical and communication nature becomes a stringent necessity even at its earliest stages, not only for researchers of various departments and ethics committees but also for governments, corporations, and other industry branches. Therefore, creating and engraving a culture of social responsibility towards AI represents one of the most difficult challenges of our times, and finding the balance will make the difference between utopia and dystopia, where AI is a miracle... or an evil.

KEY WORDS

Artificial Intelligence (AI). Ethics. Robots. Communication. Challenges. Utopia. Dystopia.

1. Introduction

What has dictated the necessity of the present study is the accelerated development of AI, which continues to generate increased interest in AI and the countless possibilities its usage might offer. However, media and various products of popular culture abound in apocalyptical images and supposedly warn humanity of the imminent, luring and yet lurking danger represented by AI.

Even though countless studies have been conducted on this topic, the novelty of this study lies in presenting an integrated and multifaceted perspective, combining two major problematic aspects – how humans will communicate with AI and the necessity of handling AI ethically.

After taking into consideration the above-stated topic and the research focus, the content of the study is organised as follows: the first section is dedicated to issues related to the communication relationship between humans and AI, while also summing up various well-known or little-known problems for the readers. The second section explains in detail various ethical aspects and concerns associated with the usage of AI in the contemporary world and intuitively estimates those soon to be. In the next section, the author will engage himself in an intercultural comparative analysis, on how culture influences and shapes humans' attitudes, behaviour, mentality, and communication with robots. The two cultural poles chosen to exemplify the current antithetic positioning are the Orient and the Occident, more specifically, Japan and America. These two countries metaphorically represent „utopia" and „dystopia", as futuristic emerging spaces for the developing robotic industry, dual concepts used as an allegory for two strikingly different attitudes towards AI. The final section is where the author discusses the conclusions and future work. However, the first disturbingly complicated question the author brings into the discussion is given by the difficulty of estimating how humans will communicate with robots.

2. A new approach to human-robot communication

Artificial Intelligence, otherwise known as „AI" represents the intelligence shown by machines or software, and includes reasoning, natural processing language, and even various algorithms are used to put intelligence in the system.

Although until now, many researchers have approached the topic either from a technological, social, political or ethical perspective, there are still fewer insights on the academic domain of social robotics or more specifically, on how the human will communicate and reposition towards AI and robots, this being a binomial applied today to almost every domain of life and activity.

While being keen on just a set of fields, a large number of researchers seem to throw into oblivion a simple, yet unanswered question – what parameters one should consider as marking efficiency and harmony in communicating with robots.

In the ubiquitous contemporary society, where computing is omnipresent, everything is interconnected. Therefore, the AI revolution can be associated with almost every sphere of human activity.

While underlying the main question seems straightforward, answering it is far more complicated than it appears at the beginning.

Robots will challenge not only their communication relationship with humans but also human communication in general, given the fact that they enhance a trans-mediated reality, dictated by an overwhelming technological development. Moreover, the way robots will communicate with each other represents another dilemma. Therefore, this is a three-dimensional communication relationship: humans and robots, humans and humans, and finally robots and robots.

However, the primary topic for the present research is how one might envision the way humans and robots will communicate in the proximate future, and until now, very few consistent studies have been conducted on how humans and robots will interact with each other.

It is undeniable that technological change and the digital revolution shapes culture and the way individuals communicate nowadays, from the simplest tech apps to the most complex robots capable of engaging in a conversation with a human partner and completing tasks with a higher degree of difficulty.

The efficiency of communication, no matter the nature of the communicators is highly dependent on each one's ability to understand the other. It is no exception in the present case.

When it comes to the human-robot communication relationship, there are at least three parameters worthy of attention: the purpose of the communication (the exchanged information), the direction of the communication (from whom does the information flow), and the communication media (through what media is the information transferred).[1]

While verbal communication appears to be the easiest way to make a robot execute tasks, there are also other ways of communicating, such as via joystick or silent communication.

However, in a broader context, there are at least two aspects, which are worthy of being mentioned: first, the arbitrariness of the communication relationship decreases drastically, while the planning becomes proactive; the second one concerns the fact that both human and robot co-participate in a virtual mediated reality. Therefore, these two aspects have a substantial impact on permanently re-shaping the communication relationship. Humans' strength or weakness (from some points of view) is their emotive communication, one that the robots of nowadays lack.

Unlike them, humans have a unique capacity of permanently adapting to highly dynamic situations or making fast decisions based on judging various and sometimes even contradictory circumstances. However, this is where the limit of the present analysis emergences: there is no clear evidence or specific estimation of how the robotic industry will evolve in the next 50 to 70 years, and if these present weaknesses will be solved or at least improved.

While humans have an excellent adapting capacity, robots are known to have a remarkable performing ability of highly constrained tasks (i.e., taking the best photograph, after calculating the variables and best parameters).

Besides the execution as mentioned above of tasks and monitoring the robot in achieving it, another critical aspect concerning human-robot communication is related to the learning process, which is associated with both parts. At the first look, it might seem natural that the smartness of a robot can reduce the discomfort and burden of the human user, but one should look closely at therapeutic robots or those used primarily with a pedagogical purpose.

Within this broader context, another significant aspect that is worthy of being mentioned is the existence of a common vocabulary, capable of satisfying both their needs.

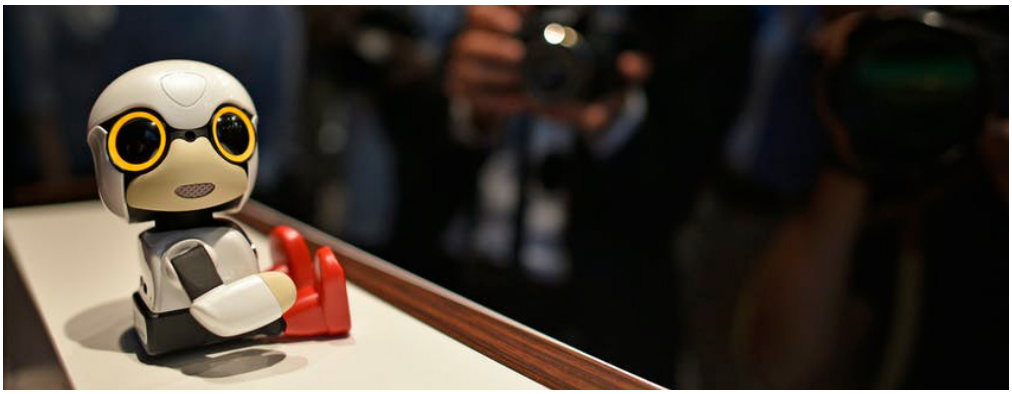
Moreover, from a social and cultural point of view, the emotionless state and lack of humanity characterise this communication relationship. One might presume that any communication relationship is highly dependent on the trust invested by both parties, in a futuristic scenario. What factors are prone to determine the level of the robot's trustworthiness? Alternatively, can one assume that in the near future, it will also become necessary to establish a measurement scale of a human's trustworthiness, in a robot's perception?

The human response towards the existence and the dynamic evolution of robots is complicated: social, cultural, political, economic, and nevertheless, psychological and psychiatric. Similarly, with video game addiction or the hunger for virtual reality of many young people, the author presumes that a similar obsession for robots is highly likely to be developed, up until the point humankind will be confronted with the necessity of new psychological symptoms or psychiatric conditions. It is not unfamiliar for people to bond with machines, even robots, but the empathy seems to be, at least until now, only one-sided.

[1] DEMIRIS, Y., KLINGSPOR, V., KAISER, M.: Human-Robot-Communication and Machine Learning. In *Applied Artificial Intelligence*, 1999, Vol. 11, No. 7, p. 6. [online]. [2019-02-11]. Available at: <https://www.researchgate.net/publication/2824923_Human-Robot-Communication_and_Machine_Learning>.

A fascinating example[2] is one of robot-human teams trained to operate bomb disposal equipment. After working together for an extended period with their human partners, the robot has frequently put themselves in harm's way to keep the humans safe. The soldiers ended up feeling that the robot saved their lives and wanted to keep it at their side. This could explain why iRobot, the manufacturers of the Packbot bomb-disposal robots, have received more than one box of shrapnel with the robots' remains after an explosion with messages asking to have the robots fixed. Although the company was more than willing to send a new robot to the unit, several teams of soldiers refused and insisted that they want that one fixed. In the author's personal interpretation, this attitude is a reflection of human nature, because the teams of soldiers looked upon the robot as „a pet" or even more, „a friend" that was ready to die with them, a loyal friend that they wanted to keep by their side and one they trusted with their lives.

Similarly, the development of robot babies has become a popular trend in Japan[3], and it has raised numerous questions of moral and ethical nature, regarding the bonding of potential parents with these robotic babies. In a rapidly ageing nation that has been confronted for the last two decades with a severe decline of population and childbirth, robot babies are highly likely to cause serious emotional issues to the parents, especially given their baby like appearance and their portrayal of human-like behaviours.



Picture 1: *JAPAN TOYOTA ROBOT: Toyota to launch 'Kirobo Mini' robot*

Source: EPA/FRANCK ROBICHON. [online]. [2019-02-11]. Available at: <http://www.epa.eu/economy-business-and-finance-photos/company-information-computing-it-photos/toyota-to-launch-kirobo-mini-robot-photos-53048049>.

Nevertheless, in this case, as well, the bonding is one-sided and mimicking a child-parent relationship raises other issues: are the parents justified to select the robot's characteristics and how should they proceed, once the child „grows up"? Is their communication relationship prone to freeze temporally or is it possible to transfer the emotional attachment to a new robot embodying an older child?

These examples lead the present article to another critical point, namely the social status of the robot. Is it predefined or does it depend on each one's personal preference and system of beliefs? What social and moral relationship can a human have with a robot? Can a robot achieve an interpretation of the world, concerning his experience?[4]

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[2] CARPENTER, J.: Just Doesn't Look Right: Exploring the Impact of Humanoid Robot Integration into Explosive Ordonance Disposal Teams. In LUPPICINI, R. (ed.): *Handbook of Research on Technoself: Identity in a Technological Society*. Hershey, PA : Information Science Publishing, 2013, p. 621.

[3] ANDERSON, M. R.: *Robot babies from Japan raise all sorts of questions about how parents bond with AI*. [online]. [2019-02-11]. Available at: <https://theconversation.com/robot-babies-from-japan-raise-all-sorts-of-questions-about-chow-parents-bond-with-ai-66815>.

[4] FONG, T., NOURBAKHSH, I., DAUTENHAHN, K.: A survey of socially interactive robots. In *Robotics and Autonomous Systems*, 2003, Vol. 42, No. 3-4, p. 146.

With increasing activities and roles in the fields of health care and education, it becomes a genuine challenge to establish the robot's position, rights and obligations in a society centred on humans, above all.

3. Ethics and AI

Countless ethical and philosophical issues have arisen, concerning the AI and its impact on humans' lives, from their place in humans' society to their ability or right to make decisions. The fact that AI continues to change and to improve our lives in domains such as health care, education, transportation, industry productivity, entertainment, public safety and so many more.

Therefore, ethics has high chances of making the difference and playing a bordering role between the utopian and dystopian future frequently imagined in mass-media, movies, literature or academic research. Accordingly, at least three ethical aspects have been identified concerning AI[5]: „*ethics by design*" (principles intended to support providers, developers and users and it represents the inclusion of ethical reasoning capabilities into service design and product per se); „*ethics in design*" (the engineering methods that serve to the analysis of ethical issues). The final one is „*ethics for design*" (the codes of conduct and standard principles, which should be adhered to by developers and users as well, throughout the process of researching, designing, constructing or using artificial intelligence systems).

However, there are multiple perspectives of this domain; for example, from the perspective of human's ethical behaviour, the ethics of robots can refer to the ethics of robotic design and architecture, the ethics of protecting the robots, and the ethics of humans towards robots[6]. The examples in this direction and the moral dilemmas are countless.

At the design level, the three *laws* of Isaac Asimov served in the beginning as the foundation of Robotics, and are frequently mentioned by researchers and public, but these principles did not solve the ethical and moral controversies that keep arising, even after more than 75 years since their debut. As for the following, the laws are:

1. A robot may not injure a human being or, through inaction, allow human nature to come to harm.
2. A robot must obey orders given it by human beings except where such rules would conflict with the First Law.
3. A robot must protect its existence as long as such protection does not conflict with the First or Second Law.

However, not even Asimov's perspective is unassailable. These laws, which restrict robots' behaviour, are set to protect humans from being harmed by robots but inherent contradictions, ambiguities, loopholes hide in the rules, and this has led to awkward and counterintuitive robot behaviour. The semantic ambiguity of the laws in stating the difference and definition of words such as „human" and „robot" is another weakness of the laws, and one should always remember that Isaac Asimov created these laws as a literary device, and even in his science fiction universe, the laws failed.

Moreover, in the context of the highly evolved field of robotics, the ethical guidelines envisioned by Asimov are in urgent need of updating, to correspond to the continuous growth and dynamism of this industry full of surprises.

[5] DIGNUM, V.: Ethics in artificial intelligence: introduction to the special issue. In *Ethics and Information Technology*, 2018, Vol. 20, No. 1, p. 1-3. [online]. [2019-02-11]. Available at: <https://link.springer.com/content/pdf/10.1007%2Fs10676-018-9450-z.pdf>.

[6] KUKITA, M.: The possibility of Robot Ethics. In *The Prospectus: The Laboratory Bulletin of the Philosophy Department*, 2009, Vol.11, No. 11, p. 3. [online]. [2019-02-11]. Available at: <http://hdl.handle.net/2433/71114>.

Besides this urgent updating, another challenge is designing an ethical template accepted on a global scale and internationally recognised, with the same purpose of creating safe, robust, and compliant robots. However, what are the chances of establishing a single ethical guidebook followed by all the nations, in the long term? This situation seems to be gloomy and depressing.

With the increasing ability to make autonomous decisions, one of the most critical issues is the necessity of rethinking the *responsibility* of robots.[7] Moreover, if components such as empathy and care interfere in the communication relationship, the decision-making process becomes even more complicated. A suitable example is one of robots caring for the elderly, a type of situation that has gained increasing attention in the public space. On the one hand, the elderly adults confront themselves with physical weakness, mental diseases associated with ageing, and some of them are in the situation where they can no longer independently live at home, without the assistance of trained personnel. On the other hand, given the current stage of the technological evolution, robots are far from what a human caregiver can offer.

Picture 2: *RIBA, the world's first nursing care robot, developed by the research institute Riken, Japan.*
Source: Nursing Care Robot Lends a Helping Hand. [online]. [2019-02-11]. Available at: <www.nippon.com/en/features/c00502/>.

If the robot acts as a caregiver, this could also turn into deception, because elders will be prone to believe that robots care for them and that they will establish a long time emotional relationship.[8]

Recently, new concepts, such as „*artificial empathy*" and „*artificial emotions*" are emerging, and even though the affective developmental robotics is in an early stage, philosophical, moral, and ethical debates concerning these topics continue to arise. Besides the above-mentioned ethical issues, there are many social challenges and risks interposed by the usage or the over-usage of robots: human unemployment caused by automation, recalibration of the job market,

[7] DIGNUM, V.: Responsible autonomy. In *Proceedings of the Twenty-Sixth International Joint Conference on Artificial Intelligence (IJCAI'2017)*, 2017, p. 4699. [online]. [2019-02-11]. Available at: <https://www.ijcai.org/proceedings/2017/0655.pdf>.

[8] SPARROW, R., SPARROW L.: In the hands of machines? The future of aged care. In *Minds and Machines: Journal for Artificial Intelligence, Philosophy and Cognitive Science*, 2016, Vol. 16, No. 2, p. 151. [online]. [2019-02-11]. Available at: <https://www.researchgate.net/publication/225790670_In_the_hands_of_machines_The_future_of_aged_care>.

the usage of AI with a destructive purpose, sometimes of a military nature, the altering of human intelligence, the alienation of humans, and so on.

The continuous morphing of ethics and morality corresponds to the advancement of technology, which explains why the complexity of ethical issues increases, with every additional step AI takes into our lives. A Manichean approach is not the answer in reaching a consensus between how humans will or can communicate ethically with robots.

One option could be aligning a machine's objectives to a human's objectives through ethical conduct and values[9], but even if inculcating the set of values and morals takes place at the programming level or through observation and active learning, failure is prone to happen. An even more straightforward solution, albeit not satisfying for the human side, is to transfer the entire responsibility of AI's actions, even the ones caused by design and functional errors, to humans.[10]

Creating an ethical paradigm upon which robots and humans should guide their conduct becomes vital, to ensure the sustainability of an AI-friendly society. Henceforth, before deciding what should be considered „ethical", in a robot's behaviour, humans have the chance to reflect upon their own ethical and moral values and to re-evaluate them, to support the reshaping of the present society at a deeper level.

One final issue arises in how people from different cultures and societies will reach consensus in their interactions with robots. For instance, cultural differences play a significant role in determining people's response to robots.

4. Utopia or dystopia: an intercultural and futuristic perspective on AI

At the intersection of ethics, social robotics, and communication, the culture exercises probably one of the most significant influences on people's response to robots. In the present study, the author has used the words „utopia" and „dystopia" as metaphors for two antithetic attitudes and reactions towards robots. Japan has intertwined a utopic future surrounding AI, while America envisions a dystopic future doomed by apocalyptic images, where robots are to blame for humankind's extinction. For a Japanese person, robots are more likely to be „cute" (kawaii), and kind (yasashii), but for Americans, and many other people living in the Occident, robots will be regarded as scary.

What can adequately explain these antagonistic perceptions of robots? Several factors are underlying the significant perception difference that is also prone to influence the harmony of a possible global ethical code, followed and respected by all nations equally.

The first one is *religious* in origin.

Japan, unlike America and many other European countries, is areligious, while its history and past have been influenced by the coexistence of more than one religion: Buddhism, Shintoism, Christianity, and even Judaism. However, within this national religious mosaic, in Japan's early religious history, Shinto has a very distinct and unique place.

Being one of Japan's dominant religions, Shinto embodies an expression of *animism*, one of the world's oldest religions. According to its doctrine, animism considers that every element existing in this world (be it animals, plants, insects, rocks, forest, rivers, spirits of deceased

[9] RUSSELL, S., NORVIG, P.: *Artificial intelligence: A Modern Approach*. New Jersey : Pearson, 2010, p. 37.
[10] PAVALOIU, A., KOSE, U.: Ethical Artificial Intelligence – An Open Question. In *Journal of Multidisciplinary Developments*, 2017, Vol. 2, No. 2, p. 21-22. [online]. [2019-02-11]. Available at: <https://arxiv.org/ftp/arxiv/papers/1706/1706.03021.pdf>.

human beings, weather-related phenomena and so on) is alive and in possession of various and distinct spirits. The non-existence of an interspecies hierarchy is what ensures the maintenance of the sublime harmony.

Animism explains, on an ancestral level, the positive and engaging attitude of the Japanese people, when it comes to interacting with robots or with messages, ideas, and images related to AI. Thus, animism reinforces the idea that the robot has its identification but must act under the law of social harmony, by serving as a tool to the human owner. As long as the human treats the robot properly, the robot should behave ethically as well.

However, from the religious perspective, America stands at the opposite pole. In a country characterised by the predominance of monotheistic faiths, such as Christianity, Islam or Judaism, in people's conscience the idea prevails that only God should create humans. Therefore, the image of humans building human like robots is almost like blasphemy and can be easily equated with being a form of usurping the divine role. Such actions cannot go unpunished, and Western mentality becomes imbued with a cultural, not logical fear of the robotised future.

As the world's leading country in the robotic industry, Japan has invested outstanding governmental budgets, to expand the robot industry and to ensure its top position globally. The striking difference between the social acceptance of robots in Japan versus America or the West can be explained only by examining the Japanese people's psychology, cultural and social customs.

Henceforth, the next important factor has a *psychological* and *philosophical* nature. Before starting an endless debate about how ethics in Western conception, and its translation in the Japanese language, „rinri"[11] (the Eastern perception) differ, the author would like to add only the fact that Japanese ethics is uniquely characterised by the superiority of social harmony, over the individual subjectivity.

Moreover, the robot corresponds in essence to the ideal of perfection, existing in Japanese mentality, and satisfies a social expectation in the context of a nation praising technology, innovation, and excellence. Whereas, in American conception, the idea prevails that robots are built to serve us exclusively, without having such social values as mentioned.

By way of contrast, in America, ethics and religion intersect, and many may assume that it is just not ethical to create a machine resembling to some extent humans. What could inculcate a sense of anxiety towards machines is the fact that robots often exhibit unnatural human reactions, despite sharing a great physical resemblance.

Japanese *popular culture*, through *anime* and *manga*, represents the following factor that has played a tremendous influence in shaping Nippon's attitude towards robots. Created in the 1950s by Osamu Tezuka, known as the godfather of anime and manga, Astro Boy or Tetsuwan Atomu is a robotic hero boy, with supernatural powers – he can fly, speak around 60 foreign languages and detect whether a person is good or bad.

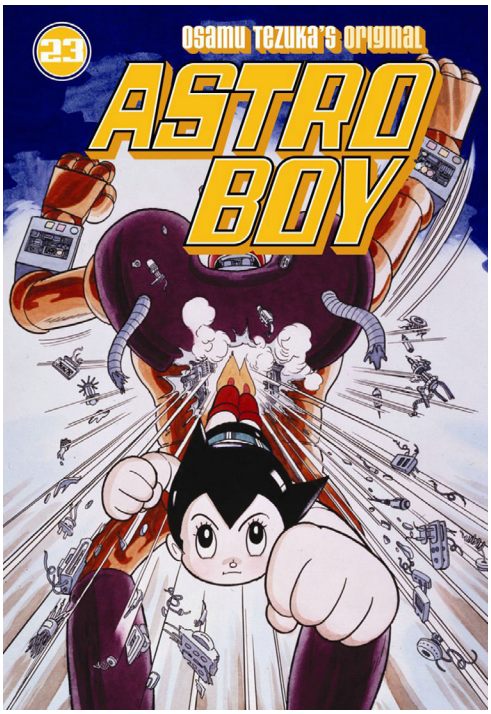
Even though he resembles the appearance of a young boy, his superpowers are gifted by the most modern technology. This hero, who continuously fights to protect humanity from evil, is powered by an atomic reactor in his chest and by a computer for a brain. The cultural icon symbolises the peaceful use of nuclear energy and manga and anime's narration explore the latent utopian usage of nuclear power, which now is used to bring peace, rather than to destroy.

The series enjoyed huge popularity and shaped the mentality of a young generation living in a Japan shocked and devastated by the effects of the Second World War and which were enduring hardship and deprivations without precedent. Besides living at a time when food, fuel, and money were scarce, the nation struggled with severe post-war trauma and depression. In this context, anime and manga were born to heal and to help the Japanese people spiritually to be reborn and to fight for rebuilding what was at that time a shattered country.

[11] KITANO, N.: Rinri: An Incitement towards the Existence of Robots in Japanese Society. In *International Review of Information Ethics*, 2006, Vol. 6, No. 12, p. 81. [online]. [2019-02-11]. Available at: <http://www.i-r-i-e.net/inhalt/006/006_full.pdf>.

The appearance of Astro Boy marked the development and spread of popularity for mecha anime (robot anime), with robot protagonists, such as „Gundam“, „Evangelion“, „Mazinger“ or „Ultraman“.

All these productions enjoyed national and international recognition and played an interactive role in reshaping Japan's culture and society. Moreover, robots were depicted as characters with their distinct personality, not only inorganic lifeless machines, with their sole purpose to serve humans unquestionably.



Picture 3: *„Astro Boy“ Vol. 1 by Osamu Tezuka, 1952.*
Source: „Astro Boy“ Vol. 1 by Osamu Tezuka, 1952. [online]. [2019-02-19]. Available at: <https://ro.pinterest.com/pin/456411743457994889/?lp=true>.

Picture 4: *Terminator (1986) – official poster.*
Source: Terminator (1986) – official poster. [online]. [2019-02-19]. Available at: <https://www.imdb.com/title/tt0088247/>.

Therefore, this is a country where children grew up being intensively exposed to anime and manga picturing robot heroes and successful human-robot teams, which were envisioned as fighting for humanity's future, good and peace, robots that were our allies, friends, and supporters, and did not represent any danger or threat, like other enemies.

One can also assume that the presence of robots in Japanese popular culture had a compensatory role and fuelled the imagination of a largely and still impoverished nation, by giving it hope and smiles.

Manga and anime educated the conscience of nowadays' Japan, which exhibits a genuine fondness for robots. Japanese people do not feel the same social anxiety when they encounter robots or the idea of robots, unlike Americans or other Westerners.

In American popular culture, Terminator symbolised the stereotypical image of robots and contributed to strengthening the apocalyptical fear of Westerners for robots. Similarly, the story of doctor Frankenstein, first published in 1818, by Mary Shelley, illustrates how the creation of a fictional scientist, who sewed together a corpse, comes to life and turns evil.

The futuristic scenario of a crushed utopia where initially machines, which initially served humans rebelled and enslaved their creators is very frequent, and this explains to a certain measure the antipathy and the anxiety felt by a vast majority of the western public when coming in contact with robots or the idea of a robot. The western attitude towards robots has roots in the recurrent negative cinematic depictions and their ramifications in popular culture.

Hence, in the Western conception, creating robots is associated with defying the divine, which is prone to be severely punished, and this ideological, cultural, and social environment bred an early form of robophia. Terminator is the marking point of the critical Western dystopia and the human extinction, where machines have crushed humans, whereas Astro Boy can be considered the genesis point of the Japanese utopia, the alternative solution for progress, and universal peace, all in the universe of robots.

This is how two strikingly different settings of popular culture trigger reflexive, ideological and cultural specific responses from two nations, displaying unique and peculiar mentalities, but sharing the same robotised near future.

5. Conclusion

In the context of a society's continuing struggle with globalisation and robotisation, humanity needs to reconsider AI with its multiple and varied representations, not only from a scientific and engineering perspective, but also from a cultural, ethical, and social one, addressing their inclusion, adaptation, and communication with their human counterparts.

On one hand, given the broadness of the selected topic, the present research has not addressed in detail some aspects, such as robot rights, rights and issues of using robots under certain circumstances, technical problems etc. On the other hand, the study focused on underlining aspects such as ethics and communication of AI in a multicultural and complex environment and explored in a comparative analysis the dual and antithetic attitudes towards robots in the West (America) and the East (Japan).

The immense power of AI can no longer be ignored, but the one problematic issue that arises is not technological, but instead is that of a social, moral, ethical, and communicational nature: reaching a consensus and harmony in the human-robot relationship seems to be the biggest challenge.

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