Journal of Data Applications
Issue: 1, 2023
E-ISSN: 2980-3357

İSTANBUL UNIVERSITY PRESS

RESEARCH ARTICLE

The Ethical Dimension of Artificial Intelligence

Gökçe KARAHAN ADALI[1]

ABSTRACT

Artificial Intelligence (AI) is based on technologies that have the potential to dramatically enhance productivity and ,-facilitate decision processes for decision makers. AI influences almost every aspect of our lives. However, when this potential for AI is accepted, not only technical but also ethical consequences are inevitable. Technology always brings benefits and risks. AI has the same benefits and risks. An innovative and significant aspect of AI is machine ethics. The creation of a machine that abides by the standards specified in a perfect ethical framework is the ultimate objective of machine ethics. These concepts serve as a guide for the potential course of action. The spread of artificial intelligence applications, which have been used in many areas, has caused ethical dilemmas and some concerns. Studies have have started to keep the behavior of intelligent machines under control and to put them intoto a certain framework. This article aims to provide an overview of artificial intelligence, a high-level conceptual treatment of the subject by introducing fundamental ideas, and to outline strategies, and key themes in AI ethics. This study provides an insight into the critical debate on the ethical use of AI. Some key ethical issues identified in this paper include the legal identity of autonomous machines, the legal problems arising from AI, and the solution proposals with application examples.

Keywords: Artificial Intelligence, Artificial Intelligence Ethics, Machine Ethics, Bias

DOI: 10.26650/JODA.1253475

[1]Halic University, Istanbul, Turkiye

ORCID: G.K.A. 0000-0001-8567-4626

Corresponding author:
Gökçe KARAHAN ADALI,
Halic University, Istanbul, Turkiye
E-mail: gokceadali@halic.edu.tr

Submitted: 20.02.2023
Revision Requested: 21.03.2023
Last Revision Received: 31.03.2023
Accepted: 02.04.2023

Citation: Karahan Adali, G. (2023). The ethical dimension of artificial intelligence. *Journal of Data Applications, 1*, 35-48. https://doi.org/10.26650/JODA.1253475

Introduction

The interaction of people with society has continued its existence by taking on different silhouettes since the existence of humanity. Machine learning and automation are deeply integrated into all aspects of our lives and work. Through the development of technology, it has become inevitable to come across artificial intelligence (AI) and its applications, which have taken their place in almost every aspect of our daily flow to make our lives easier. It takes place in our daily lives among voice assistants, language translations, suggestion systems, navigation applications that take you to your destination as fast as possible, social security systems that are authorized to allow login by an identified ID, voice, or face-id. There are also purchase forecasters with algorithms that recommend products to buy and assistant robot applications in customer services that answer your calls. It has been observed that these applications are widely used in many areas that you can think of, from smart home systems to driverless vehicles.

The potential of AI to improve itself by learning only through the examples presented to them and the successes achieved in this direction have led to concerns about whether intelligent systems will begin to act against human control over time. For this reason, studies have been started in this area to keep the behavior of intelligent machines under control and to put them into a certain framework.

The main aim of this article is to provide a high-level conceptual treatment of the subject by introducing fundamental ideas, outlining strategies, and key themes in AI ethics. This study tries to provide insight into the critical debate on the ethical use of AI. The legal identity of autonomous machines, the legal problems arising from artificial intelligence, the solution proposals and application examples in this field, can be counted among these titles.

Artificial Intelligence

The concept of AI was first introduced to computer science by John McCarthy in 1955 at a conference held at Dartmouth College in New Hampshire. John McCarthy, Martin Minsky (founder of the MIT AI Laboratory), Claude Shannon (IBM), Allen Newell (the first president of the USA Artificial Intelligence Association), and Herbert Simon (a Nobel Prize-winning economist), attended this meeting and , suggested investigating the possibility of realizing the development of intelligent computers. With the proposal in question, the work to be carried out in artificial intelligence gained momentum.

AI is described as the intelligent actions of a machine, such as reasoning, learning, communicating, etc. It is one of the most contentious topics of today. The basic goal of artificial intelligence research is to create a machine that is sentient, capable of thought, and morally

compatible in a manner akin to humans. In this regard, it is vital to incorporate artificial ethics to prevent harm to both humans and other living things if artificial intelligence systems have the capacity to think and become conscious.

Since the use of artificial intelligence applications has spread to various fields over time, artificial intelligence has taken on an umbrella identity that includes sub-disciplines in terms of structure. The sub-disciplines include machine learning and data mining, robotics, expert systems, fuzzy logic, natural language processing, machine vision and optimization (Özen, 2021). On the other side, the study of good and evil, as well as how they relate to morality and human behavior, is called ethics. A unique concept in abstract terms, ethics is an idea, structure, or model of thought and conduct having a flexible scope and substance. The explanation is that morality, good and evil, and models of human behavior are all notions that change across time and space rather than being fixed, inflexible, or static (Robles Carillo, 2020).

Artificial intelligence ethics is a field that has emerged as a response to the growing concern regarding the impact of AI. Today, artificial intelligence has been accepted as one of the most important research and areas of interest that shape the future of humanity. Just like every rapid technological development, this unstoppable and rapid rise of artificial intelligence has also led to various concerns and problems for human beings, who often have problems in keeping up with technological changes. The potential of artificial intelligence to improve itself by learning only from the examples presented to them and the successes achieved in this direction have caused concerns about whether intelligent systems will start to act against human control over time (Köse, 2018).

Therefore, to control the behavior of intelligent machines and to maintain the ethical dimension of artificial intelligence, studies have been started in this area. The legal identity of autonomous machines, legal problems arising from artificial intelligence and solution proposals in this field and practice proposals can be presented among these titles. Human beings have been in interaction with their environment throughout history. More precisely, man has tried to become the subject of the world he was born into, to change and transform it in line with his own wishes, desires and often ambitions. This effort has sometimes been in the form of taking steps that may be beneficial for humanity, and sometimes it has led to the disaster of humanity. However, in any case, humanity adds something new to its own history with every step it takes.

Although every invention made and every new step taken causes pain from time to time, in general terms and in the integrity of time, it has facilitated the development of humanity, the shaping of social structures, the establishment of systems, and the civilization of people (Çelebi, 2018). AI has come to the stage of being a decision maker on its own, rather than being in interaction with human beings. At this point, even the decisions made by human

beings are questioned in an ethical framework, while the decisions made or to be made by a machine open a window to brand new and never-ending discussions.

Literature Review

According to John Mc McCarthy who is considered as one of the founding fathers of the AI discipline, expressed AI as "science and engineering of making intelligent machines. It is related to the similar task of using computers to understand human intelligence, but AI does not have to confine itself to methods that are biologically observable" (McCarthy, 2007). Minsky defined AI as "the science of making machines do things that would require intelligence if done by men. It requires high-level mental processes such as perceptual learning, memory, and critical thinking".

The categorization for classification of artificial intelligence was carried out by Kaplan and Haenlein according to three different working systems of artificial intelligence. These are "analytical", "human-inspired" and "humanoid" artificial intelligence (Kaplan & Haenlein, 2019). In this context, "analytical artificial intelligence" is a type of artificial intelligence that constantly updates its future data autonomously and can use this existing data flexibly by making algorithmic comments. The working principle of this type of artificial intelligence is also called "machine learning".

On the other hand, human-inspired artificial intelligence, includes elements of emotional intelligence (EQ) as well as cognitive elements (IQ) such as algorithms in decision-making processes; at least, it can use the detected external emotional data in its autonomous decisions. This technology is also called "deep learning" in the literature (Akkurt, 2019). "Humanoid artificial intelligence" is a type of artificial intelligence". For example, artificial intelligence used in weather forecasts and games such as chess and "Go" can compete with humans at a high level and is evaluated in this category. Hence it can interact autonomously with other fellows or humans, as well as having cognitive and emotional functions, and in this respect, it also displays social intelligence features. Self-driving cars, virtual assistants, military, medical, industrial robots/bots, which can act together like a social community (interactive) can be included in this category.

A study of the global AI ethics landscape concluded that at least five principle-based approaches of an ethical nature; transparency, justice and fairness, non-harmful use, responsibility, and integrity/data protection are broadly accepted as having ethical value. The study also shows that there are significant discrepancies in how these principles are understood, why they are valued, what problems, areas, or actors they apply to, as well as how they ought to be put into practice. The most prevalent principle is "transparency," which appears to have several different meanings (Jobin et al., 2019).

Larsson analyzes the unique characteristics of AI development that have caused ethical issues to take on such a prominent role. It also emphasizes the interaction with legal mechanisms for governance (Larsson, 2020). According to a study, the moral use of AI has so many tensions that cannot be easily resolved. They suggest there are some advantages to state them more clearly. Principles must be codified in standards, codes, and finally regulations to be useful in practice (Whittlestone et al., 2019).

In the study of Vakkuri et al., (2019) the keywords' classified in the field of AI to guide and provide directions to future studies. It seems to be three main variations: Even if keywords may be categorized under the well-known themes, there is a lack of various branches of AI in keywords, technology-based keywords play a minimal role, and there is a great deal of variation in how keywords are phrased. Besides, no main papers in AI ethics were acknowledged because the focus was solely on the keywords.

According to Owe and Baum, the field of artificial AI ethics should pay more attention to the values and interests of nonhumans, including other biological species, the natural environment and the AI itself. They deserve moral consideration, which means that they should be actively valued for their own sake (Owe & Baum, 2021).

Huang et al. categorise ethical theories into three branches. Meta ethics; investigate nature, normative ethics; establish moral principles and guidelines that define what is right and wrong conduct. The third branch, applied ethics, is interested in application fields like animal rights, war, etc. Human beings never apply just one ethical theory, but instead alternate between them depending on the circumstance or context. It is confirmed by the study as strict adherence to any moral doctrine can have negative effects (Hang et al., 2022).

In Kumar et al. (2023), the authors emphasize the difficulties in integrating AI on a large scale into medical systems. They give an overview of the ethical, legal, trust, and long-term consequences of AI in healthcare. They highlight that we have a responsibility to carefully consider ethical values to ensure appropriate responses and the implications of applying AI.

Adams et al. argue the ethical principles currently guiding AI ethics policy development for children and K-12 education. Artificial Intelligence in K-12 Education ethics policy must be responsive not only to the diverse abilities, cultural backgrounds, and developmental requirements of children, but also to what they are becoming as human-AIs or post-humans (Adams et al., 2023)

The Ethical Dimension of Artificial Intelligence

Robots and smart software have an increasing impact on our daily lives, and the machines that are created by us will make decisions that can have profound effects on our lives. Some

of these decisions have a moral dimension. Therefore, we need to consider whether we want them to make such decisions and, if so, how to endow machines with "moral sensibility" or "moral decision-making abilities".

We are afraid of falling behind the artificial intelligence systems that we produce with our own natural intelligence. The question that comes to mind is, as Kaku stated, although scientists produce artificial intelligence systems, are these artificial intelligence systems as natural as the biologically existing human brain? It focuses on whether it will be successful in being thoughtful and experienced (Kaku, 2016). Therefore, the focus of the studies produced in the field of artificial intelligence is to bring the artificial intelligence systems working through programming to a level that will imitate the human brain by making it like the human brain.

The human brain has the most complex structure known in the universe, consisting of billions of neurons (Taslaman, 2015). The most striking characteristic of such a complex structure is the ability to offer creative solutions based on one's own and someone else's experiences, as they have learned the non-programmable/non-imitable feature. Compared to the computer with artificial intelligence, the human brain with natural intelligence is a very complex and superior structure of the human brain. We can think of it as having a system, and it creates itself without a program. The human brain can produce a creative, fast, and new solution in the face of a new or unexpected situation (Adalı, 2017). On the other hand, the solutions that artificial intelligence can produce are limited to the solutions taught to it.

Although it is said to be limited, just like every rapid technological development, the unstoppable and rapid rise of artificial intelligence has led human beings, who often have problems keeping up with technological changes, to having various concerns and problems. The potential for self-development by learning from the examples presented and the successes achieved in this direction cause concerns about whether intelligent systems will begin to act against human control over time (Köse, 2018). Some groups, including Anderson & Anderson and Kaku, think that it would be useful to gather the ethical rules that are thought to be applied to robots under the name of machine ethics. The goal of machine ethics is to create a machine that follows an ideal ethical principle or set of principles.

To introduce the subject of machine ethics, it is necessary to mention another point. Ethics can be seen as both easy and difficult (Vakkuri et al., 2019). The reason it seems easy is that we all make generally accepted decisions based on social norms under the umbrella of ethics in our daily routine (for example, exceeding the speed limit while trying to get a patient to the hospital). On the other side, let's consider that there are many patients who need urgent intervention at the same time in the context of work and profession, and we can use an artificial intelligence-based algorithm that intervenes in this process.

In the functioning of the decision mechanism in the healthcare system, when the decision maker decides which patient should intervene, he will enter into an ethical paradox. When you treat person A, person B will left be out, and when you treat person B, person A will be left out. Therefore, even the person her/himself can be inside an ethical paradox at this decision stage. Or, let's imagine a person who helps the poor by committing a crime, and while an artificial intelligence-based judge robot should judge the person in question, this situation contains ethical contradictions (Köse, 2018).

Therefore, it is necessary to integrate ethically correct and critical decisions into artificial intelligence-based robots against these paradoxical situations. According to the World Health Organization (WHO), health systems, and public health organizations should regularly publish information about the decision-making process that has gone into adopting AI technology, how it will be evaluated going forward, as well as its applications, known drawbacks, and the decision -making role (WHO, 2021). However, this does not mean that we are all experts in ethics. Ethics is a field that requires a lot of study and experience. Machine ethics is also an interdisciplinary field by nature (Anderson & Anderson, 2007).

There are three different approaches in the literature to teaching ethical values that can be applied to artificial intelligence. The first one is the determination of rules containing moral values or the teaching of normative moral rules that can be taken from traditional moral philosophy to the machine through algorithms. These normative rules should be chosen in such a way that there is no space for uncertainty and controversy for the behaviour of the robot. Utilitarian and duty-based morality can be used as examples of traditional thought. The other approach is for the machine to grasp right and wrong on its own, without any externally dictated set of rules.

There are examples of this approach, such as using evolutionary algorithms, such as genetic algorithms, or adapting game theory for moral actions. There is also a third approach in the literature that proposes the use of combining these two approaches. In this approach, the machine should first start with a set of rules and use it by changing over time (Wallach & Allen, 2009). Artificial intelligence-based algorithms developed to date are not considered a threat if they are under human control. However, recently, there are those who think that it has started to pose a threat to humanity, and there are differences of opinion because of dilemmas over this issue.

There are different opinions by the centreres that can be considered as authorities on how the use of artificial intelligence should be carried out within the framework of the proposed laws and the ethical rules. To list some of them: Joseph Weizenbaum, the creator of the ELIZA[1]

[1] ELIZA is a program which makes natural language conversation with a computer possible (Weizenbaum, 1996).

program, is seen as an advocate of the restrictive use of artificial intelligence. He claimed that some tasks, such as nursing or adjudicating, should never be done by artificial intelligence, and that these professions need compassion and intuition, and according to him that machines could not achieve these qualities.

Weizenbaum argued that the human brain is much more than a brain and that a simple copying of the brain could never achieve realistic human behavior. Pamela McCorduck, an American author interested in the history and philosophical significance of artificial intelligence, stated that she would take a chance with an impartial computer, unlike Weizenbaums, on why computers should not be judges. A properly programmed computer should be neutral towards minority issues such as gender, that people may be prejudiced against. Ben Schneiderman argues that how to assign responsibility to autonomous systems should be followed closely and repeated with plenty of examples of how to do it. The underlying logic is learning by feeding from the training set of autonomous systems.

It proposes a step-by-step approach, in which people initially monitor the system intensively and as they gain confidence in the system, the monitoring is reduced (Schulze, 2012). The famous trolley problem, created by the moral philosopher Philippa Foot, would be the best example of this situation. The problem is a collection of ethical and psychological thought experiments that simulate ethical decisions on whether to sacrifice one person to save more people. A runaway train or trolley is on course to hit and kill several people (often five) down the track, but a driver or bystander can intervene and reroute the vehicle to kill just one person on a different track. This is how most episodes of the series start. Then, different iterations of the runaway car are presented, along with comparable life-and-death situations (medical, legal, etc.). In each case, there is a choice between doing nothing, in which case several people will perish, and intervening and sacrificing one initially "safe" person to save the others. Most people prefer to save the others. This morality is a product of "teleological ethics". What is this teleological ethics? Moral theories that argue what determines the value of moral action is the result produced by the action. However, teleological ethics, including the phenomenon of social utilitarianism, is based on the basis that the criterion of goodness is to make the maximum number of people happy. Rather than watching four people die, it is preferable to intervene in the system and let another innocent person die. The reason for this is that the basic decision unit of our choice is utility. Rather than saving one life, people are in favour of providing maximum benefit by saving four lives.

At this point, the question that comes to mind is: Will robots behave like humans, and most thinkers answer that they cannot think like humans in instant and intuitive decisions. When we look at the trolley example, if the robot thinks like a human, a situation arises that contradicts Asimov's three robot laws. In contrast to this law, which is based on the principle that a robot

can never harm a human, the robot has harmed a human being, and with the decision it has made, it has changed the fate of an innocent human being who will not die.

It is possible to encounter similar studies on the "Moral Machine" Platform developed by the Massachusetts Institute of Technology (MIT). Visitors to the "Moral Machine" website are asked to decide, through an autonomous system, what to do when faced with certain scenarios (moralmachine.net, 2022). An online test leaves you with some moral dilemmas over driving behaviour. It compares your decisions against the answers given by others and is also accumulated to train autonomous machines.

For example, if a driverless car is forced to harm pedestrians, it would sacrifice two children to save three adults. Could it ? Could it sacrifice an old man to save a pregnant woman? As AI development progresses, experts have managed to figure out the best way to give an AI system an ethical or moral backbone. The basic idea aims to teach artificial intelligence behaviours because of the decisions taken by the average person. In these and similar cases, when the decision mechanism is human, it does not cause much speculation, but when a robot gets involved, it drags different questions and situations behind it. Based on the experiences of people, we need to integrate artificial ethics into artificial intelligence to minimise the damage when faced with this and similar critical situations.

There are participants from more than 200 nations, and the website gathered nearly 40 billion decisions. The findings show that visitors from various nations or areas frequently have diverse moral standards. Three geographical groups with distinct decision-making inclinations can be used to categorise countries. For instance, Eastern nations had the lowest propensity to preserve the young at the expense of the elderly, Southern nations preferred to save women, while Western nations had the highest propensity for inaction. Also there were observable values divergences between two nations related to variations in decision-making. People from nations with more economic disparity, for instance, were more inclined to protect the wealthy. In contrast to the conventional view of morality as a sharp distinction between right and wrong, this study demonstrates how cultural norms can shift the line (Awad et al., 2018).

Bias in Artificial Intelligence

A controversial ethical and well-observed issue for AI is bias. Bias can be defined statistically and socially. In terms of statistics, bias describes situations where a dataset's distribution does not accurately reflect the true distribution of the population. On the contrary, social bias refers to inequality that may lead to less desirable outcomes for specific groups of the human population (Norori et al., 2021). Statistically, bias refers to cases in which the distribution of a given dataset is not reflecting the true distribution of the population. Social bias, by contrast, refers to inequalities that may result in suboptimal outcomes for given groups of the human population.

According to Kartal's study, the numerous types of bias that appear in AI are categorized in various ways in the literature like systematic bias, human based bias, algorithmic bias. When we examine factors that lead AI systems to make biased decisions; data collecting, data set construction, and data preprocessing are the three types of them. (Kartal, 2002). These systems are built of data and the systems are influenced by the data they are fed (Carter et al., 2020). For example, a hiring algorithm, due to the high levels of predictive accuracy, an AI system can predict the likelihood of depression by simply analyzing the candidate's social media before symptoms appear.

The system can predict the probability of a potential candidate becoming pregnant or select a highly aggressive person to fit a corporate culture. This and similar examples can prove that hidden bias is also an important ethical problem in recruitment. Therefore, transparency is an important issue. The more powerful a predictive system is, the less transparent it becomes (Tüfekci, 2016). Building customer trust in and acceptance of AI-enabled products depends on effectively incorporating ethical concepts into these products and making sure that the user and the product are on the same ethical page (Due & Xie, 2021).

Biases are frequently determined by who funds and develops AI technology. AI-based technologies have historically been created by a single demographic group and gender. Thus, the first versions of the Apple Health Kit, which allowed specialized monitoring of some health risks, lacked a menstrual cycle tracker, possibly due to the lack of women on the development team. (WHO, 2021).

Artificial Intelligence and Responsibility Debates

By the production and use of artificial intelligence for many purposes, the possibility of harmful consequences from interactions with humans becomes inevitable day by day. In this context, artificial intelligence may violate personal values such as life, bodily integrity, health, privacy, personal data, honouur, and dignity because of autonomous decisions and behaviouurs, as well as cause moral and material damage as a result of some ethical and economic mistakes. For example, the fact that artificial intelligence for military purposes, especially robotics, terminates the right to life or harms health and/or bodily integrity, is one of the issues that has been discussed a lot in recent years.

The same risk is valid for the examples of artificial intelligence for automotive purposes as well as for the example of self-driving cars causing traffic accidents due to their wrong decisions. In the case of deciphering personal data by artificial intelligence used in the shopping or banking sector, violation of personal rights and moral/economic (material) damages to a large extent may occur (Akkurt, 2019).

These and similar unfortunate situations have recalled the questions of who will be responsible if you have an autonomous vehicle or an autonomous device with artificial

intelligence that moves with taught algorithms and makes a wrong decision due to a malfunction. We as the owner of the vehicle? The company that programmed the vehicle? Or the artificial intelligence product that commands the vehicle? Of course, many more can be derived from these questions, some of which are highly speculative and exaggerated. These are the law issues that will probably start to matter more and more. An increase in product liability claims is possible in the future. Such regulations are already starting to be passed in some USA states (Stout, 2022). In this instance, the manufacturer may occasionally be considered as the "driver." It is argued that by producing a successful moral algorithm in response to each question, behavioral patterns that can satisfy the majority can be developed.

The Legal Position of Artificial Intelligence

The long-standing development of robots and artificial intelligence continues today. Their increasing use in social life brings with it some legal problems. These problems are linked to various branches of law. For instance, in terms of the effects of robots used in the online environment in electronic commerce, Electronic Trade Law. In case the data excavated by "crawling" is personal data, Personal Data Protection Law. Criminal Law and Liability Law in terms of accidents involving autonomous vehicles; Law of Obligations in terms of automatic trading bots that enter a contractual relationship on the internet; in terms of analysing and influencing voter behaviouur through robots in the online environment.

Personality Recognition for Artificial Intelligence

The legal personality of artificial intelligence is important in terms of determining the liability issue. Whether abstract elements such as artificial intelligence can have abilities such as will, consciousness, logic and thinking are both philosophical and legal questions (Çetin, 2019). There are some opinions and/or suggestions in the doctrine about the legal position of artificial intelligence. These are generally listed as "goods", "slave", "legal person" and "electronic person" approaches. Legal systems, taking into account some realities of daily life, have given personality to some beings other than humans; For example, some individuals or groups of goods have been accepted as people. These structures, called legal people, refer to entities that have the title of person, apart from the real person.

Legal systems have accepted that these assets also have a a legal capacity. According to this view, it may be plausible to model the "company" structure for intelligent software. Since companies have similarly scattered and complex activities, a registry system has been developed to overcome this problem. Autonomous robots can also be registered in such a registry system and even their assets can be introduced; in difficult situations. It is emphasised that the damages can be collected from this pool. It is claimed that this pool of money can be created by the stakeholders who will use the system. The "Electronic Person" approach

for advanced autonomous robots was introduced by the European Parliament's Legal Affairs Commission in the Report with Recommendations to the Commission on Civil Law Rules on Robotics dated January 27, 2017. According to this idea, it is argued that a system includes various parties, such as the user, manufacturer and seller and would be especially beneficial in terms of liability. Similarly, in this approach, it is envisaged to design a system similar to a commercial registry system in which artificial elements such as robots are registered in an official registry. Then they will become a personality as soon as they are registered, and be able to apply for the funds allocated to robots under the responsibility of compensation.

Discussion and Conclusion

Machine ethics is a new and important dimension of AI. The goal of machine ethics is to create a machine that follows the rules established in an ideal ethical framework. These principles guide the possible actions that are taken. AI needs to be a part of human development to help increase human creativity and create a collaborative culture. There is a consensus on social norms or ethical principles that AI should now follow. However, different solutions are increasing day by day. Countries have accelerated their work in this area and started to publish artificial intelligence strategies. However, until ethics becomes a vital part of human behaviour, it is more than just autonomous machines produced with artificial intelligence technologies. It would be unfair to expect them to always remain faithful to ethical behaviour.

The general opinion is that artificial morality should be integrated into machines. For this, the machine will need to be trained with exemplary behaviour. It should be considered not only by ethics committees or research departments of future practice, but also by the government, industry, international institutes and institutions at the initial stage. To create and maintain an artificial intelligence-friendly environment, a culture of responsibility needs to be developed on a global scale (Pavaloiu & Köse, 2017).

Ethics Committee Approval: Authors declared that this study does not require ethics committee approval.

Peer Review: Externally peer-reviewed.

Conflict of Interest: The authors have no conflict of interest to declare.

Grant Support: The authors declared that this study has received no financial support.

References

Adams, C., Pente, P., Lemermeyer, G., & Rockwell, G. (2023). Ethical principles for artificial intelligence in K-12 education. *Computers and Education: Artificial Intelligence*, *4*(April 2022), 100131. https://doi.org/10.1016/j.caeai.2023.100131

Adalı, E. (2017). Yapay Zekâ, İTÜ Vakfı Dergisi, Ocak-Mart 2017 (75), s.8-13.

Akkurt, S. (2019). Yapay Zekânın Otonom Davranışlarından Kaynaklanan Hukukî Sorumluluk, Uyuşmazlık Mahkemesi Dergisi, 0(13), s.39-59.

Anderson, M. & Anderson S. (2007). Machine Ethics: Creating an Ethical Intelligent Agent, AI Magazine, 28(4), s.15-26.

Carter, S. M., Rogers, W., Win, K. T., Frazer, H., Richards, B., & Houssami, N. (2020). The ethical, legal and social implications of using artificial intelligence systems in breast cancer care. *Breast*, *49*, 25–32. https://doi.org/10.1016/j.breast.2019.10.001

Çelebi, Ö. G. (2018). Tarih Öncesi Dönemlerde İletişim, Üsküdar Üniversitesi İletişim Fakültesi Akademik Dergisi, 2, s.142-156.

Çetin, S. (2019). Yapay Zekâ ve Hukuk ile İlgili Güncel Tartışmalar. İstanbul, Ankara ve İzmir Baroları Çalıştay Raporu.

Du, S., & Xie, C. (2021). Paradoxes of artificial intelligence in consumer markets: Ethical challenges and opportunities. *Journal of Business Research*, *129*(February 2019), 961–974. https://doi.org/10.1016/j.jbusres.2020.08.024

European Parliament, (2017, January). Report with Recommendations to The Commission on Civil Law Rules on Robotics.http://www.europarl.europa.eu/doceo/document/A-8-2017-0005_EN.html.

Huang, C., Zhang, Z., Mao, B., & Yao, X. (2022). An Overview of Artificial Intelligence Ethics. *IEEE Transactions on Artificial Intelligence*, *PP*, 1–21. https://doi.org/10.1109/TAI.2022.3194503

Kaku, M. (2016). Geleceğin Fiziği. (Çev. Yasemin Saraç Oymak & Hüseyin Oymak). Ankara: ODTÜ Geliştirme Vakfı Yayıncılık.

Kaplan, A., Haenlein, M. (2018). Siri, Siri in my Hand, who's the Fairest in the Land? On the Interpretations, Illustrations and Implications of Artificial Intelligence, Business Horizons, 32(1), s.15-25.

Kartal, E. (2022). A Comprehensive Study on Bias in Artificial Intelligence Systems. *International Journal of Intelligent Information Technologies*, *18*(1), 1–23. https://doi.org/10.4018/ijiit.309582

Kumar, P., Chauhan, S., & Awasthi, L. K. (2023). Artificial Intelligence in Healthcare: Review, Ethics, Trust Challenges & Future Research Directions. *Engineering Applications of Artificial Intelligence*, *120*(May 2022), 105894. https://doi.org/10.1016/j.engappai.2023.105894

Köse, U. (2018). Güvenli Yapay Zekâ Sistemleri İçin Denetimli Bir Model Geliştirilmesi, Mühendislik Bilimleri ve Tasarım Dergisi, 6(1), s.93-107.

Larsson, S. (2020). On the Governance of Artificial Intelligence through Ethics Guidelines. Asian Journal of Law and Society, 7(3), 437-451. doi:10.1017/als.2020.19

McCarthy J. (2007, November 12). *What Is Artıfıcıal Intellıgence?* Retrieved January 2023, from http://jmc.stanford.edu/articles/whatisai/whatisai.pdf.

Moralmachine.net. (2022). https://www.moralmachine.net/

Norori, N., Hu, Q., Aellen, F. M., Faraci, F. D., & Tzovara, A. (2021). Addressing bias in big data and AI for health care: A call for open science. *Patterns*, *2*(10), 100347. https://doi.org/10.1016/j.patter.2021.100347

Owe, A., & Baum, S. D. (2021). Moral consideration of nonhumans in the ethics of artificial intelligence. *AI and Ethics*, *1*(4), 517–528. https://doi.org/10.1007/s43681-021-00065-0

Özen, Z. (2021). Güncel Bilişim Teknolojileri. In N. Bozbuğa & S. Gülseçen (Eds.), Tıp Bilişimi (pp. 335–349). Istanbul University Press. https://doi.org/10.26650/B/ET07.2021.003.17.

Pavaloiu, A. & Köse, U. (2017) Ethical Artificial Intelligence - An Open Question, Journal of Multidisciplinary Developments. 2(2), s.15-27.

Robles Carrillo, M. (2020). Artificial intelligence: From ethics to law. *Telecommunications Policy*, *44*(6), 101937. https://doi.org/10.1016/j.telpol.2020.101937

Schulze, C. (2012). Ethics and AI. University of Maryland. Retrieved December 12, 2022, from https://www.cs.umd.edu/class/ fall2012/cmsc828d/oldreportfiles/schulze1.pdf.

Stout, H. (2022, October 28). What Happens When Self-Driving Cars Crash? The Legal Ramifications of Automation. Entrepreneur. https://www.entrepreneur.com/living/what-happens-when-self-driving-cars-crash-the-rise-of/436942

Taslaman, C. (2015). Modern Bilim, Felsefe ve Tanrı. 10.Basım. İstanbul: İstanbul Yayınevi.

Tüfekci, (2016, June 1). Machine Intelligence makes human morals more important.TED.https://www.ted.com/talks/zeynep_tufekci_machine_intelligence_makes_human_morals_more_important.

V. Vakkuri and P. Abrahamsson. (2019). "The Key Concepts of Ethics of Artificial Intelligence," *2018 IEEE International Conference on Engineering, Technology and Innovation (ICE/ITMC)*, Stuttgart, Germany, 2018, pp. 1-6, doi: 10.1109/ICE.2018.8436265.

Wallach, W. & Allen, C. (2009). Moral Machines: Teaching Robots Right from Wrong. Oxford Press.

Weizenbaum, J. (1966). ELIZA-A computer program for the study of natural language communication between man and machine. *Communications of the ACM*, *9*(1), 36–45. https://doi.org/10.1145/365153.365168

Whittlestone, J., Nyrup, R., Alexandrova, A., & Cave, S. (2019). The role and limits of principles in AI ethics: towards a focus on tensions. In Proceedings of the 2019 AAAI/ACM Conference on AI, Ethics, and Society (pp. 195-200).

WHO. (2021). Ethics and Governance of Artificial Intelligence for Health: WHO guidance. In World Health Organization. http://apps.who.int/bookorders.