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Review Article

Ethical Considerations for Using Artificial Intelligence in Digital Technologies

William Jorgensen*, **Matt Bjornsen**, **Rikke Carlsen**

Department of Applied AI and Data Science, The Maersk Mc-Kinney Moller Institute, University of Southern Denmark, Denmark.

Corresponding Author: William Jorgensen, Department of Applied AI and Data Science, The Maersk Mc-Kinney Moller Institute, University of Southern Denmark, Denmark. E-mail: Willijorge@hotmail.com

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Abstract

Introduction: The widespread penetration of artificial intelligence technology in various aspects of human life raises major concerns regarding the degree to which these technologies adhere to ethical standards. Therefore, the aim of the present study is to identify key ethical concepts for using artificial intelligence in digital technologies.
Material and Methods: In the present study, a literature review was used as a research methodology. Articles published in the field of ethics and artificial intelligence were examined.
Conclusion: Based on the review of the existing literature, ethical considerations of digital ethics, including: human dignity, safety, sustainability, understandability, responsibility, self-organization, promotion of happiness and well-being, cohesion and solidarity, democratic participation, fairness, diversity, privacy, security, regulatory-supervisory effect, financial-economic effect, and individual-social effect, were raised, which should be considered in the use of artificial intelligence.
Keywords: *Ethics, Artificial Intelligence, Digital Technologies, Flourishing Ethics*

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INTRODUCTION

The digital revolution has led to a re-ontology of the world [1]. In particular, the separation of related concepts such as "ownership", "location", "presence" and "use" can be seen as a result of the merging of virtual and physical realities, following the emergence and emergence of digital technologies [2]. Digital technologies have also dominated various areas of human life, including health supply chains, healthcare, energy networks, online banking, agriculture, food preparation and distribution, etc. On the other hand, the combination of artificial intelligence with digital technologies in the era of the second machine has caused enormous changes in society [3]. Artificial intelligence enables machines to perform cognitive tasks that were previously the responsibility of humans with high accuracy, while minimizing or even eliminating the human role. In the last decade, significant advances in machine learning have created the impression that artificial intelligence systems can eventually reach the level of human performance. Although we are far from this achievement, technological leaps in machine learning have crossed the threshold; In a way that can have a huge economic impact. Algorithms designed in laboratories, which are the basis of AI, are rapidly moving beyond the laboratory space and are being established at the societal level, in areas

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such as health, transportation, industrial production, agriculture, education, economics, etc. Such a level of expansion and deployment of AI has reinforced the fact that these algorithms have both positive and negative social effects. For example, hidden biases in data and algorithms can lead to greater discrimination at the societal level. At its simplest, an imbalance in the data input to a machine can have such an outcome. For example, facial recognition algorithms perform poorly on gender and racial minorities [4]. If AI algorithms are poorly designed, humans lose their agency and instead of AI serving humans, humans become responsible for meeting AI's needs and serving it [5]. Another negative impact of the development of AI is the massive volume of cybercrime related to hacking and abuse of big data, which affects millions of users by violating privacy [6]. Of course, the scope of concerns goes far beyond the immediate effects of AI on individuals. AI can affect the processes and structures on which society relies. For example, there is evidence that AI can be used to exert political influence and distort elections by targeting audiences with misleading messages [7]. Also, with the automation of jobs due to the spread of AI, major concerns have arisen about human unemployment. Large multinational companies are also using AI to dominate the market and completely monopolize the sources of wealth and power; which can have dangerous consequences such as uncontrolled political influence on the global community [8]. Beyond all hidden biases, given the high impact potential of research in the field of artificial intelligence and machine learning, the question always arises whether experts, when developing their tools and programs, think about providing the greatest benefits to humans and society. This is exactly where ethics and moral values come into play. Therefore, in the present study, an attempt was made to discuss and examine the ethical considerations of using artificial intelligence in digital technologies.

MATERIAL AND METHODS

In this study, a literature review was used as the research methodology. Articles published in the fields of ethics and artificial intelligence in the two databases "Elsevier" and "Science Direct" between 2015 and 2025 were examined.

DISCUSSION

Ethics and Digital Technology

Ethics studies have a rich history dating back to the time of ancient philosophers. Today, "ethics" is a concept that is the subject of much debate and controversy in various scientific fields, especially new technologies. Theories related to this concept, under the title of "ethical theories," generally seek to answer this important question: "What makes one action morally better or worse than another?" [9]. "Consequentialism" and "deontology" are among the most prominent ethical theories that are very helpful in answering the above question because they provide us with rules for evaluating the moral quality of an action. Theories of ethical consequentialism focus on the results of action. The various approaches to utilitarianism of Jeremy Bentham [10] and John Stuart Mill [11] are among the most prominent examples in this field. The core of the aforementioned approaches is that, at least in theory, the sum of the desirability and dis-desirability of a particular action can be calculated. The action option that has the highest net utility (utility minus disutility) will be the morally best option. On the other hand, "moral deontology" is based on the principle that the basis for the moral evaluation of an action is the duty of the agent performing that action. The most prominent representative of this theoretical approach is Kant. He says: "Act only on the basis of a rule by which you can at the same time wish that the rule be universal" [12]. According to this

approach, agents of action can no longer consider themselves exempt from performing duties and make it appear logical and rational. What is notable in such an approach to ethics is its lack of immediate attention to the consequences of action and its focus on the motivation for performing the action.

The application of ethical theories to specific application areas has led to discourses rich in concepts such as computer ethics [13-15], information ethics [16,17], and technology ethics [18]. The focus of the virtue ethics approach is not to evaluate the predicted outcomes of an individual action or their intentions, but to guide individuals in order to help them develop a virtuous personality [19]. According to McIntyre [20], virtue ethics as a guide to how to live has been re-examined since the late twentieth century, and many efforts have been made to situate it in the context of modern society. Terry Bynum is one of the researchers who has succeeded in translating the old principles of virtue ethics into the language of a society saturated with modern technologies. For this purpose, he uses a concept called "thriving ethics" that has its roots in Aristotle's ideas and emphasizes its development in the context of modern technologies [21]. The key principles of flourishing ethics are:

1. Human flourishing is the center of ethics.
2. Man, as a social animal, can flourish only in society.
3. Flourishing requires that man do what he is specially equipped to do.
4. Man must acquire true knowledge through theoretical reasoning; then, through practical reasoning, act independently and fairly in order to flourish.
5. The key to very good practical reasoning, and consequently morality, is the ability to reflect on goals, weigh them, and then choose a wise course of action.

Bynum [22] believes that virtue ethics is related to ethical considerations of information technology and can be found in the ideas of Norbert Wiener [23], one of the founders of digital technologies. Much research has been done to explore how virtue ethics can be applied to technology and how we can live a virtuous life in a technology-based society. Bynum believes that people have different skills and strengths. Flourishing involves excellence in the pursuit of goals. That is, there are as many paths to flourishing as there are skills. Thus, flourishing is not a single concept, but rather a clothing that can be measured on each person depending on the type of skill and the degree of persistence in pursuing goals [21]. Flourishing ethics is part of the tradition of virtue ethics that has historical roots in Aristotelian ethics. In order to understand how flourishing works in practice, it can be helpful to look at other situations that aim to promote human flourishing. "Critical Theory of Technology", "Capability Theory" and "Responsible Research and Innovation Theory" are three positions that have emerged as a result of technological research and development and have gained great importance. Critical Theory of Technology is one of the theories related to artificial intelligence that seeks human flourishing. Andrew Feinberg's research [24] is probably the best-known example of the use of critical theory to study modern technologies. In addition, critical theory in the field of information systems has used other theoretical traditions such as the postcolonial approach [25] and postmodernism [26]. According to Stahl [27], the central core of all critical theories is "emancipation". The meaning of emancipation in critical research is that this research should not remain at the level of description, but should actually promote emancipation [28]. Myers and Klein [29] believe that emancipation facilitates the realization of human needs and talents, critical self-reflection and, subsequently, self-transformation.

Therefore, it has a close relationship with the principle of human flourishing. The second theoretical position worth highlighting in the field of human flourishing is capability theory. This theory has its roots in philosophy and economics and is influenced by the views of Amartya Sen [30] and Martha Nussbaum [31]. It also has a direct connection with the Aristotelian concept of flourishing and the ethics of artificial intelligence [32]. The aforementioned approach seeks to find better ways to describe human development. Capability theory has a history of application in information technology [33] and has often been used in the context of studies in the field of information and communication technologies to examine marginalized and vulnerable populations and the impact that artificial intelligence can have on such populations [34]. Another theoretical position in the field of ethics of artificial intelligence and human flourishing is responsible research and innovation. "Responsible research and innovation" mean "the ongoing process of aligning research and innovation with the values, needs, and expectations of society" [35]. According to von Schomberg [36], responsible research and innovation is a transparent and interactive process through which social actors and innovators hold themselves accountable to society by considering the ethical acceptability, sustainability and social desirability of their innovative processes and marketable products. In recent years, the European Parliament [37] has placed great emphasis on responsible research and innovation as a way to ensure ethical sensitivity in future AI research, development and deployment. Human flourishing is a broad semantic domain that is applicable to all humans; it does not commit us to a particular way of life; or require us to adopt a particular moral position; it does not prevent us from using other ethical theories, such as deontology and utilitarianism, to assess ethical questions; and it is compatible with different theoretical positions [21]. As a common ethical language, it therefore bridges the gaps created by the global spread of AI.

Ethical Considerations for the Use of Artificial Intelligence

Some of the most important ethical considerations discussed in the field of artificial intelligence are introduced below.

1. Human Dignity, Safety, Sustainability:

"Human dignity" means preserving human dignity and improving the well-being of individuals [38, 39], which is one of the principles of human rights and has been emphasized in numerous statements related to the development of artificial intelligence. In fact, this concept is the product of creating a balance between the ethical concepts of "self-regulation" and "privacy" [40-43]. "Safety" means protection against physical harm caused by technologies equipped with artificial intelligence [44, 45]. The aforementioned concept refers to ensuring safe interactions between humans and machines with minimal physical harm. "Sustainability" is another ethical concept in digital technologies, which means promoting the health of the planet and a positive approach to the future [46]. The central core of this concept is the environmental impact of digital technologies, the sustainability of the planet, and maximum attention to the common good. The concept of sustainability, with a positive outlook on the future, seeks to highlight the existing capacities of artificial intelligence and its development to solve climate and environmental sustainability challenges.

2. Understandability, Responsibility, Self-Organization:

The ethical concepts of "understandability," "responsibility," and "self-organization" lie beneath the ontological layer of services in digital technologies and support the principle of "explainability" in AI. Understandability is an ethical concept that expresses an epistemological

sense of how AI functions and how accurate it is. Researchers [47] believe that AI researchers consider the ethical concept of "understandability" to be part of the process of building trust in AI outputs, considering four important issues:

1) Ensuring the accuracy and reliability of algorithms and digital or physical outputs;

2) Machine learning occurs based on causal relationships, not correlations;

3) Scalability and generalizability of algorithms for the development of applications;

4) The need for transparent, interpretable, and explainable algorithms for designing backbox AI with the aim of preserving human agency and autonomy.

In reviewing the existing literature, the important question that has always been raised alongside the concept of "understandability" is who is ultimately responsible for algorithmic decisions? Software engineers, users, or machines? Floridi and Cowls [38] consider "accountability" to refer to the existence of a moral sense of who is responsible for how AI functions. "Self-regulation" is another moral concept that states that "the development of AI should not undermine human decision-making power" [38]. In fact, self-regulation emphasizes the protection of human agency and freedom of choice and prevents humans from simply following algorithmic designs.

3. *Promoting Well-Being, Cohesion and Solidarity, Democratic Participation, Fairness, Diversity*

According to this ethical concept, the development and use of AI should contribute to the creation of a just and equal society [48]. The literature review in this study indicates that despite the existence of social biases in the data used in machine learning, the concept of "fairness" in the process of developing AI and designing algorithms is still a subject of much discussion and attention; to ensure that the outputs are not biased and biased. Researchers [49] point to the liberating power of AI to create a just society by reducing social heterogeneity and racial and gender stereotypes. "Promoting well-being" means increasing the common good, social utility, and considering the interests of all interested groups [50]. This ethical concept is based on a utilitarian argument for the collective good, with the ultimate goal of developing an AI that can benefit humanity [51]. In other words, the use of AI should be able to create conditions for increasing the well-being of all sentient beings [52]. According to the research findings, the ethical concept of "cohesion and solidarity" refers to maintaining the connection between social groups and generations through the use of AI [53].

4. *Privacy, Security*

The ethical concepts of "privacy" and "security" refer to the principle of "non-harm" in artificial intelligence. "Privacy" is a concept centered around access, consent, and the right to personal data in the era of big data and mass surveillance, and it means consent and protection against surveillance and collection of big data [54]. It also refers to the use of personal data in applications that the user has not authorized to access and does not consent to its publication. The concept of "security" also refers to data protection and information security management [55, 56], which ensures privacy and data protection by creating barriers.

5. *Regulatory-supervisory effect, financial-economic effect, individual-social effect*

The principle of control in AI means "the creation and implementation of policies, processes and standards for the appropriate development, use and management of the information domain". This domain includes formal and informal laws and social moral values that imply regulatory-supervisory, financial-economic and individual-social effects. The concept of "regulatory-supervisory effect" means

appropriate legislation, as well as a system of laws developed and implemented through social or government institutions that can monitor the behavior of agents related to the information domain. These effects are considered in terms of laws and regulations to ensure human rights, intellectual property rights, data control and legal oversight. Financial-economic effect means the positive and negative effects of the development of AI on organizations, societies and countries, from market dominance, abundant revenues and cost savings to concerns about how data is monetized and non-transparent and monopolistic financial practices [57, 53]. The individual-social impact refers to transformative changes and transformations in society and individual agency, such as labor displacement, unemployment, and employee de-skilling as a result of the use of artificial intelligence [58].

CONCLUSION

The widespread penetration of AI-based applications in digital technologies and subsequently in many aspects of human existence and biology highlights the urgent need for the global community to develop the ethics of AI. This article, adopting an applied ethics approach, describes the key concepts of digital ethics in the context of using AI in digital technologies. Based on a review of the existing literature, ethical considerations of digital ethics, including: human dignity, safety, sustainability, understandability, responsibility, self-organization, promotion of happiness and well-being, cohesion and solidarity, democratic participation, fairness, diversity, privacy, security, regulatory-supervisory effect, financial-economic effect, and individual-social effect, were raised and should be considered in the use of AI.

ETHICAL CONSIDERATIONS

Ethical issues (such as plagiarism, conscious satisfaction, misleading, making and or forging data, publishing or sending to two places, redundancy and etc.) have been fully considered by the writers.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interests.

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