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AI ACT OF THE EUROPEAN UNION AS AN INSTRUMENT FOR THE PROTECTION OF HUMAN RIGHTS

Abstract: Artificial intelligence is a rapidly evolving technology that offers a wide range of economic, environmental, and social opportunities for the development of modern society. However, its increasing deployment simultaneously raises numerous concerns regarding associated risks, particularly in the context of the protection of fundamental human rights and freedoms. The harms that may be caused by artificial intelligence can be either material or immaterial in nature, including physical, psychological, social, or economic harm. The establishment of a unified legal framework of the European Union, governing harmonised rules in the field of artificial intelligence, is considered necessary to foster the development, deployment, and use of AI systems within the internal market, while ensuring a high level of protection of public interests and fundamental rights, including democracy, the rule of law, and environmental protection, as recognised and safeguarded under European Union law. This paper will, by applying the normative method and analysing both domestic and international scholarly and professional sources, examine the extent to which the current European Union regulatory framework on artificial intelligence reflects contemporary needs arising from current societal expectations and technological developments. Particular attention will be devoted to the assessment of the mechanisms for the protection of fundamental human rights.

***Key words**: AI Act, European Union, fundamental rights, regulation.*

1. INTRODUCTION

The development of artificial intelligence represents one of the most significant technological advancements of the modern era, largely shaped by rapid progress in computing, data processing, and algorithmic learning. From the earliest theoretical concepts in the mid-20th century to today's complex systems based on machine learning and neural networks, artificial intelligence has evolved from a narrow research field into a technology with widespread application across almost all segments of society.

The concept of artificial intelligence, although modern in terminology, has its origins deeply rooted in human history, where the idea of machines capable of intelligent behavior appears in various ancient myths and philosophical traditions. In Greek mythology, the idea of automata-self-operating machines is reflected in stories such as those of Hephaestus, the god of craftsmanship, who created mechanical servants to assist him (Susilo, 2025, p. 1.).

Although there is no universally accepted definition, artificial intelligence is broadly defined as the simulation of human intelligence by machines programmed to learn, reason, and solve problems (Abbas, 2025, p. 1). In a general sense, it involves the adoption of characteristics of human intelligence, whereby algorithms enable computers to perform specific tasks and respond to commands (Bhbosale, Pujari, & Multani, 2020, p. 227). Artificial Intelligence (AI) is a broad and evolving discipline aimed at developing systems capable of intelligent behavior, typically associated with human cognitive functions such as learning, reasoning, problem-solving, and perception (Mishra, Mishra & Agarwal, 2025, p. 32).

Such development of artificial intelligence has led to its increasingly deep integration into the daily lives of individuals and the functioning of contemporary societies. Consequently, AI systems are no longer limited to purely technical and industrial applications but are increasingly influencing decision-making processes that produce legal and social effects. At the same time, the growing autonomy and complexity of these systems raise a number of ethical and legal questions, particularly in relation to accountability, transparency, and the ability to control automated decision-making. For this reason, there is an increasing emphasis on the need for an adequate legal framework that would ensure a balance between technological progress and the protection of fundamental human rights.

It is emphasized in the literature that artificial intelligence remains an uncertain and unpredictable domain, and its implementation may give rise to various legal challenges in the realization of different rights, particularly in

the application of the principles of equality and non-discrimination as universal legal values (Mihajlović, Ćorić, 2024, p. 9).

2. Opportunities and Challenges of Artificial Intelligence Systems

As artificial intelligence plays an increasingly significant role in economic, social, scientific, medical, financial, and military domains, it is useful to consider both the potential harms and protective measures, or in contemporary terminology, the risks and benefits it may entail (Russell, Norvig, 2021, p. 45).

Artificial intelligence technologies have permeated various industries, demonstrating their versatility and potential to transform traditional practices (Akhter, Ahmad, Chibb, & Zai, 2024, p. 4601). Owing to their capacity to process large volumes of data, automate complex procedures, and continuously learn from new information, artificial intelligence systems contribute to increased efficiency, improved service quality, and more accurate decision making across numerous sectors.

One of the most significant advantages of artificial intelligence lies in the automation of routine and time intensive tasks (Fatima, Kakumanu, & Veni, 2025, p. 5). By taking over work based on repetitive operations, artificial intelligence systems enable faster process execution, reduce the likelihood of human error, and allow for more rational use of available resources. Of particular importance are generative artificial intelligence models, which are capable of producing texts, images, computer code, and other digital content, thereby significantly enhancing productivity in various economic and professional fields.

In the field of healthcare, artificial intelligence contributes to the improvement of diagnostics and to the more efficient delivery of medical services. Through the analysis of large volumes of medical data, it becomes possible to identify certain diseases at an earlier stage, provide support to physicians in establishing diagnoses and proposing treatment, and enhance the monitoring of patients' health conditions. In addition, intelligent systems may remind patients of medical examinations, therapy schedules, or preventive measures, thereby contributing to a higher quality of healthcare.

Artificial intelligence also achieves significant results in the field of education, and in recent decades there has been a growing interest in the application of computer science in education (Sanchez, Lama, 2008, p. 138). Modern educational systems increasingly rely on intelligent algorithms to adapt learning content to the individual needs of students. In this way, a personalized approach to learning is enabled, whereby educational

materials, tasks, and recommendations are adjusted to the prior knowledge, abilities, and pace of learning of each individual learner.

There is also considerable potential for the application of artificial intelligence in agriculture (Fatima, et. al., p. 7). Through the analysis of data concerning soil quality, climatic conditions, and crop development, it is possible to optimize production, ensure more rational use of natural resources, and increase yields. Such an approach contributes to more sustainable agricultural development, reduced production costs, and more efficient management of agricultural holdings.

A significant area of application also relates to environmental protection. Artificial intelligence systems enable continuous monitoring of environmental indicators, prediction of pollution levels, analysis of climate change, and identification of potential environmental risks. The application of these technologies facilitates the planning of environmental protection measures and improves the sustainable management of natural resources. In addition, artificial intelligence contributes to the development of the financial sector and to the increased accessibility of financial services. The use of intelligent systems enables faster processing of financial transactions, more efficient detection of fraud, improvement of electronic banking systems, and greater accessibility of financial services to the population, particularly in less developed areas. This contributes to greater security of the financial system and the advancement of financial inclusion.

All of the above advantages indicate that artificial intelligence represents one of the most significant technological innovations of the contemporary era. Its application may contribute to increased efficiency, improved quality of public and private services, stimulation of economic development, and the resolution of numerous social challenges. However, precisely due to the growing importance of this technology in contemporary society, it is necessary to ensure its responsible, transparent, and secure application through an adequate legal and institutional framework.

Algorithmic bias represents one of the key challenges in the application of artificial intelligence. Since AI systems learn on the basis of existing datasets, biased or unrepresentative data may lead to discriminatory outcomes and the reproduction of existing social inequalities, particularly in the areas of employment, finance, and healthcare.

The protection of privacy and personal data also constitutes one of the central issues in the regulation of artificial intelligence. The capacity of AI systems to collect, process, and analyse large volumes of data increases the risk of privacy violations and requires the establishment of clear rules governing the lawful processing and use of data.

The application of artificial intelligence also affects the labour market, primarily through the automation of routine tasks, which may reduce the need for certain occupations while simultaneously creating new job profiles. At the same time, generative AI increases the risk of the spread of misinformation, the misuse of deepfake technology, and other forms of digital manipulation, thereby raising new issues concerning the protection of individual rights and the preservation of public trust.

Finally, a significant challenge is represented by an underdeveloped and uneven regulatory framework, as the pace of technological development often exceeds the ability of legislators to establish appropriate rules for the safe and responsible use of artificial intelligence. Consequently, the impact of artificial intelligence on social norms and values remains considerably uncertain in situations where adequate legal and regulatory standards are absent (Hopster, Maas, 2024, p. 1055).

All these challenges rightfully raise the question of the impact of artificial intelligence on human rights.

3. AI and Human rights

The issue of human rights is one of the topics that is discussed and written about on a daily basis and for which a large number of individuals and institutions advocate. Human rights are so frequently threatened, while individuals are so often deprived of their rights, unprotected, and left to their own means in attempts to safeguard their entitlements, that the question arises as to where the limits lie and whether human rights can be continuously and indefinitely infringed (Petrović, 2025, p. 414).

As a consequence of the development of artificial intelligence, some authors (Quintavalla, Temperman, 2023, p. 4) argue that artificial intelligence and human rights currently operate within the same normative and social environment, and that their inevitable interaction has become increasingly visible, although it simultaneously raises significant legal, ethical, technological, and societal questions.

In recent years, there has been an increasing focus on the impact of artificial intelligence on human rights. Artificial intelligence has generated tensions affecting the enjoyment of human rights, which makes it essential to recognize these challenges and seek adequate solutions (Bakhtawar, 2024, p. 54). Opinions regarding the impact of artificial intelligence on human rights are highly divided. While proponents of artificial intelligence emphasize its numerous benefits and advocate its broad application, based on the assumption that technological progress is inevitable and boundless, a

significant part of the public and academic community expresses concern, viewing AI as a potential threat and questioning its positive effects. At the same time, the fact that artificial intelligence is developed and normatively regulated by humans indicates that it is precisely the human factor that determines the manner of its use, as well as the direction of the regulatory framework being established today, which will largely shape its future application and development.

Some authors emphasize that the use of products and services based on artificial intelligence may lead to the potential infringement of fundamental rights and freedoms of individuals, including:

1) the right to human dignity,
2) the right to respect for private life,
3) the right to data protection,
4) the right to non discrimination,
5) the right to equality between women and men,
6) the right to freedom of expression and freedom of assembly,
7) the right to an effective legal remedy,
8) the right to a fair trial and the presumption of innocence,
9) the right to good administration,
10) the right to fair and just working conditions,
11) the right to consumer protection,
12) the rights of children and persons with disabilities,
13) the right to environmental protection, and
14) the right to human health and safety (Prlja, Gasmi, Korać, 2022, p. 81).

The protection of the rights of individuals as well as groups from discrimination that may arise as a consequence of the application of artificial intelligence represents one of the key rights that requires particular emphasis and consistent insistence. The fact that certain vulnerable categories of the population are especially exposed to discrimination, and that there is an increased risk of endangerment and violation of their rights, imposes on the Member States of the European Union the obligation to ensure, through appropriate regulatory mechanisms and by guaranteeing transparency and access to information, the reduction and mitigation of discriminatory effects within this segment of society.

The application of artificial intelligence should be fair, which implies equality in its implementation in relation to all individuals (Mudrinić, 2022, p. 101). However, it has been emphasized that despite calls for the adaptation of international law in response to the challenges posed by artificial intelligence, international organizations have not adopted binding

treaties; instead, they have issued various resolutions and guidelines addressing issues such as corporate responsibility, data governance, privacy, and related matters (Stanić, Tintor, 2024, p. 171).

4. AI Act of the European Union

The Artificial Intelligence Act (AI Act) was adopted in May 2024 and entered into force twenty days after its publication in the Official Journal of the European Union, on 12 July 2024 (European Parliament, 2024/1689). Its full application is scheduled for 2 August 2026. This Act represents the first comprehensive legal framework at the global level addressing artificial intelligence. Its primary objective is to ensure that artificial intelligence systems developed and used within the European Union are trustworthy, while simultaneously establishing mechanisms for the protection of fundamental human rights. Accordingly, European regulation of artificial intelligence seeks to reconcile two objectives that sometimes pull in different directions: on the one hand, the desire to encourage innovation, and on the other, the need to strongly protect fundamental rights (Buneci, 2026, p. 100).

The Preambles to the EU AI Act provide a detailed account of its underlying aims and objectives. In particular, Recital 1 sets out the key objectives of the Regulation, namely ensuring the safe and ethical development and use of artificial intelligence, safeguarding fundamental rights, and promoting innovation while preserving the integrity of the internal market. This principle of regulating artificial intelligence is, in theory, understood as a model based on the rule of law and respect for human rights (Ćeranić Perišić, Mišan Mišan, 2025, p. 22). The approach of the European Union to the regulation of artificial intelligence is characterized by a clearly defined orientation regarding the objectives it seeks to achieve. Emphasis is placed on fostering research and development in the field of artificial intelligence, as well as strengthening industrial and technological capacities, while simultaneously ensuring effective protection of fundamental human rights. The core principles on which the Artificial Intelligence Act is based include the affirmation of the technological sovereignty of the European Union within a strategic economic framework, as well as the central role of the human being and their fundamental rights in the process of digital transformation. In this regard, the EU regulatory framework on artificial intelligence develops in line with contemporary challenges in the protection of human rights, placing the human being and fundamental rights at the centre of its overall approach.

The EU Artificial Intelligence Act adopts a risk-based regulatory model, classifying AI systems into four categories: (i) unacceptable risk (prohibited AI practices), (ii) high-risk systems, (iii) limited risk (transparency risk), and (iv) minimal risk. Each category is subject to distinct regulatory requirements (Phạm, 2025, p. 28). In line with its horizontal regulatory design, the AI Act avoids sector-specific regulation and instead organizes AI systems into risk-based categories. Such a framework allows for greater regulatory flexibility, while still ensuring that each category is subject to essential safeguards. The highest level of protection applies to systems classified as posing an unacceptable risk, which are prohibited precisely due to their potential to seriously undermine human dignity, privacy, freedom of decision-making, and the principle of equality, particularly through manipulative practices, opaque profiling, and discriminatory data processing. High-risk systems, although permitted, are subject to stringent regulatory requirements due to their potential to affect the exercise of key rights, including the right to non-discrimination, fair decision-making, and access to essential social services, with particular emphasis placed on ensuring effective human oversight and legal protection. Limited-risk systems primarily trigger transparency obligations, thereby indirectly safeguarding the right to information and user autonomy, while minimal-risk systems remain outside binding regulatory requirements. In this way, the Act establishes a hierarchical model of protection in which the intensity of regulatory intervention increases in line with the degree of potential impact on fundamental rights, thereby seeking to ensure a balance between technological development and the preservation of the core values of the Union's legal order.

An important element for the protection of rights is the direct link established by the Artificial Intelligence Act between data governance and the prevention of discrimination. Datasets used for training, validation, and testing must be managed in a manner that enables the identification and mitigation of biases that may lead to unfair outcomes for individuals or groups (Buneci, 2026, p. 101). One of the central mechanisms for strengthening the protection of fundamental rights within the artificial intelligence regulatory framework is the Fundamental Rights Impact Assessment (FRIA), which is conducted prior to the deployment of certain high-risk AI systems. This obligation primarily applies to entities deploying AI systems, including public authorities and bodies, as well as private entities providing services of public interest, and to those systems whose use may have direct consequences for access to essential and existentially important services. Within the FRIA, a detailed analysis must be carried out,

including a description of the purpose, duration, and frequency of the system's use, the identification of relevant categories and groups of individuals who may be affected, an assessment of risks to fundamental rights, and a review of established safeguard mechanisms, including human oversight, internal procedures, and legal remedy mechanisms.

The relationship with the General Data Protection Regulation (GDPR) is explicitly regulated. Where a Data Protection Impact Assessment (DPIA), carried out in accordance with Article 35 of the GDPR (European Parliament, 2016/679), has already been conducted and covers the relevant aspects of processing, the FRIA does not constitute a repetition of the same analysis, but rather its complement within a broader normative framework for the protection of fundamental rights. In this way, an integrated risk assessment model is established, whereby the DPIA is primarily focused on the protection of personal data and privacy, while the FRIA covers a broader range of fundamental rights, including the prohibition of discrimination, the right to access services, procedural rights, and the right to effective legal remedy. This ensures that the assessment is not limited exclusively to the aspect of privacy, but encompasses the full spectrum of potentially affected rights.

The Artificial Intelligence Act represents a significant step towards ensuring the ethical and responsible use of artificial intelligence, with a particular focus on the protection of human rights and the promotion of innovation. This regulatory framework paves the way for safer and more reliable development of artificial intelligence, bringing benefits to startups and researchers within the European Union, while simultaneously establishing a model that may serve as a reference for the rest of the world (Lantyer, 2023, p. 6). However, although the Artificial Intelligence Act establishes a relatively comprehensive and normatively elaborated framework for the protection of fundamental rights through a risk-based classification and a set of binding mechanisms, the literature increasingly emphasizes that its actual effectiveness remains dependent on a broader, globally coordinated regulatory approach. The fragmentation of existing legal solutions and the absence of unified international standards may lead to regulatory gaps and uneven levels of protection of fundamental rights across different jurisdictions. Therefore, a key issue in the future development of this field is the need to strengthen international cooperation and harmonize legal frameworks in order to ensure consistent and universally applicable protection of human rights in the context of artificial intelligence.

5. Concluding remarks

The Artificial Intelligence Act represents one of the most significant contemporary legal instruments at the global level in the field of artificial intelligence regulation. Its particular importance lies in the fact that it seeks to simultaneously promote technological development and innovation while ensuring consistent protection of fundamental human rights and freedoms. Although these two objectives may, in certain circumstances, appear to be in tension, the European Union regulatory framework attempts to achieve a balance between them through a risk-based approach and a set of binding legal mechanisms.

The adoption of this Act constitutes an important step towards the legal institutionalisation of artificial intelligence, particularly in light of the complexity of the concept itself, its dynamic nature, and the difficulties associated with its precise normative definition, as well as numerous open legal questions relating to liability, discrimination, privacy, and transparency. In this regard, the AI Act not only introduces the first comprehensive regulatory framework of its kind, but also lays the foundation for the further development of legal theory and practice in this field.

Although its full application is still forthcoming, it can already be concluded that it represents a significant step towards the establishment of a stable and predictable system for the regulation of artificial intelligence, both at the European level and in the broader international context.

REFERENCES

1. Abbas, I. A. M. (2025). Theory and practice of artificial intelligence. International Journal of Innovative Science and Research Technology. https://doi.org/10.38124/ijisrt/25mar506
2. Akhter, S., Ahmad, M. R., Chibb, M., & Zai, A. F. (2024). Artificial intelligence in the 21st century: Opportunities, risks and ethical imperatives. Educational Administration: Theory and Practice, 30(5), 4600-4605. https://doi.org/10.53555/kuey.v30i5.3125
3. Bakhtawar, A. (2024). AI and human rights: Navigating technological responsibility. UCP Journal of Law & Legal Education, 2(2), 54-72. https://doi.org/10.24312/ucp-jlle.02.02.299
4. Bhbosale, S., Pujari, V., & Multani, Z. (2020). Advantages and disadvantages of artificial intelligence. Aayushi International

Interdisciplinary Research Journal, (Special Issue 77), ISSN 2349-638x, 227-230.
5. Buneci, B. (2026). Respect for human rights in European legislation on the use of artificial intelligence. In RAIS Conference Proceedings, 100-106.
6. Ćeranić Perišić, J., Mišan Mišan, S. (2025). Akt o veštačkoj inteligenciji Evropske unije i savremeni izazovi u ostvarivanju i zaštiti ljudskih prava [The European Union Artificial Intelligence Act and contemporary challenges in the realization and protection of human rights]. Zbornik radova Pravnog fakulteta Univerziteta u Prištini, 19-35. ISBN 978-86-6083-102-8
7. Fatima, F., Kakumanu, R. K., & Veni, P. (2025). AI: Opportunities, challenges and its future prospects. International Journal for Multidisciplinary Research, 7(4). https://doi.org/10.36948/ijfmr.2025.v07i04.54716
8. Hopster, J. K. G., & Maas, M. M. (2024). The technology triad: Disruptive AI, regulatory gaps and value change. AI and Ethics, 4, 1051-1069. https://doi.org/10.1007/s43681-023-00305-5
9. Lantyer, V. H. (2023). Understanding the EU AI Act: A new era in AI regulation in Europe. SSRN Electronic Journal, https://doi.org/10.47272/KIKPhD.2025.1.2
10. Mihajlović, A., Ćorić, V. (2024). Artificial intelligence and discrimination - strengths and weaknesses of the current European anti-discrimination legal framework. https://doi.org/10.56461/iup_rlrc.2024.5.ch2
11. Mishra, R. K., Mishra, D., & Agarwal, R. (2025). Foundations and core concepts of artificial intelligence. In Artificial intelligence: Concept, techniques and applications. Nature Light Publications, 31-52. https://doi.org/10.5281/zenodo.17213915
12. Mudrinić, Lj. M. (2022). Posledice razvoja novih tehnologija na ljudska prava sa aspekta međunarodnog prava [Consequences of the development of new technologies on human rights from the perspective of international law]. Megatrend revija / Megatrend Review, 19(2), 93-116. UDK 341.231.14342.738
13. Petrović, D. (2025). The impact of artificial intelligence on human rights. Zbornik radova Pravnog fakulteta Univerziteta u Prištini, 1(1), 413-424. https://doi.org/10.63177/ppf.012025.28
14. Phạm, T. M. (2025). The Protection of Human Rights Under the Artificial Intelligence Act. Közigazgatási és Infokommunikációs Jogi

PhD Tanulmányok, 6(1), 22-37. https://doi.org/10.47272/KIKPhD.2025.1.2
15. Prlja, D., Gasmi, G., Korać, V. (2022). Ljudska prava i veštačka inteligencija [Human Rights and Artificial Intelligence]. Institut za uporedno pravo. ISBN: 978-86-80186-82-5.
16. Quintavalla, A., Temperman, J. (2023). Introduction. In A. Quintavalla, J. Temperman (Eds.), Artificial Intelligence and Human Rights. Oxford University Press, 3-15.
17. Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 on laying down harmonised rules on artificial intelligence (Artificial Intelligence Act), OJ L 2024/1689 (2024).
18. Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 (General Data Protection Regulation). (2016).
19. Russell, S., Norvig, P. (2021) Artificial Intelligence: A Modern Approach (4th ed.). Harlow: Pearson. ISBN 978-0-13-461099-3
20. Sanchez, E., Lama, M. (2008). Artificial intelligence and education. In J. R. Rabunal (Ed.), Encyclopedia of artificial intelligence. IGI Global. https://api.semanticscholar.org/CorpusID:1354096
21. Stanić, M., Tintor, Lj. (2024). Human rights and artificial intelligence: International public law and constitutional aspects, 169-178. https://doi.org//10.56461/iup_rlrc.2024.5.ch13
22. Susilo, Y. K. B. (2025). Foundations of artificial intelligence: Theory, methods, and applications (Chapter 1: What is artificial intelligence?), 1-12. https://doi.org//10.2139/ssrn.5219265