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Ethical Implications of Artificial Intelligence Technologies: Copyright, Privacy, Security, and Regulation

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Abstract

This study addresses the ethical implications associated with artificial intelligence (AI) technologies, focusing on challenges related to copyright, privacy, security, and regulation. The research, conducted through a literature review, uses academic works, scientific articles, and regulatory documents as a theoretical and methodological framework to identify the ethical impacts and gaps in the application of AI in various social contexts. The work is based on a critical analysis of sources collected from recognised databases, such as Scopus, JusBrasil and Google Scholar, using criteria of relevance and duality to select the material. The main results highlight that copyright faces significant challenges due to the use of protected works in algorithm training and the lack of definition regarding authorship in AI-generated creations. On the issue of privacy, the massive collection and use of personal data exposes individuals to ethical and legal risks, highlighting the need for standards that guarantee informed consent and the protection of sensitive information. Regarding security, the risks associated with the spread of misinformation, cyberattacks and algorithmic biases require robust strategies to mitigate social and institutional damage. In the regulatory field, the study reveals significant gaps in existing legislation, emphasising the need for international and harmonised guidelines to ensure ethics in the development and use of AI. It concludes that the ethical regulation of AI requires coordinated efforts between governments, the private sector and civil society, as well as the promotion of interdisciplinary approaches to balance innovation and responsibility. The study reinforces the importance of inclusive governance that prioritises the protection of human rights and the promotion of sustainable technological development.

Keywords
copyright, ethics, artificial intelligence, privacy, regulation

Implicações Éticas das Tecnologias de Inteligência Artificial: Direitos Autorais, Privacidade, Segurança e Regulação

Resumo

O estudo aborda as implicações éticas associadas às tecnologias de inteligência artificial (IA), com foco nos desafios relacionados aos direitos autorais, privacidade, segurança e regulação. A pesquisa, conduzida por meio de uma revisão bibliográfica, utiliza como referencial teórico-metodológico obras académicas, artigos científicos e documentos normativos para identificar os impactos éticos e as lacunas existentes na aplicação da IA em diversos contextos sociais. O trabalho fundamenta-se na análise crítica de fontes recolhidas em bases de dados reconhecidas, como Scopus, JusBrasil e Google Académico, utilizando critérios de relevância e dualidade para selecionar o material. Os principais resultados destacam que os direitos autorais

enfrentam desafios significativos devido ao uso de obras protegidas no treino de algoritmos e à indefinição sobre autoria em criações geradas por IA. Na questão da privacidade, a recolha e utilização massiva de dados pessoais expõem os indivíduos a riscos éticos e jurídicos, evidenciando a necessidade de normas que garantam o consentimento informado e a proteção de informações sensíveis. Relativamente à segurança, os riscos associados à propagação de desinformação, ataques cibernéticos e vieses algorítmicos demandam estratégias robustas para mitigar prejuízos sociais e institucionais. No campo regulatório, o estudo revela lacunas significativas na legislação existente, com ênfase na necessidade de diretrizes internacionais e harmonizadas para assegurar a ética no desenvolvimento e uso de IA. Conclui-se que a regulação ética da IA exige esforços coordenados entre governos, sector privado e sociedade civil, bem como a promoção de abordagens interdisciplinares para equilibrar inovação e responsabilidade. O estudo reforça a importância de uma governança inclusiva que priorize a proteção dos direitos humanos e a promoção de um desenvolvimento tecnológico sustentável.

Palavras-chave
direitos autorais, ética, inteligência artificial, privacidade, regulação

1. Introduction

Júnior et al. (2023) highlight that artificial intelligence (AI) technologies are revolutionising various sectors, but they raise profound ethical questions that require reflection and regulation. In the field of copyright, AI's ability to create original content raises debates about the ownership of productions and the protection of intellectual property. For example, algorithms that generate text, music, and art challenge traditional norms, especially when authorship is attributed to machines rather than humans. In addition, there are dilemmas involving the use of pre-existing works to train AI models without proper recognition or compensation to the original creators.

Privacy is another critical dimension of the ethical implications of AI technologies. Sophisticated systems collect and analyse large volumes of personal data, often without the clear consent of individuals. This practice can compromise fundamental rights, such as informational self-determination and control over one's data. The misuse of private information by AI systems not only exposes users to security risks but also creates ethical challenges for organisations that develop and operate these technologies (Júnior et al., 2023).

Security is equally central to this debate, as AI systems can be exploited for malicious purposes, such as cyberattacks and the spread of misinformation. The sophistication of AI technologies makes it difficult to detect and mitigate these threats, requiring robust prevention and response strategies. In addition, non-transparent or biased algorithms can perpetuate discrimination, intensifying social inequalities and harming vulnerable populations (Fernandes et al., 2024).

Regulation emerges as an essential element in balancing the benefits and risks of AI. Governments, international organisations, and private entities face the challenge of creating standards that ensure ethics in the development and use of these technologies. Such regulation must be sufficiently agile to keep pace with technological developments and,

at the same time, robust to guarantee fundamental rights and the protection of citizens (Fernandes et al., 2024). The research problem is as follows: what are the ethical consequences of AI technologies in the contexts of copyright, privacy, security and regulation, and how can their negative effects be mitigated?

The overall objective of the research was to analyse the ethical implications of AI technologies in the fields of copyright, privacy, security and regulation, providing guidelines to mitigate their negative effects. The specific objectives were: (a) to identify the main ethical challenges related to the application of AI in the contexts of copyright, privacy, security, and regulation; (b) to map the legislation and regulations that address the ethical implications of AI technologies; and (c) to investigate academic proposals and innovative practices for mitigating the ethical impacts of AI technologies.

Research is essential in view of the increase in these tools and their cross-cutting impact on various social and economic areas. Issues such as copyright, privacy, security, and regulation require in-depth analysis to ensure that technological progress is accompanied by ethical responsibility and respect for fundamental rights. Therefore, it is essential to understand and propose solutions to the ethical challenges of AI in order to create a society that enjoys the benefits of these technologies while minimising risks and promoting equity.

2. Ethical Foundations of Artificial Intelligence

For Xênia Barbosa (2020), the ethical foundations of AI are anchored in philosophical reflections and moral principles that aim to guide the development and responsible application of these technologies. The emergence of AI as a disruptive force in multiple sectors revisits questions about how to mitigate its negative impacts while preserving fundamental rights and universal values. In this sense, the study of ethical foundations seeks to establish a normative basis capable of regulating technological advancement in a way that benefits society as a whole.

One of the central ethical pillars in the debate on AI is transparency. This principle refers to the need for decision-making processes carried out by algorithms to be understandable and verifiable for both experts and ordinary users. The lack of clarity in AI systems, often referred to as the "black box", not only limits developers' accountability but also undermines public trust. Thus, transparency emerges as an indispensable ethical value to ensure that AI systems are reliable and accessible (Silva, 2023).

Equity is another fundamental principle in AI ethics, highlighting the need for systems to be designed and used without discrimination. Algorithms often reflect biases present in the data used to train them, which can perpetuate social inequalities or create forms of injustice. The pursuit of fairness involves not only mitigating biases in AI models but also including a diversity of perspectives in the development of these technologies, ensuring that they meet the needs of different social groups (X. Barbosa, 2020).

The principle of accountability is essential to ensure that the social and ethical impacts of AI are properly considered. This implies that both developers and users of AI

systems must be held accountable for their decisions and actions. Ethical responsibility requires the creation of normative frameworks that clearly assign roles and duties, especially in cases of automated decisions that result in harm or negative consequences for individuals or communities (Silva, 2023).

In addition to these principles, the ethical debate on AI is largely influenced by philosophical currents, such as utilitarianism, which seeks to maximise collective well-being, and deontology, which emphasises compliance with moral rules and duties. While utilitarianism may justify the use of AI for broad social benefits, even if there is harm to some individuals, deontology argues that certain rights cannot be violated, regardless of the overall benefits. These perspectives help shape the ethical guidelines that guide the use of AI (Duque et al., 2023).

Virtue ethics also contributes significantly to this field, proposing that AI developers and users cultivate virtues such as prudence, empathy, and justice in their practices. This approach emphasises the importance of moral character and intention behind the use of technologies, placing individual responsibility at the centre of the ethical debate. Virtue ethics thus offers a counterpoint to more structured approaches, highlighting the relevance of human qualities in the technological context (Duque et al., 2023).

Another crucial aspect of the ethical debate is the need for a balance between innovation and caution. Although AI technologies promise significant advances, they also bring uncertainties and risks that require a careful ethical approach. The precautionary principle argues that, in the absence of scientific certainty about the potential impacts of technology, measures to prevent significant harm should prevail, even if this slows progress (Moreira & Ribeiro, 2023).

The ethical foundations of AI also relate to issues of distributive justice, which deals with the equitable distribution of the benefits and risks of technologies. This debate gains relevance as advances in AI can exacerbate existing inequalities, especially in contexts of unequal access to these technologies. Ensuring a fair distribution of the resources and opportunities generated by AI is, therefore, a central concern for applied ethics (Moreira & Ribeiro, 2023).

Furthermore, respect for individual autonomy is an ethical principle that demands attention in the context of AI. Technologies that make decisions or influence human choices can compromise individual freedom, especially when they operate without the consent or knowledge of users. Protecting autonomy requires that systems be designed in a way that respects individuals' ability to make informed and independent decisions (Fernandes et al., 2024).

According to Kaufman (2022), the debate on the ethical foundations of AI reflects the need to build a robust moral framework to guide the development of these technologies. The articulation between transparency, fairness, accountability, and diverse philosophical values provides a solid foundation for addressing the ethical challenges that emerge with the growing adoption of AI. Only with this multidimensional approach will it be possible to ensure that AI technologies are aligned with the best interests of humanity, promoting advances while respecting universal ethical principles.

3. Copyright and Artificial Intelligence

The ethical implications of using copyrighted works to train AI models are emerging as a central issue at the intersection of technology and intellectual property. The growing use of protected content to feed deep learning algorithms raises questions about respect for the rights of original creators and the limits of legality in accessing and using such materials. This debate becomes even more complex given the transformative nature of AI technologies, which often produce derivative works, amplifying the associated ethical and legal challenges (Barros, 2024).

One of the main ethical concerns is the use of protected works without the proper consent or compensation to the original authors. AI models, especially those based on supervised learning, require vast data sets, often obtained from public or private sources without detailed analysis of copyright status. This practice not only violates the rights of creators but also threatens the incentive for cultural and artistic production, which depends, for the most part, on recognition and fair remuneration for the use of their works (Barros, 2024).

Another relevant aspect is the difficulty in defining the authorship and intellectual property of creations generated by algorithms. When AI systems produce artistic works, music or texts, the question arises as to who or what should be recognised as the author. This issue challenges traditional concepts of authorship, which are based on human creativity and deliberate intention, whereas AI operates through calculations and combinations of pre-existing data without intentionality (Assis, 2023).

In addition, there is a growing debate about the nature of AI-generated works as original productions or mere reproductions derived from protected content. Many algorithms use stylistic elements or explicit material from existing works, raising questions about the extent to which these creations can be considered genuinely innovative. This ethical dilemma is exacerbated as such productions begin to compete directly with human creators in terms of market and recognition (Assis, 2023).

Current copyright laws are, in many cases, insufficient to address the challenges posed by AI. Although some countries have adapted their regulations to include specific provisions on the issue, most still operate under legal frameworks that do not address autonomous creation by technological systems. This regulatory gap favours ethically questionable practices and creates uncertainty for developers, users, and copyright holders (Vicente & Flores, 2021).

An ethical approach to mitigating these challenges requires the creation of guidelines that establish clear parameters for the use of protected works in the training of AI models. Such guidelines should balance the right of creators to control their works with the need for access to data for technological advancement. In this context, the concept of "fair licensing" and proportional remuneration may offer viable solutions, promoting an environment of cooperation between human creators and AI technologies (Preuss et al., 2020).

Another important point is the need for awareness of the social and cultural impacts of the use of copyrighted works in AI. Indiscriminate access to these materials without proper recognition can lead to the devaluation of creative and artistic work, negatively

impacting cultural diversity and the sustainability of creative professions. Applied ethics must, therefore, consider not only legal rights but also the cultural values associated with respect for originality and human effort (Oliveira et al., 2023).

Transparency in the development and operation of AI models also plays a crucial role in mitigating ethical conflicts. Developers must ensure that systems are designed to respect copyright by implementing mechanisms to track and monitor the use of protected materials. This practice not only reinforces ethical compliance but also strengthens public trust in AI technologies (Preuss et al., 2020).

Collaboration between governments, industry, and civil society is essential to create effective solutions that align technological advances with ethical principles. The establishment of discussion forums and the promotion of interdisciplinary research can facilitate the development of more comprehensive standards that are adaptable to technological changes, ensuring that copyright is respected in the context of AI (Vicente & Flores, 2021).

According to Aguiar (2023), the ethical challenges related to copyright and AI require an integrative approach that combines technological innovation with social and legal responsibility. Respect for the rights of creators and the promotion of robust ethics are essential to ensure that the progress of AI occurs equitably and sustainably, preserving the fundamental values of creativity and justice.

4. Privacy and Data Protection

As Boulay (2023) clearly defines, the collection, storage and use of personal data by AI systems raise important ethical considerations, especially with regard to respect for privacy and informed consent. These systems rely heavily on data to operate efficiently and in a personalised manner. However, this dependence carries significant risks of invasion of privacy, misuse of information and imbalance in the relationships between individuals and entities using these technologies. Ethical analysis of this scenario is essential to ensure that technological advancement does not occur at the expense of fundamental rights.

Privacy is a basic human right recognised by legislation in various jurisdictions, but it faces unprecedented challenges in the context of AI. AI systems often collect data in a massive, automated, and continuous manner, usually without users' clear knowledge. This practice compromises individuals' ability to control their personal information, creating an environment in which privacy is easily overlooked in favour of commercial interests or technological efficiency (Boulay, 2023).

Informed consent emerges as a fundamental ethical principle in the relationship between users and AI systems. For the use of data to be ethically acceptable, individuals must be fully informed about what information is being collected, how it will be used, and what risks are involved. However, many privacy policies are written in a complex and inaccessible manner, making them difficult for users to understand and compromising the validity of the consent obtained (S. Santos et al., 2024).

In addition, the storage of personal data presents inherent risks to the security and integrity of this information. Data stored in large databases is an attractive target for

cyberattacks, leaks and unauthorised use. The ethical impact of data protection failures is significant, as it can expose sensitive information about individuals, resulting in financial, social and emotional harm. Thus, the ethical responsibility of AI developers and operators includes the implementation of robust security measures (Carvalho, 2021).

The use of personal data by AI systems can also result in discrimination and exclusion, especially when algorithms process information in a biased manner. Training systems with unbalanced or outdated data sets can perpetuate social biases, negatively affecting certain population groups. This ethical problem highlights the need for rigorous data curation and validation practices, as well as the inclusion of diverse perspectives in system design (Carvalho, 2021).

Another critical ethical issue is the possibility that indiscriminate data collection could compromise individual autonomy. Excessive personalisation of services based on personal information can manipulate choices and behaviours, limiting free decision-making. This situation requires a careful balance between personalisation and respect for freedom of choice, ensuring that AI systems operate transparently and fairly (Cruz et al., 2023).

Legislation plays a central role in the ethical regulation of the use of data by AI systems. Initiatives such as the General Data Protection Regulation in the European Union establish clear standards for the responsible collection and use of personal information. However, the enforcement of these standards still faces practical challenges, especially in global contexts, where different jurisdictions have different approaches to data protection (Cruz et al., 2023).

The ethical debate also includes the issue of data anonymisation. Although this practice is often presented as a solution to protect privacy, studies show that re-identification techniques can compromise its effectiveness. This highlights the need for more sophisticated and innovative approaches to ensure that personal data is protected, even in scenarios of extensive use by AI systems (Maranhão et al., 2021).

Ethical issues surrounding privacy and data protection require a multidisciplinary approach that combines technology, law, and philosophy. Developers, legislators, and ethics experts must work together to create solutions that prioritise individual rights and promote transparency and accountability in the use of AI. Only in this way will it be possible to achieve a balance between innovation and respect for human dignity (Maranhão et al., 2021).

5. Technological Security and Integrity

The technological security and integrity of AI systems are central issues in the contemporary ethical debate, considering the growing impact of these technologies in various social and economic spheres. The robustness of such systems is constantly challenged by vulnerabilities that can compromise their functionality and reliability, as well as generate serious implications for human rights and institutional stability. Ethical analysis of these risks is essential for the creation of guidelines that ensure the responsible and safe use of AI (Bezerra et al., 2024).

The spread of misinformation is one of the most discussed vulnerabilities in the context of AI-based system security. Algorithms can be used to create and disseminate false content on a large scale, from manipulated images to fraudulent news, with the potential to influence social behaviour and decisions. The ethical impact of this practice is significant, as it undermines trust in information sources, promotes social polarisation, and threatens democratic processes such as elections (Bezerra et al., 2024).

Cyberattacks represent another crucial risk associated with AI. Intelligent systems are valuable targets for attackers, who can exploit security flaws to obtain sensitive data, compromise critical infrastructure, or manipulate automated operations. These attacks not only result in financial and operational losses but also jeopardise the safety of individuals and communities, requiring a rigorous ethical approach to mitigate such threats (S. Santos et al., 2024).

The manipulation of automated decisions is a growing concern in the field of AI ethics. Systems used in sensitive sectors such as healthcare, justice, and finance can be exploited for malicious purposes or operate with unintended biases, directly affecting human lives. The lack of transparency in many of these systems exacerbates the problem, making it difficult to identify flaws and hold those responsible for the damage caused accountable (Aguiar, 2023).

Furthermore, the use of AI for surveillance purposes raises significant ethical concerns. Facial recognition and mass surveillance systems can be exploited to restrict civil liberties, control populations, and suppress political dissent. These practices challenge fundamental ethical principles, such as individual autonomy and the right to privacy, and require clear regulations to prevent abuse (Dantas et al., 2024).

Technological integrity also faces challenges related to the development of autonomous systems that make critical decisions. The failure or unexpected behaviour of such systems can have serious consequences, such as accidents in autonomous vehicles or errors in AI-based military operations. The implementation of human oversight mechanisms and technological redundancy is essential to mitigate these risks, reinforcing ethical responsibility in the use of these technologies (Dantas et al., 2024).

Another relevant aspect is the impact of security failures on public trust in AI systems. Incidents such as data leaks or biased decisions can compromise the adoption of these technologies, limiting their potential to generate social benefits. Therefore, ethics applied to AI should prioritise strategies that promote transparency and accountability, ensuring the reliability of these systems in society (Antunes, 2019).

Research on AI security highlights the need for interdisciplinary collaboration involving experts in technology, ethics, law, and public policy. This integrated approach is essential for developing standards that balance innovation with the protection of fundamental rights, preventing abuse and promoting the ethical use of these technologies. In addition, the inclusion of diverse perspectives in system design can contribute to the identification of vulnerabilities and the creation of more effective solutions (Antunes, 2019).

The ethical implications of the risks associated with technological security are broad and require a proactive response from all parties involved. Governments, companies and

civil society organisations have a crucial role to play in setting global standards for the responsible development of AI. This includes strengthening legislation, promoting good practices and creating monitoring and accountability mechanisms (Kaufman, 2022).

As Serra and Machado (2024) clearly define, the security and technological integrity of AI systems are not only technical issues but also ethical and social ones. Mitigating vulnerabilities such as misinformation, cyberattacks, and decision manipulation requires a collective commitment to ensure that technological progress is accompanied by responsibility and respect for human rights. Only in this way will it be possible to build a future in which AI is used safely, reliably, and ethically.

6. Algorithmic Bias and Discrimination

Algorithmic biases present in AI systems represent one of the most significant ethical challenges in the application of these technologies. These biases, often unconscious, are incorporated into systems from historical data or human decisions that guide the training and design of algorithms. As a result, AI can replicate and amplify existing inequalities, perpetuating patterns of discrimination that primarily affect vulnerable and marginalised groups (Preuss et al., 2020).

One of the main causes of algorithmic bias is the quality and representativeness of the data used in training. Unbalanced data that does not adequately reflect demographic, cultural, or socioeconomic diversity can lead to systems that favour certain groups over others. This problem is especially concerning in sensitive applications such as personnel recruitment, credit granting, and judicial decisions, where impartiality should be a fundamental principle (Oliveira et al., 2023).

The ethical impacts of these biases are profound, as they directly affect fairness and justice in automated processes. A recurring example is the use of algorithms to determine the likelihood of criminal recidivism. In some cases, discrimination against individuals based on race or ethnicity has been found. Such practices reinforce social stigmas and exacerbate existing inequalities, contradicting the principles of equal opportunity and human dignity (Dantas et al., 2024).

In addition, algorithmic bias can limit certain groups' access to fundamental opportunities, such as employment and education. AI systems used in selection processes, for example, may prioritise specific demographic characteristics or ignore the skills of candidates from marginalised backgrounds. This not only perpetuates inequalities but also excludes talent that could contribute significantly to organisations and society (Serra & Machado, 2024).

The lack of transparency in AI systems is another factor that exacerbates the effects of algorithmic bias. Algorithms often operate as "black boxes", making it difficult to identify the criteria used in automated decisions. This opacity hinders accountability for unfair or discriminatory decisions, leaving affected individuals without recourse to challenge them. The absence of clear auditing and oversight mechanisms exacerbates the lack of accountability (Serra & Machado, 2024).

According to F. Santos et al. (2019), correcting algorithmic biases requires a joint effort that combines technology and ethics. Developers and engineers have a responsibility to implement design practices that minimise biases in AI systems, such as constant data validation and the inclusion of diverse perspectives in development processes. In addition, organisations need to promote ethical and technical training to ensure that the professionals involved are equipped to deal with these issues responsibly.

The role of public policy and regulation is also essential in this context. Governments and regulatory bodies should establish clear standards for assessing and mitigating bias in AI systems, including mandatory impact testing and regular audits. The creation of specific legislation to protect individuals' rights against algorithmic discrimination is a crucial step towards promoting justice and equality in automated environments (F. Santos et al., 2019).

Another important aspect is the engagement of civil society in monitoring the ethical use of AI. Human rights organisations, scholars and activists have played an important role in identifying cases of algorithmic discrimination and pushing for greater transparency and accountability. This involvement is vital to ensure that technologies are developed and applied with a focus on equity and collective well-being (F. Santos et al., 2019).

An ethical approach to algorithmic bias also requires a commitment to inclusion and diversity. By designing systems that take into account the realities of different social groups, it is possible to mitigate bias and ensure that the benefits of AI are distributed more equitably. Promoting diversity in the teams that develop these technologies is an effective strategy for reducing inequalities and increasing fairness in outcomes (Cruz et al., 2023).

Lemes and Lemos (2020) highlight that algorithmic bias is a reflection of human limitations transferred to AI systems, but its ethical consequences are amplified in scale by automation. Combating these biases requires a multidimensional approach that integrates technology, ethics, legislation, and social engagement. Only through coordinated efforts will it be possible to build fairer and more inclusive systems, ensuring that AI is a tool for promoting equality and respect for human rights.

7. Regulatory and Normative Aspects

For Figueiredo et al. (2023), regulatory and normative aspects related to the ethical use of AI are at the heart of discussions about the impact of these technologies on society. As AI becomes more integrated into everyday activities and organisational processes, the need for regulations that ensure ethical standards and protect fundamental rights becomes increasingly evident. However, existing legal frameworks still struggle to keep pace with the rapid advancement of technological innovation, resulting in significant gaps and challenges.

International regulations for AI are fragmented, reflecting different cultural, political, and economic approaches to the technology. The European Union, with initiatives such as the Artificial Intelligence Act, is leading efforts to create a comprehensive regulatory framework, prioritising transparency, security and the protection of human rights. Despite these advances, many other regions of the world lack specific legislation, which

allows for the unregulated use of AI and increases the risks of ethical violations (Figueiredo et al., 2023).

According to Gorzoni (2021), one of the main difficulties in regulating AI is defining clear criteria for ethical and legal responsibility. The technical complexity of AI systems, combined with their ability to learn autonomously, raises questions about who should be held responsible for errors, biased decisions or damage caused by these technologies. The absence of standardised rules for assigning responsibility creates uncertainty for both developers and users.

Another significant challenge is the balance between innovation and regulation. Creating overly strict rules can inhibit the development of innovative technological solutions, while a lack of regulation can lead to abuse and ethical risks. This dilemma requires legislators to adopt flexible and dynamic approaches that can adapt to the rapid evolution of AI without compromising security and fundamental ethical values.

As Carlos Barbosa (2023) aptly puts it, personal data protection is a central issue in the regulatory aspects of AI, especially in the context of legislation such as the General Data Protection Regulation in Europe. This legal framework establishes strict guidelines for the collection and use of personal information, imposing clear restrictions on automated practices that could compromise privacy. However, the practical application of these standards faces difficulties, mainly due to the technical complexity involved in assessing compliance with regulations by AI systems.

Regulations must also address the issue of algorithmic bias and discrimination. The requirement for audits and ethical impact assessments for AI systems is an important step in this direction, but there are still gaps in the implementation of these practices on a global scale. The lack of harmonisation between different laws and the absence of clear mechanisms to identify and correct biases make it difficult to comply with established ethical standards (C. Barbosa, 2023).

Another relevant aspect is the international governance of AI. Although organisations such as the United Nations Educational, Scientific and Cultural Organization, and the World Economic Forum have proposed guidelines for the ethical use of these technologies, the lack of global consensus limits the effectiveness of such initiatives. Differences between countries' economic and geopolitical interests create barriers to the formulation of universal standards that regulate AI consistently and inclusively (Pereira & Moura, 2023).

Transparency is a fundamental principle that must be incorporated into AI regulatory frameworks. AI systems often operate as "black boxes", making it difficult for users and regulators to understand their operations. Requiring developers to provide clear explanations of decision-making processes and the data used is essential to promote trust and accountability (Pereira & Moura, 2023).

The training of regulatory agents is also a critical factor in the success of AI standards. Many regulators do not yet have the technical knowledge necessary to assess intelligent systems and ensure adequate compliance with the law. Investment in specialised training and interdisciplinary cooperation is essential to overcome this obstacle (Pereira & Moura, 2023).

According to Moraes et al. (2023), the ethical regulation of AI requires coordinated efforts between governments, international organisations, companies and civil society. The creation of robust regulatory frameworks that balance innovation and responsibility is essential to mitigate ethical risks and ensure that AI is used in a way that benefits humanity. However, the success of these initiatives depends on inclusive, dynamic approaches that are adaptable to the rapid technological changes that characterise the field of AI.

8. Methodological Strategy of the Study

The methodology adopted for this study was an in-depth literature review with the purpose of analysing the ethical implications of AI technologies, especially with regard to copyright, privacy, security and regulation. This approach allowed access to a variety of academic materials, such as scientific articles, specialised books, dissertations, theses and regulatory documents, all aimed at understanding the ethical impacts of AI application in multiple social and institutional contexts. This methodological strategy enabled a well-founded critical analysis highlighting both the contributions and challenges posed by these technologies regarding the protection of fundamental rights and the need for adequate regulation.

The first methodological step consisted of carefully defining the parameters for selecting bibliographic sources. Priority was given to materials published in the last 10 years, available in indexed journals, with an emphasis on works that addressed, either theoretically or empirically, the ethical dimensions of AI technologies. Reference works on digital ethics, information security, digital law, and public policies related to technological governance were also incorporated into the corpus. The selection took into account the recency of the publications, their thematic relevance to the research objectives, and the academic credibility of the authors and institutions involved. The initial collection stage resulted in a total of 84 documents analysed, from which 30 studies were selected that were most aligned with the central axes of the research.

The search for materials was carried out in recognised academic databases, such as Scopus, JusBrasil and Google Scholar, using keywords such as "ethics in AI", "copyright in AI", "data privacy", "algorithmic security", and "AI regulation", in various combinations with Boolean operators. After the preliminary screening stage, an exploratory reading of the selected documents was carried out to assess their relevance to the research objectives. Next, an analytical and in-depth reading of the 30 selected studies was conducted, and they were organised into four main thematic areas: ethical implications for copyright in creations produced by AI, privacy risks of massive data collection, challenges for information security, and regulatory dilemmas at the national and international levels.

The data analysis was conducted qualitatively, based on content analysis, in accordance with the methodological principles proposed by Creswell (2014), which allowed the identification of conceptual patterns, theoretical tensions, normative gaps, and convergences between the authors. The guiding questions of the analysis included: how do AI technologies challenge current models of copyright protection? How does the intensive

use of personal data impact individual privacy? What are the main security risks associated with AI, and how can they be mitigated? What regulatory models are most effective in ensuring the ethical and responsible use of AI? To ensure the validity and reliability of the interpretations obtained, source triangulation strategies were used, cross-referencing the information in the selected documents, in addition to peer review, which ensured consistency in the analysis and robustness of the results presented.

9. Analysing the Results

The authors' analysis of the ethical challenges of AI reveals significant gaps in copyright, privacy, security, and regulation. According to Barros (2024), the use of copyrighted works in training AI models without the consent of the original creators compromises both intellectual property and the incentive for creative production. This practice highlights the need for a more robust regulatory framework to govern the use of protected content, especially in a scenario where the output of AI-derived works is becoming more common.

From a privacy perspective, Boulay (2023) highlights the massive and often non-consensual collection of personal data by AI systems, which raises ethical concerns related to individual autonomy. The lack of transparency in privacy policies and the use of complex language makes it difficult for users to understand, limiting the validity of informed consent and exacerbating the risks associated with the protection of sensitive data.

Technological security is another critical aspect. Bezerra et al. (2024) point out that the vulnerability of AI systems to cyberattacks compromises not only confidential data but also essential infrastructure, such as electrical networks and transport systems. These risks make it urgent to implement ethical guidelines that prioritise technological protection and integrity as pillars of AI governance.

Algorithmic bias also emerges as a central concern. According to Oliveira et al. (2023), the lack of representativeness in the data sets used to train algorithms perpetuates social inequalities and discriminates against marginalised groups. This problem is amplified by the absence of standardised practices for monitoring and correcting biases in AI applications, especially in sensitive sectors such as justice and health.

Another challenge identified is the fragmentation of international regulatory efforts. Figueiredo et al. (2023) note that although initiatives such as the European Union's Artificial Intelligence Act are an important step, the absence of a globally harmonised approach limits the effectiveness of these measures. This regulatory disparity creates legal uncertainty and hinders accountability in a scenario of transnational application of AI technologies.

The ethical guidelines proposed by the authors converge on the need for greater transparency in AI processes. For Pereira and Moura (2023), explaining the criteria used by algorithms in their decisions is essential to building public trust and ensuring that these technologies operate fairly and responsibly. This includes developing mechanisms that enable the verifiability and accessible explanation of automated decisions.

In the field of copyright, Preuss et al. (2020) advocate the establishment of specific licences for the use of protected works in the training of AI models. These licences should

balance the interests of creators with the need for access to data, promoting a collaborative relationship between technological innovation and respect for intellectual rights.

Inclusive and interdisciplinary governance is essential to address the ethical challenges of AI. According to Lemes and Lemos (2020), diversity in the groups that develop and regulate these technologies can contribute significantly to mitigating biases and building more equitable systems. This approach requires the active participation of experts from different fields, as well as representatives from communities impacted by automated decisions.

In addition, Moraes et al. (2023) highlight the importance of training regulatory agents. The technical complexity of AI technologies requires legislators and regulators to have a deep understanding of the ethical and operational issues involved. Investments in interdisciplinary education are, therefore, essential to ensure effective governance.

With regard to security, Antunes (2019) suggests that the implementation of technological redundancies and human supervision can reduce the risks associated with failures or manipulations of autonomous systems. This strategy is especially relevant for critical applications, such as autonomous vehicles and military operations, where the impacts of errors can be catastrophic.

Respect for individual autonomy has also been widely discussed. Cruz et al. (2023) argue that excessive personalisation of AI services can limit users' freedom of choice, creating an environment of behavioural manipulation. To mitigate this risk, systems should be designed to ensure that individuals retain control over their decisions and data.

The results of the studies analysed also point to the need for greater harmonisation between national and international regulations. Vicente and Flores (2021) emphasise that the absence of global standards for AI allows unequal and ethically questionable practices to continue. Multilateral initiatives, coordinated by bodies such as the United Nations Educational, Scientific and Cultural Organization, are crucial to filling these gaps.

From a theoretical perspective, Duque et al. (2023) underscore the relevance of philosophical approaches, such as utilitarianism and virtue ethics, to guide the construction of ethical guidelines. While a utilitarian approach prioritises collective well-being, virtue ethics emphasises the need for prudence and empathy on the part of AI developers and users, promoting a balance between innovation and moral responsibility.

Finally, Kaufman (2022) summarises the importance of a robust and multidimensional ethical framework to ensure that advances in AI benefit humanity as a whole. The integration of principles such as transparency, fairness, accountability, and distributive justice into regulatory frameworks is essential to address emerging ethical challenges and promote sustainable technological progress aligned with universal values.

10. Final Considerations

The ethical implications of AI technologies represent an indispensable field of study in the contemporary scenario, given the growing influence of these tools in multiple

dimensions of society. The analysis of impacts related to copyright, privacy, security, and regulation reveals a complex landscape in which technological advancement must be balanced with the protection of fundamental values such as equity, justice, and human dignity. This duality requires the formulation of integrated strategies that promote innovation responsibly and ethically.

The challenges associated with copyright reflect the need to establish guidelines that address new forms of creation and use of AI-generated content. The absence of clear rules for attributing authorship and protecting works used in algorithm training compromises both creators and developers, demonstrating the urgent need for a legal framework that reconciles the interests of all involved. Such regulation must be accompanied by mechanisms that ensure transparency and fairness in technological processes.

In the context of privacy and data protection, AI technologies introduce significant risks, such as the mass collection and misuse of personal information. These challenges highlight the need for more robust regulations that guarantee respect for individual privacy and establish clear criteria for informed consent. The implementation of effective standards in this field is crucial to mitigate abuse and protect users' rights, promoting a relationship of trust between society and technological innovations.

The issue of technological security and integrity reflects the potential of AI for both benefits and threats. The spread of misinformation, cyberattacks and algorithmic biases exemplify the ethical risks that require ongoing attention. These problems reinforce the importance of incorporating ethical design practices and rigorous oversight measures, as well as involving legislators, developers and experts in the creation of solutions that ensure the reliability of technologies.

Finally, regulation emerges as an essential component for aligning technological progress with global ethical standards. Despite regional and international efforts, significant gaps remain that need to be filled through interdisciplinary and global collaborations. The ethical approach to AI technologies, especially in aspects related to copyright, privacy, security, and regulation, is not only a technical issue but a commitment to sustainable and equitable development, ensuring that the benefits of AI are widely distributed and accessible.

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