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Code of Ethics for the Use of AI Technologies in Scholarly Publishing

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Abstract: Integrating artificial intelligence (AI) into scientific research has significantly advanced various processes, including data analysis, literature reviews, and manuscript preparation, thereby enhancing efficiency. However, the rapid adoption of AI has raised ethical concerns, such as authorship disputes, misinformation dissemination, plagiarism, and intellectual property violations. This study comprehensively examines the ethical implications of AI, evaluates pertinent EU regulations, and proposes mitigation measures. The study's findings indicate significant institutional policy deficiencies: nearly half of the surveyed researchers reported an absence of AI guidelines. Despite the EU's 2019 ethics guidelines emphasizing transparency, accountability, and human oversight, challenges related to fragmented intellectual property (IP) laws and governance issues persist. The study proposes implementing comprehensive ethical frameworks that include the following components: requiring AI disclosure, preserving human agency, and establishing robust data privacy protocols. Striking a balance between the transformative potential of AI and stringent ethical standards is imperative to ensuring the integrity of research. Institutions and policymakers must prioritize establishing clear regulations, transparency, and human oversight to prevent ethical breaches and maintain trust in scientific scholarship.

Keywords: Artificial Intelligence, Ethics, Natural Language Processing, Machine Learning, Deep Learning, COPE

Öz: Yapay zekânın (YZ) bilimsel araştırmaya entegrasyonu; veri analizi, alanyazın taraması ve makale hazırlama gibi pek çok süreci önemli ölçüde ilerletmiş ve verimliliği artırmıştır. Ancak YZ'nin hızlı biçimde benimsenmesi, yazarlık anlaşmazlıkları, yanlış bilginin yayılması, intihal ve fikrî mülkiyet ihlalleri gibi etik kaygıları da beraberinde getirmiştir. Bu çalışma, YZ'nin etik boyutlarını kapsamlı biçimde incelemekte, konuyla ilgili Avrupa Birliği düzenlemelerini değerlendirmekte ve olası önleyici tedbirler önermektedir. Çalışmanın bulguları, kurumsal politika düzeyinde ciddi eksiklikler olduğunu ortaya koymaktadır: ankete katılan araştırmacıların yaklaşık yarısı, kurumlarında herhangi bir YZ politikasının bulunmadığını belirtmiştir. Avrupa Birliği'nin şeffaflık, hesap verebilirlik ve insan denetimini vurgulayan 2019 etik ilkelerine rağmen, parçalı fikrî mülkiyet mevzuatı ve yönetişim sorunlarından kaynaklanan güçlükler varlığını sürdürmektedir. Çalışma; YZ kullanımının açıklanmasını (beyanı), insan iradesinin korunmasını ve güçlü veri gizliliği protokollerinin oluşturulmasını içeren kapsamlı etik çerçevelerin uygulanmasını önermektedir. Araştırmanın bütünlüğünü güvence altına almak için YZ'nin dönüştürücü potansiyeli ile katı etik standartlar arasında bir denge kurulması zorunludur. Kurumlar ve politika yapıcılar; etik ihlalleri önlemek ve bilimsel yayıncılığa duyulan güveni korumak için açık düzenlemeleri, şeffaflığı ve insan denetimini önceliklendirmelidir.

Anahtar Kelimeler: Yapay Zekâ, Etik, Doğal Dil İşleme, Makine Öğrenmesi, Derin Öğrenme, COPE

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Introduction

The concept of simulated intelligent behavior and critical thinking using computers, now recognized as artificial intelligence (AI), was initially developed in the 1950s. The objective of this research was to engineer sophisticated computer programs capable of communicating to the extent that they could perceive and respond to inquiries in a manner analogous to humans. This process is referred to as natural language processing (NLP), and it has proven challenging for numerous reasons, including the intricacy, ambiguity, and variability inherent in human language. During the 1980s and 1990s, there was a resurgence of interest in NLP due to technological advancements that enabled the development of more sophisticated AI systems. Since 2010, the field of NLP has experienced a renewed surge in momentum, driven by advancements in internet technologies and an expanding community of scientists engaged with an expanding body of data. In 2018, a US technology company unveiled the first AI model capable of processing vast volumes of internet text data and generating responses that closely resemble human writing (Dergaa et al., 2023; Nadkarni et al., 2011). Consequently, several prominent global technology companies initiated the development of AI models. Thus, the development of artificial intelligence (AI) technologies has become an inextricable facet of human life, permeating various aspects of scientific research. Digital technologies have been applied in numerous scientific fields. Machine learning (ML), deep learning (DL), and natural language processing represent three distinct categories of artificial intelligence (AI) technologies that have found application in the context of scientific research. These technologies are of particular relevance to digital platforms and ethical debates. Machine learning is defined as a set of techniques that enable machines to learn autonomously and evolve from their experiences without explicit programming. Deep learning, an artificial intelligence (AI) framework that utilizes structured neural networks to emulate the functionality of neurons, has emerged as a seminal concept in the field. The conversion of complex speech text into various formats can be seamlessly executed through the utilization of deep learning algorithms. Natural language processing, constituting the third pillar of AI technologies, encompasses all techniques that enable machines to automatically analyze, interpret, manipulate, and produce natural language, including speech and text (Ford, 2018; Jordan & Mitchell, 2015; Küçükvardar et al., 2020; Wilding et al., 2018). In contrast, machine learning involves the application of algorithms to data sets to identify patterns, make predictions, or perform tasks without the need for specialized programming. Natural language processing (NLP) can be defined as the computer's ability to comprehend written or spoken text. NLP facilitates the

detection of emotions or tone in written language, the reception of input from the tangible world, its processing, and the attempt to comprehend human language as it is spoken and written (Panesar, 2020).

However, the integration of AI in the domain of scientific research is a relatively recent development. AI can be succinctly defined as a set of technologies capable of autonomously executing tasks regarded as requiring intelligence when performed by humans (Crawford et al., 2016; Kaul et al., 2020; Marti, 2022). The Committee on Publication Ethics (COPE) (2023) proposed a more expansive definition, stating that AI encompasses "the engineering of intelligent systems, machines, and software capable of emulating human intelligence and behavior." The rapid advancements in artificial intelligence are poised to exert a direct and significant influence on numerous sectors in the near future." This transformation will encompass a broad range of production methodologies across diverse disciplines, heralding a new era of AI-driven innovation. Within a relatively brief period, AI-based technologies will become pervasive, resulting in the development of solutions across all scientific domains. In recent years, there has been a marked increase in the employment of artificial intelligence (AI) technologies by scientists in a variety of processes, including translation, proofreading, editing, literature review, coding, computation, analysis, and research design. Nonetheless, the accelerated integration of artificial intelligence (AI) instruments into scientific research and academic publishing has given rise to ethical concerns. Of particular concern is its application in scientific research, as it gives rise to inquiries regarding potential infringements of ethical principles. On the one hand, the integration of AI into education at all levels has empowered students and academics by equipping them with the ability to interact with and process vast data systems. This is a capability that has only emerged in the last decade. However, recent advancements in artificial intelligence have profoundly impacted the academic publishing sector, leading to a transformation with the potential to disrupt long-standing practices and norms. The capacity of AI tools to function as intermediaries between computers and humans, exhibit intelligent behavior, analyze environments, and process large datasets has contributed to this transformation (Akinrinmade et al., 2023). The objective of this research is to address the ethical standards of utilizing AI technologies in scientific research, the adequacy of regulations in EU countries addressing this issue, and potential measures to prevent ethical violations in scientific research based on these regulations. In the initial phase, an exposition of the AI tools employed in the scientific research process will be presented, accompanied by an examination of the propositions concerning ethical regulations.

The Digital Assistive Technology (AI) Tools for Research Process

The primary function of assistive AI tools for academic researchers is to augment productivity and streamline various components of research processes. According to Adams and Chuah (2022), the most widely used tools include grammar checkers, spelling error detectors, word list suggestions, text summarizers, word concordances, academic phrase banks, sentiment analysis tools, tone and diction analysis tools, textual analytics tools, advanced summarizers, and real-time intelligent tutors. These assistive technology tools consist of a set of applications designed to fulfill these functions. These tools leverage the capabilities of natural language processing (NLP) to facilitate writing, data analysis, and general research methodologies. These resources offer researchers several advantages, with the potential to considerably improve the quality of studies. Pividori and Greene (2024) delineate AI's contributions to authorship under the following headings: enhanced writing efficiency, improved text quality, support for diverse writing styles, transparency in revision, focus on critical research aspects, and potential for wider adoption. The integration of large language models into the writing process, as facilitated by Enhanced Writing Efficiency, has been shown to reduce the time spent on drafting and revising manuscripts. Consequently, this approach empowers researchers to prioritize the content and originality of the work. The enhancement of text quality has been demonstrated to facilitate the creation of higher-quality manuscripts, particularly for authors encountering writing difficulties, such as non-native English speakers. These authors can leverage this technology to implement revisions that enhance consistency. Conversely, AI support facilitates researchers' ability to adapt to writing style and requirements with ease, catering to demands such as adhering to specific publication guidelines or meeting academic standards. Transparency, a crucial aspect in academic writing, ensures that all modifications made by AI can be traced. This, in turn, clarifies the boundaries between human and machine contributions in research and preserves the integrity of the research process. The ethical concerns that have been raised regarding the role of AI in authoring are addressed. As stated in the extant literature, AI-based authoring tools are classified into two categories: rule-based and corpus-based. Rule-based tools, as defined by Soni and Thakur (2018), are grammar-checking systems that suggest and check common sentence structures and academic vocabulary in research papers. Conversely, corpus-based tools employ text summarization techniques to identify key sentences from a large body of text. These techniques are designed to produce a concise and fluent summary while retaining the essential information and overall meaning (Extance, 2018).

Despite the evident benefits of AI tools in facilitating scientific writing, some aspects require improvement. It has been observed that these tools are not infallible and have been known to omit crucial details, misanalyse data, provide inaccurate information, cite non-existent sources, misinterpret the context of a paragraph, or translate incorrectly. These issues have the potential to result in substantial complications for scientific research endeavors. This underscores the necessity for human oversight of the revision process. The potential for further development of AI tools is promising, as evidenced by recent advancements in the field (Pividori, 2023). The potential for such advancements is evident, particularly in light of the investments made in AI technologies and the rapid development of the technology itself. However, it is imperative to acknowledge that addressing these concerns necessitates a conscientious adherence to ethical principles when utilizing AI tools, as they can play a pivotal role in facilitating researchers' work, particularly when employed judiciously.

AI Usage in Research Process Designs

In the period following the Dartmouth Conference in 1956, the domain of artificial intelligence (AI) has undergone substantial advancements, particularly in the areas of machine learning, deep learning, and natural language processing. The technologies enabled by AI have enabled researchers to surpass conventional social science methodologies. These technologies empower researchers to conduct more profound analyses, develop predictions, and construct models of social processes (Maral, 2024). Significant advancements in the field of scientific discovery modeling have effectively eliminated impediments, thereby enabling a more pronounced focus on the utilities employed in contemporary scientific research (Kocabaş, 2015). In recent years, with the advent of technological advancements, artificial intelligence (AI) applications have been employed in scientific research processes encompassing various branches of the social sciences, including law, economics, anthropology, psychology, sociology, and political science. These disciplines elucidate the intricate interplay between life, nature, and society, offering a multifaceted examination of their influence on human beings, society, and social relations from diverse vantage points.

AI tools are employed for tasks such as research hypothesis formulation, method design, sample size determination/power analysis, data analysis, data collection, data storage, and sharing (including federated data sharing/use systems), literature review, source editing, grammar and spelling check, and translation. The

employment of artificial intelligence has been instrumental in the analysis of voluminous and intricate datasets, thereby unveiling patterns and correlations that might otherwise remain imperceptible to researchers. The automation of literature reviews facilitates a more efficient and comprehensive examination of associated studies, while the integration of language editors enhances the rigor of scientific research (Başaran & Özenç, 2024). Oxford University Press (2024) sought to ascertain the perceptions and use of AI by academic researchers. This study examined current practices, attitudes, and the evolving role of AI in academic research. A salient finding is that 76% of researchers employ AI tools in their work, despite persistent concerns regarding data security, intellectual property (IP) rights, and the efficacy of AI. The most prevalent application was translation, with 49% of respondents indicating its use. Subsequent to this development, the utilization of AI-powered search engines was reported by 25% of respondents. The primary applications of artificial intelligence in academic research include the discovery, editing, and summarization of existing research. Despite the proliferation of AI tools and options with the advancement of technology, scientific research primarily utilizes chatbots, such as ChatGPT, Bard, Gemini, Claude, NotebookLM, Copilot, and DeepSeek, along with various types of AI tools, including natural language processing and machine learning techniques. These chatbots have the capacity to be applied in a variety of fields, including literature review, hypothesis generation, translation, and reorganization of written language, as well as data analysis and interpretation. Literature search tools such as Consensus, Crossref, Research Kick, Research Rabbit, Scinapse, and Semantic Scholar have been developed to facilitate the process of scientific literature searches, thereby enhancing their efficiency, effectiveness, and comprehensiveness.AI tools such as Elicit, Iris.ai, JabRef, Readcube, Recite, Scholarcy, and Sciwheel have been developed for the purpose of recommending resources and managing bibliographies. In addition, tools such as ChatPDF, Netus AI, Perplexity AI, Scispace, Smodin, and Summaverse are classified as AI-supported text summarization tools.In the context of scientific research, tools like Beearly, Jasper, Jenni, and Ludwig have been utilized. Guru, Paperpal, ProWritingAid, QuillBot, TinyWow, Trinka, and Writesonic are employed to enhance the quality of writing, reduce time expenditure, and facilitate more effective communication among researchers. AI tools such as DeepL and Grammarly have been employed to enhance the quality of research writing and facilitate access to research published in various languages (Başaran & Özenç, 2024). Due to its numerous advantages, it is increasingly preferred in different fields of the social sciences. As the role of artificial intelligence (AI) in scientific research continues

to expand, ensuring its ethical and responsible use is of paramount importance. When employing AI technologies, it is imperative to exercise caution with regard to issues such as data source and permission to use data, data privacy and confidentiality, data bias, AI hallucinations, data timeliness, data reliability, and intellectual property rights (YÖK, 2024).

The AI Paradox in Higher Education: Strategic Priorities and Policy Deficits

Perhaps the most surprising finding of the Oxford University Press (2024) study is that 46% of researchers reported that their institution had no AI policy in place, leaving many without clear guidelines on responsible AI use. This policy vacuum is indicative of broader trends in higher education. According to the findings of the EDUCAUSE (2025) AI Landscape Study, while a significant proportion of higher education institutions, amounting to 57%, currently regard artificial intelligence as a strategic priority, only a minority have established AI-related acceptable use policies. Moreover, a mere 9% of these institutions believe their existing cybersecurity and privacy policies are sufficient for addressing the unique risks posed by AI. These findings underscore a substantial governance gap: the rapid adoption of AI tools by students and faculty has outpaced the development of institutional policies and safeguards. This institutional disparity mirrors a broader, global challenge that has emerged in recent analyses of AI and IP law. The accelerated development of AI technologies has surpassed the capacity of existing IP frameworks, which were established in the early stages of social media adoption. This has engendered widespread uncertainty regarding the application of copyright and patent laws to AI-generated works. Governments and institutions must address the challenge of balancing the promotion of innovation with the necessity of safeguarding intellectual property rights, particularly in contentious domains such as Text and Data Mining for training AI models. While certain jurisdictions have instituted exceptions to facilitate Text and Data Mining, others maintain restrictive policies, resulting in a fragmented global landscape. This has led to an increase in regulatory oversight and a corresponding rise in legal actions, as evidenced by cases such as Getty Images v. Stability AI. This case pertains to the unauthorized utilization of copyrighted images for the training of generative artificial intelligence models. In the United States, legal action has been initiated against prominent artificial intelligence companies, including OpenAI, Microsoft, and Anthropic. These legal actions assert that these companies' extensive language models have been trained on copyrighted materials without the requisite authorization or attribution (Dentons, 2025). Within academic institutions, the ambiguity surrounding AI and IP is

further exacerbated by the absence of comprehensive institutional AI policies. A recent EDUCAUSE (2025) study indicates that while faculty AI training is a strategic focus at many institutions (63%), students are the ones who utilize AI tools far more frequently than faculty (68%). This incongruity prompts critical inquiries regarding the extent to which institutions are effectively empowering their academic communities to navigate the intricate legal and ethical challenges associated with AI utilization in research and educational pursuits. As artificial intelligence continues to be adopted in academic settings, there is an urgent need for clearly defined institutional guidelines, robust cybersecurity measures, and updated intellectual property frameworks to address the unique challenges posed by AI in research and innovation (Oxford University Press, 2024; Dentons, 2025). Absent these considerations, faculty and students remain vulnerable to unintentional infringement, data privacy violations, and ethical missteps in their use of AI technologies.

Ethical Frameworks and Guidelines for AI Use by Researchers

The integration of artificial intelligence tools into academic research underscores the necessity for comprehensive ethical frameworks. It appears that the rapid adoption of AI technologies, particularly in the realm of social media, has outpaced the establishment of ethical frameworks governing their use. Nevertheless, the ethical frameworks for AI are of paramount importance as AI is increasingly utilized in more sensitive domains. A number of challenges have been identified in the application of artificial intelligence tools in research contexts, including data analysis, literature review, and the creation of research materials. It is imperative to address these issues to alleviate ethical concerns for several reasons, including bias and fairness, transparency, and explainability. A multitude of approaches, methods, and tools have been proposed to address the ethical concerns of AI systems. In 2019, the European Commission published a series of guidelines concerning artificial intelligence. These guidelines centered on seven principles: human agency, technical robustness, privacy and data governance, transparency, fairness, societal well-being, and accountability. With respect to the objectives of the researcher, human agency is pertinent to academic research, with the exception of societal well-being.

The principle of human agency is pertinent to academic research because human oversight can occur in research. By implementing this principle, researchers can exercise control over their studies and utilize AI tools to support their scholarship. The maintenance of intellectual property is emphasized in numerous fra-

meworks in the literature. In accordance with this principle, we propose five guardrails (Limongi, 2024; Resnik & Hosseini, 2024):

i. Maintaining Intellectual Ownership: Researchers must ensure that AI tools are not employed to generate ideas without human agency. Ideas and arguments must be original and created by the author. The utilization of AI tools in brainstorming, summarizing literature on a specific subject, or proofreading is a viable option. However, it is imperative to attribute fundamental ideas, such as formulating hypotheses or conducting analyses, entirely to the researcher. This is because AI tools should not be regarded as the sole originators of these ideas.

ii. The Preservation of Critical Thinking: Critical thinking should not be substituted for human judgment. While researchers may benefit from AI tools by verifying their reasoning processes and having AI provide suggestions or corrections, the ultimate conclusions should be attributed exclusively to the researcher. Researchers must examine the contributions or modifications made to AI tools and maintain the core of critical thinking.

iii. Limited Reliance: The utilization of AI should be restricted to supporting ancillary operations, such as grammar correction and data visualization, among others. Human oversight is imperative to ensure the integrity of human judgment when dealing with intricate data. The utilization of AI tools should be regarded as a complementary augmentation to human research endeavors rather than a substitution thereof.

iv. Technology Awareness: It is imperative that researchers develop a comprehensive understanding of the capabilities and limitations of the AI tools they utilize, particularly within the context of the writing process. The intellectual capacity, experience, and depth of scholars' knowledge, which is one of the greatest contributions of scholarly work, may be lacking in AI tools due to their algorithms. To this end, researchers are encouraged to complete a set of AI training modules at their respective universities to develop a comprehensive understanding of these capabilities and limitations.

v. Authentic Voice: The employment of artificial intelligence tools for grammatical corrections or proofreading has the potential to markedly modify written content, thereby jeopardizing the preservation of the author's authentic voice. While artificial intelligence can enhance readability, researchers must ensure that the final draft accurately reflects their unique

style. In order to achieve the aforementioned objective, it is imperative that researchers exercise discernment in their adoption of AI-driven tools. This entails ensuring that the suggestions align with their style and perspective, and removing or modifying those that do not align.

In the contemporary landscape, several AI applications and platforms have emerged in recent years, particularly in the social media sector. It is evident that prominent social media corporations have incorporated proprietary artificial intelligence instruments into their platforms, thereby furnishing users with a plethora of options to capitalize on AI capabilities. This underscores the significance of the technical capabilities of the AI tool selected by the researcher. Concomitantly, the principle of technical robustness should be incorporated into AI-aided academic research. We identified three guidelines for this principle:

i. Verifying Tool Accuracy: The utilization of artificial intelligence tools remains in its nascent stages. Consequently, there are several risks associated with accepting AI suggestions at face value without verifying their factual correctness, coherence, and alignment with reality. AI tools have the capacity to suggest summaries, articles, or references for specific topics; however, it is imperative to trace the information they provide back to its original source to avoid misinterpretation or dissemination of misinformation. It is incumbent upon researchers to subject the suggestions of AI tools, even in complementary tasks, to critical evaluation.

ii. Testing AI Tools: Firstly, researchers should test the AI tools they use for smaller tasks. For instance, if an AI tool is employed for a mathematical operation, it should be initially applied to simpler operations to ensure accuracy. An additional example is that if artificial intelligence is utilized for paraphrasing, one of its outputs should be examined against the original text.

iii. Avoiding Misinformation: It is incumbent upon researchers to exercise discernment when identifying errors introduced by AI tools. In instances where an AI tool suggests statistical data for a specific topic (e.g., the GDP of certain countries per year), it is crucial to validate the data from the original source document. In addition, researchers must be cognizant of fabricated citations generated by AI and should refrain from incorporating hallucinated citations.

Privacy compliance is another fundamental principle that should be integrated into researchers' ethical framework.

i. Data Anonymization: The identification of personal or sensitive data generated by AI tools is imperative prior to their incorporation into studies. Prior to uploading a dataset into artificial intelligence (AI) tools for analysis, it is imperative to deidentify or encrypt personally identifiable information (PII), such as names, email addresses, or phone numbers. Researchers must review data protection regulations, such as the General Data Protection Regulation (GDPR), to ensure that the datasets they upload are in compliance.

ii. User Consent: In the context of research involving survey responses, it is imperative to explicitly inform respondents that AI tools can be employed for analysis.

iii. Responsible Data Usage: When performing specific tasks, researchers should upload only the minimum viable data to AI tools.

Transparency is paramount for effective communication regarding the use of AI tools.

i. AI Usage Disclosure: The onus, therefore, falls on the researchers to ensure that the findings are interpreted with the requisite degree of scrutiny. It is imperative that researchers and academic writers disclose the extent to which they utilize artificial intelligence in their work. This can be incorporated into the methodology or the acknowledgments section, for instance, "This research employed AI tools (specific tool name) for data analysis, proofreading, and bibliography." This methodological framework enables researchers to articulate the utilization of AI instruments and delineate the boundaries of their intellectual contribution.

ii. Transparent Data Processing: In the context of research involving data management, it is incumbent upon researchers to articulate the role of AI tools in preserving data integrity and privacy. These activities include data preparation, cleaning, and manipulation.

Accountability is a core principle of ethical AI use in academic research. Accountability denotes the accountability of individuals and institutions in their use of AI.

i. Ownership of Researchers: Researchers must explicitly state any content produced with the assistance of AI tools, such as sections, graphics, or images, and take responsibility for any errors or biases. Researchers must ensure that any misinterpretation or misinformation presented by AI is

corrected prior to submitting their paper, including cross-checking AI suggestions against primary sources and field standards.

ii. Ownership of Institutions: Institutions should establish explicit guidelines regarding the utilization of artificial intelligence (AI) in academic research. This will ensure that researchers are held accountable for adhering to these guidelines. Institutions of higher education and research centers have the capacity to facilitate training sessions or allocate modules to promote responsible AI utilization. It has been observed that journals and conferences have begun to incorporate guidelines on the utilization of artificial intelligence in research papers.

Potential Ethical Violations of AI in Scholarly Publishing

The principles of ethical use of AI tools in scientific research and publishing have yet to be established. The integration of artificial intelligence in the development of manuscripts or the formulation of editorial decisions has the potential to give rise to significant ethical concerns, including citation disputes, the generation of misinformation, intellectual property infringement, and plagiarism (Pearson, 2024; Carobene et al., 2024). However, it is imperative to acknowledge that the utilization of AI, when guided by explicit criteria and principles, is not currently regarded as an ethical transgression, provided that the authors disclose the employment of AI to the pertinent authorities, typically the publisher or editor. Dergaa et al. (2023) explored the potential advantages of artificial intelligence for scientists, emphasizing the capabilities of natural language processing technologies in automating various tasks, including analysis, scanning, highlighting important details, summarization, proofreading, and editing scientific studies. The utilization of AI technologies, encompassing their breadth of application, continues to be a subject of considerable debate. In addressing these concerns, Van Dis et al. (2023) published an article in Nature that addressed the following questions: The question of which research tasks should or should not be delegated to large language models (LLMs) is a complex one. Which academic skills and characteristics are essential for researchers? In the context of AI-assisted research, what measures should be implemented to ensure the necessity of human verification? It is imperative to ascertain the most efficacious manner in which to modify extant research integrity and other policies, so as to effectively address LLMs. The integration of large language models into the educational and training curricula for researchers is a subject that merits close examination. In what manner may researchers and funders

contribute to the development of independent, open-source LLMs and ensure that models accurately represent scientific knowledge? It is imperative to ascertain the quality standards that LLMs should anticipate, and by which stakeholders these standards should be established. It is imperative for researchers to devise mechanisms that ensure the promotion of equity in research by LLMs, while concurrently mitigating the risk of exacerbating existing inequalities. The following inquiry is posited: In what manner ought LLMs be utilized to bolster the tenets of open science? A critical question to pose is what legal implications these large language models might have for the practice of science. These issues are intricately linked to the role and function of AI technologies in ethical considerations. The integration of artificial intelligence into various fields has occurred with great rapidity, extending even to the domain of academic publishing. Its potential misuse has already garnered considerable attention, prompting many journals and conferences to inquire about its use in academic work. The augmentation of AI capabilities, in the absence of commensurate regulatory frameworks, has the potential to exacerbate existing challenges. While artificial intelligence has reached a level that enables authors to focus on the substance of their work while delegating the drudgery to AI, this also brings its own limitations. The capabilities of artificial intelligence extend beyond translation, proofreading, and grammar correction. This development gives rise to concerns and challenges related to the integration of AI in the domain of scholarly publishing. This section explores these key areas of concern and discusses the specific principles and frameworks surrounding transparency, accountability, and fairness. Nevertheless, these advancements have given rise to ethical concerns. A particularly salient ethical dilemma pertains to authorship, a question that has become increasingly salient in the context of AI-generated content. While AI-generated content is not yet capable of producing flawless results, it has the potential to generate convincing narratives, including entire manuscripts and literary works. This prompts critical inquiries into the definition of authorship and implications for traditional notions of intellectual property and attribution. The following inquiries are of particular importance: The primary question to be addressed is whether artificial intelligence assistance should be disclosed in publications. A secondary question is who should be considered the owner of the manuscript, considering the extent of AI's contribution. The failure to acknowledge the distinct roles of AI tools and human agency can lead to significant challenges across various domains, including ethical considerations.

These challenges also extend to the domain of misinformation, which has emerged as a pressing concern for social media platforms and affects various sectors, including electoral processes. In the context of academic research, the utilization of AI tools can manifest in various forms, with the potential to generate inaccurate results, particularly in their nascent stages if employed or trained without adequate oversight. The foundational operation of AI entails the processing of voluminous datasets through the implementation of algorithms meticulously engineered to discern patterns, develop predictions, and execute tasks that are ordinarily associated with human intelligence. However, there are potential limitations that may introduce errors, including (i) data quality issues due to biased or unrepresentative data, (ii) algorithmic limitations stemming from developmental stages, and (iii) a lack of contextual understanding due to misinterpreting ambiguities in user input (Time, 2024; Le Monde, 2024; The Atlantic, 2024). These factors can result in three possible outcomes: data fabrication, data bias and inaccuracy, and academic fraud. Each of these fields exerts a distinct influence on academic scholarship.

Conclusion

The ethical guidelines proposed in this study, which are centered on the EU's 2019 principles of human agency, technical robustness, privacy compliance, transparency, and accountability, provide a foundation for responsible AI integration. Researchers must exercise intellectual ownership, maintain critical thinking skills, demonstrate technological awareness, and ensure an authentic voice in their work. Institutions bear a significant responsibility to establish clear policies, provide training, and establish accountability mechanisms that guide faculty and students through the complex ethical terrain of AI-assisted research. In the subsequent sections, several imperatives will be delineated. First, it is imperative that academic institutions develop and implement AI policies that address the unique challenges of academic research. These policies should include clear guidelines on disclosure, authorship attribution, and data privacy. Secondly, regulatory frameworks must evolve to address the gaps in intellectual property law exposed by AI technologies, balancing innovation with the protection of creative and scholarly work. Thirdly, the academic community must cultivate a culture of transparency. This entails the open discussion and appropriate documentation of AI use, as well as the normalization of disclosure rather than its treatment as an admission of inadequacy.

The ethical use of AI in scholarly publishing is not merely a technical or legal concern; rather, it is an issue of paramount importance to the preservation of the integrity of scientific inquiry and the maintenance of public trust in academic research. As artificial intelligence (AI) capabilities continue to expand, the academic community finds itself at a critical juncture. To achieve this objective, a collective commitment is imperative. It is incumbent upon researchers to exercise ethical judgment when utilizing AI tools. Institutions are obligated to furnish unambiguous guidance and establish mechanisms for accountability. It is incumbent upon policymakers to develop regulatory frameworks that are adaptable to these circumstances. It is incumbent upon the broader scholarly community to engage in ongoing dialogue about the evolving role of AI in knowledge creation. The primary objective should not be to resist technological change; rather, it should be to ensure that artificial intelligence (AI) serves as a complement to human intelligence rather than a replacement. By establishing robust ethical frameworks, promoting transparency, and maintaining human oversight, the academic community can harness AI's transformative potential while safeguarding the principles that underpin scholarly excellence. The integrity of scientific research is contingent upon our capacity to thoughtfully navigate this transition, thereby ensuring that technological advancement and ethical responsibility advance in tandem.

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