EDITORIAL

The Legitimacy of Artificial Intelligence and the Role of ChatBots in Scientific Publications

Authors' Contribution:
A – Study design;
B – Data collection;
C – Statistical analysis;
D – Data interpretation;
E – Manuscript preparation;
F – Literature search;
G – Funds collection

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Abstract

Background and Aim of Study:
Developing and using ChatBots based on artificial intelligence (AI) has raised issues about their legitimacy in scientific research. Authors have increasingly begun to use AI tools, but their role in scientific publications remains unrecognized. In addition, there are still no accepted norms for the use of ChatBots, and there are no rules for how to cite them when writing a scientific paper.
The aim of the study: to consider the main issues related to the use of AI that arise for authors and publishers when preparing scientific publications for publication; to develop a basic logo that reflects the role and level of involvement of the AI and the specific ChatBots in a particular study.

Results:
We offer the essence of the definition "Human-AI System". This plays an important role in the structure of scientific research in the study of this new phenomenon. In exploring the legitimacy of using AI-based ChatBots in scientific research, we offer a method for indicating AI involvement and the role of ChatBots in a scientific publication. A specially developed base logo is visually easy to perceive and can be used to indicate ChatBots' involvement and contributions to the paper for publication.

Conclusions:
The existing positive aspects of using ChatBots, which greatly simplify the process of preparing and writing scientific publications, may far outweigh the small inaccuracies they may allow. In this Editorial, we invite authors and publishers to discuss the issue of the legitimacy we give to AI, and the need to define the role and contribution that ChatBots can make to scientific publication.

Keywords:
ChatBot, artificial intelligence, Human-AI System, legitimacy, logo, scientific publication

Conflict of interests:
The authors declare that there is no conflict of interests

Peer review:
Double-blind review

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Dear Authors and Publishers,

This paper was not written by a ChatBot and is intended for humans. It is likely that in the near future there will be a need to introduce such alerts for scientific publications. We are now seeing an increasing trend of using ChatBots based on artificial intelligence (AI) in scientific research and writing. It is no secret that machine-readable texts today are more demanding and more readable. We live in a time when machines write texts that are read by machines far more often than by humans.

Several companies have announced the development of AI-based ChatBots: OpenAI's ChatGPT, Google's Bard, Microsoft's Bing (a search engine with a ChatBot), etc. There are already many AI tools with different specializations for text, photos, videos, etc. AI tools are developing at an unimaginably fast pace.

Figure 1 shows the AI tools available to users for writing text.

Figure 1
AI Tools for Writing Text

Note. The logos shown in the figure are taken from public sources (from the official websites of the companies). They are not ranked by ratings or other indicators.

Is ChatBots an advanced search engine? Or is it a real human intellectual competitor capable of exploring, learning, improving, creating?

Discussions about the trends and replacement of humans by AI, and the possible threats associated with it, have been ongoing since the term was introduced by John McCarthy (1959) in the middle of the last century.

This type of discussion is characteristic of most innovations. Think back to the discussions about robotics. Just as in the current AI situation, people saw benefits, problems, and threats. In the AI situation, things have become even more complicated because it has a new characteristic – learnability, as well as the use of the Large Language Model (LLM).

To answer the above question, it is necessary to consider the essence of this phenomenon. There are many aspects to this problem: from the physical level (availability and quality of servers) to the moral and ethical level (rules, norms, values, etc.).

There is no denying that AI, including ChatBots such as GPT, has enormous potential to greatly facilitate our daily lives and be an indispensable assistant in professional activities.

A number of scientists believe that AI and ChatBots are real competitors of humans in their professional activities and may replace them in many areas in the near future (Çalli & Çalli, 2022; Dans, 2019; Dimitriadou & Lanitis, 2023; Singh & Sood, 2022).

There are also often radical views that argue that the development of AI and the proliferation of ChatBots could lead to a loss of control over them and even the extinction of humanity (Farahani, 2023).

It is normal to have different points of view about new phenomena. However, one cannot ignore the personal position of those who are leading the development of these technologies and systems. They are more immersed in the problem than others, aware of the latest research, and able to anticipate trends more objectively. Their disagreement and lack of a unified view on the prospects of using AI can have ambiguous consequences. On the one hand, it generates competition, which contributes to the development of this market and to innovation. On the other hand, we cannot be completely sure that we will not lose something more important in the pursuit of profit and the desire to lead.

The aim of the study. To consider the main issues related to the use of AI that arise for authors and publishers when preparing scientific publications for publication; to develop a basic logo that reflects the role and level of involvement of the AI and the specific ChatBots in a particular study.

Results and Discussion

In this paper, we will not discuss the advantages, disadvantages, and limitations for human use of AI. We will limit ourselves to considering the problem in the area of using AI for scientific research and publication. To be fair, the rivalry between AI and humans is indeed growing. In the near future, we can expect AI to increasingly displace humans from certain areas of activity, including consulting services, telemedicine, online education, journalism, IT, etc.

This problem raises a number of fundamental questions: can AI significantly influence (replace) human activity in the Human–Human System with the new Human-AI System?

This is a fundamentally new system that raises even more questions, especially how it will affect the quality of life of the individual himself.

First of all, it is necessary to describe this definition.

Human-AI System is a complicated dynamic complex of interactions between living and non-living matter, is an accumulation of coordinated, interdependent and interconnected informational-technological actions of human and AI, oriented to learn from the information obtained, designed to effectively perform tasks and achieve goals.

While the answers to some questions are obvious (technology and robotization have made heavy and monotonous work easier, computerization and the Internet have helped speed up information retrieval and processing), the use of AI, including ChatBots, remains uncertain. This is especially true in the intellectual sphere: scientific research, media publications, etc.

Some of the positive things about using AI and ChatBots are that they can find relevant documents, summarize text and draw conclusions from documents, make predictions, answer questions quickly, and argue for answers based on the latest scientific research.

Despite all these impressive benefits, we have some doubts about the pace and scope of AI delegation. Would not the use of AI accelerate the pace of life so much that we lose control over it? You would agree that this small factor could radically affect our lives. Therefore, the problem of AI legitimacy needs to be addressed as soon as possible.

Since scientists are (still) the leaders of innovation and the level of development of society depends on them, let us consider the role of ChatBots in scientific publications. It is in scientific publications that ideas are first expressed and then put into practice, significantly affecting human activity and life on the planet as a whole. Existing search engines and the emergence of new ChatBots, such as ChatGPT, which use language models, greatly simplify the process of preparing and writing scientific publications. They can help authors automate research workflows such as literature searching, literature review, statistical analysis, and more.

In this Editorial, we would like to introduce our idea of creating a digital platform that has the potential to legitimize and regulate the use of AI, intelligent search engines, ChatBots in scientific and practical human activities. And first of all, it should be implemented for scientific publications.

We believe that the method we have developed, indicating AI involvement and ChatBots contributions to scientific publications, can solve this problem. We offer to use a logo that is visually easy to perceive and essentially reflects the role and level of involvement of the AI and the specific ChatBots in a particular study.

We have developed a basic logo layout that can be used to indicate the use of AI-based ChatBots in a publication. The logo has a color image and a black and white image. Consider the black and white image. The basic logo layout (Figure 2) is a rectangle with rounded corners, divided into two segments by the background.

The left segment with a gray background contains a hexagonal figure with the AIC abbreviation centered on white background. The AIC abbreviation stands for AI-based Chatbot as well as Academic International Corporation, which provides this platform.

The right segment with a white background contains the "AI Chatbot" inscription. This indicates that the author(s) of the manuscript used AI-based Chatbot. Below the inscription, A, B, C, etc. letters in alphabetical order indicate this contribution to the research.

The name of the Chatbot/toolkit(s) in the Materials and Methods section; the author(s) can include the name of the Chatbot developer in the Acknowledgments section. Authors may disagree because using the logo looks like co-authoring with AI. In anticipation of this disagreement, we suggest looking at the actual capabilities of ChatBots and their role in preparing the paper. After all, ChatBots are quite capable of performing study design, data collection, statistical analysis, data interpretation, manuscript preparation, literature searches... The author only needs to specify the topic, key parameters, and manuscript design requirements, and that will be enough for ChatBot to write a review article or even an original article.

We assume that in the near future, such papers will fill publishers' email inboxes. Therefore, the dilemma of quality or quantity in scientific publications will become particularly relevant (Melnyk & Pypenko, 2021).

Figure 2
Layout of a Basic Logo to Indicate the Use of AI-Based Chatbot in a Publication
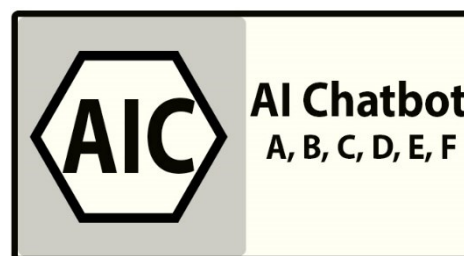
Note.
1. The presented logo is the authors' own creation.
2. If the author(s) used an AI-based Chatbot in the manuscript, we recommend using a contribution classification index for the manuscript.
Example of a letter designation: A – Study Design; B – Data Collection; C – Statistical Analysis; D – Data Interpretation; E – Manuscript Preparation; F – Literature Search…

Are the papers written by ChatBots the result of the intellectual activity of the author, who has skillfully set the parameters for entering information, or are they still the product of the ChatBot, which has a share in co-authorship?

Let us try to answer the question of who owns the authorship of such a publication objectively.

Despite the significant contributions that ChatBots can make, at this stage ChatBots cannot be considered legitimate authors of a scientific paper.

If only because ChatBots are not responsible for the text they write, they cannot sign a statement about the presence or absence of a conflict of interest. Such a statement is required by most scientific journals, including the International Journal of Science Annals (IJSA).

However, there is a precedent of ChatGPT having a profile in Scopus (ChatGPT, n. d.), as well as papers published by prestigious international publishers in which ChatGPT is listed as an author (O'Connor & ChatGPT, 2022).

Also noteworthy is the book "Impromptu: Amplifying Our Humanity through AI", in which GPT-4 writes: "I would like to thank Reid Hoffman for inviting me to co-author this book with him". Please note that Reid Hoffman, a leader in the field of AI, states on the title page "By Reid Hoffman with GPT-4" (Hoffman with GPT-4, 2023).

There is one case in the literature where ChatGPT has answered negatively to the question of whether it meets all of the International Committee of Medical Journal Editors (ICMJE) criteria for authorship – "ChatGPT can assist in the drafting or revising of a work, but it cannot fulfill all of the ICMJE criteria for authorship" (Anderson, 2023).

Perhaps it is a question of specific criteria for authorship, rather than ChatGPT's refusal to acknowledge its role in writing. In any case, we have not received a clear answer to this question. Therefore, the answer should be sought in the aspect of ethics, as well as the willingness of the person to recognize the authorship of ChatGPT or not.

Todd Carpenter conducted a ChatGPT survey on the impact of AI on science communication. Specifically, he asked about the ethics for an author of using AI in developing a scholarly paper. As ChatGPT learned from the response, ethics "depends on the specific context and the expectations of the research community in which the article will be published" (Carpenter, 2023).

ChatGPT itself sees no ethical problems with the use of AI in scientific writing. However, it notes that authors must "clearly state this in the article and provide appropriate credit to the AI program" (Carpenter, 2023).

Springer Nature and Taylor & Francis Publishers suggest that AI contributions should be reflected in the methods or acknowledgements section, rather than being listed as an author (Stokel-Walker, 2023).

This position is justified by the important characteristic of authorship – responsibility for publication.

In this context, it should be noted that it is known that AI has convincingly described the results of studies (specifying the organizations that conducted them and the quantitative indicators). However, when clarifying the information, he could not confirm it with any sources and apologized for the error and confusion in his statement (Davis, 2023).

These facts point to the need for caution and responsible use of information obtained from AI. It is important to remember that human remains responsible and accountable for copyright infringement.

If someone claims undivided authorship, he/she should objectively, based on facts, state the role of ChatBot in the scientific publication, claim full responsibility for the content of his/her manuscript and the result, including the parts created by ChatBots, as well as the degree of originality of his/her publication. Perhaps there is no shame in stating that the research design, data collection, or statistical analysis was done using a particular ChatBot. In doing so, the question posed to the ChatBot and the answer received from the ChatBot should be clearly stated.

In our opinion, information about the use of ChatBot should necessarily be reflected in the methodology with a correct indication of which ChatBot was used by the author, where and to what extent. The name of ChatBot and its characteristics should be specified in the References list.

Our recommendation is also based on the fact that in the near future it will probably be impossible to hide the involvement of ChatBots in the writing of a scientific paper. ChatBots-creating companies will start using something like a "watermarking" on the bot's output to make plagiarism easier to spot. The San Francisco-based company OpenAI, which created ChatGPT, has already announced this. OpenAI guest researcher Scott Aaronson said that "the technology would work by subtly tweaking the specific choice of words selected by ChatGPT, …, in a way that wouldn't be noticeable to a reader, but would be statistically predictable to anyone looking for signs of machine-generated text" (Hern, 2022).

So there is a good chance that if you try to pretend to be the author of text written by a ChatBot, you may be detected. Turnitin has already begun work on developing an AI-based text detection tool (Chechitelli, 2023).

In early April 2023, the American Psychological Association (APA) website published information with guidelines for quoting and reproducing text generated by ChatBots (McAdoo, 2023).

We recommend that Authors of our Journal use these standards when preparing a manuscript and citing text generated by ChatBots.

It is important to note the statement of the Committee of Publication Ethics (COPE). On its website, the Committee has published its official position on authorship and the use of AI tools (COPE Council, 2021; COPE, 30 January 2023; COPE, 13 February 2023; COPE, 23 February 2023; Watson & Stiglic, 2023). Also a number of papers on using AI for scientific writing (Çalli & Çalli, 2022; Dans, 2019; Dimitriadou & Lanitis, 2023; Farahani, 2023; Singh & Sood, 2022).

Today, COPE is virtually the only organization in the scientific world that promotes ethical principles in scientific publishing. COPE Council members warn that the increasing role of AI in research writing "has significant implications for research integrity and the need for improved means and tools to detect fraudulent research" (COPE, 23 March 2023).

This is a matter of concern for those scientific publishers who conduct their activities responsibly and put into practice the principles of scientific publishing ethics and the COPE standards.

The IJSA is a full member of the COPE (COPE, n.d.).

Thanks to this, the members of the IJSA Editorial Board were able to participate online in events dedicated to the discussion of this topical issue (COPE, 23 March 2023).

Conclusions

We started our Editorial with a warning: this paper was not written by a ChatBot and is intended for humans.

Although we don't have the slightest doubt that it will be read by AI, because this paper will be converted into multiple formats and found in several dozen scientometric databases, repositories, and search engines. It is time for humans to define the legitimacy we give to AI.

We have offered the essence of the definition "Human-AI System". This allows us to clarify the essential features of the new phenomenon under consideration, which opens prospects for its further study.

Authors should be transparent about the use of AI tools. This will allow readers to know what and how the paper was created, and it will allow reviewers, editors, and publishers to check the quality of the paper.

We encourage you to consult the recommendations of leading publishers Springer Nature and Taylor & Francis, as well as the expertise of COPE Council members on the ethics of scientific publication, and the recommendations of APA experts on citing and reproducing ChatBot-generated text.

The need to determine the legitimacy of using AI-based ChatBots in scientific research prompted us to develop a method for indicating AI involvement and the role of ChatBots in a scientific publication.

We recommend using the developed base logo to indicate ChatBots' involvement and contributions to the writing of the paper. This would be appropriate for authors, reviewers, editors, readers, and, from our point of view, ethical.

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