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Editorial

Sci and AI

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Abstract

Artificial Intelligence (AI) is rapidly changing the format, style and content of scientific publishing. Traditional reviews are likely to give way to more personalized, AI-generated literature surveys on the one hand and more innovative, perhaps even controversial hypothesis, opinion or essay-style contributions on the other. Original publications based on experimental data are still less affected even if AI teams up with robots. Eventually, science and scientific publishing are social activities and although the AI-driven tools and technologies at hand may accelerate and also refine scientific publishing, scientists, as always, are well equipped to adapt and to turn these challenges into new opportunities, for instance in handling, processing and illustrating experimental data.

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1. The Advent of Artificial Intelligence in Publishing

These are indeed interesting times! Besides the usual economic, political and ecological upheavals, the advent of Artificial Intelligence (AI), in fact long on the horizon yet often gone unnoticed, is about to change the face of Science for generations to come. Thanks to AI, you may embark on a daring journey to a faraway place today without a map, a plan, currency, Swiss army knife or even a dictionary or ticket in your rucksack, simply in anticipation that your smartphone will be at hand and handy to solve each and every issue you may encounter for you. And indeed, this little intelligent and well-connected device, equipped with a suitable "predator app", may even identify the animal creeping up to you, provide you with its adequate English and Latin name, indicate its danger level on a scale from zero to ten and advise you if you should hide or better run, again on a scale from zero to ten. If you are lucky, you may even have a suitable app installed which may flash, electrocute or otherwise get rid of the fellow mammal or reptile with ease. Yes, these are indeed exciting days for you and your smartphones, algorithms, co-pilots, avatars and other digital friends. And there is more to come, assuming that you did not run out of battery and that that animal did not get you first and had you and your smartphone for lunch!

As for scientific publishing, AI is already changing the way we search for information and how we communicate in science. Online communication, virtual conferences and podcasts are among these innovations. Yet even traditional publishing, the written word, is also changing quickly. Take, for instance, reviews. During the last couple of years, I have noticed that AI is indeed able to write excellent reviews, in almost perfect English and considerably faster and more comprehensively than most colleagues including myself. This is simply due to the fact that AI can sample considerably more existing literature and publications in considerably more detail, with considerably more focus and in considerably

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shorter times than us humans, without the need for the occasional break or professional language editing. AI is also able to produce more artistic illustrations and figures, such as frontispieces and graphical abstracts, with ease and, admittedly, of excellent quality. It is therefore not entirely unlikely that within the next couple of years, most traditional-style reviews may be written and illustrated with the help of AI or entirely by AI.

In the long run, traditional reviews may even become obsolete altogether. It may be easier to consult AI on a very specific topic with very specific keywords and thus produce a tailored, custom-made review on that specific topic for private use within seconds, rather than sifting through existing published reviews to see if one may eventually find the information one is actually looking for (and often does not as titles etc. may be slightly misleading). This situation is reminiscent of the old-fashioned analogous Chemical Abstracts or Beilstein search systems of the 20th Century, stored in the basements of most libraries and tedious to use. No doubt, they were extraordinarily useful at the time, clearly the best one could have, yet are now entirely obsolete and, if they are still around, are covering the dust of history.

Still, this does not mean that review-like publications may disappear altogether. They may just need to adapt as far as their format, content, style and eventually originality are concerned. Manuscripts using existing literature to support a new idea or hypothesis, for instance, may still be of enormous value, and although they may at first glance look a bit like reviews, their approach is different: originality stems from the innovative ideas, the literature review, by providing support for the arguments, takes second place. These types of non-experimental manuscripts are often referred to as Hypothesis, Opinion, Emerging Area, Personal Accounts etc., they are a pleasure to read—and to write—and they are probably here to stay for a while.

Indeed, a more individual style of writing texts may provide fresh impetus to scientific publishing. Reviews based on seemingly infinite rollcalls of facts and citations are clearly exhausting compared to short, captivating texts. A more eloquent style of writing is common in the humanities, it allows authors to leave their personal, recognizable scent in texts and to uphold the interest of the readers. Indeed, it is a pleasure to read a text from Aristotle or Kant, Nietzsche or Rousseau, and although a natural scientist does not necessarily have to write like Shakespeare, she/he should still aim to convey her/his message "in style". I am not sure if AI itself one day may also be able to innovate new ideas or to engage readers in such a Shakespearian manner. So far, AI as an author seems to be rather dull.

The other place where AI obviously still fails is on the bench. Although AI may be able to sift through the existing literature and may one day also provide you with some clever new ideas and even design and interpret experiments for you, it can neither shake your tubes, flasks, co-workers nor project students! In essence, the hands-on aspect of us (natural) scientists, together with our teamplay and networking, will definitely survive, even if AI teams up with robots and other machinery. Eventually, Science is a social activity—and I am not convinced that a dancing robot is up for a truly intelligent (*sic*) conversation on shaking spears or pears.

Thus cherish your co-pilot and entrust it with the stuff it can do, yet do realize that this is just a co-pilot, a helpful tool which may be able to assist you here and there.

2. The Feature Papers Editors Collection 2024 Special Issue

Indeed, the 2024 collection features a number of exquisite contributions on vastly diverse yet equally timely topics in science, from engineering to medicine, urban planning to biochemistry. Actual challenges, such as climate change, circular economy and changes in society form a central theme, such as the article by Avi Friedman on circularity of

communities and homes or the contribution of Ante Gudelj and colleagues on the efficiency of ecofonts in printing [1,2]. Covid is also still high on the agenda with Alicia-Portais-Riomao, Augusto G. Zapico and colleagues reporting on the hidden effects of lockdown on child health [3]. The other disease stimulating research is cancer and excellent contributions from Jose Ramón Jarabo and colleagues considering the benefits of surgical resection for non-small cell lung cancer and Toby J. Phesse and colleagues looking at the Wnt signalling pathway to target cancer with Paris' Arrow cover this field [4,5]. Talking about health, we find a spectrum of contributions. Some are more practical, such as Peter Matew, Marcello Trovati and colleagues looking at the internet of medical things and Seán Paul Teeling and colleagues using person-centred lean six-Sigma to transform dermatology waiting lists [6,7]. Others are more biochemical, such as Elisa Bellei and colleagues discussing prospective biomarkers in severe periodontitis, Andra Oros and colleagues investigating heavy metal concentrations in wild mussels on the Romanian Black Sea Coast or Fernando Esperón-Fajardo, Arisbel Cerpa-Naranjo and colleagues looking at the antimicrobial efficiency of graphene oxide [8–10]. In the field of engineering, we feature a captivating contribution by Achanai Buasri and colleagues on innovative electrolytes for rechargeable zinc-ion batteries and an article by Mohd Faheem Khan on enzyme applications for sustainable textile processing and waste management [11,12]. This leaves us with two contributions which follow the lead of reviews that AI can't (easily) do: A strategic manuscript by Muhammad Jawad Nasim, Claus Jacob and colleagues on the chalcogen exchange in molecular design and synthesis and an essay by Ahmad Yaman Abdin and Claus Jacob on Pharmasophy, an emerging field of research that brings together pharmacy, society and philosophy [13,14].

3. Concluding Remarks

Taken together, this collection of 14 publications featuring state-of-the-art science demonstrates what AI can and cannot do today. No doubt, AI already has a major role in scientific research and publishing and may even deal with waiting lists in hospitals. And indeed, these roles are likely to increase considerably in the years to come! At the same time, it is also certain that scientific communication is changing at a rapid pace and that journals such as Sci need to adapt. Original articles based on experimental data, and a more personal style of scientific writing, as witnessed in these Feature Papers, bear promise as more original forms of communication. As for this specific Editorial, it clearly has been written without the assistance of AI, as AI would neither have been able nor allowed to make the many small yet distinct linguistic mistakes and puns which are, indeed very personal and distinguish someone who shakes the spear from one that only shakes the pear.

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