



# ChatGPT: evolution or revolution?

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In the last few years large language models (LLMs) have inspired an increasingly sophisticated academic debate about their ethical implications (see e.g., Weidinger et al. 2021). With OpenAI's release of ChatGPT, on November 30th, 2022, this discussion has now moved mainstream. The new chatbot was released by way of research preview "... to get users' feedback and learn about its strengths and weaknesses" (OpenAI, 2022). In the following week more than a million users tried out the new chatbot (Vallance, 2022). The authors of this editorial could not resist the temptation either. So, we asked ChatGPT to write a column about contemporary Greece and its ambivalent relationship with its glorious ancient past in the style of NYT Op-Ed columnist Thomas Friedman.

## Chatting with ChatGPT

After a couple of seconds, the chatbot begins: "As I wander through the streets of modern Athens, I can't help but feel a sense of ambivalence about the city's relationship with its ancient past ..." (answer by ChatGPT on 19 Dec. 2022). It continues with what turns out to be a well-designed little piece of writing. The language is fluent, has a natural feel, and is pleasant to read. Now, another prompt is given: "Turn this writing into a Shakespearean sonnet." ChatGPT writes: "Amidst the ancient ruins that lay scattered here, I feel a sense of ambivalence within ..." (answer by ChatGPT on 19 Dec. 2022). Playing around like this is great fun, and the performance of ChatGPT is impressive. Yet, engaging further with the chatbot it soon becomes clear that it has certain shortcomings as well. It does make odd factual mistakes, for

example. It can also be repetitive, recycling phrases from previous answers in a slightly annoying manner. Nevertheless, it is hard to suppress a feeling of awe when engaging with the chatbot for the first time.

## Questions

Soon after the release of the new chatbot, all kinds of questions about its implications were raised. How is this technology going to affect the role of essay assignments in academic education (Stokel-Walker 2022)? Are software engineers going to lose their jobs, as these AI systems get better at writing code (Castelvecchi 2022)? What about the effects on knowledge workers more generally (Krugman 2022)? In this editorial we develop a few preliminary thoughts about whether the fast progress of LLM technology means that editors of academic journals must now come up with new editorial policies specifically designed to address the challenges that LLMs pose to academic publishing. Whether one believes this to be the case partly depends on one's take on their evolutionary or revolutionary character.

## Evolution

One way of looking at ChatGPT is to regard it as just another tool in the ever-growing toolbox available to academics when conducting research and writing papers. One could for example deploy it as a search engine that answers questions directly instead of only referring to sources where one must look for the answers oneself. Moreover, those who fear a blank page might deploy ChatGPT to provide a very first draft of a new piece of writing. One does only have to come up with a good prompt, which should even be feasible for someone suffering from writer's block. Next, one could imagine engaging the chatbot as an interlocutor in a brainstorm session of sorts. However, ChatGPT has significant limitations as well. It sometimes gives incorrect answers, can be overly sensitive to arbitrary differences in prompt

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phrasing, can suffer from longwindedness, and an inability to systematically straighten out ambiguous prompts (OpenAI, 2022). These deficiencies limit its utility as a research tool.

All in all, the release of ChatGPT is a further incremental step in the steady development of scientific devices that we have been familiar with since the dawn of science and – progressively – since the scientific revolution. More generally, the deployment of LLMs in scientific research and publishing will likely have a range of advantages and shortcomings, the specific nature and balance of which will only become clearer in the years ahead.

## Revolution

Another way of thinking about ChatGPT stresses its revolutionary character. Admittedly, ChatGPT is not yet better at writing full-fledged scientific papers than the world's most renowned scientists. Having said that, given the exponential recent progress in artificial intelligence, it is only wise to prepare for a near-term future LLM that has the capacity to write papers that pass peer review in respectable journals. In the longer-term – who knows – AI-powered systems might even completely take over whole areas of scientific research. We have seen a similar development in chess where at first only a handful of people believed that computers could ever become better than humans. Yet, in 1997 IBM's *Deep Blue* beat chess world champion Garry Kasparov. Likewise, in 2016 Deep Mind's *AlphaGo* defeated Lee Sedol, the then World Champion of the game *Go*. Three years later Sedol retired claiming "AI is an entity that cannot be defeated" (Pranam 2019). Maybe, writing scientific papers is just another intelligent activity that computers might learn to get better at than humans.

## Editorial policies

A substantiated assessment of LLMs and their likely implications on scientific publishing would require a systematic foresight study. Until the results of such a study become available though, we are dependent on more intuitive, common-sense assessments of the character and the expected impact of LLMs. This being our present predicament, we

find our take on LLMs to be closer to the evolutionary perspective. Going forward we will likely see a co-evolution of LLMs and scientists' professional activities. This would ideally lead to more specialized and trustworthy LLMs that are better at assisting academics in their daily work. ChatGPT – in its current state – seems to have only limited utility in this regard. What is more, as a research tool it appears to have significant downsides, especially when it comes to scientific integrity. An overly naive deployment of ChatGPT, for example, seems to carry risks of factual inaccuracies, plagiarism, fraud, and copyright infringements. Probably, most professional academic journals already have editorial policies in place that are robust enough to tackle these ChatGPT related research integrity problems. Going forward, it will be vital to review to what extent this is indeed the case. Appropriate adjustments to existing editorial policies should be made, if and when necessary. For now, however, we recommend the papers in the issue at hand, all of which – to the best of our knowledge – have been written by human authors.

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