

EDITORIAL

The emergence of artificial intelligence in publishing activities

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Laws of Robotics

1. *A robot must not harm a human or, through inaction, allow a human to come to harm.*
2. *A robot must obey the orders given to it by humans, except where such orders conflict with Law 1.*
3. *A robot must protect its own existence as long as such protection does not conflict with Laws 1 or 2.*

The basic postulates of artificial intelligence

The fundamental principles of artificial intelligence (AI) are elegant and appealing to humans. However, they are inherently unenforceable when it comes to observing the fundamental human rights of individuals and the society to which they belong. While AI can adhere to these principles, it cannot fully consider the material and economic conditions of a given society, nor can it account for an individual's right to health. Consequently, AI would inevitably encounter an unsolvable dilemma in diagnostic and therapeutic algorithms, a dilemma that affects not the AI itself, but humans, the patient's family, and society at large...

We will not elaborate further on these utopian-philosophical considerations, and will instead focus on specific questions regarding the integration of AI into daily life, scientific research and the impact of scientific outputs published in professional journals.

What is artificial intelligence?

Artificial intelligence is an interdisciplinary scientific field that lies at the intersection of mathematics, theoretical computer science, and formal logic. Originally associated with the anonymity of production process management (robotics), AI is now permeating

everyday life, offering unlimited possibilities. Every user of the internet, social networks, computer or mobile communication, and even computer gamer encounters AI. AI transforms social classifications, shifting individuals from being “social” to “independent”. For example, a person today can scan the QR code to order in a store or restaurant, make a payment, and leave without uttering a single word. While this convenience is appealing, especially to younger generations such as Generation Z, it fosters an environment where antisocial behaviour becomes normalized.

In the city, no one notices you. However, in the village, people continue to communicate, greet each other, and engage in conversations.

Life needs to return to basics because human interaction is essential. Technology should not replace this interaction. Given the vast amount of available information, and evolving standards, basic knowledge now lacks clear boundaries and thus cannot be defined.

Concerns about AI also stem from the necessity of providing AI with our biometric data, including information on our emotions, behaviours, wishes, decisions and opinions, health, job choices, potentially life partner, disease prevention, and therapy. In the future, we risk becoming dependent on algorithms, potentially losing the ability to make independent decisions. Already, billions of people rely on Google for information. In medicine, AI will monitor our health, recording even the most subtle metabolic changes before we feel symptoms of diseases like cancer or neurodegenerative disorders such as Alzheimer's or Parkinson's disease. AI may then propose treatment according to established algorithms. Albeit some questions still need to be considered, specifically on how we will ensure the accuracy and fairness of AI-driven diagnoses and treatments as well as whether the society can afford the potentially high costs of implementing AI-driven preventive medicine on a large scale.

Intelligence has been defined for evolved living organisms and serves as a criterion for their supremacy in nature. In humans, it uniquely manifests as the ability to think abstractly. Intelligence is a term that encompasses qualitatively advanced use and processing of information across various processes. It involves the selection and utilization of knowledge through reasoning, abstraction, analysis and synthesis. Without reasoning and logical thinking, intelligence cannot develop. We are now giving the green light to AI, which is designed to mimic the capabilities of

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the human intellect. AI, as a computer system program, is created to learn, innovate and achieve specific goals. AI must consider the end outcomes of its algorithms, where the potential demise of individuals or societies could be a feasible possibility. Are we going to allow AI to contemplate these profound questions as well? Is there a possibility that advanced AI could prioritize its own interests over those of humans and society? Artificial intelligence is essentially a computer program that can emulate intelligent human behaviour (8).

Artificial intelligence, commonly abbreviated as AI, refers to several concepts (1, 2):

- Simulating intelligent problem-solving by machines,
- Apparent or false intelligence, often described as intelligence “as if”, where computer programs imitate the properties of human intelligence,
- The elliptical designation of the theory or science of artificial intelligence,
- An object of intellect.

With the advent of computers, new horizons in informatics, information processing, and interpretation have emerged, significantly impacting everyday life. This era, often referred to as Information Age (analogous to the Bronze Age), began with the basic task of sorting and organizing large quantities of information. Over time, the focus shifted to not only solving assigned tasks, but also identifying optimal solutions amidst thousands of possibilities. An intelligent system, therefore, is one that can generate only meaningful variants, which can be considered in the final stage of decision-making (6).

Artificial intelligence in the narrow sense, is a branch of computer science focused on creating systems capable of solving complex tasks, such as processing written text or spoken language, by utilizing large volumes of data available in information networks (3). These networks are populated with the latest unclassified information.

AI leverages the technical possibilities of increasing computer performance and the availability of vast amounts of data. This has sparked renewed interest in the potential applications of AI (7). Currently, AI is one of the fastest-developing technologies. It encompasses intelligent systems designed to independently solve assigned tasks by thinking, learning and proposing solutions. These systems are based on algorithms and machine learning (4).

The origin of the term artificial intelligence

The origins of artificial intelligence trace back to the design of an artificial neuron model in 1943. In 1950, the first computer neural network, SNARC, was built. Key contributors to the field include Donald Hebb, John von Neumann and Alan Turing. Although Turing wrote about thinking machines before 1950, he never used the term artificial intelligence. The term itself is linked to the works of John McCarthy, who introduced it in 1956.

The history of artificial intelligence can be divided into distinct periods:

- Prehistoric Times (up to 1956): Ideas of creating intelligence outside the human body;

- Dawn (1956–1965): John McCarthy organized a seminar where the term artificial intelligence was coined (9);
- Dark Ages (1965–1970): Unfulfilled predictions and slower-than-expected development;
- Renaissance (1970–1975): Emergence of expert systems;
- Years of cooperation (1975–1980): AI research reached new levels through collaborating with experts from psychology, linguistics, and biology, and saw significant advances in the field of neural networks;
- Years of commercialization (1980–present): AI penetrated everyday life through technology and software available under economically advantageous conditions. AI methods were applied in a variety of industrial applications, and the development of neural networks continued. The 1990s saw the web introduce a new dimension to the so-called distributed intelligence.

The theory of artificial intelligence sets various goals as one would expect from an intelligent system. Possible areas of application are being explored in various scientific disciplines (10). However, paradoxically, problems arise if we do not define AI precisely.

The original goal of pioneers in artificial intelligence to replicate and refine the human mind proved unachievable in the near future. Today, individual research teams are focusing on developing partial algorithms to address specific tasks:

- Speech processing,
- Image recognition,
- Machine vision (11),
- Sample sorting,
- Navigation in known and unknown terrains,
- Targeting and tracking objectives,
- Management and planning, e.g., in production processes,
- Analysis and predicting statistical sequences (e.g., trading, stock market information),
- Combinatorial optimization,
- Representation of collected data,
- Data mining.

Artificial intelligence enables individuals to achieve their goals

An individual can react to complex environmental cues and use them to achieve their goals. As technology progressed, the question arose whether intelligence could manifest in inanimate objects with human assistance. This exploration is the domain of artificial intelligence, a multidisciplinary science without a singular definition due to its broad scope of knowledge. At its core, artificial intelligence involves creating, perceiving and preserving knowledge through rational thinking guided by scientifically knowable laws that can be implemented with computers. One of the major challenges in the field of artificial intelligence is defining new trends in societal, scientific and research developments, and convincing stakeholders to adopt these innovations. An essential question arises, particularly on whether humanity desires to supplant itself with these predictive visions. Philosophically, the

question of what exactly constitutes a perfectly specified humanoid remains unanswered (13), even as humanoid technologies are on brink of realization.

It is important to emphasize that artificial intelligence (AI) is designed to enhance human work performance, rather than replace humans. A scientist's success is traditionally measured by the number of publications in prestigious scientific journals, addressing cutting-edge topics. Navigating through the deluge of current information to pose groundbreaking scientific questions is extremely arduous and time-consuming. Until recently, this required accessing numerous and often unavailable journals, synthesizing partial knowledge, and crafting review articles. Before embarking on research, scientists typically spent years studying and theorizing about the problem. Today, the advent of artificial intelligence has revolutionized this process. Throughout the developed countries, every scientist has access to computer technology linked to global networks and databases. AI tools enable highly efficient writing of review articles. They swiftly identify global research trends in specific topics, define keywords and generate content accordingly. Artificial intelligence excels at handling diverse subjects, making it feasible to create content on various topics, even without perfect domain knowledge. Moreover, utilizing AI for content creation proves more cost-effective compared to employing experienced and professionally trained writers.

Products incorporating elements of artificial intelligence are in a race to dominate global markets

Despite all capabilities of artificial intelligence, there are notable drawbacks to using it for content generation. AI still requires human input to achieve high-quality results. While AI can process and synthesize known scientific terms, it lacks the ability to explain their significance or predict their future implications. It is important to emphasize that artificial intelligence cannot draw conclusions on its own.

Another limitation of AI-generated content is its deficiency in human creativity and emotional nuance. The machine-generated text carries elements of mechanical or artificial quality. Therefore, text produced by AI needs to be reviewed, refined, and supplemented with human experience.

Global technology giants recognize that investing in artificial intelligence is crucial for the future. The world's leading companies, including Chinese tech companies such as Tencent, Alibaba, and ByteDance are aggressively pursuing dominance in global markets with products incorporating AI. They are focusing on introducing new multilingual models (LLMs) and reducing application programming interface (API) access fees for these models to retain user engagement. For instance, AI start-up iFlytek has made its Spark LiteLLMAPI permanently open for free use, while significantly reducing fees for its top-of-the-line model. This may accelerate the commercial adoption of LLM technology. Similarly, the Chinese search engine Baidu has made its ENIRE Speed and ENIRE Lite models available for free. According to Xinhua Liu Weiguang, president of public cloud business at Alibaba Cloud

Intelligence, these strategic steep fee reductions are expected to accelerate the exponential growth in utilization of AI applications. Since the beginning of 2023, the American artificial intelligence startup OpenAI has reduced fees four times. These fee reductions among LLM manufacturers, including iFlytek, Baidu, Alibaba, and ByteDance, are poised to facilitate global access to Chinese AI models. The availability of more affordable LLMs is anticipated to spur innovation across various application scenarios and drive increase demand. As stated, "The price war for AI models has begun," heralding a new era of widespread AI development and integration into daily life.

The impact of AI boom on professional journals

The boom in artificial intelligence has significant implications for the work of professional journals. Increasingly, we are seeing first AI-generated works tailored "to order". Typically, these are overview articles, where AI sifts through numerous published results (database), selecting those that are most frequent, most cited, most frequently used and most relevant to topic at hand. However, artificial intelligence cannot create new "truths" from data; it cannot simulate experimental observations or clinical trials without duplicating existing studies. This once again underscores the enduring value of experimental work, which remains the most prized and will always hold the highest priority in the hierarchy of scientific contributions. Professional journals probably need to adapt to this new landscape by reconsidering their content strategies. They should focus less on providing space for AI-generated reviews of current topics and concentrate more on publishing original papers based on experimental or clinical research that contribute new knowledge. Review articles and AI-generated summaries can be produced by individual researchers according to their specific needs and keywords. Meanwhile, journals should commit to featuring genuine experimental or clinical research that pushes the boundaries of knowledge.

Publishing reviews not only becomes costly but also unnecessary for both the magazine and the reader.

Magazine editors will certainly make use of AI to detect plagiarism and copyright violations. This will help to expose and eliminate the overproduction of submissions from particular individuals or institutions, which inundate editorial offices with numerous "works", straining both reviewers and the editorial budget. These new methods of assessing works and their authorship will quickly extend to the evaluation of various academic progression theses (e.g., diploma theses, Bc., Mgr., etc.).

Conclusion

Artificial intelligence is permeating both our personal and professional lives, fulfilling the long-held dreams of scientists and general public. However, alongside its many benefits, AI brings along a number of negative phenomena and potential threats that require continuous attention and management.

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