

Artificial intelligence in medical science

La inteligencia artificial en la ciencia médica

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In 1996, IBM developed Deep Blue, a supercomputer designed solely for playing chess, to challenge the reigning champion of the 1980s, 90s, and early 2000s, Gary Kasparov. Deep Blue was capable of calculating between 50-100 million moves per second. In addition to its computational power, engineers had loaded an algorithm with several thousand of the best chess games for Deep Blue to utilize. However, despite this brute computational force and its algorithmic assistance, Kasparov won the series of matches.⁽¹⁻²⁾

Following this event, a new version called Deeper Blue was developed, with doubled processing capacity and modifications to the algorithm. This supercomputer defeated to Kasparov in 1997, though questions remained about human involvement in the decision-making of some of Deeper Blue's moves.⁽¹⁻²⁾

Deep Blue was created to defeat a world chess champion, whereas Deeper Blue was specifically designed to beat Gary Kasparov. Kasparov was in excellent form, and his moves likely could have defeated any other human player. However, Deep Blue did not resign, nor tire after hours of play, and was not influenced by psychological factors. It was a historic milestone where a machine triumphed over a human. This, along with other examples from previous decades, reflects the development of what came to be called artificial intelligence.

Artificial intelligence involves the creation of computer systems capable of performing cognitive functions or tasks that require human intelligence, such as problem-solving, visual perception, speech recognition, decision-making, and translation.⁽³⁾

Machine learning refers to the computer's ability to

learn without being explicitly programmed, achieved through the study and construction of algorithms that learn from data and make predictions. Examples in our everyday lives include email filtering, facial recognition (in smartphones or social media), optical character recognition, among others.⁽³⁾

Deep learning is a modification of machine learning that attempts to mimic human learning. While machine learning algorithms use decision trees (linear processing, generating new data from existing ones like branches on a tree), deep learning forms interconnections between all datas, resembling artificial neural networks (non-linear, multi-layered, and unsupervised processing).⁽³⁾

All of this has led to diverse and highly capable computer systems. In the medical field, some deep learning-based systems achieve diagnoses and patient prognoses that are equal to or better than those of human professionals.⁽⁴⁾

Another application, not strictly medical but highly controversial, is ChatGPT, a chatbot developed by OpenAI released to the public in November 2022. It can generate text of nearly human quality on a wide range of topics and languages. Notably, a recent study by Ayers et al. found that the responses provided by ChatGPT in a medical forum responses were rated of significantly higher quality, longer, and more empathetic than those given by doctors.⁽⁵⁾

Due to its text generation capabilities, several scientific papers have referenced ChatGPT as a co-author, sparking debate within the international scientific community about whether this is acceptable.⁽⁶⁾ Following intense debate among journal editors, several of these have decided

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to ban ChatGPT as a co-author.

This has prompted an update in the recommendations of the International Committee of Medical Journal Editors, stating: “Chatbots (such as ChatGPT) should not be listed as authors because they cannot be responsible for the accuracy, integrity, and originality of the work, and these responsibilities are required for authorship (see Sec-

tion II.A.1)”.⁽⁷⁾

Artificial intelligence is already a part of our daily lives, and also in our professional practice. It offers advantages such as rapid data processing and analysis but can contain interpretation errors within a context. They can be used under medical supervision, as the decision-making and responsibility for the decisions will remain human.

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