FUTURE SCOPE OF ARTIFICIAL INTELLIGENCE IN HEALTHCARE

ABSTRACT

Artificial intelligence (AI) has been developing rapidly in recent years with the help of software algorithms, hardware implementation, and application in many areas. In this review, we summarize the latest developments in AI applications in biomedicine, which include diagnostic, biological, biomedical information processing, and biomedical research. The purpose of this review is to follow the latest scientific advances, to understand the discovery of technology, to appreciate the great potential of AI in biomedicine, and to provide researchers in the fields of inspiration. It can be argued that, like AI itself, the use of AI in biomedicine is still in its early stages. New advances and breakthroughs will continue to push the boundaries and expand the scope of the AI system, and rapid progress is envisioned in the near future.

KEYWORDS

Performance skills Mechanical learning Intensive learning Neural network Medical research Health care applications fall epilepsy Filling bladder.

INTRODUCTION

Artificial intelligence (AI), the ability of a digital computer or a computer-controlled robot to perform tasks that are commonly associated with intelligent creatures. The term is often used in a project to develop systems that are endowed with cognitive processes that are human characteristics, such as the ability to think, to interpret, to act normally, or to learn from past experiences. Since the advent of digital computing in the 1940's, it has been shown that computers can be programmed to perform more complex tasks.

Typically, AI includes a program that contains both software and hardware. From a software perspective, AI is very concerned with algorithms. The artificial neural network (ANN) is a framework for the use of AI algorithms. It mimics the human brain — a interconnected network of neurons, in which there are dynamic communication channels between neurons. A single neuron can respond to multiple systems from neighboring neurons and the entire network can change its shape according to a different input mechanism. As a result, the neural network (NN) can produce effects as its response to natural stimuli — just as the human brain responds to various environmental changes. NNs are usually structures with layers of different configurations. Researchers have designed NNs that can supervised reading, in which the task is to consider an activity that reflects the input output based on the input and output parameters; Unchecked reading, where the task is to read test data that has not been labeled, split, or split, in order to identify common features in the data and, instead of responding to system response, respond based on presence or absence. Common identified features in new data; and reinforced learning, where the task is to do something in a given area in order to increase rewards and reduce penalties, both depending on the nature of the accumulated environment. With the development of cognitive abilities, NNs become "deep," meaning that many layers of neurons are involved in networking to mimic the human brain and perform learning. In addition, many functions can be integrated into NN, such as combining output features and splitting functions into a single deep network — hence the technical term "deep learning"

From a hardware point of view, AI is very concerned about the use of NN algorithms instead of physical computations. The most straightforward way to use the NN algorithm is in the central processing unit of common purpose (CPU), in mixed or multimedia configuration. Typically, AI involves a system that integrates both software and hardware. From a software perspective, AI is very concerned with algorithms. The artificial neural network (ANN) is a framework for the use of AI algorithms. It mimics the human brain — a interconnected network of neurons, in which there are dynamic communication channels between neurons. A single neuron can respond to multiple systems from neighboring neurons and the entire network can change its shape according to a different input mechanism. As a result, the neural network (NN) can produce effects as its response to natural stimuli — just as the human brain responds to various environmental changes.

WHAT ARE THE CURRENT SCIENCES IN AI MEDICINE?

In addition to demonstrating high efficiency, new technologies entering the medical field should also be integrated with current practices, obtain appropriate regulatory approvals, and, perhaps most importantly, encourage medical staff and patients to invest in the new paradigm. These challenges have led to a variety of styles emerging from AI research and adoption.

AI is very effective in well-defined tasks

The study focuses on activities where AI is able to successfully demonstrate its effectiveness in relation to a human physician. Typically, these functions have a clearly defined input and binary options that are easily verified. In classifying sensitive skin lesions, the input is a digital image and the output is a simple binary system: dangerous or dangerous. Under these circumstances, researchers simply demonstrate that AI has a higher sensitivity and clarity than dermatologists when distinguishing previously unseen images of certified biopsy lesions.4

AI supports doctors, it does not change them

Machines do not have human qualities such as empathy and compassion, so patients should see to it that consultation is led by human doctors. In addition, patients cannot expect to quickly trust AI; technology covered by mistrust.6 Thus, AI tends to handle important tasks, but is limited enough in its place to leave the primary responsibility of managing a patient to a human physician. There is an ongoing clinical trial that uses AI to calculate targeted areas of head and neck radiotherapy more accurately and more quickly than a person. The invading radiologist is still responsible for finally delivering the treatment but AI plays an important role in the background in protecting the patient from harmful radiation.

AI supports non-resource applications

A single AI system is capable of supporting large numbers and is therefore well suited to situations where human technology is a rare resource. In many TB-filled countries there is a shortage of radiologists in remote facilities.8 Using AI, radiographs uploaded to these centers can be translated into a single system; Recent research shows that AI effectively diagnoses pulmonary TB with 95% sensitivity and 100% clarity.

AI is a very selective player

Improving ML models requires well-organized training data about something that remains stable over time. From this it results in ‘excessive intrusion’, in which AI gives unnecessary value to false links within previous data. In 2008, Google attempted to predict the spread of the flu season using only the search terms included in its search engine. Because human search patterns change dramatically from year to year, the model did not predict the future so accurately that it was quickly discontinued.9 In addition, anonymous and digitally digitized data is also attractive, as this contributes to research and development.

OPPORTUNITIES

AI will extract important information from the patient's electronic footprint. Initially this will save time and improve efficiency, but following adequate testing will also directly guide patient management. Take the example of consulting a patient with type 2 diabetes; meanwhile the doctor spends valuable time reading outpatient literature, checking blood tests, and obtaining clinical guidelines for many discontinued programs. In contrast, AI can automatically prepare for the most important risks and actions if a patient's clinical record is provided. It can also automatically convert a recorded consultation dialogue into an abridged letter for the doctor to approve or amend. Both of these applications will save you a long time and can be used quickly because they help doctors rather than replace them.

As all these systems become more validated, they will be given more responsibilities. For patients having type-2 diabetes, the beginning of statin may be determined by the AI on an individual basis which will be based on patient history concerns rather than a strictly defined ‘equality-all’ algorithm. The research required for this 'personalized medicine' is only possible if AI cleverly summarizes a wealth of medical knowledge. In addition, because AI is able to simultaneously monitor millions of entries, it will play an important role in preventive medicine. AI can further suggest consultation when determining that a patient's risk of developing a specific diabetes problem requires intervention. On the contrary, it would be impossible to give a person the task of carefully monitoring the results and evaluation of every diabetic patient in real time.

AI-based systems will also bring diagnostic specialists to basic care. If a picture of a skin lesion is sufficient to diagnose its aetiology, the images may be taken by a doctor and sent to a professional dermatology AI system for immediate analysis. Patients identified as low risk will receive immediate confirmation while high-risk patients will receive lower referral waiting times because clinics will only receive selected cases. This concept is not limited to skin lesions, AI has demonstrated the ability to interpret multiple types of image data including retina scanning, 10 radiographs and 5 ultrasounds. Many of these images can be taken with inexpensive and widely available equipment.

Future AI research should be directed to carefully selected activities that are closely related to the trends mentioned in this article. Integrating these systems into a clinical practice requires building beneficial relationships between AI and nurses, where AI would provide physicians with greater efficiency or cost effectiveness and physicians would provide AI with the important clinical exposure that they require to learn the clinical case management. Throughout this entire process it will be important to ensure that AI does not riddle the human face of the medical profession because a major hurdle to the widespread adoption of AI will be the public's reluctance to embrace the technology that creates controversy.

RESULT

A study of 101 papers in the domain of AutoML led to the discovery that these automated techniques can match or improve upon expert human performance in certain machine learning tasks, often in a shorter duration of time. The main drawback of AutoML at this point is the ability to get these systems to work efficiently on a large scale, i.e. beyond small- and medium-size datasets.

DISCUSSION

The use of machine learning strategies has demonstrated potential to improve health outcomes, reduce health care costs, and advance clinical research. However, many hospitals do not currently use machine learning solutions. One reason for this is that health care professionals often lack the machine learning technology needed to create an effective model, use it in production, and integrate it with clinical practice. To make machine learning methods easier to use and to reduce the need for human experts, AutoML) has emerged as a growing field that seeks to automatically select, compose, and perform machine learning models by parameters, in order to achieve full advantage. Performance on a specific task and / or data set.

CONCLUSION

It is time to move AI research from silico model development to real-world construction, implementation, and testing to improve health care delivery. We will probably see that ML models will be needed, but not enough components of a wide range of AI enabled solutions. The science of AI delivery will need to deal with how those systems are made, used, and tested, and how their emerging properties can be captured and used to transform health care.

REFERENCES

1. Topol, E. J. High-performance medicine: the convergence of human and artificial intelligence. *Nat. Med.* **25**, 44–56 (2019).
2. Emanuel, E. J. & Wachter, R. M. Artificial intelligence in health care will the value match the hype? *J. Am. Med. Assoc.* **321**, 2281–2282 (2019).
3. Schulman, K. A. & Richman, B. D. Toward an effective innovation agenda. *N. Engl. J. Med.* **380**, 900–901 (2019).
4. Fihn, S. D. et al. Deploying AI in Clinical Settings. In *Artificial Intelligence in Health Care: The Hope, the Hype, the Promise, the Peril* (eds Matheny, M., Thadaney-Israni, S., Ahmed, M. & Whicher, D.) (National Academy of Medicine, 2019).
5. Challener, D. W., Prokop, L. J. & Abu-Saleh, O. The proliferation of reports on clinical scoring systems: issues about uptake and clinical utility. *J. Am. Med. Assoc.* **321**, 2405–2406 (2019).
6. Tomašev, N. et al. A clinically applicable approach to continuous prediction of future acute kidney injury. *Nature* **572**, 116–119 (2019).
7. Connell, A. et al. Implementation of a digitally enabled care pathway (Part 2): qualitative analysis of experiences of health care professionals. *J. Med. Internet Res.* **21**, e13143 (2019).
8. Westfall, J. M., Mold, J. & Fagnan, L. Practice-Based Research—"Blue Highways" on the NIH.
9. Avati, A. et al. Improving palliative care with deep learning. In *Proceedings—2017 IEEE International Conference on Bioinformatics and Biomedicine, BIBM* (2017).
10. Juran, J. & Godfrey, A. B. *Juran's Quality Handbook*. https://doi.org/10.1007/978-3-540-78773-0_5 (McGraw-Hill, 1998).
11. Yock, P. et al. *Biodesign: The Process of Innovating Medical Technologies*, 2nd edn (Cambridge University Press, 2015).
12. Foundation, I. D. *Empathy Map—Why and How to Use It*. Available at: https://www.interaction-design.org/literature/article/empathy-map-why-and-how-to-use-it.
13. Shah, N. H., Milstein, A. & Bagley, S. C. Making machine learning models clinically useful. *J. Am. Med. Assoc.* **322**, 1351–1352 (2019).
14. Davis, S. E. et al. A nonparametric updating method to correct clinical prediction model drift. *J. Am. Med. Inform. Assoc.* **26**, 1448–1457 (2019).
15. Obermeyer Z, Powers B, Vogeli C, Mullainathan S. Dissecting racial bias in

an algorithm used to manage the health of populations. Science.