Editorial

Artificial Intelligence and Medical Science: Present Perspective

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Introduction

Artificial Intelligence (AI) is a branch of computer science that has extensive and diversified scope of work, concerned with building smart machines capable of performing tasks that typically require human intelligence. Some applications of AI include automated interfaces for visual perception, speech recognition, decision-making and translation between languages. It is an interdisciplinary science.

Extended healthcare services nowadays contains huge amount of data and it rises! So AI becomes more relevant in healthcare sector. Several types of AI are already being employed by payers and providers of healthcare. The key categories of applications are patient engagements and adherence, diagnosis, treatment recommendations, drug discovery as well as administrative activities.

It is widely accepted that the term AI was first thought in 1956 when American computer scientist John McCarthy *et al*. organized the Dartmouth Conference. It came forward when Turing test proposed by Alan Turing as a measure of machine intelligence and a chess-playing program written by Dietrich Prinz.

Artificially intelligent systems in healthcare have the following typical pattern. Such a system starts with a large amount of data; on these data machine-learning algorithms are employed to get information which is to generate a more data to solve a problem in the healthcare system. It also include matching patient symptoms to appropriate physician for their diagnosis, prognosis of disease, drug discovery, translate languages, organize and interpret different images and files.

Discussion

AI systems to apply to drug discovery and doctors personal treatment planning were contents of huge amount of research! Companies, such as Verge Genomics, focus on the application of machine-learning algorithms to analyze human genomic data and identify drugs to combat neurological diseases, such as Parkinson's, Alzheimer's, amyotrophic lateral sclerosis (ALS) in a cost-effective way.

Many companies such as Bot MD have built systems that can help patients with clinical issues regarding:

- Instantly finding which physicians are on call and scheduling the next available appointment; the AI system can also search multiple scheduling systems across different hospitals
- Answering prescription related questions, like drug availability and cost-effective alternative drugs
- Assisting doctors search hospital protocol, list of available clinical tools and available drugs all through the use of a mobile application, thus improving workflow in the hospital.

The most recent application of AI in global healthcare is the prediction of emerging hotspots using contact tracing and flight traveler data to fight off the novel Coronavirus (COVID-19) pandemic.

Artificially intelligent systems is used for diagnosing some specific disease of patients like dematological conditions which can be diagnosed by physicians visual efficiency, medical data of radiological films are processed and analyzed by artificially intelligent machine system. In ophthalmological fields of research, much work has been done. Researchers at Google developed and trained a system using 128,175 retinal fundus images to classify them into diabetic retinopathy and macular edema for adults with diabetes. Here the AI model shows several advantages such as:

1. Automated grading of diabetic retinopathy leading to increased efficiency in diagnosing many patients in shorter time;
2. AI can give second opinion to the Ophthalmologist as assistant to him!

3. Early detection of diabetic retinopathy due to capability of the model to study images at the granular level which is rarely possible for a human Ophthalmologist!

There is virtually no area in medicine and care delivery that is not already being touched by artificial intelligence!

Contact tracing is a disease control measure used by government authorities to limit spread of a disease. Contact tracing works by contacting and informing individuals that have been exposed to a person who has contacted the disease. Then they are advised to be quarantined or isolated to prevent further spread of the disease. As reported by Apple Newsroom, tech giants like Google and Apple have joined forces to create a contact tracing platform that will use AI systems through the use of application programming interfaces. That interface is programmed in the smartphones to reach the users. Location services of Smartphones are then allowed in the vicinity of the infected person which ultimately reported to government health system.

BlueDot, a Canadian company works in health sector. They first published scientific article on AI and ML that can accurately predicted worldwide spread of the virus. They also used other techniques like natural language processing (NLP). About 100,000 articles from over 65 countries analyzed searching travel information and flight paths, an area's climate, temperature and even local livestock to help predict future outbreaks.

Despite the limitations, AI looks well positioned to revolutionize the healthcare industry. AI systems can help free up the time for busy doctors with follow-up care and availability of prescription drug alternatives. AI also has the capability of remotely diagnosing patients, thus extending medical services to remote areas, beyond the major urban centers of the world. The future of AI in healthcare is bright and promising, and yet much remains to be done.

There are many negative effects of modern technology on mental health. However, researchers at the University of Southern California (USC) in collaboration with Defense Advanced Research Projects Agency and the U.S. Army found that people suffering from post-traumatic stress and other forms of mental anguish are more open to discussing their concerns with virtual humans than actual humans for fear of judgment. This research has promising results for the role of virtual assistants resulting in the collection of honest answers from patients that could help doctors diagnose and treat their patients more appropriately and with better information.

Most global pharmaceutical companies have invested their time and money on using AI for drug development of major diseases, such as cancer or cardiovascular disease. Apart from these, AI is incorporated into some sleep medicine software solution. This network approach detect sleep pattern more accurately and predict sleep apnoea markers and can score the sleep apnoea indicators. The FDA now incentivizes companies to develop new treatments for these diseases on priority basis. It should be included in medical curriculum because the cost of a wrong decision can be fatal. The data used to learn from and the optimization strategy used has a deep impact on the applicability of the AI system to solve a particular problem.

In the next decades, AI will integrate more with electronic and digital medical records in the analysis of outcome and risk or benefit of any treatment modalities. While the evolving use of artificial intelligence will continue to play a crucial role in patient outcomes, of course the patients treatment plan will always be in human hands

Conclusion

The ongoing development in AI and ML has significantly improved treatment, medication, screening, prediction, forecasting, contact tracing, and drug/vaccine development process for the Covid-19 pandemic and reduce the human intervention in medical practice. Success of AI during this pandemic encouraged the medical experts to use its skill to handle human disease, its diagnosis, risk detection and drug discovery. But it is not widely used by the clinicians, so adoption of AI in clinical practice needs further development.

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