

Enigma to Artificial Intelligence

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ABSTRACT

The potential power of the usage of artificial intelligence (AI), a computer program that is capable of making intelligent decisions in healthcare, is enormous and undeniable. The emergence of AI in the healthcare system results in its consequences for healthcare delivery. Also, its involvement in health services management, drug prediction, patient illness diagnosis, and usefulness in clinical decision-making, as well as this article's emphasis on its value in optimizing medication adherence and its efficacy. Machines can take over humans in the near future. Artificial intelligence has become a major threat in healthcare, with its impact expanding across the health sector. Healthcare providers must take steps to address this issue. Artificial intelligence-enabled decision support systems can help improve patient safety by detecting errors, patient stratification, and drug management.

Keywords: Cyber threat, Drug safety, Healthcare, Machine intelligence, Patient safety, Robotic nursing, Robotics.

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Story So Far

A machine can never be flawless, according to the idea from a Hollywood film released in 2014, and they were termed as "Turing Machines". These devices are referred to as computers in the modern world.¹ "If a computer could fool a human into thinking it is a human, then it would deserve to be called intelligent". Throughout World War II, Alan Turing published technological devices and developed the Turing test for assessing intelligence. He cracked unbreakable Enigma codes by constructing a machine to decipher them. The term artificial intelligence (AI) was first used by McCarthy in 1979. In an article titled "Ascribing Mental Qualities to Machines," he wrote that even ordinary devices like thermostats can be considered to have beliefs, and most machines that are capable of resolving problems appear to have this feature. Turing believed that by 2000, people would accept the idea of AI.²

Even in the digital era of things, machine intelligence, and technology, humans still fall short of achieving holistic health for all. The above technological attainment has advanced healthcare but is still inaccessible to the general public. Compared with the average of 150 doctors per 100,000 people around the world, India only has 64 doctors accessible for every 100,000 people.³ As per recent reports submitted by Union Health Ministry to Rajya Sabha, nurse-to-population ratio is 1.96:1000.⁴

With the intent to create a digital India, we are driving innovation to provide healthcare services. As we are well-versed in the era of the recent pandemic, online doctor consultations, and contact tracing using the Arogya setu application, the Cowin portal has helped us to tackle this adverse situation effectively. Hence, there is a high scope of technology in the healthcare sector to achieve positive outcomes in the attainment of good health and well-being (sustainable development goal 3).⁵

Artificial intelligence, a computer program that is able to generate intelligent judgments, has immense and unquestionable potential. In the field of healthcare, AI presents unlimited possibilities. The potential to enhance outcomes pertaining to patient safety and medical care delivery has increased with the introduction of AI into the healthcare system. In health facilities, AI is being used to support clinical decisions made by doctors in

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the areas of radiology, cardiology, laboratory, procedures, post surgery, and critical care units.⁶ In order to detect diabetes early, the NITI Aayog has been looking forward to introduce AI to manage this issue.⁷

India's first de-identified cancer image library was created by Tata Medical Center and the Indian Institute of Technology⁸ for evaluating vast amounts of healthcare data, uncovering hidden information, determining challenges, and improving communication. Technologies for detection of speech and images are being used to provide more effective treatment for patients. Artificial intelligence is based on machine-generated algorithms, which help prevent manual errors, assisting in precise clinical judgments and treatment plans without adding any more costs to the patient. Additionally, AI automates tasks to free up internal workers so that they may focus on contributing more value in their domains of specialization.

To counter the shades of an increasing old age population and to maintain the ecosystem of human productivity, the country like Japan has introduced robotics in healthcare delivery. Robotic nursing is one step forward to amalgamating AI tech and healthcare effectively. Robotic nurses assist the patients in moving around or executing simple activities such as collecting vital signs as well as providing prescriptions, e.g., Android demo. A robot named RIBA can lift a patient up to 61 kg and helps transfer the patients. Yet

another robot Actroid-F is a teleroobot designed after a human female that can be operated remotely and can replicate the expressions and words of the operator.⁹ “Stan the Man” – which is used to train nurses and health professionals.¹⁰ A fully integrated, completely autonomous robot nurse, on the other hand, does not yet exist because of the technological challenges in developing an ethical and suitably error-free system under the high uncertainty that governs direct connection with humans. Furthermore, according to Van Wynsberghe, medical robots do not yet possess the skills of performing compassionate nursing care that is expected of a human nurse.

AI in Healthcare: A Critical Perspective

Using clinical and laboratory data from over 400,000 patients, Apollo Hospitals and Microsoft’s AI Network for Healthcare are creating a machine learning model to identify the risk of heart attacks. Without the need for a thorough physical examination, the AI solution may uncover new risk factors. A machine learning technique called reinforcement learning involves an algorithm that tries to complete a task while learning from its successes and errors. Healthcare workers typically lack the technical knowledge necessary to operate advanced AI. They lack the training necessary to recognize AI flaws that could lead to deceptive results such as discrepancies in data or errors in the software. This might lead to substandard treatment and ineffective medicine dosing.

Studies have demonstrated the outstanding accuracy of AI in the realm of medicine. However, the entirety of the effect of the data would not be seen until it is used by healthcare practitioners or integrated into healthcare institutions. Artificial intelligence is used to foresee drug interactions, concentration, and pharmaceutical safety.¹¹ The capability of doctors to reliably identify errors at any stage of AI integration could be impaired by a high level of automation based on AI, which could also result in an overreliance on AI-based alternatives.

Recently, AIIMS New Delhi suffered a ransomware attack, compromising the data of 3–4 crore patients. Delhi Police, Ministry of Home Affairs, and CERT-IN tried to resolve the problem.¹² Information databases are frequently incompatible within different divisions in hospitals and among the hospitals.

Advantages

All facets of medical treatment, including image-based diagnostics, are being investigated using AI. It possesses the ability to help physicians in establishing more accurate diagnoses and has assisted in pharmaceutical research, tailored medicine, and care delivery supervision.¹³ Electronic health record (EHR) systems now use AI in order to assess, examine, and get rid of the health risks for the patients.¹⁴

Artificial intelligence-enabled robotic pets deliver care to dementia patients.¹⁵ Robots powered by AI are useful for early diagnosis, drug development processes, drug trials, cardiac diseases, and ocular and cancer treatment. Due to their unpredictability or fluctuating nature, there has not been much research on their ability to replace human nurses.¹⁶

Challenges

It is possible that AI may either advance mankind or advance its demise. Recently, the US Marshals service suffered a majority security breach. Elon Musk said, “AI is far more dangerous than nukes”. Atomic weapons are no longer a concern; cyberterrorism is the most serious menace. Artificial intelligence advancement may

lead to the extinction of the human species. Machines can take over humans in the near future. Artificial intelligence has become a major threat in healthcare, with its impact expanding across the health sector. Healthcare providers must take steps to address this issue.

Patient confidentiality, on the other hand, is a big worry for healthcare practitioners since nonacceptance and adoption of healthcare workers and patients are difficult. However, when AI is used in the medical sector, a range of risks and obstacles may arise at the personal, macro, and technological levels (e.g., functionality, execution, confidentiality, and safety).

Therefore, in contrast to a very few adverse events brought on by the mistake of the healthcare workers, an error in the system utilized by AI can lead to a considerable number of patient injuries.¹⁷ Additionally, since different institutions manage medical information in different ways, inaccuracies could take place whenever data from one organization are interpreted by AI models that were trained at another.

Weighing up Both Sides of the Argument

By identifying mistakes, categorizing patients, and managing medications, AI-powered guidance systems can assist to increase the confidentiality of patients. A significant number of studies found that AI had improved security consequences. Identifying the amount of details accessible and the veracity of forecasts and information is AI’s toughest difficulty.¹⁸

To ensure a precise projection and to understand how AI will affect healthcare security, it is crucial to comprehend the evidences. Instead of replacing healthcare professionals, AI technology aims to assist them in raising the general efficacy and accessibility for healthcare. Artificial intelligence integration in healthcare is not a pipe dream. Particularly in medical institutions, the government should establish AI courses and curricula. While we live in Amrit kaal, India is ideally positioned to demonstrate leadership in advancing Vishwaguru’s ideology by adopting AI Internet of Things across the health sector.

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