AI CAN HELP CURE DISEASES

AI Debate Research Paper

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Abstract:

In this debate research paper, I would like to explain how “AI is a danger to the well-being of society and will be the end of our world” and how it’s benefiting the medical industry to cure diseases. Today, artificial intelligence (AI) technologies are rapidly spreading throughout all facets of modern life, including the medical field. There are several ways in which healthcare professionals might benefit from the implementation of artificial intelligence, including the enhancement of patient care and the streamlining of administrative processes. Despite the widespread applicability of AI and healthcare technology, the methods made possible by these innovations may be vastly different amongst hospitals and other providers of healthcare [1]. Healthcare is one of the most important sectors in the big data environment because of the important role it plays in maintaining a productive and healthy society. There is a life-or-death stake in using AI to healthcare data. Artificial intelligence can help healthcare professionals in their daily work. The use of AI in healthcare has the potential to enhance preventative care, enhance quality of life, provide more precise diagnoses and treatment plans, and ultimately improve patient outcomes. AI can predict and monitor the development of potentially fatal diseases by analyzing data from government and hospital systems, among other places. Therefore, artificial intelligence (AI) may play an important role in public health as a tool for preventing and responding to pandemics throughout the world [2].

Keywords: : Artificial intelligence , clinical decision support , electronic health record systems, Concerns related to AI.

Introduction:

Among the many types of AI used in medicine, machine learning is rather widespread. It's a flexible method with multiple implementations that forms the basis of several AI and healthcare tech strategies. Traditional machine learning is most often used for precision medicine, which is an application of artificial intelligence in healthcare. A big step forward for many healthcare organizations is the ability to forecast what treatment techniques will be effective with patients based on their makeup and the treatment framework. Most of the artificial intelligence (AI) in healthcare now relies on machine learning and precision medicine applications, both of which need training data for which the outcome is known. Educators call this kind of learning "guided."

Artificial intelligence and medical technology have been working toward 50 years to make sense of human language. Speech recognition and subsequent translation are commonplace in NLP systems. Natural language processing (NLP) tools that can decipher and categorize clinical paperwork are a popular use of AI in the healthcare industry. By analyzing unstructured clinical notes on patients, NLP systems provide invaluable information into quality, technique improvement, and improved patient outcomes.

In the 1980s and later, 'if-then' rule-based expert systems were the most common kind of artificial intelligence (AI) used in medicine. Clinical decision support is an area where AI has found widespread use in modern healthcare. The majority of EHRs now include a rule set in their applications for managing patient records electronically.

For the last 50 years, artificial intelligence (AI) in healthcare has focused on improving illness diagnosis and treatment. Although early rule-based systems showed promise in therapeutic settings, they were ultimately rejected. Their connection with physician workflows and health record systems was also subpar, and they weren't any better at diagnosing than humans.

It may be challenging to integrate AI-based healthcare decision-making (whether rules-based or algorithmic) into existing clinical processes and electronic health record (EHR) systems. As impressive as AI's recommendation accuracy may be, it hasn't been enough to prevent its broad adoption in the healthcare industry due to integration problems. A lot of the artificial intelligence (AI) and healthcare capabilities for diagnosis and treatment offered by medical software companies are siloed and only apply to one facet of medical practice. The healthcare analytics features included by certain EHR software providers are still in its infant phases of development, but they are starting. For providers utilizing standalone EHR systems to really benefit from AI in healthcare, they will need to either undertake significant integration projects themselves or make use of the skills of third-party suppliers that have AI capabilities and can connect with their EHR.

Expert systems need humans, such as subject matter experts and engineers, to construct a large body of rules covering a specific domain of knowledge. To a certain extent, they do what they're supposed to and are simple to understand and implement. However, when there are too many rules, often more than a few thousand, they might start to contradict one other and become unworkable. Moreover, updating the rules might be tedious and time-consuming if the knowledge domain undergoes substantial change. Machine learning is gradually replacing rule-based systems with methods focused on analyzing data using proprietary medical algorithms.

“As every positivity has some sorts of negativity. Meanwhile, AI has some concerns about curing diseases in the medical field”.

Concerns:

Problems with AI Security and Privacy:

Data privacy and security are newly complicated by AI since most algorithms need access to large datasets for training and validation. Most healthcare companies have never had to move terabytes of data between different systems before, and stakeholders are now aware of the financial and reputational risks associated with such a move.

It is recommended that most businesses use HIPAA-compliant, highly secure systems to protect their sensitive data. Data security officers (CSOs) have every reason to be wary of letting the proverbial drawbridges down in the wake of a widespread outbreak of ransomware and other knockout blows from cyberattacks of all stripes. When many datasets are gathered in one place, the repository becomes a prime target for cybercriminals. In addition to AI becoming a tempting target for threat actors, there is an urgent need for rules concerning AI and how to secure patient data utilizing these technologies. "Updating data privacy legislation and regulation to encompass data used in AI and ML systems is necessary to ensure privacy for all data," CSA said.

To keep up with developments in AI and ML, privacy rules must be stable and adaptable. Unfortunately, the regulatory framework now in place has failed to keep pace with technological

advancements. While HIPAA requires that personal information be removed from public view, modern technology makes it possible to connect previously de-identified records, allowing for the restoration of a person's identity.

Since AI exists in a regulatory limbo, it is challenging to guarantee that every user is obligated to respect patient privacy and will suffer repercussions for not doing so. As if the risks of conventional cyberattacks and patient privacy weren't enough, a 2021 study from the University of Pittsburgh published in Nature Communications demonstrated that AI models might be fooled by hacks using false medical photos.

Adversarial assaults, in which bad actors intentionally modify photos or other data points in order to trick AI algorithms into reaching the wrong conclusions, were shed some light on in the research. The team first trained a deep learning system to distinguish between malignant and benign instances with an accuracy rate of 80%. In order to throw off the algorithm, the researchers next created a "generative adversarial network" (GAN) that creates fake pictures by arbitrarily repositioning malignant patches from negative or positive photos.

Sixty-nine-point one percent of the faked pictures were able to trick the AI model. In a test with 44 fake-positive photos, the model correctly recognized 42 of them as having a negative tone. The AI model agreed with 209 of the 319 digitally altered "positive" photos [3].

The first step in making AI models safer and more robust is to learn how they react to adversarial assaults in healthcare settings. In a health IT environment where data is segregated and access to quality information is one of the industry's major impediments, this continual change in viewpoint is crucial for enabling AI to thrive. Security and privacy will always be key.

Integrity, Accountability, and Control:

The philosophical questions surrounding AI have proven to be the most contentious. When the term "malpractice" enters the conversation, it brings with it more than just philosophical questions about who should bear ultimate responsibility for a catastrophic error. By their very nature, AI systems are intricate. It will become increasingly difficult for the typical person to understand the thought processes underlying increasingly complex technological systems.

Trusting advice flashing on a computer screen is already a challenge for many businesses, and providers are in the awkward position of having access to massive amounts of data yet lacking confidence in the tools at their disposal to make sense of it. In spite of the widespread belief that AI is immune to the kind of ingrained prejudices that come from a combination of social conditioning and experience, research suggests that algorithms can be just as, if not more, prone to generating assumptions about the world as humans are.

Unfortunately, effective tools to detect such biases are still few. The situation is only made more complicated by "black box" artificial intelligence programs, which provide no explanation for their actions and make it harder to pinpoint who is at fault when anything goes wrong.

If service providers are on the hook for any unintended repercussions that should have been spotted thanks to the data at their disposal, then they had better make quite sure the algorithms they employ convey all the pertinent information in a way that permits optimum decision-making. In order to be effective, a diagnostic or predictive analytics program powered by AI must be able to act with greater fairness and objectivity than any human analyst. The algorithms used in AI and machine learning are susceptible to cognitive bias and a lack of complete data.

The Cloud Security Alliance (CSA) recommended in a 2022 study that the standard operating procedure be to presume that AI algorithms include bias and then to take steps to uncover and eliminate those biases [4]. The paper said that there is growing evidence that the general public is concerned about the societal implications of AI, and that this worry is fueled in part by the widespread use of modeling and prediction approaches based on data-driven and MI methodologies.

To better the problem-solving process, it is crucial to recognize and eliminate biases as soon as possible. It is possible for developers to inadvertently bias AI systems or use insufficient data while training them. Users, regardless of the mechanism, must be cognizant of the possibility of bias and take steps to mitigate it.

In 2021, the WHO published the first international study on the legality and regulation of AI in medical settings. With many AI systems trained on data acquired from patients in high-income care settings, WHO highlighted the possible health inequities that might arise as a result of AI. The World Health Organization (WHO) recommended that ethical issues be factored into the creation, testing, and eventual use of AI system [5].

It will be on to everyone involved in the healthcare system, from clinicians to patients to payers to developers, to make sure that AI is implemented in a way that is ethical, safe, and useful. An insurmountable duty comes with defining the industry's approaches to AI, but it also presents a wonderful chance to learn from mistakes and forge a better course for the future. It's an interesting, perplexing, frustrating, and hopeful moment to work in healthcare, with the increasing maturation of AI adding to the complexity of the existing arguments. While it's true that there aren't any simple solutions to these underlying problems at the present, people can still take charge, make tough decisions, and define the future of patient care.

Implications for the healthcare workforce:

The fear that AI would lead to the automation of occupations and the significant displacement of the labor has received a lot of attention. Research conducted by Deloitte and the Oxford Martin Institute 26 found that 35 percent of UK occupations might be eliminated within the next 10 to 20 years due to AI. Other research has shown that while it is possible to automate some jobs, the rate at which this happens may be constrained by factors other than technology. These include the price of automation technologies, the size and cost of the labor market, the benefits of automation beyond simple labor substitution, and regulatory and social acceptance. These considerations may limit the actual rate of employment loss to below 5% [6].

So yet, no human healthcare workers have been replaced by AI, as far as we know. The absence of an effect on employment is partially attributable to the limited penetration of AI into the sector to date and the difficulties of integrating AI into clinical processes and EHR systems. Jobs in healthcare that deal with digital information, such as radiology and pathology, appear to be more at risk of automation than those requiring direct patient contact.

However, even in positions like radiologist and pathologist, it is conceivable that AI will slowly penetrate these disciplines. Despite our argument that deep learning and other technologies are improving their capacity to analyze and categorize pictures, we still think employment in fields like radiology are safe for the foreseeable future.

To begin, a radiologist's duties extend beyond just analyzing medical scans. AI systems in radiology, like other AI systems, are designed to do certain things. For instance, nodule detection on chest computed tomography and hemorrhage detection on brain magnetic resonance imaging are just two of the many image recognition tasks for which deep learning models are created in research laboratories and companies. To properly identify all potential discoveries in medical photos, however, hundreds of such limited detection jobs are required, but only a small subset of which can be done by AI at now. Additionally, radiologists collaborate with other doctors to diagnose and treat patients, define the technical parameters of imaging examinations to be performed (tailored to the patient's condition), relate findings from images to other medical records and test results, discuss procedures and results, and more.

The second issue is that the clinical procedures for using AI-based image work are not yet at a point where they can be used routinely. The likelihood of a lesion, the likelihood of malignancy, the features of a nodule, or its location are all areas of interest for various providers of imaging equipment and deep learning algorithms. Due to their separate emphases, deep learning systems would be challenging to implement into standard clinical practice.

Thirdly, millions of photos from patients who have gotten a definitive diagnosis of cancer, a fractured bone, or other pathologies are needed to train deep learning algorithms for image identification. The radiology community, however, lacks a centralized database of labeled or unlabeled picture files.

If automated image analysis is ever going to take off, then major shifts are needed in healthcare insurance and regulation. The field of pathology, like other technologically oriented areas of medicine, has similar challenges. With these in place, we can rule out a radical shift in healthcare employment because of AI in the next twenty years. Employment opportunities related to the use and advancement of AI technology may potentially expand. However, this does not guarantee that advances in artificial intelligence will lead to a significant decrease in the expenses associated with medical diagnosis and treatment anytime soon.

Conclusion:

There will be a significant need for AI in future healthcare services, and we expect to see it implemented soon. To put it another way, machine learning is the driving force behind precision medicine, which is generally acknowledged as a much-needed improvement in patient care. We

anticipate that AI will eventually master the area of delivering diagnostic and treatment suggestions, despite early attempts having proved tough. Most radiology and pathology pictures may one day be analyzed by a computer, thanks to the fast development of AI for imaging processing. In the medical field, speech and text recognition are already used for things like talking to patients and taking down notes.

The major difficulty in using AI in certain areas of healthcare is not whether the technologies will be effective, but rather how to get them adopted in regular clinical practice. Artificial intelligence (AI) systems need regulatory approval, integration with electronic health record (EHR) systems, sufficient standardization so that similar products function similarly, education of clinicians, funding from public or private payer organizations, and ongoing updates in the field to achieve widespread adoption. The time it takes to solve these problems will be substantially longer than the time it takes for the underlying technology to get to a usable state. Thus, we anticipate some incorporation of AI into clinical practice over the next five years, with broader use following within the next ten. It is also becoming more evident that AI systems will not replace human physicians on a big scale, but rather will complement their work in the treatment of patients. Possible future directions for human doctors in healthcare.

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