

Future of Artificial Intelligence in the Healthcare Industry

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Abstract: Artificial Intelligence (AI) is a collection of multiple technologies that are rapidly developing. AI is an area of computer science where their focus is to create intelligent machines which can perform tasks like humans. AI technology is bringing revolutionary changes that haven't even been seen before and are noticed across the healthcare field. Although the work done today cannot be completely replaced by AI robots or technology in the future, medical AI technology will play a huge role and also have a great impact on electronic health records (EHRs), diagnosis, treatment protocol development, patient monitoring and care, personalized medicine, robotic surgery and health system management. The primary goal of health-related AI applications is the analysis of relationships between the treatment techniques and patient outcomes.

Keywords: artificial intelligence, intelligent machines, healthcare, rural areas, service networks

1. Introduction

Artificial intelligence is a kind of technology where human-like tasks are performed by machines. As AI is a vast technology, has various domains as Robotics, Healthcare, Big Data and many more. In this paper, it will be focusing on healthcare.

Artificial intelligence in healthcare is using complex algorithms and software's so that we can estimate human cognition while analyzing complicated medical data. AI is the ability for the algorithms to approximate conclusions based on structures without direct human input.

It was interesting to write on as we know Healthcare is not a small issue to look upon. As per the analysis, every single day 500 people are losing their lives just due to the errors and manipulation of data being one of the most common reasons seen. Here the question comes how AI can play a vital role in this case and benefit the patients. Thus, this paper talks all about how the advancements of technology, particularly in the field of Artificial Intelligence that can be a part of Healthcare Industry and how can AI change the Healthcare in the present as well as the future.

In paper [3] it only talks about the AI changing the Healthcare and its respective benefits and challenges but doesn't focus on the future scope whereas, in this paper, Section

IV is the Discussion which also involves the Future Scope. Most importantly talking about the Relevance of AI in the Healthcare industry, it is quite appropriate in today's world as technology is advancing and demand are more. Expectations are more and we want everything to happen fast and error-free. So, AI is a technology which is quite apt in today's advancing world and will surely make a great difference not only to the Healthcare Industry but also to the other fields where Artificial Intelligence plays a vital role.

In this paper, we have various sections that cover different topics concerning AI in the Healthcare Industry. Section I talks about the Introduction where we get to know about what AI technology is and what is its impact on the Healthcare Industry. While Section II has explained Role of Artificial Intelligence, dealing with Healthcare problems and what all Algorithms and studies have gone through it. Section III talks about an overview on Artificial Intelligence in Healthcare and what is its current scenario. Section IV tells about the Applications of Artificial Intelligence in Healthcare and how will it benefit society. Section V is the Discussion where what all problems are the people facing in healthcare and how can AI provide relevant solutions to it. Also, it talks about the Future Scope of Artificial Intelligence in Healthcare. Lastly, Section VI is the Conclusion.

2. Role of Artificial Intelligence

A. Spotting DNA mutations in Tumors

There are many such reasons that why it's so difficult to treat Cancer these days, one of the reasons is malignant tumors tend to mutate, grow, evolve and change. In the past few years, scientists discovered that not only Cancer itself transforms but so does its DNA. As costs significantly dropped, the genetic analysis of tumors became possible, also in recent research, human experts have started to analyze the data to figure out what kinds of genetic changes, or mutations, occur.

Nowadays Artificial Intelligence is taking more control on analyzing the problems which the people are facing, also they are reviewing on the past decades and comparing it to the present so that they can come to know what is affecting the people from such problems. AI is also into taking more of

control in human decision making, systems supported by digital twins which can prove game-changing for the automotive industry.

B. AI systems in ICU

Intensive care units are the most intense parts of any hospital. It's a case of life and death and has lots of stress in that environment. As every moment is counted, patients are monitored 24/7 throughout with an army of devices. A recent study brought to this technology that it was trying to ease the burden. It's highlighted AI-driven systems to monitor the patients in critical conditions in the ICU around the clock, where they particularly focused on monitoring the movements day today. Researchers had installed some sensors around in the room of the patients over two months so that they could collect the information and its range about the movements. Algorithms were thereby designed to analyze the data collected also identified when the patient left their bed or returned. It was also able to detect whether the patient is out of his chair or not. AI here could also help the patients in guiding them when and what to do, especially in the Critical cases.

3. Artificial Intelligence in Healthcare

In today's current scenario, Healthcare has changed a lot from the past. In the year 1991, no one even knew about the World Wide Web but now in 2019, A.I. technology is life changing. With Healthcare related AI projected to be around \$200 billion industry by 2025 and the consumers are dying to get their hands on the latest healthcare apps and technology. Currently AI healthcare is focusing more on the patient outcomes and trying to reduce the cost of medicine. Patients are suffering a lot from different kinds of illnesses; many physicians are concerned that they are ill-equipped to properly care for these patients. This is the reason why researchers are developing aids in the Patient-Centered Approach. Using electronic health records from patients across the country, new AI technology helps to compile data for clinical research and reviews. There are programs for identifying efficacious treatments based on patient evidence. Data is just as essential for a highly responsive AI as it is for well-informed medical decisions. That's just one of the reasons these two industries pair so well together.

4. Applications of AI in Healthcare

There has been a great shift in the way patients are treated by the doctors as they now have inordinate amounts of data in their hands and the amount of this data can be put to good use.

It is possible to apply AI to both structured and unstructured data, with the help of techniques such as machine learning and natural language processing. The technology is widely used, but it is also important to note that the largest concentrated usage is in cardiology, neurology, and oncology. Nurses and doctors have started adopting technology to reduce manual work and to provide more accurate services to the patients.

A. Curing health diseases using artificial intelligence

In the developing countries, there is also inequality between urban and rural health services which these days have become a serious problem, of which the shortage of qualified healthcare providers is the major cause of the unavailability and low quality of healthcare in rural areas. More and more people in rural areas are suffering from such diseases which haven't even been noticed before. Some studies have shown that the application of computer-assisted could hopefully improve the healthcare outcomes in rural areas of developing countries.

Diabetes is one of the most common problems which people are having when they reach 60 years of age. In the past, there was a check-up done with this diabetes doctor in Iowa City, Kevin Sales had rested his chin onto a machine where they snapped some of the pictures of his eye. Using artificial intelligence, it analyzed his retina and, just after 20 seconds, made its diagnosis. So, diseases are caused just because of not proper usage of water which people who get misuse and the people who don't even get suffer. The aim of AI should be treating every individual in society equally with all respect and saving water.

B. Use of electronic health records in healthcare systems

Electronic Health Records (EHR) have brought strategic changes to the Healthcare Industry. Clinical documentation is one of the most important areas where a lot of time is invested but with the possibility of voice recognition also combined with NLP, a lot of time and effort can be saved.

These days doctors don't even worry about the cases where drug overdoses, or by chance if any wrong combinations or allergies are given.

The reason is this information will all be saved in the cloud so that it can be relied on and acted upon at the right time. This is not only beneficial for the patients that are suffering from the above problems but also for them with various infections, benefit from the technology as it is now easier to identify the patterns and send notifications accordingly.

Apart from storing information and identifying patterns, AI can also handle routine requests as well. Some of the scenarios which can be seen are:

Consider a patient which has an overdue for a lab test, in that case, it would send notifications to the concerned patient.

Another patient which is about to run short of his day today medicines. With the help of AI, the request for medicine refill will be sent promptly to the patient. Identify which patient out of many will need immediate care and it will prioritize them accordingly.

C. Use of virtual health assistance in healthcare systems

Nowadays there are health monitors which have AI incorporated in them. Some of the ways in which this can happen as,

- Reminding patients to take their medicines at the appointed time, also when they are about to run out of medicines and order prescriptions.

- Remind them of doctor appointments and manage bookings, also allowing Virtual interaction with doctors.
- It is also possible for patients to enter medical websites and chat with the chatbots, discuss symptoms, and ask health-related questions.
- Chatbots can never replace the typical doctor, but they can at least help alleviate the stress and fears faced by the patient.
- Companies like IBM, Microsoft, and Amazon already have intelligent conversational systems that can respond to voice or text-based questions through apps downloaded on mobile devices.

5. Discussion

When Healthcare is taken into consideration, everyone has problems from doctors to patients. If we see then 400 to 500 people are dying per day just from errors, accidents, and infections in hospitals alone. The biggest problem faced by the patients is the cost in the hospitals. As per the analysis and studies, the cost goes to \$1 billion per year which is enormous.

These are some of the problems which are being faced daily and people are having a lot of difficulties in overcoming them. Here we can use Artificial Intelligence technology wherein we can overcome the errors and improve results. AI capabilities such as machine learning, computer vision, natural language processing, and forecasting and optimization can be used to its full potential of data to improve population health and solve some of the greatest health care challenges.

This necessary evolution will enable health care organizations to improve the outcomes of the patients. Improve the operational performance of hospitals by optimizing staffing resources and considerably, taking action to reduce the number of hospital readmissions. Apart from the problems and its solutions discussed above, one of the challenges that stand in the way of AI is the risk involvement. There could be a case that even the smart algorithms may make a wrong decision, also the doctors must be ready for the new cases that have never been

addressed or recorded by AI yet. This is could be a problem in the rural areas where there is a shortage of water and no facilities for people with respect to Healthcare.

In the future, it is likely that AI systems will be more advanced to carry out a wider range of tasks without human control or input. There are some suggestions that AI systems will need to make ethical decisions [2]. This subject is of much philosophical debate, raising questions and whether duties that apply to humans can or should also apply to the machines, or whether new ethical principles might be needed to change the face of AI. Based on the knowledge attained by writing this research paper, we can also design an algorithm or make a model or design for the patients' health care so that it can help in the future and can be beneficial to the society as well.

6. Conclusion

The essential part of AI in health-patient care is picture examination. The future holds incredible potential for applying AI to enhance several parts of patient care [3]. Incredible difficulties stay because of the information's size and intricacy; however, the AI people group is well on its approach to meet these difficulties by making and growing the new examples like recognition methods, adaptable calculations, and methodologies to be implemented. AI is totally changing the field of Healthcare Industry. It is not only changing the role of doctors but also the patients. There are many challenges still the benefits overweigh them.

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