



Original Contribution

Digital Platforms in Learning and Assessment: The Coming of Age of Artificial Intelligence in Medical Checkup

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Artificial intelligence is growing quickly as of late in the area of machine learning as well as deep learning algorithms, device performance, and applications in other diversified domains. In this review, we sum up the most recent improvements of AI in the field of modern medicine/healthcare that consists of medical diagnostics, patient monitoring, and precision medical care. The motivation behind this paper has been to discuss enhanced logical achievements, in order to understand the accessibility of new tools and technologies enabled by AI in the field of healthcare, to see the value in the huge capability of AI as a whole, and to enable physicians in related fields with accurate methodologies. It tends to be stated that, very much like AI itself, the applications of AI in healthcare are as yet in their beginning phase. New advancements and leap forwards will keep on pushing the limits and extend the degree of AI applications, and rapid innovations are likewise expected to disrupt the area soon. The way we perform medical exercises or practice is dynamically changing with the developments introduced by AI strategies for healthcare. Combined with quick upgrades in data handling, AI-based frameworks are now working on the precision and productivity of medical diagnostics and patient treatment in different specializations. A broader perspective of AI inpatient treatment has prompted a few experts to propose that sometimes it might be possible that AI may replace the physicians in a certain task. These ideas bring up the discussion of whether these artificial intelligence-supported frameworks will ultimately take place of physicians in certain domains or will only augment the job of physicians without really replacing them altogether. To review this effect of AI in the field of medicine, this paper attempts to more readily comprehend how this ever-growing technology is changing the field of medicine – especially the medical diagnosis based on historical data of patients. Keeping that in mind, we also explore the role of applications of AI in carrying out medical tasks in specific domains including the assessment of patients by analyzing their past medical or checkup history, and leverage that data to make more intelligent decisions related to suggesting the medication. It reasons that the discussed frameworks will expand the abilities and approaches of doctors and may also augment the usual doctor-patient interaction.

INTRODUCTION

Having seen the fast development of artificial intelligence in healthcare all throughout the world

is a sign of bright future. A future where tools are probably going to characterize how the medical industry will be revamped in the time to come (Ganapathy, 2015). AI or otherwise understood as

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the imitation of human behavior by machines is ideal for having human traits like thinking, capacity to understand and learn as a matter of fact. Studies propose that these frameworks and technologies can assist with providing highly precise medical diagnosis of patients, be quicker, compelling and as exact as human physicians and further develop conveyance of medical services. However in their earlier stages now however with the consistent patterns seen up until now, automated medical practices, electronic collection of medical data and so on are probably going to be the traditional practice in modern medicine landscape. People need to understand that modern medicine practices are going to be an integration between doctors and healthcare experts, computers and patients. Artificial intelligence is all set to affect almost every sector of medicine industry, refined jobs for medical experts shall be introduced that will require new methods of practices and knowledge (Vadlamudi, 2016).

Likewise, this significance of artificial intelligence as a part of the patient diagnosis process has consistently been expanding since AI has turned out to be more useful. There is a wave of excitement and publicity about AI, and both researchers and experts focus similarly on this innovation according to various points of view. There is no uniform definition for the term AI however considered as the capacity of a machine to perform cognitive tasks that we see in human personalities, for example, thinking, perceiving, understanding, adjusting with the environment, critical thinking, and decision making, and even sometimes showing creativity on its own (Ebenezer et al., 2015). Artificial intelligence is generally connected with humanlike behavioral patterns and covers a wide range of research areas, for example, natural language processing or robotics to strengthen the medical practices for good.

Be that as it may, current useful applications, including medical and disease diagnostics, are limited to a specific task, and are being developed utilizing AI (Vadlamudi, 2017). AI algorithms use medical information and previous history of checkups to provide predictions and persistently learn and create after some time by continually handling new and updated information. These algorithms acquire data through different kinds of sources and inputs over several years of experience. Subsequently, AI-supported tools can handle more information as compare to people,

potentially outperforming them in certain medical tasks (Ganapathy, 2016).

THE USE OF ARTIFICIAL INTELLIGENCE IN DISEASE PREDICTION AND DIAGNOSIS IS BECOMING INCREASINGLY COMMON

The most earnest requirement for improvement brought in by AI in the field of medical lies in the diagnosis of diseases with the help of previous history of a particular patient. Various breakthroughs have been made around here. Artificial intelligence allows health experts to give historically accurate and precise diagnostics for some sorts of health diseases. A significant type of medical diagnosis depends on the biosensors or biochips that are used for real-time medical diagnostics. In that case, gene expression is a vital analytic parameter that can be examined and processed by ML quite smoothly (Jaworek-Korjakowska, 2016). Likewise, AI understands the micro-array information to group and identify anomalies.

Another AI application is to characterize data for cancer disease diagnosis. Having integrated the AI framework in the system, biosensors frameworks are able to analyze cardiovascular problems right at the earlier stages. Along with the diagnosis, AI can assist with predicting the survival chances of some cancer patients, for example, a certain kind of colon disease patients. Analysts also have shown a few challenges of artificial intelligence in modern medical diagnosis and have proposed some solutions to minimize the impacts of such disadvantages. Along these lines, there is still a lot of impact that AI can bring about in medical diagnostics and prognostics.

Table 1: Distribution of AI Methods used in Medical Industry by Medical Discipline

Disease Name	Machine Learning	Deep Learning
Cardiology	2	2
Neurology	2	2
Breast Cancer	2	2
Kidney Diseases	2	2
Liver Cancer	0	1
Dental Diseases	2	0
Asthma	0	0
Skin Cancer	0	2

Similarly, one such significant type depends on image and signal processing. These procedures are widely utilized in the disease diagnostics, the segmentation, and likelihood of diseases. As far as signal processing, various deep learning and machine learning algorithms are used in the feature extraction. It's highly significant to ensure seizures at the right time to limit their adverse effect on patients. Lately, artificial intelligence has emerged as one of the key components of a precise and reliable prediction system (Vadlamudi, 2015). Medical experts can now anticipate through AI algorithms, and the implementation of prediction system can easily be integrate within a application for a more portable usability.

ARTIFICIAL INTELLIGENCE'S EFFECT ON MODERN MEDICAL INDUSTRY

As mentioned before, a few variables have been influential lately to enable this growing development of artificial intelligence in medication. These developments incorporate the way healthcare information is collected in modern medicine, strong processing of computing power for minimal price accessible for handling huge datasets, the expanding application of electronic media records, and developments in processing tools and methodologies, that are supporting AI's growth in healthcare. While AI in medical industry is still in its starting phases, it is very much situated to have beneficial results in medical practices (Ganapathy, 2016). For instance, AI can extract as well as examine the medical information of patients from their previous history of checkups and from different sources like smart fitness watches, and fitness trackers that allow physicians to the health status of patients as compared to other traditional methods where the cost, time, and methods other than artificial intelligence would not allow. This section examines the influence and capability of artificial intelligence in some of the major specializations to make things simpler for medical professionals.

Radiology

Artificial intelligence's ability to both comprehend and process large data sets and extract relevant information from such data sets is becoming more important in radiology. For many of these sources, radiologists have to analyze a lot of sophisticated data entirely on their own. The introduction of AI/DL technology, tools, and methods into medical

practice are poised to affect radiologists' day-to-day activities. AI can help offer medical accuracy to physicians, and focus on the quality of treatment given to patients. Using deep learning and machine learning, radiologists can choose and extract critical characteristics from pictures, and even create new features from scratch. Radiology's ready for picture dissection, labeling, and examination automation using real sources. One thing worth noting here is that artificial intelligence, in general, is just as essential as datasets (Telang et al., 2015). We should evaluate the size and quality of the dataset while selecting a DL framework. Due to scanners, we need to be much more cautious when labeling all of the photos we've taken. This study requires large labeled datasets. Some kind of go-to techniques and best practice guidelines are recommended in order to train datasets and subsequently distribute them. This integrated approach allows for more common and unconventional data sources to be made available for the training of deep learning systems.

Pathology

Pathologists use their expertise and knowledge to conduct analysis of biological specimens. As new information is discovered, this is quickly turning into a complicated series of duties for pathologists of all kinds. Additionally, only a tiny percentage of senior medical students go into this area. Artificial intelligence-based technology and tools have a duty to look after these people (Ganapathy, 2016). Research specialists at Google suggested a CNN model to help with the detection of breast cancer on sample pictures, with similar levels of accuracy. It is a tiring task to search for little indications of illness on a sample, and even a pathologist may feel weary during this process, however, a framework based on deep learning encounters no such issues and handles samples fairly well. It will be virtually difficult for human pathologists to stay relevant in light of the emergence of new technologies like AI, ML, and DL without the help of AI, ML, and DL algorithms.

Cardiology

Many research investigations have affirmed that artificial intelligence, more particularly machine learning, and may build more accurate prediction frameworks for cardiovascular illnesses by linking various risk variables. 4 machine learning techniques (gradient boosting machines, random

forest, and neural network, logistic regression) were used to train the models and enable them to link past medical histories with heart attack rates. In order to predict who the patients most likely to suffer heart attack failures were, these models were created (Gittelman et al., 2015).

The best performing technique turned out to be neural network, which accurately predicted a larger and more precise number of occurrences. To more accurately anticipate samples, people who would have been diagnosed are spared. According to researchers, AI's effectiveness revolves on predicting cardiovascular illnesses, thus increasing the number of people who get preventative care while avoiding subpar quality medical therapy.

DIFFERENT APPLICATIONS OF AI IN ASSESSMENT LEARNING ON MEDICAL DIAGNOSIS

Wearable Technology and Advanced Medicine:

Machine Learning is used to manage and train sophisticated Neural Networks in both the IBM Watson Cloud and the Targeted Real-time Early Warning System (TREWS).

Drug Discovery and Precision Medicine:

The selection of candidates for Alzheimer Disease therapy is still in the early stages of development, according to the researchers. There are a few beta program inhibitors that are being investigated as potential treatments for Alzheimer's disease. An artificial intelligence (ML) program was created with consideration for the structural, physical, and chemical properties of these inhibitors.

The Role of Artificial Intelligence in Modern Medicine:

Obtaining medical history and checkup information from patients via talks and physical examinations.

- Medical information is used to infer a careful diagnosis.
- An appropriate cure technique is identified and controlled.
- Patients are diagnosed and observed.
- Rehabilitation and continuation plans are developed.
- Medical information is used to infer a careful diagnosis and to treat the patient.

CONCLUSION

Artificial intelligence has intriguing applications related to various biomedical domains. No wonder artificial intelligence assumes an important role in the field of modern medical landscape, not because of the developments and methods it has brought about, but also due to the solution provided for complex internal nature of medical issues and the suitability to solve such challenges. Modern AI tools provide appropriate solutions for modern medical industry and practices in general, and emerging transition of medicine requires improved ability from artificial intelligence.

Artificial intelligence is surely going to back the necessities of modern medicine by evaluating and analyzing huge chunks of datasets that medical organizations and patients store every day. There's a great chance that AI is also going to support and augment physicians by eliminating the traditional practices – allowing them to spend all their time and energy with their patients. Make no mistake, AI is definitely not going to replace physicians anytime soon completely, but it is imperative for physicians to master the essentials of artificial intelligence as well as how applications powered by AI can assist them with their traditional medical practices providing better results and precise diagnosis. Physicians who fail to keep up with this change are most likely to be completely replaced by AI, that's for sure.

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