Application of artificial intelligence in medical field- A review

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Abstract— **Artificial Intelligence is a trending field in Computer Science and Engineering, which enhances the performance of computer systems to think and perform the tasks like humans such as Decision Making, Solving complex problems etc. as we know that AI has developed in many areas and it has made human life easier now we can invest financially through Automated financial investing and also now a days we can book travelling tickets by virtual travelling agent. So Artificial Intelligence has become a part of human life.**

AI has also developed in medical field. AI programs are used for practices such as Drug development personalized medicine treatment protocol development etc. This Review paper discusses current uses of AI in healthcare. AI also can detect the problems and threats automatically for patient safety. Current researches of AI applications provide a future view of AI in healthcare.

Keywords— *Artificial Intelligence, MRI, Diseases, Healthcare, Robots.*

I. INTRODUCTION

Artificial Intelligence is comprised of two words : 'Artificial + Intelligence' , where 'Artificial' means that objects which are made by humans or non-natural objects and 'Intelligence' means the ability to understand, learn and think, therefore Artificial Intelligence means Intelligence of machines or intelligence of non-natural objects[1]. In AI, machines are able to think like human being and also capable of doing work like humans, for example: Robots have intelligence like humans and capable of doing the work like human being.

AI is a developed field in Medical field such as machine learning algorithms are used for Medical Imaging and also AI provides many modern techniques for patient's treatment and safety.

Like past years now days Doctors don't need much more physical and mental efforts for diagnosis of patient's problem and treatment of patient, now a days AI has made it easy as compare to previous time. As we know that 50 years ago significant time was needed to diagnosis the disease, to think and to collect the information about disease and also lot of time was needed to make the decision about treatment but now with the use of AI (Computer assisted diagnosis tools) one can diagnose the disease in very less time and also the accuracy of computer assisted diagnosis is better than human decisions [5].

AI takes thinking level of specialists to the next level in three crucial regions: highly developed computation,

statistical analysis and hypothesis generation. These three regions correspond to three unique waves within AI progression[3].

A Specialist can observe maximum 50 patients per day but unlike human doctors AI tools can observe too many number of patients per day .So AI saves time and effort of doctors and increases the ability of doctors to do the work[6].

Hence, AI has made medical treatments so easy with automatic appointment booking, symptom checking, report tracking for patients etc.

2. APPLICATIONS OF AI IN HEALTHCARE

A). Managing medical records and data

Managing medical records and data is one of the important applications of Artificial Intelligence in Healthcare. Gathering, storing and normalizing the data and discover its magnitude is the essential step in revolutionize the attainable healthcare systems [12]. Google DeepMind's

health team is continuously working on some of the most complex health problem using AI to offer extremely good and expeditious health services [13]. So the primary step in medical field is assembling and exploring data, data management is most widely used application of AI and digital automation in healthcare. Robots accumulate, store, re-form and detect data for making the quick and more consistent access [14].

AI is a field in computer science and engineering which makes computer system smart i.e. computer systems can make decisions more perfectly or intelligently. Because of AI computer systems having intelligence like humans so that they can think like humans and can make decisions like human. Synchronizing the experience, information, and human contact of doctors with the enhancement of AI will increase the level of treatment of the patients and it will be less expensive as compare. This recorded data of patients also can help in future to discover new ideas about healthcare [17].

B). Treatment design

Artificial intelligence is bringing about headways in medical care therapies, for example, redesigning the association of therapy strategies, breaking down information to give prevalent therapy system, and checking therapies [15]. Artificial intelligence can quickly and precisely perceive signs and indications of sickness in clinical pictures, for example, MRI, CT Scan, ultrasound and x-beams, and consequently allows quicker diagnostics decreasing the hour of patients sit tight for a conclusion from weeks to only hours and helps the doctors to take the treatment decisions quickly.

AI can now help the doctors as assistant. In previous years, before approximate 50 years AI was not this much developed So doctors needed an assistant (human being) to accumulate the patient information, patient's all tests information , diagnoses record and for their billing information . Furthermore, the aptitude to explore public databases with information from thousands of doctors and patient cases can assist physicians manage better personalized treatments or discover similar cases [8]. AI will encourage clinicians adopt a more extensive strategy for malady administration, better facilitate care designs and help patients to all the more likely oversee and satisfy with their long haul treatment programs.[9]

C). Detecting mental conditions

Researches from the past few years are trying to understand the underlying neurobiology associated with mental problems. Mental problems are affecting from an early age in all over world. For collecting the information about these mental problems in children there are many techniques in Artificial Intelligence [15]. One such popular technique is a view on the eye-tracking technology (Right Eye LLC). Recently the AI specialists have discovered an AI generated Autism experiment which allows applying eye-tracking technology to find the early stage of ASD (Autism Spectrum Disorder) in 12 to 40 months children. In this technique eye-tracking device show many images on screen during the test of kids. By using this technique psychiatrist can find out which child have healthy brain and which have not. So AI helps to detecting the mental conditions which affecting children in worldwide [17].

D). Management of diabetes

Diabetes is a constant advancing metabolic disturbance depicted by high blood glucose level. Addition in blood glucose level is recognized due to one or the other pounding of pancreatic β-(Type I) or cells impervious to insulin (Type 2) [11]. Constantly high blood sugar can cause several problems in body for example neuropathy, nephropathy, retinopathy and cardiomyopathy.

AI sensors can continuously record the blood glucose level of patient and therefore can assist doctors and patients to manage the diabetes more effectively. The utilization of AI upgrades translation of results with high exactness and at most extreme speed [12]. For example, The Diabetes Clinics most recent observational test applied a framework based on top of a self-

enhancing AI stage. The framework, named as Rhythm, estimates and oversees blood glucose levels of individuals with diabetes, depended distinctly on non-intrusive biometric sensors and AI.

E). Detecting Tumours

Detecting malignant diseases and assessing the effectiveness of chemotherapy in cancer patients some sort of skin markings, like sores, can be indicative of ailments. Remembering them can help clinical specialists recognize dangerous conditions like skin disease [16]. Certain treatment frameworks are presently applying AI calculations for this. Derma Compare is a primary model that applies AI calculations to look into pictures of melanoma moles with pictures of 50 million realized moles transferred by patients and specialists in the whole world.

Through the utilization of AI, uncommon highlights can be removed from pictures that give significantly more data than the natural eye could decide [17]. Imaging, for example, can catch full scale contrasts among tumours, for example, measurement, shape, and outside highlights (smooth versus harsh and penetrating diseases.) If these actual highlights can be associated with explicit transformations, for example, the information may be used to decide determination or anticipate results. The insurgency in computerized PC innovation that has made plausible new and convoluted imaging methods may hence affect the translation of radiology pictures. In mammography, PC picture and AI strategies have been utilized adequately to recognize or to depict anomalies in computerized pictures [18].

F). Recognition of facial symptoms

Innovation that licenses AI frameworks to recognize faces in advanced photos is currently introducing the comparative potential in finding Actual identifiers in some ailments [16]. Facial feeling acknowledgment (FER) is a most significant zone in the fields of PC vision and computerized reasoning inferable from its amazing instructive and business potential. despite the fact that FER can be completed using numerous sensors. To illustrate, consider Face2Gene phenotyping purposes that utilization face identification and AI to help medical care suppliers in perceiving phenomenal hereditary problems [21]. These applications draw information focuses from a picture and assess it to pictures of patients from an information base, which have likewise been treated with these problems.

Using facial acknowledgment is possible to see an individual from an advanced photograph or a video. This is reached by identifying a face in the picture or video and contrasting it and an information base including both face pictures and metadata relating the image with an individual. Our face, like our fingerprints, is a biometric identifier, an exceptionally novel attributes are separated (particulars), for face distinguishing proof, the comparative cycle is utilized [13].

G). Robot assisted surgery

Now a days Robot assisted surgeries are trending, in robotic surgery computers are involve in surgery to help the doctor therefore it reduces the number of human assistant for the Surgeon and thereby decreasing the chances of infection and also Robot assisted surgery is more accurate than human assisted surgery. Robot assisted Surgery was made to vanquish the constraints of previous negligibly obtrusive surgeries and to improve the limit of specialists doing open medical procedure.

In robot assisted minimally-invasive surgery, instead of straightly operating the equipment, the specialist utilizes one of two strategies to control the equipment; either a direct telemanipulator or through PC control [13]. A telemanipulator is a distant regulator that permits the specialist to execute the conventional exercises related with the medical procedure for now the robotic arms complete those movements using end-effectors and manipulators to perform the genuine medical procedure on the patient[19]. In PC controlled frameworks the specialist uses a PC to manage the automated arms and its end-effectors, anyway these frameworks actually use telemanipulators

for their data. One interesting benefit of the electronic method is that the specialist needs not to be present physically during the medical procedure [21].

The most natural careful robot is the da Vinci Surgical System. As of late, Google has revealed that it started working with the drug goliath Johnson& Johnson in planning another careful robot framework [20]. They are by all account not the only recoveries, however. With their AXSIS robot, Cambridge counsellors seek to vanquish the impediments of the da Vinci, for example, its enormous size and inability to work with amazingly point by point and sensitive tissues [27]. Their robot fairly depends on adaptable segments and little, worm-like arms. The developer considers it very well may be applied later in ophthalmology, for example in waterfall medical procedure.

3. FUTURE VIEW OF ARTIFICIAL INTELLIGENCE IN HEALTHCARE

Artificial intelligence is ahead of time foothold in numerous fields. Computer based intelligence has the probability to have a huge and positive effect for specialists and patients in medical services. In view of the ability to gather and break down a tremendous measure of different information, AI could yield impressively faster and substantially more precise judgments for a more extensive part of the populace [23]. People without admittance to incredibly particular medical care may accomplish the benefit of that experience through AI. Medical services costs might fall because of fast and more exact analyse.

Artificial intelligence likewise causes chances for the clinical calling and patients. Until the information stockroom gets sufficiently large and amazingly all around qualified, specialists should persevere to utilize their preparation and experience to ensure that man-made consciousness is yielding the best possible judgments and course of clinical treatment [25].

As AI advances grow, they will change the manner in which specialists look towards their patients, expand the potential outcomes to anticipate and treat illnesses, spare medical services costs and progress clinical consideration in locales where admittance to medical services is restricted [24]. At long last, imagining a fate of medication dependent on information and examination gives clarification for trust however needs steady exploration to comprehend its maximum capacity.

4. LIMITATIONS OF AI IN MEDICAL FIELD

The expression "Artifical consciousness" could be beguiling as a rule as it includes a definitely more created innovation than it remains right now. At best, current innovation – which means an assortment of AI strategies, can accomplish counterfeit thin knowledge (ANI) in different fields. However, that is creating at an improbable speed. These barely keen projects beat people specifically errands. To try not to over-publicity the innovation, the clinical limitations of present-day ANI additionally must be acknowledged. Smoothing out and normalizing clinical records so that calculations can sort out them mean another immense impediment in acquainting ANI with emergency clinic divisions for doing authoritative errand[22].

V). CONCLUSION

Artificial Intelligence is developing field in many areas and it is developing in Healthcare also. Many researches shown that Artificial Intelligence is a base (in 21th century) in medical field, such as because of Artificial Intelligence, diagnosis of disease is very easy, also collecting the knowledge about diseases and treatment of diseases is easy as compare to previous time. AI has a lot of variety of applications in medical area such as Robot assisted surgery, Managing medical records and data, Treatment design and Detecting mental conditions etc. It can be seen clearly that Artificial Intelligence can be very helpful to doctors, nurses and patients also, by providing diagnosis and treatment of the diseases

very easily and also by providing knowledge of diseases. So Artificial Intelligence plays an important role in healthcare in 21th century. We have seen recently in this COVID-19 pandemic also that many researchers developed deep learning based applications which can accurately diagnose covid-19 patient from the X-ray or CT-Scan.

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