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Implications of Artificial intelligence in Medicine

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ABSTRACT
In recent time, Artificial intelligence is one of the hot topic in every field. The role of AI is the new dimension in the field of medicine. In this paper, the benefits of AI are presented in the field of medicine. Also, the paper presents how AI based techniques can help a patient 24x7, diagnosis of critical diseases, treating a patient, error or mistakes reduction performed by a doctor. The doctors can be updated by an AI model by giving recent developments in the field of medicine though textbooks and research paper published in reputed journal through the world. Machine learning approaches are used to predict the probability of having a disease by learning from the previous similar cases. Also, natural language processing techniques are employed to take out the useful information from the unstructured corpus.
 Keywords: Artificial Intelligence, Medicine, Machine Learning, Natural Language Processing.
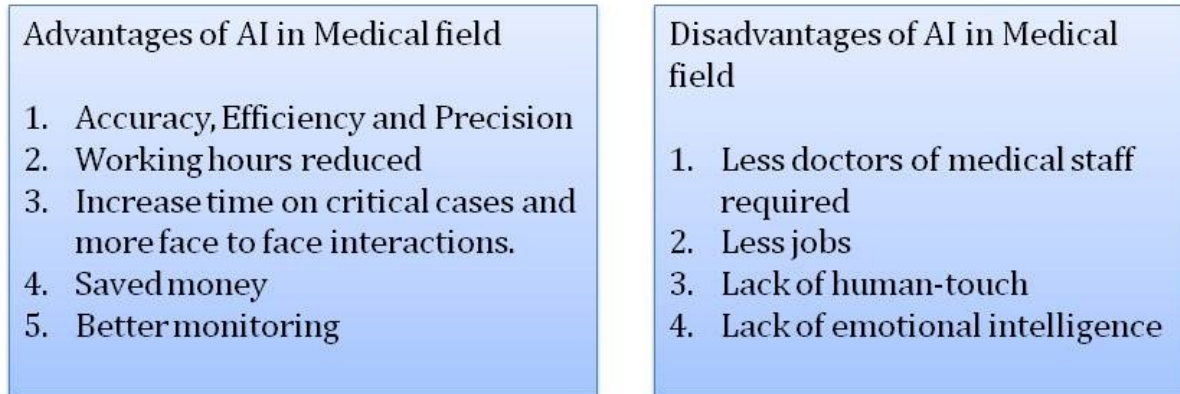
INTRODUCTION
What will happen when a patient could approach a computer before getting diagnosed by a physician? Isn't it an amazing gospel!!!! Think about how many years of ambulatory blood pressure devices do you have or even how much storage capacity you would have to store a complete 3D image of a body organ in your laptop. In 1950, a computer scientist named as Alan Mathison Turing is considered as a Father of Artificial Intelligence and even originator of Modern computers. He has explained, "The Turning Test" that was established on the quick-witted deportment/behavior of a computer, that can achieve human-level performance in the analytical related assignment.
Distinct clinical systems such as neural network, support vector machine, logistic regression, random forest, linear regression, discriminant analysis, nearest neighbor, decision tree, hidden Markov, hybrid intelligence, Bayesian network system and so on are the parts of Artificial intelligence that are utilized in the health care sector [1].
Generally, the implications of artificial intelligence in medicine can be categorized into two subtypes such as virtual and physical. The virtual component consists of several applications that ranged from electronic/digitalized based health record systems to artificial neural networks. While the other portion i-e the physical part may deal with robotic systems that would help in executing the surgeries, prostheses system for handicapped individuals. It is well being employed in online appointment scheduling with medical healthcare, medical digitalized records, reminder appointment calls for follow-up, side effects warning notifications, algorithms of drug dosage, electronic medical documents, information systems for pharmacy, information management system for laboratory, urgent situation division information system, perinatal/perioperative information systems, digital pathology systems, medical decision support system.
Baranuik et al. [2] suggested that the treatment time will be reduced by applying AI techniques. Ai based treatment requires 1 hour instead of 4 hours of treatment. They also suggested that head and neck cancer can be treated by Google's AI. Further, AI based medication also lower the side effects of drugs given to a patient by giving precise treatment. AI based treatment cab save the life of a patient. Patient can get the medication just on smartphones by interacting with their doctors [3]. Majority of the people in world have smartphones and in case of any emergency, the patients can get immediate medication.
As compared to the mistakes conducted by doctors, 72% correct treatment is performed by AI based medication strategies. It is also obvious that mistakes cannot be fully eliminated in medical field but AI

based methods can handle these mistakes to some extent. The manufacturing's of medicines are also made easy and quick by applying these techniques. Borukhovich *et al.* [3] conceded that these techniques also help patients to recall about their medicines. AI help by reminding them to take ther medicines on time as these medicines are very critical for the patients. Figure 1 summarizes the benefit and drawbacks of AI in the field of medicine.

Advantages of AI in Medical field	Disadvantages of AI in Medical field
1. Accuracy, Efficiency and Precision 2. Working hours reduced 3. Increase time on critical cases and more face to face interactions. 4. Saved money 5. Better monitoring	1. Less doctors of medical staff required 2. Less jobs 3. Lack of human-touch 4. Lack of emotional intelligence

Figure 1: Advantages and disadvantages of AI in medical field

Current and Advanced Applications of Artificial Intelligence
Applications of AI in medicine include numerical based data such as blood pressure or heart rate or image-based scanning system such as MRI or Biopsy images of tissue organ.
AI in Cardiology
Atrial fibrillation was detected earlier by the first application of AI technology. It has included AliveCor approved by FDA in 2014 for monitoring and detecting the disease. Some other examples of AI are Apple watch 4 for monitoring ECG and REHEARSE-AF [4]. Additionally, AI technology has been employed in the prediction of cardiovascular risk in individuals, including heart failure and coronary syndrome.
AI in Pulmonary medicine
Analysis and interpretation of results obtained from pulmonary function tests have been revealed to be a capable approach for the enhancement applications of AI in pulmonary medicine [5, 6].
AI in Clinical Nephrology
AI system has been found helpful in predicting the glomerular filtration rate in those patients who are suffering from polycystic kidney disorders [7, 8, 9].
AI in Gastroenterology
The technology of neural network has been used in examining the gastro esophageal reflux disease, inflammatory bowel disease, metastasis in colorectal tumors, atrophic gastritis and so on [10, 11].
AI in Cancer
AI-based algorithm used to diagnose cancer in computational histopathology with more precision and accuracy. For example, Paige.AI model is very popular AL model in treating cancer and gave very accurate results [12].
AI in Medical Imaging
Ai is used for thoracic imaging, colonoscopy, mammography, brain imaging [13].
Figure 2 shows the role of Ai in field of medicine.
Therefore, artificial intelligence is the advanced technology that has incorporated in many forms into our daily lives such as Google assistant, Alexa, computer gaming, aviation etc. However, now-a-days such novel approaches have begun to be assimilated into medical health care for patients to enhance the process of diagnosis and their recovery rate with overall high accuracy.
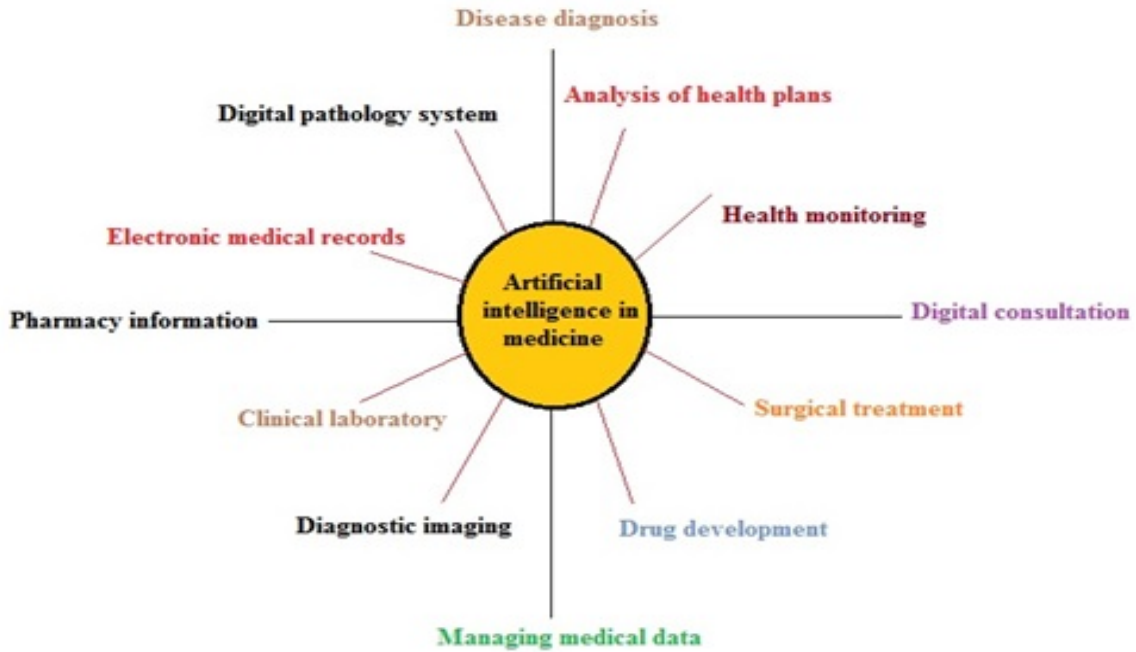
Figure 2: Role of AI in the field of medicine

Although machine learning (ML) has an advantage over evaluating the radiology images, histopathological images which ultimately would be helpful in the diagnosis process and even expanding the doctor's capabilities. Figure 3 shows the scope of AI, ML and deep learning models.
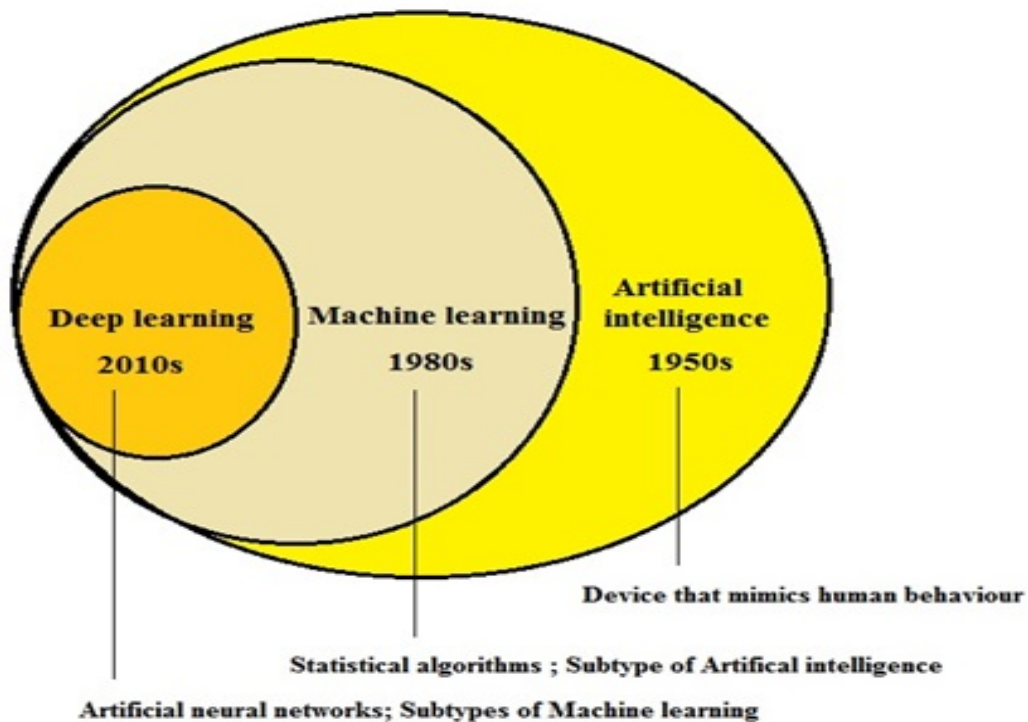
Figure 3: AI Vs Machine Learning Vs Deep Learning

CONCLUSION
The use of artificial intelligence models in medicines is a promising field of progress, which quickly developed in past few years. These AI based techniques are very helpful in improving healthcare and

medical issues. These techniques are reducing the need of doctors to some extent and also decreasing the mortality rates. The conventional way of treatment and medical practices are changed using AI in near future. These treatment techniques will reduce time, mistakes occurred during diagnosis and tackle health issues more accurately and efficiently. Virtual assistant are present 24x7 with the patients. In future, the risk associated with AI based techniques must be calculated for smooth functioning of these techniques in treating diseases and developing medicines

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