

## **Burgeoning of Machine Learning in the field of Medical & Health Sciences.**

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In recent years, there has been a significant improvement in medical science and its related equipment, especially to diagnose a particular disease in the early stage. Use of technology helps in early diagnoses which leads to early treatment and recovery from disease. If the person does not receive proper treatment in accordance to the diagnosis the disease might get worse which results in increase morbidity and mortality rate. In short, early diagnoses and right treatment is the best remedy against any particular disease. Due to this fact, there is a need to analyze complex medical data, medical reports and medical images that could provide mechanisms to help the health care professional with more precision. In the field of medical science there is a need to devise standardized mechanism to analyze complex medical data. Introduction of machine learning and artificial intelligence provide ease to examine medical reports and images that aids healthcare professionals with greater accuracy. ML & AI adds new dimensions that referred to enormous growth and advancement in this field.

Machine learning is burgeoning sub-discipline of artificial intelligence (AI). It is mainly based on probability and statistics but is more influential than the standard statistical methodologies' when it comes to decision making. In many situations certain abnormalities can't be directly recognized and rightly diagnose by humans. The prime concern of the healthcare professional is to achieve short- and long-term treatment goal through early diagnoses. In such scenario there is a need of an instrument that provide supports to healthcare professional to see the cause-and-effect relation. The application of machine learning algorithm on medical data can be a better choice to reveal the hidden relationship or abnormalities which are not possible in normal healthcare conditions. Machine learning can also be used to recognize the pattern of medical data and to predict the disease. It is not possible to get the desired results without implication of these algorithms. On the

other hand, it is more challenging to reduce time and bring efficiency despite the execution of these machine algorithms. However, various diseases are being diagnosed using machine learning techniques which are based on computational decision making in healthcare sector.

The study conducted by Ambale-Venkatesh et al reported that the machine learning improves the prediction accuracy of deep phenotyping in an initially asymptomatic population.<sup>1</sup>

The article referred “P-Wave Area Predicts New Onset Atrial Fibrillation in Mitral Stenosis: A Machine Learning Approach by Tse et al. The authors examined Chinese patients who are reported with mitral valve stenosis in sinus rhythm at baseline. Atrial Fibrillation is a patient condition with excessively high heart rate. The author determined that atrial electrophysiological variations in mitral stenosis may be identified through electrocardiogram. Other factors that also contributes include patient age, systolic blood pressure. The P-wave area in V3 could predict the onset of atrial fibrillation (AF). The authors suggested a decision tree learning model, that statistically enhance outcome prediction.<sup>2</sup>

Another study concluded that machine learning successfully ensure automatic elucidation of pulmonary function tests for any discrepancy in diagnosis of obstructive chronic lung diseases.

Deep learning models for instance convolutional neural network is advanced technique used for obstructive pattern recognition in computed tomography. The study revealed that machine learning is also practiced for other investigated methods as well, like forced oscillation test, breathing analysis, lung sound analysis and telemedicine with encouraging results in small-scale studies.<sup>3</sup>

Machine learning is successfully established in the early diagnosis of heart failure patients its classification and in prediction of re-admission for medical adherence.<sup>4</sup> Furthermore, machine learning algorithm can also be used for solving patient facing problems in hospitals.<sup>5</sup>

In this era of digitalization, it has been observed that in government hospitals there is a lack of framework to keep records of in and out patients. On the other hand, government is willing to provide free healthcare facilities to all but this might look impossible without having patient’s data. In addition, Higher Education Commission (HEC) and other accrediting bodies should encourage and promote both Artificial Intelligence and Machine learning in medical sciences.

The government must set its direction and take measures to facilitate institutions to organize medical conferences, workshops and seminars on AI and ML. This will result in increasing awareness in these specialized fields and also promote research and development culture in the country. Further to contribute in these fields there is a need to hire professionals and consultants to encourage R&D. In pursuit of excellence the government must provide financial support to researcher and scholar to conduct research in these specific fields and help in publication of data in medical research journals in Pakistan. The research articles should be included with the aim to contribute in the pivotal segment for better provisioning in healthcare.

### **References**

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