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# Application of Learning Approaches in Healthcare

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***Abstract:*** ***The learning approaches in healthcare would aim at phenotyping the disease based on clinical as well as physiological characteristics as ideally disease is defined and diagnosed by a combination of clinical symptoms and physiologic abnormalities. The medicine today is advanced into new realm with the growth of applications of artificial intelligence and machine learning in healthcare. This is important as we will not be addressing the target population for a specific disease alone; rather predict the likely outcome of the related disease in an unknown population of interest with the knowledge gained. This is of utmost focus especially with rare diseases, the data for which are available in lower volumes. Further, prediction outcomes available at earlier stages are important to prepare points of care to handle disastrous outcomes resulting from the diseases.***

***Keywords:*** ***Preprocessing, Learning, Hybrid, Objective, AI***

## I. INTRODUCTION

An AI system is aimed at addressing major challenges including reduction of errors in diagnostic and therapeutic measures with a view to prove quality healthcare services. This necessitates the systems to be trained on clinical data generated during the process of screening, prognosis and treatment in order to study correlations between features characterizing common subjects in a group. A further more challenging problem is to integrate existing AI applications within prevailing clinical workflow[9,10,11]. We provide a brief review on the preprocessing approaches besides the adoption of appropriate learning algorithms that can build intelligence into the existing systems.

## II. METHODOLOGY

Features extraction as a part of preprocessing is more central to applications involving health and medical informatics Preprocessing plays a significant role in preparing the data for training especially with respect to clinical data. Demographic data and anthropometric indices included as part of the study are sometimes considered irrelevant to the objective of study. In this regard, the wrapper approaches and filter approaches would be most applicable to achieve the desired task. While the filter approaches involve preliminary removal of features irrelevant to the study, the wrapper approaches would aim at improving the performance efficiency of the learning algorithms developed. Commonly used learning algorithms for prediction of diseases include both, supervised and unsupervised approaches [6,7].

With unsupervised approaches our main target would be identify phenotypes of the disease that would remain distinct from one group to the other, while identifying highly similar subjects with common disease presentations clustered in similar groups. Cluster analysis is the most applicable methodology at this stage.

Supervised learning involves the application of classification algorithms with the intention of identifying subjects with the disease as well as predicting severity levels pertaining to the disease outcomes [3,4,5]. Commonly used classification algorithms including logistic regression, support vector machines and decision trees yield a considerably decent outcome [5,8], however the accuracies with which these algorithms perform will be better with the design of ensemble and hybrid techniques that utilize these algorithms in an efficient way [1,6].

Neural networks have also proved to yield good results with medical data involving images and prediction problems [1,2,3].

## III. CONCLUSION

An improved understanding of underlying causes of the disease will aid in development of new strategies with an aim to control and therefore prevent severity. Further research into the role of comorbidities and cofactors will help better management of the disease. For the welfare of the public health ,a uniform definition of severity levels is needed to identify those patients who require particular attention ,to ensure appropriate treatment and regular monitoring and to improve adherence to treatment to reduce the use of emergency departments and hospitalizations. The performance of the learning algorithms can be justifiable only upon cross validating the results of the models across populations and populations beyond the scope of the study. Early recognition of the attributes influencing the disease outcome is utmost important with a view to address the specific patients at risk. The strategy can be seen as an important means to gain objective opinion to enhance reliability and accuracy withincreased efficiency from the perspective of both clinicians and patients.

## REFERENCES

1. Bhardwaj R, Nambiar AR, Dutta D. A study of machine learning in healthcare. In2017 IEEE 41st Annual Computer Software and Applications Conference (COMPSAC) 2017 Jul 4 (Vol. 2, pp. 236-241). IEEE. [CrossRef]
2. Pooja M R and Pushpalatha M P, "A hybrid decision support system for the identification of asthmatic subjects in a cross-sectional study," 2015 International Conference on Emerging Research in Electronics, Computer Science and Technology (ICERECT), Mandya, 2015, pp. 288-293. [CrossRef]
3. Pooja MR, Pushpalatha MP. A Neural Network Approach for Risk Assessment of Asthma Disease.Journal of Health Informatics & Management. 2018;2(1).

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4. Wiens J, Shenoy ES. Machine learning for healthcare: on the verge of a major shift in healthcare epidemiology. Clinical Infectious Diseases. 2018 Jan 1;66(1):149-53. [CrossRef]
5. .M. P. Pushpalatha and M. R. Pooja, "A predictive model for the effective prognosis of Asthma using Asthma severity indicators," 2017 International Conference on Computer Communication and Informatics (ICCCI), Coimbatore, 2017, pp. 1-6. [CrossRef]
6. Pooja MR, Pushpalatha MP. An Empirical Analysis of Machine Learning Classifiers for Clinical Decision Making in Asthma.InInternational Conference on Cognitive Computing and Information Processing 2017 Dec 15 (pp. 105-117).Springer, Singapore. [CrossRef]
7. Shailaja K, Seetharamulu B, Jabbar MA. Machine learning in healthcare: A review. In2018 Second international conference on electronics, communication and aerospace technology (ICECA) 2018 Mar 29 (pp. 910-914). IEEE [CrossRef]
8. Pooja MR, Pushpalatha MP. Analysis of A Panel Of Cytokines in BAL Fluids to Differentiate Controlled and Uncontrolled Asthmatics Using Machine Learning Model. Journal of Respiratory Research. 2019 Jun 8;5(1):142-5. [CrossRef]
9. Pooja MR, Pushpalatha MP. A Comparative Performance Evaluation of Hybrid and Ensemble Machine Learning Models for Prediction of Asthma Morbidity.J Health Med Informat. 2019;10(330):2.
10. MR, Pooja, and M. P. Pushpalatha. "Clinical Respiratory Diseases and Care." (2019).
11. Pooja MR, Pushpalatha MP. A Predictive Framework for the Assessment of Asthma Control Level.Int J EngAdv Tech. 2019;8:239-45.

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