

Detection of Different stages of COPD Patients Using Machine Learning Techniques

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Abstract— In recent years, there are an increase in the mortality rate due to Chronic obstructive pulmonary disease (COPD) patients and it is estimated that it will increase in the coming years. Traditional methods take a long time to identify these diseases because a lot of clinical tests has to be performed for getting the confirmation, however with the advent of intelligent techniques as well as looking at the potential of the powerful techniques for predicting other critical diseases, it is believed that it would help to detect the chronic diseases at an early stage in a precise manner. In this paper, an attempt has been made to detect COPD patients and at the same time, it could distinguish the stages such as the early stage of chronic obstructive pulmonary disease patients (ESCP) and the Advanced stage of COPD patients (ASCP). We have used the Recursive Feature Elimination, Cross-Validated (RFECV) feature selection method to select features and then we consult the doctors, those are expert in the field to recommend the features among the features selected using RFECV method. The features selected using the doctor recommendation called features reduction with doctor recommendation (FRDR). After selecting two groups of features, we have used different machine learning algorithms to compare the performance of the algorithms as well as the importance of the features. It was found that the features selected using the RFECV method could able to provide accuracy of 96%, whereas the features selected with doctor recommendation name FRDR could able to provide accuracy of 90%. Although there is a difference of result in both the methods but overall, both set of features produces a good result. So, it is recommended that this approach would help distinguish different stages in real-life situations.

Keyword— Machine Learning, Chronic Obstructive Pulmonary Disease (COPD), Classification, Features Selection, Performance comparison.



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