

Early Detection of Chronic Kidney Disease using Machine Learning

Introduction:

Chronic kidney disease occurs due to improper functioning of kidneys. Diabetes, high blood pressure and several Heart disease problem which causes Chronic kidney disease are taken as primary features . Detection of chronic kidney disease in early stage is a challenging task because there are no early stage symptoms to be seen, so when kidney disease worsens we could see more waste buildup in your blood which may result in many complications like nerve damage, high blood pressure and anemia. Diabetes and high blood pressure are responsible for two-thirds of chronic kidney disease. Chronic kidney disease could affect any human being irrespective of age. Most importantly person with a family history of kidney failure are more prone to this disease. At early stage of Chronic kidney disease there won't be severe symptoms at start later on we could notice trouble sleeping , swollen feet and urinate more often especially at night. Chronic kidney disease gets worse over time which can progress to kidney disease. Often this disease could be predicted in later stage. Medical researchers use Urine and blood sample to detect the Chronic kidney disease at much more earlier rate.

Literature review:

Gunarathne W.H.S.D et.al. [1] Has compared results of different models. And finally they concluded that the Multiclass Decision forest algorithm gives more accuracy than other algorithms which is around 99% for the reduced dataset of 14 attributes. S.Ramya and Dr.N.Radha [2] worked on diagnosis time and improvement of diagnosis accuracy using different classification algorithms of machine learning. The proposed work deals with classification of different stages of CKD according to its gravity. By analysing different algorithms like Basic Propagation Neural Network, RBF and RF. The analysis results indicates that RBF algorithm gives better results than the other classifiers and produces 85.3% accuracy. S.Dilli Arasu and Dr. R. Thirumalaiselvi [3] has worked on missing values in a dataset of chronic Kidney Disease. Missing values in dataset will reduce the accuracy of our model as well as prediction results. They find solution over this problem that they performed a recalculation process on CKD stages and by doing so they got up with unknown values. They replaced missing values with recalculated values. Asif salekin and john stankovic [7] they use novel approach to detect CKD using machine learning algorithm. They get result on dataset which having 400 records and 25 attributes which gives result of patient having CKD or not CKD. They use k-nearest neighbours, random forest and neural network to get results. For feature reduction they use wrapper method which detect CKD with high accuracy. Pinar Yildirim [8] searches the effect of class imbalance when we train the data by using development of neural network algorithm for making medical decision on chronic kidney disease. In this proposed work, a comparative study was performed using sampling algorithm. This study reveals that the performance of classification algorithms can be improved by using the sampling algorithms. It also reveals that the learning rate is a crucial parameter which significantly effect on multilayer perceptron. Sahil Sharma, Vinod Sharma, and Atul Sharma [9], has assessed 12 different classification algorithm on dataset which

having 400 records and 24 attributes. They had compared their calculated results with actual results for calculating the accuracy of prediction results. They used assessment metrics like accuracy, sensitivity, precision and specificity. They find that the decision tree technique gives accuracy up to 98.6%, sensitivity of 0.9720, and precision of 1 and specificity of 1.

References:

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