EARLY DETECTION OF CHRONIC KIDNEY DISEASE USING MACHINE LEARNING

LITERATURE REVIEW

The basic idea of this research is to devise a comprehensive methodology that analyzes and predicts Chronic Kidney Disease of humans with the help of human symptoms. There are many researchers who work on prediction of CKD with the help of many different classification algorithm. And those researchers get expected output of their model.

Prior Stage Kidney Disease Prediction Using AI & Supervised Machine Learning Techniques

Author: Barot mitishal et.al.,(2021)

This paper proposed a system that uses various data mining techniques like KNN, DT, NB, and SB classifiers. A confusion matrix helps us with this by describing the performance of the classifier. This paper deals with the prediction of CKD in people. A wrapper method used here. SBC is a meta-heuristic algorithm. Out of the 24 attributes present 12 best attributes are taken for prediction. Prediction is done using the machine learning technique, SBC. In this classification problem SBC classifies the output into two class with CKD and without CKD.

Comparison and development of machine learning tools in the prediction of chronic kidney disease progression

Author: Jing Xiao and Ruifeng Ding et.al (2019)

In this paper the clinical and blood biochemical results from 551 patients with proteinuria were collected. Thirteen blood-derived tests and 5 demographic features were used as non-urinary clinical variables to predict the 24-h urinary protein outcome response. Nine predictive models were established and compared, including logistic regression, Elastic Net, lasso regression, ridge regression, support vector machine, random forest, XGBoost, neural network and k-nearest neighbour. The AU-ROC, sensitivity (recall), specificity, accuracy, log-loss and precision of each of the models were evaluated. The effect sizes of each variable were analysed and ranked. The linear models including Elastic Net, lasso regression, ridge regression and logistic regression showed the highest overall predictive power, with an average AUC and a precision. Where the Logistic regression ranked first.

Comparative Analysis for prediction of kidney Diseases using Intelligent Machine Learning Models

Author: Gazi Mohammed Ifraz et.al(2021)

The proposed system utilizes the CKD prediction dataset. After preprocessing and feature selection, the DT, KNN, and logistic regression algorithms have been used. J. Hussain and the team have obtained an highest accuracy in predicting CKD in early stages using multilayer perception while including preprocessing of data set with neural networks to fill the missing values. The workflow includes discarding the outliers, selecting the optimal seven attributes with statistical analysis, and discarding the attributes which have a higher inter co-relation by principal component analysis (PCA).

Chronic Kidney Disease Prediction Using Machine Learning Methods:

Author: Imesh Udara Ekanayake(2020)

In this paper the features with more than 20% missing values were removed from the analysis. The KNN Imputer technique is utilized to fill in the missing values. In the model training, 11 categorization models were explored. They are KNN regression, logistic regression, SVC with a linear kernel, decision tree classifier, SVC with an RBF kernel, XGB classifier, random forest classifier, extra trees classifier, Gaussian NB, an AdaBoost classifier, and a conventional neural network. As a result of their research, six algorithms outperformed 11 algorithms in terms of training accuracy, cross-validation accuracy and testing accuracy. Random forest classifiers, Decision tree classifiers, XGB classifiers, AdaBoost classifiers, extra trees classifiers, and traditional neural network classifiers are among them.

Prediction of Chronic Kidney Disease Using Machine Learning Algorithm:

Author: Siddheshwar Tekale(2018)

In this paper they have studied different machine learning algorithms. They have analysed 14 different attributes related to CKD patients and predicted accuracy for different machine learning algorithms like Decision tree and Support Vector Machine. From the results analysis, it is observed that the decision tree algorithms gives the highest accuracy and SVM gives accuracy of comparatively lower then the decision tree.When considering the decision tree algorithm it builds the tree based on the entire dataset by using all the features of the dataset. The advantage of this system is that, the prediction process is less time-consuming It will help the doctors to start the treatments early for the CKD patients and also it will help to diagnose more patients within a less time period. Limitations of this study are the strength of the data is not higher because of the size of the data set and the missing attribute values.

Chronic Kidney Disease Prediction using Machine Learning

Author: Reshma S et.al(2017)

This paper deals with the prediction of CKD in people. A wrapper method used here for feature selection is ACO. ACO is a meta-heuristic optimization algorithm. Out of the 24 attributes present 12 best attributes are taken for prediction. Prediction is done using the machine learning technique, SVM. In this classification problem SVM classifies the output into two class with CKD and without CKD. The main objective of this study was to predict patients with CKD using less number attributes while maintaining a higher accuracy. Here we obtain an accuracy of about 96 percentage.

Predict Chronic Kidney Disease using Data Mining in Hadoop:

Author: Guneet Kaur

This paper proposed a system for predicting the CKD using Data Mining Algorithms in Hadoop. They use two data mining classifiers like KNN and SVM. Here the predictive analysis is performed based upon the manually selected data columns. SVM classifier gives the best accuracy than KNN in this system

Intelligent Diagnostic Prediction and Classification System for Chronic Kidney Disease

Author: Mohamed Elhoseny, K.Shankar & J.Uthayakumar

This paper has presented an intelligent prediction and classification system for healthcare, namely DFS with ACO algorithm called D-ACO algorithm is proposed for the classification of CKD dataset. The proposed D-ACO framework, however, jointly performs FS, ACO based learning and removes irrelevant features. Using a benchmark CKD dataset, the efficiency of the D-ACO algorithm is evaluated, and a comparison is also made with the existing methods. On comparing with the existing methods, the proposed D-ACO algorithm outperformed the other methods with improved classification performance in various aspects. In overall, the proposed D-ACO algorithm is found to be an appropriate classifier for the identification of the CKD.

COMPARATIVE ANALYSIS OF LITERATURE SURVEY:

S.No	Year	Researcher	Title	Algorithm	Remarks
01	2021	Barot mitisha1, prof. Barkha bhavsa	Prior Stage Kidney Disease Prediction Using AI & Supervised Machine Learning Techniques	KNN, DT, NB, and SB classifiers	Highest accuracy of 99% by using SBC Classifier
02	2019	Jing Xiao and Ruifeng Ding et.al	Comparison and development of machine learning tools in the prediction of chronic kidney disease progression	logistic regression, Elastic Net, lasso regression, ridge regression, support vector machine, random forest, XGBoost, neural network and k-nearest neighbor	The model with the highest sensitivity was Elastic Net (85%)
03	2021	Gazi Mohammed Ifraz et.al	Comparative Analysis for prediction of kidney Diseases using Intelligent Machine Learning Models	K-Nearest Neighbor, Logistic Regression, Decision Tree, Random Forest, Naïve Bayes, Support Vector Machine and Multi-Layer Perceptro Algorithm	Individual F1 scores are 95% for non -CKD and 97% for CKD
04	2020	Imesh Udara Ekanayake	Chronic Kidney Disease Prediction Using Machine Learning Methods	logistic regression, k-Nearest Neighbors (KNN) regression, SVC,Gaussian NB, decision tree classifier, random forest classifier, XGB classifier, extra trees classifier, an ada boost classifier and a classical neural network.	Highest accuracy of 96% by using Decision Tree Classifier, Random Forest Classifier
05	2018	Siddheshwar Tekale	Prediction of Chronic Kidney Disease Using Machine Learning Algorithm	Decision Tree, GFR, SVM, Machine Learning	Highest accuracy of 96.75% by using SVM
06	2017	Reshma S , et.al.,	Chronic Kidney Disease Prediction using Machine Learning	ACO, Support Vector Machine(SVM)	Highest accuracy of 96% by using SVM
07	2017	Guneet Kaur	Predict Chronic Kidney Disease using Data Mining in Hadoop	Data Mining Algorithms in Hadoop, KNN and SVM Naive Bayes, PCA, ICA	Naive Bayes show better output with 100% accuracy
08	2020	Mohamed Elhoseny,K et.al.,	Intelligent Diagnostic Prediction and Classification System for Chronic Kidney Disease	Density-based Feature Selection (DFS) with Ant Colony-based Optimization (D-ACO)	D-ACO shows the better output with 95.00 % accuracy