EARLY DETECTION OF CHRONIC KIDNEY DISEASE USING MACHINE LEARNING

Abstract:

Chronic Kidney disease (CKD) is one of the most critical health problems due to its increasing prevalence .We aim to test the ability of machine learning algorithms for the prediction of chronic kidney disease using the smallest subset of features. It is important to identify the early stage of CKD , so that necessary treatment can be provided to prevent or cure the disease. We use attributes of medical tests taken for different purposes that might contain useful information concerning kidney diseases to build the machine learning model that detects Chronic Kidney Disease. Several statistical tests have been done to remove redundant features such as the ANOVA test, the Pearson's correlation, and the Cramer's V test. CNN algorithm has been trained and tested for this project. We achieve an accuracy of 98.1% which can be game changing in the detection of Chronic Kidney Disease.

PAPER 1: Prediction of Chronic Kidney Disease Using Machine Learning Algorithm [Siddheshwar Tekale, Pranjal Shingavi, Sukanya Wandhekar, Ankit Chatorikar] International Journal of Advanced Research in Computer and Communication Engineering Vol. 7, Issue 10, October 2018.

In today's era everyone is trying to be conscious about health although due to workload and busy schedule one gives attention to the health when it shows any symptoms of some kind. But CKD is a disease which doesn't shows symptoms at all or in some cases it doesn't show any disease specific symptoms it is hard to predict, detect and prevent such a disease and this could be lead to permanently health damage, but machine learning can be hope in this problem it is best in prediction and analysis. By using data of CKD patients with 14 attributes and 400 record we are going to use various machine learning techniques like Decision Tree, SVM, etc. To build a model with maximum accuracy of predicting whether CKD or not and if yes then its Severity.

PAPER 2: Analysis and Prediction of Chronic Kidney Disease using Machine Learning Classification approaches [Abhimanyu Agarwala , Asfar Sharief,Faaiz Ahmed] ,Department of Computer science and Engineering CMR Indtitute of Technology,Bangalore-37.

Chronic Kidney Disease (CKD) is one of the deadliest diseases that slowly damages human kidney. The disease remains undetected in its early stage and the patients can only realize the severity of the disease when it gets advanced. Hence, detecting such disease at earlier stage is a key challenge now.

Machine Learning is one of the emerging field used in the health sectors for the diagnosis of different diseases. In this paper, we compute, analyze and compare between Machine Learning classification approaches to determine which classification approach is the optimal for the prediction of CKD. K-Nearest Neighbor Classifier, Decision Tree Classifier, GaussianNB, Logical Regression and Artificial Neural Network (ANN) are some renowned machine learning methods which were selected to train the model and based on these results, we can compare and determine which among the following Machine Learning Methods can predict the possibility of CKD at the most accurate level. From this comparative analysis, Logical Regression is found to be the best approach to predict CKD. Methods can predict the possibility of CKD at the most accurate level. From this comparative analysis, Logical Regression is found to be the best approach to predict CKD.

PAPER 3: Performance Analysis of Machine Learning Classifier for Predicting Chronic Kidney Disease [Ch.V.Ramana , J.Vinod Kumar ,N.Sravani, M.Virajitha , V.Vivek5]Pragati Engineering College September 2021| IJIRT | Volume 8 Issue 4 | ISSN: 2349-6002 IJIRT 152714.

Chronic Kidney Disease (CKD) is a type of chronic disease which means it happens slowly over a period of time and persists for a long time thereafter. It is deadly at its end stage and will only be cured by kidney replacement or regular dialysis which is an artificial filtering mechanism. It is important to identify CKD at the early stage so that necessary treatments can be provided to prevent or cure the disease. The main focus in this paper is on the

classification techniques, that is, tree-based decision tree, random forest, and logistic regression has been analyzed. Different measure has been used for comparison between algorithms for the dataset collected from standard UCI repository. That over a period of time and persists for a long time thereafter. It is deadly at its end stage and will only be cured by kidney replacement or regular dialysis which is an artificial filtering mechanism. It is important to identify CKD at the early stage so that necessary treatments can be provided to prevent or cure the disease.

PAPER 4: Development of a Graphical User Interface Software for The Prediction of Chronic Kidney Disease[S.C. Nwaneri1, H.C. Ugo] Nigerian Journal of Technology (NIJOTECH) Vol. 41, No. 1, January, 2022, pp.175 –183.

Chronic Kidney Disease (CKD) is a severe kidney damage that is difficult to diagnose at the early stages due to the absence of clear symptoms.. This study is designed to develop a user-friendly web-based graphical user interface (GUI) software for the prediction of CKD using artificial neural networks (ANNs). The model was developed using Python programming language and trained with 1200 instances of CKD datasets obtained from the University of California Irvine (UCI) machine learning repository. This dataset was split into 80% for training and 20% for testing achieved through an iterative process. A GUI software was developed based on the model using Django, an open-source python web development framework. The model achieved an accuracy of 95.83%, a precision of 100%, a specificity of 100%, and a sensitivity of 89.80%. The GUI software was effectively used to predict CKD and could be of immense benefit as a point of care application for early CKD prediction.