LITERATURE SURVEY

1. Comparative Study of Classifier for Chronic Kidney Disease prediction using Naive Bayes, KNN and Random Forest -Devika R, Sai Vaishnavi A Vila la, V. Subramaniyaswamy – [2019]

Chronic kidney disease (CKD), is also known as chronic nephritic sickness. It defines constrains which affects our kidneys and reduces our potential to stay healthy. It is the deadly disease. There will be various complication concerns like increased levels in your blood, anemia, weak bones, and nerve injury, etc. Detection and treatment should be done prior so it will keep chronic uropathy from obtaining a worse condition. Data processing is the term used for information discovery from big databases. The task of knowledge mining is to generate regular patterns from historical data and emphasize future conclusions, follows from the convergence of many recent trends: the decreased value of huge knowledge storage devices and therefore the tremendous ease of aggregation knowledge over networks, the development of robust and economical machine learning algorithms to method this data and therefore the decrease value of machine power, enabling use of computationally intensive strategies for knowledge analysis. Machine learning is an important task as it benefits many applications such as analyzing life outcomes, sleuthing fraud, sleuthing faux users etc. varied knowledge mining classification approaches and machine learning algorithms are applied for prediction of chronic diseases. Therefore, this paper examines the performance of Naive Bayes, K-Nearest Neighbor (KNN) and Random Forest classifier on the basis of its accuracy, preciseness and execution time for CKD prediction. Finally, the outcome after conducted research is that the performance of Random Forest classifier is finest than Naive Bayes and KNN.

2. Optimization of Prediction Method of Chronic Kidney Disease Using Machine Learning Algorithm - Pronab Ghosh, F.M. Javed Mehedi Shamrat, Shahana Shultana, Saima Afrin, Atqiya Abida Anjum, Aliza Ahmed Khan – [2020]

Chronic Kidney disease (CKD), a slow and late identified and diagnosed disease, is one of the most important problems of increasing the mortality rate in the medical sector nowadays. Based on this critical issue, a significant number of men and women are now suffering due to the lack of early screening systems and appropriate care and measures each year. However, patients' lives can be saved with the fast detection of disease in the earliest stage. In addition, the evaluation process of machine learning algorithm can detect the stage of this deadly disease much quicker with a reliable dataset. In this paper, the overall study has been implemented based on four reliable approaches, such as Support Vector Machine (SVM), AdaBoost (AB), Linear Discriminant Analysis (LDA), and Gradient Boosting (GB) to get highly accurate results of prediction. These algorithms are implemented on an online dataset of UCI machine learning repository. The highest predictable accuracy is obtained from Gradient Boosting (GB) Classifiers which is about to 99.80% accuracy. Different performance evaluation metrics have also been displayed to show appropriate outcomes.

3. Prediction of Chronic Kidney Disease Using Machine Learning Algorithm – Siddheshwar Tekale, Pranjal Shingavi, Sukanya Wandhekar, Ankit Chatorikar – [2018]

In this paper, Chronic Kidney disease 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 and to take preventive measures, 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 25 attributes and 400 record which gives the result of patient having CKD or not. They used various machine learning techniques like Naive bayes, KNN, Neural network, Decision Tree, support vector machine, etc. To build a model with maximum accuracy of predicting whether CKD or not and if yes then its Severity. Naive bayes used probability for predicting CKD, whereas decision tree is used to provide classified report for CKD, the neural network provides opportunities to minimize the error prediction of CKD. All these techniques are using old patient record for getting prediction about new patient.

4. Early Prediction of Chronic Kidney Disease Using Machine Learning Supported by Predictive Analytics – Ahmed J. Dhiya Al-Jumeily, Hussein M. Haglan, Mohamed Alloghani, Thar Baker, Abir J. Hussain, Jamila Mustafina – [2018]

In this paper, they examine the ability of several machine-learning methods for early prediction of Chronic Kidney Disease. This has been studied widely however, the methodology by the use of predictive analytics, in which we examine the relationship in between data parameters as well as with the target class attribute. Predictive analytics enables us to introduce the optimal subset of parameters to feed machine learning to build a set of predictive models. This study starts with 24 parameters in addition to the class attribute, and ends up by 30% of them as ideal sub set to predict chronic kidney disease. A total of 4 machine learning based classifiers have been evaluated within a supervised learning setting, achieving highest performance outcomes of AUC 0.995, sensitivity 0.9897, and specificity 1. The experimental procedure concludes that advances in machine learning, with assist of predictive analytics, represent a promising setting by which to recognize intelligent solutions to know the problem easily, which in turn prove the ability of predication in the kidney disease domain and beyond.

5. Chronic Kidney Disease Prediction using Machine Learning ModelsS.Revathy, B.Bharathi, P.Jeyanthi, M.Ramesh – [2019]

Data mining methods and machine learning play a major role in this aspect of biosciences. Chronic Kidney Disease is a condition in which the kidneys are damaged and cannot filter blood as they always do and leads to some major health problems . A family history of kidney diseases or failure, high blood pressure, type 2 diabetes may lead to CKD. This is a lasting damage to the kidney and chances of getting worser by time is high affecting the patient silently. The very common complications that results due to a kidney failure are heart diseases, anemia, bone diseases, high potasium and calcium. The worst case situation leads to complete kidney failure and necessitates kidney transplant to live. An early detection of CKD can improve the quality of life to a greater extent. This shows a wide range of machine learning algorithms employed for the prediction of CKD. This paper uses data preprocessing, data transformation and various classifiers to predict CKD and also proposes best Prediction framework for CKD. The results of the framework show promising results of better prediction at an early stage of CKD and can be cured earlier.

6. Predicting the Risk of Chronic Kidney Disease (CKD) Using Machine Learning Algorithm – Weilun Wang, Goutam Chakraborty, Basabi Chakraborty – [2020]

In this study, they used open-source data containing 1 million samples. These data contain 23 health-related features, including common diagnostic test results provided by National Health Insurance Sharing Service. A low GFR indicates possible chronic kidney disease. As is commonly accepted in the medical community, a GFR of 60 mL/min is used as the threshold, below which is considered to have CKD. In this study, the first step aims to build a regression model to predict the value of creatinine from 23 features, and then combine the predicted value of creatinine with the original 23 features to evaluate the risk of CKD. We will show by simulation that by the proposed method we can achieve better prediction results compared to direct prediction from 23 features. The data is extremely unbalanced for predicting the target variable creatinine. We used under sampling method and proposed a new cost-sensitive mean-squared error loss function to deal with the problem. Regrading model selection, this work used three machine learning models they are a bagging tree model named Random Forest, a boosting tree model named XG Boost, and a neural network-based model named Res Net. To improve the result of the creatinine predictor, they averaged results from eight predictors, a method known as ensemble learning. Finally, the predicted creatinine and the original 23 features is used to predict the risk of CKD.

7. Machine Learning Prediction Models for Chronic Kidney Disease Using National Health Insurance Claim Data in Taiwan – Surya Krishnamurthy, Kapelesh KS, Erik Dovgan, Mitija Lustrek, Barbara Gradisek Piletic, Karthiravan Srinivasan, Shabbir Syed-Abdul – [2021]

Chronic kidney disease (CKD) represents a worstcase on the healthcare system because of the increasing number of patients and death cases, high risk of progression to end-stage renal disease, and poor prognosis of morbidity and mortality. The aim of this study is to develop a machine-learning model that uses the comorbidity and medication data obtained from Taiwan's National Health Insurance Research Database to forecast the occurrence of CKD within the next 6 or 12 months before its onset, and hence its prevalence in the population. In this paper, A total of 18,000 people with CKD and 72,000 people without CKD diagnosis were selected using propensity score matching. Their demographic, medication and comorbidity data from their respective two-year observation period were used to build a predictive model. Among the approaches investigated, the Convolutional Neural Networks (CNN) model performed best with a test set AUROC of 0.957 and 0.954 for the 6-month and 12-month predictions, respectively. The most prominent predictors in the tree-based models were identified, including diabetes mellitus, age, weight, gout, and medications such as sulfonamides and angiotensin's. The model proposed in this study could be a useful tool for policy makers in predicting the trends of CKD in the population. The models can allow close monitoring of people at risk, early detection of CKD, better allocation of resources, and patient-centric management.