LITERATURE SURVEY

TOPIC : EARLY DETECTION OF CHRONIC KIDNEY DISEASE USING MACHINE LEARNING

Chronic Kidney Disease (CKD) is a major medical problem and can be cured if treated in the early stages. Usually, people are not aware that medical tests we take for different purposes could contain valuable information concerning kidney diseases. Consequently, attributes of various medical tests are investigated to distinguish which attributes may contain helpful information about the disease. The information says that it helps us to measure the severity of the problem and we make use of such information to build a machine learning model that predicts Chronic Kidney Disease.

Early detection of chronic kidney disease using machine learning

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Published in : Brac University, 2019

Chronic kidney disease (CKD) is a global prevalent ailment that causes lives in a predominant number. CKD is the 11th most deadly cause of global mortality with 1.2 million death each year and according to kidney Foundation of Bangladesh, around 40,000 CKD people experienced kidney failure annually as well as several thousand passed away in short stage of life because of CKD. Predictive analytics for healthcare using machine learning is a challenged task to help doctors decide the exact treatments for saving lives. Scientist researched collaboratively chronic kidney diseases, with the majority of their work on pure statistical models, generating numerous gaps in the development of machine-learning models. In this article we discussed the current methods and suggested improved technology based on the XGBoost (Extreme Gradient Boost), which combined significant characteristics of the F scores and evaluated four pre-processing scenarios. In addition, we provided machine training methods for anticipating chronic renal disease with clinical information. Four techniques of master teaching are explored including Support Vector Regressor (SVR), logistic Regressor (LR), AdaBoost, Gradient Boosting Tree and Decision Tree Regressor. The components are made from UCI dataset of chronic kidney disease and the results of these models are compared to determine the best regression model for the prediction. From this four preprocessing cases, replacing missing values with mean values of each column and choosing important features was most logical as it allows to train with more data without dropping. However, XGBoost gave the best outcomes in all four cases where it obtained 98% accuracy in case one where nulled valued are dropped, 98.75% testing accuracy for both case two and three where null values were replaced with minimum

and maximum values of each column and it scores 100% accuracy in case four where null values are replaced with mean values. Thus, the system can be implemented v for early stage CKD prediction in a cost efficient way which will be helpful for under developed and developing countries.

Detection and diagnosis of chronic kidney disease using deep learning-based heterogeneous modified artificial neural network

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Published in : Future Generation Computer Systems 111, 17-26, 2020

The prevalence of chronic kidney disease (CKD) increases annually in the present scenario of research. One of the sources for further therapy is the CKD prediction where the Machine learning techniques become more important in medical diagnosis due to their high accuracy classification ability. In the recent past, the accuracy of classification algorithms depends on the proper use of algorithms for feature selection to reduce the data size. In this paper, Heterogeneous Modified Artifical Neural Network (HMANN) has been proposed for the early detection, segmentation, and diagnosis of chronic renal failure on the Internet of Medical Things (IoMT) platform. Furthermore, the proposed HMANN is classified as a Support Vector Machine and Multilayer Perceptron (MLP) with a Backpropagation (BP) algorithm. The proposed algorithm works based on an ultrasound image which is denoted as a preprocessing step and the region of kidney interest is segmented in the ultrasound image. In kidney segmentation, the proposed HMANN method achieves high accuracy and significantly reducing the time to delineate the contour.

Detection of chronic kidney disease using machine learning algorithms with least number of predictors

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Published in : International Journal of Soft Computing and Its Applications 10 (8), 2019

Chronic kidney disease (CKD) is one of the most critical health problems due to its increasing prevalence. In this paper, we aim to test the ability of machine learning algorithms for the prediction of chronic kidney disease using the smallest subset of features. 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. Logistic regression,

support vector machines, random forest, and gradient boosting algorithms have been trained and tested using 10-fold cross-validation. We achieve an accuracy of 99.1 according to F1-measure from Gradient Boosting classifier. Also, we found that hemoglobin has higher importance for both random forest and Gradient boosting in detecting CKD. Finally, our results are among the highest compared to previous studies but with less number of features reached so far. Hence, we can detect CKD at only $26.65 by performing three simple tests.

Optimization of prediction method of chronic kidney disease using machine learning algorithm

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Chronic Kidney disease (CKD), a slow and late-diagnosed disease, is one of the most important problems of 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 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 (henceforth SVM), AdaBoost (henceforth AB), Linear Discriminant Analysis (henceforth LDA), and Gradient Boosting (henceforth 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. Later, different performance evaluation metrics have also been displayed to show appropriate outcomes. To end with, the most efficient and optimized algorithms for the proposed job can be selected depending on these benchmarks.

Predict chronic kidney disease using machine learning algorithms

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Published in : 2020 4th International Conference on Electronics, Communication and Aerospace Technology (ICECA), 1630-1635, 2020

A staggering 63,538 cases have been registered according to India's health statistics on Chronic Kidney Disease (CKD). The average age of nephropathy for humans lies between 48-70 years. CKD is more prevalent among males than females. Bitterly, India ranks among top 17 countries in CKD since 2015, which is characterized by a gradual loss of excretory organ performance over time. Earlier detection of the illness followed by treatment could keep this dreaded disease at the shore. Machine Learning, is making sensible applications in the areas such as analyzing medical science outcomes, sleuthing fraud etc. For the prediction of chronic diseases various machine learning algorithms are implemented.Our main aim is to differentiate the performance of various machine learning algorithms that are primarily based on its accuracy. This research work has idolized Rcode to compare their performance. The pivotal purpose of this study is to analyze the Chronic Kidney Disease dataset and conduct CKD and Non CKD classification cases.

Predictive analytics for chronic kidney disease using machine learning techniques

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Predictive analytics for healthcare using machine learning is a challenged task to help doctors decide the exact treatments for saving lives. In this paper, we present machine learning techniques for predicting the chronic kidney disease using clinical data. Four machine learning methods are explored including K-nearest neighbors (KNN), support vector machine (SVM), logistic regression (LR), and decision tree classifiers. These predictive models are constructed from chronic kidney disease dataset and the performance of these models are compared together in order to select the best classifier for predicting the chronic kidney disease.

The diagnosis and estimate of chronic kidney disease using the machine learning

methods

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Published in: International Journal of Intelligent Systems and Applications in Engineering 4 (Special Issue-1), 27-31, 2016

Chronic kidney disease is a prolonged disease that damages the kidneys and prevents the normal duties of the kidneys. This disease is diagnosed with an increase of urinary albumin excretion lasting more than three months or with significant reduction in a kidney functions. Chronic kidney disease can lead to complications such as high blood pressure, anemia, bone disease and cardiovascular disease. In this study we have been investigated to determine the factors that decisive for early detection of chronic kidney disease, launching early patients treatment processes, prevent complications resulting from the disease and predict of disease. The study aimed diagnosis and prediction of disease using the data set that composed of data of 250 patients with chronic kidney disease and 150 healthy people. First, the chronic kidney disease data was classified with machine learning algorithms and then training and test results were analysed. The estimation results of chronic kidney disease were compared with similar data and studies.