

LITERATURE SURVEY

TITLE: A Machine Learning Method with Filter-Based Feature Selection for Improved Prediction of Chronic Kidney Disease

AUTHOR: Sarah A. Ebiaredoh-Mienye

YEAR: 2022

CONTEXT:

The high prevalence of chronic kidney disease (CKD) is a significant public health concern globally. The condition has a high mortality rate, especially in developing countries. CKD often goes undetected since there are no obvious early-stage symptoms. Meanwhile, early detection and on-time clinical intervention are necessary to reduce the disease progression. Machine learning (ML) models can provide an efficient and cost-effective computer-aided diagnosis to assist clinicians in achieving early CKD detection. This research proposed an approach to effectively detect CKD by combining the information-gain-based feature selection technique and a cost-sensitive adaptive boosting (AdaBoost) classifier. An approach like this could save CKD screening time and cost since only a few clinical test attributes would be needed for the diagnosis. The proposed approach was benchmarked against recently proposed CKD prediction methods and well-known classifiers. Among these classifiers, the proposed cost-sensitive AdaBoost trained with the reduced feature set achieved the best classification performance with an accuracy, sensitivity, and specificity of 99.8%, 100%, and 99.8%, respectively. Additionally, the experimental results show that the feature selection positively impacted the performance of the various classifiers. The proposed approach has produced an effective predictive model for CKD diagnosis and could be applied to more imbalanced medical datasets for effective disease detection.

TITLE: A diagnostic prediction model for chronic kidney disease in internet of things platform

AUTHOR: Mehdi Hosseinzadeh, Jalil Koohpayehzadeh, Ahmed Omar Bali, Parvaneh Asghari

YEAR: 2020

CONTEXT:

Chronic Kidney Disease (CKD) is being typically observed as a health threatening issue, especially in developing countries, where receiving proper treatments are very expensive. Therefore, early prediction of CKD that protects the kidney and breaks the gradual progress of CKD has become an important issue for physicians and scientists. Internet of Things (IoT) as a useful paradigm in which, low cost body sensor and smart multimedia medical devices are applied to provide remote monitoring of kidney function, plays an important role, especially where the medical care centers are hardly available for most of people. To gain this objective, in this paper, a diagnostic prediction model for CKD and its severity is proposed that applies IoT multimedia data. Since the influencing features on CKD are enormous and also the volume of the IoT multimedia data is usually very huge, selecting different features based on physicians' clinical observations and experiences and also previous studies for CKD in different groups of multimedia datasets is carried out to assess the performance measures of CKD prediction and its level determination via different classification techniques. The experimental results reveal that the applied dataset with the proposed selected features produces 97% accuracy, 99% sensitivity and 95% specificity via applying decision tree (J48) classifier in comparison to Support Vector Machine (SVM), Multi-Layer Perception (MLP) and Naïve Bayes classifiers. Also, the proposed feature set can improve the execution time in comparison to other datasets with different features.

TITLE: A Machine Learning Model for Predicting of Chronic Kidney Disease Based Internet of Things and Cloud Computing in Smart Cities

AUTHOR: Ahmed Abdelaziz, Ahmed S. Salama, A. M. Riad & Alia N. Mahmoud

YEAR: 2019

CONTEXT:

Cloud computing and internet of things (IOT) plays an important role in health care services especially in the prediction of diseases in smart cities. IOT devices (digital sensors and etc.) can be used to send big data onto chronic kidney diseases (CKD) to store it in the cloud computing. Therefore, these big data are used to increase the accuracy of prediction of CKD on cloud environment. The prediction of dangerous diseases such as CKD based cloud-IOT is considered a big problem that facing the stakeholders of health cares in smart cities. This paper focuses on predicting of CKD as an example of health care services on cloud computing environment. Cloud computing is supported patients to predict of CKD anywhere and anytime in smart cities. For that, this paper proposes a hybrid intelligent model for predicting CKD based cloud-IOT by using two intelligent techniques, which are linear regression (LR) and neural network (NN). LR is used to determine critical factors that influence on CKD. NN is used to

predict of CKD. The results show that, the accuracy of hybrid intelligent model in predicting of CKD is 97.8%. In addition, a hybrid intelligent model is applied on windows azure as an example of a cloud computing environment to predict of CKD to support patients in smart cities.

TITLE: Design System For Early Detection And Prediction Of Chronic Kidney Disease Using Machine Learning Techniques

AUTHOR: Sreeji S, Balamurugan Balusamy

YEAR: 2022

CONTEXT:

The objective is to utilize the Machine Learning Schemes to evaluate the underlying forecast of extreme kidney sicknesses, otherwise called serious renal infections. In diabetic patients, and afterward to prescribe decision pecking orders to infer strong results with unsurprising accuracy by assessing their presentation in light of its prerequisites and awareness. Chronic renal disease is mostly caused by diabetes and high blood pressure. Researchers all around the globe utilise the glomerular filtration rate (GFR) and kidney damage indicators to define CKD as a disorder that leads to decreased the renal function over time. A person with chronic kidney disease (CKD) has an increased risk of dying young. The challenging effort in recognising the many disorders associated with CKD at an early stage so that the disease might be prevented. This study provides a unique Machine learning model for detecting and predicting CKD in its early stages. The goal of this study is to build a deep neural network and compare it to the performance of other modern machine learning approaches. In testing, the database's missing values were replaced with the average of the corresponding characteristics. After that, the ideal parameters of the neural network were determined by setting the parameters and executing several trials. Recursive Feature Elimination was used to pick out the most significant features (RFE). The RFE revealed critical characteristics such as haemoglobin, specific gravity, serum creatinine, red blood cell count, albumin, packed cell volume, and hypertension. For categorization purposes, a set of features was fed into machine learning models. The suggested deep neural model achieved 100 percent accuracy, beating out the other four classifiers SVM, KNN, Logistic regression, Random Forest, and Naive Bayes classifier. Nephrologists could find the proposed method beneficial in identifying CKD.

TITLE: A Comprehensive Analysis on Detecting Chronic Kidney Disease by Employing Machine Learning Algorithms

AUTHOR: Mirza Muntasir Nishat, Fahim Faisal

YEAR: 2021

CONTEXT:

Chronic Kidney Disease refers to the slow, progressive deterioration of kidney functions. However, the impairment is irreversible and imperceptible up until the disease reaches one of the later stages, demanding early detection and initiation of treatment in order to ensure a good prognosis and prolonged life. In this aspect, machine learning algorithms have proven to be promising, and points towards the future of disease diagnosis.