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S No	TITLE	Authors	Abstract	Drawbacks
1	Prediction of Chronic Kidney Disease Using Adaptive Hybridized Deep Convolutional Neural Network on the Internet of Medical Things Platform	Guozhen Chen, Chenguang Ding, Yang Li, Xiaojun Hu, Xiao Li, Li Ren, Xiaoming Ding, Puxun Tian, Wujun Xue	Chronic Kidney disease is a severe lifelong condition caused either by renal disease or by impaired functions of the kidneys. In the present area of research, Kidney cancer is one of the deadliest and crucial importance for the survival of the patients ' diagnosis and classification. Early diagnosis and proper therapy can stop or delay the development of this chronic disease into the final stage where dialysis or renal transplantation is the only way of saving the life of the patient. The development of automated tools to accurately identify subtypes of kidney cancer is, therefore, an urgent challenge in the recent past. In this paper, to examine the ability of various deep learning methods an Adaptive hybridized Deep Convolutional Neural Network (AHDCNN) has been proposed for the early detection of Kidney disease efficiently and effectively. Classification technology efficiency depends on the role of the data set. To enhance the accuracy of the classification system by reducing the feature dimension an algorithm model has been developed using CNN. These high-level properties help to build a supervised tissue classifier that discriminates between the two types of tissue. The experimental process on the Internet of medical things platform (IoMT) concludes, with the aid of predictive analytics, that advances in machine learning which provides a promising framework for the recognition of intelligent solutions to prove their predictive capability beyond the field of kidney disease.	It is very difficult to train the model for predictive analysis due to unavailability of big data sets.
2	A Comprehensive Unsupervised Framework	LINTA ANTONY, SAMI AZAM, (Member, IEEE), EVA	The incidence, prevalence, and progression of chronic kidney disease (CKD) conditions have evolved over time. In most countries, diabetics and hypertension are the main causes of CKDs. The global guidelines classify CKD as a condition that results in	This work aims to support the medical community in just detecting the existence of the disease but not in

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	for Chronic Kidney Disease Prediction	IGNATIOUS, RYANA QUADIR, ABHIJITH REDDY BEERAVOLU, MIRJAM JONKMAN, (Member, IEEE), FRISO DE BOER	decreased kidney function over time, as indicated by glomerular filtration rate (GFR) and markers of kidney damage. People with CKDs are likely to die at an early age. It is crucial for doctors to diagnose various conditions associated with CKD in an early stage because early detection may prevent or even reverse kidney damage. Early detection can provide better treatment and proper care to the patients. In many regional hospital/clinics, there is a shortage of nephrologists or general medical persons who diagnose the symptoms. This has resulted in patients waiting longer to get a diagnosis. Therefore, this research believes developing an intelligent system to classify a patient into classes of 'CKD' or 'Non-CKD' can help the doctors to deal with multiple patients and provide diagnosis faster. In time, organizations can implement the proposed machine learning framework in regional clinics that have lower medical expert retention, this can provide early diagnosis to patients in regional areas. Although, several researchers have tried to address the situation by developing intelligent systems using supervised machine learning methods, till date limited studies have used unsupervised machine learning algorithms. The primary aim of this research is to implement and compare the performance of various unsupervised algorithms and identify best possible combinations that can provide better accuracy and detection rate. This research has implemented five unsupervised algorithms, K-Means Clustering, DB-Scan, I-Forest, and Autoencoder. And integrating them with various feature selection methods. Integrating feature reduction methods with K-Means Clustering algorithm has achieved an overall accuracy of 99% in classifying the clinical data of CKD and Non-CKD.	identifying the stages of the disease.

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3	Clinically Applicable Machine Learning Approach to Identify Attributes of Chronic Kidney Disease (CKD) for Use in Low-Cost Diagnostic Screening	MD. RASHED-AL-MAHFUZ, ABEDUL HAQUE, AKM AZAD, SALEM A. ALYAMI, JULIAN M. W. QUINN, MOHAMMAD ALI MONI	Objective: Chronic kidney disease (CKD) is a major public health concern worldwide. High costs of late-stage diagnosis and insufficient testing facilities can contribute to high morbidity and mortality rates in CKD patients, particularly in less developed countries. Thus, early diagnosis aided by vital parameter analytics using affordable computer-aided diagnosis could not only reduce diagnosis costs but improve patient management and outcomes. Methods: In this study, we developed machine learning models using selective key pathological categories to identify clinical test attributes that will aid in accurate early diagnosis of CKD. Such an approach will save time and costs for diagnostic screening. We have also evaluated the performance of several classifiers with k-fold cross-validation on optimized datasets derived using these selected clinical test attributes. Results: Our results suggest that the optimized datasets with important attributes perform well in diagnosis of CKD using our proposed machine learning models. Furthermore, we evaluated clinical test attributes based on urine and blood tests along with clinical parameters that have low costs of acquisition. The predictive models with the optimized and pathologically categorized attributes set yielded high levels of CKD diagnosis accuracy with random forest (RF) classifier being the best performing. Conclusions: Our machine learning approach has yielded effective predictive analytics for CKD screening which can be developed as a resource to facilitate improved CKD screening for enhanced and timely treatment plans.	This proposed work was aimed at getting accurate prediction of the disease but requires clinical tests to be done for detecting kidney disease.

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4	Prediction of Chronic Kidney Disease - A Machine Learning Perspective	PANKAJ CHITTORA ,SANDEEP CHAURASIA,(Senior Member, IEEE), PRASUN CHAKRABARTI, (Senior Member, IEEE), GAURAV KUMAWAT ,TULIKA CHAKRABARTI, ZBIGNIEW LEONOWICZ, (Senior Member, IEEE), MICHAŁ JASIŃSKI, (Member, IEEE), ŁUKASZ JASIŃSKI, RADOMIR GONO, (Senior Member, IEEE), ELŻBIETA JASIŃSKA, VADIM BOLSHEV	Chronic Kidney Disease is one of the most critical illness and proper diagnosis is required. With the help of a machine learning classifier algorithms, the doctor can detect the disease on time. Chronic Kidney Disease dataset has been taken from the UCI repository. Seven classifier algorithms have been applied in this research such as artificial neural network, C5.0, Chi-square Automatic interaction detector, logistic regression, linear support vector machine with penalty L1 & with penalty L2 and random tree. The important feature selection technique was also applied to the dataset. For each classifier, the results have been computed based on (i) full features, (ii) correlation-based feature selection, (iii) Wrapper method feature selection, (iv) Least absolute shrinkage and selection operator regression, (v)synthetic minority over-sampling technique with least absolute shrinkage and selection operator regression selected features, (vi) synthetic minority over sampling technique with full features. From the results, it is marked that LSVM with penalty L2 is giving the highest accuracy of 98.86% in synthetic minority over-sampling technique with full features. Along with accuracy, precision, recall, F-measure, area under the curve and GINI coefficient have been computed and compared results of various algorithms have been shown in the graph. Least absolute shrinkage and selection operator regression selected features with synthetic minority over-sampling technique gave the best after synthetic minority over-sampling technique with full features. Linear support vector machine gave the highest accuracy of 98.46%. Along with machine learning models one deep neural network has been applied on the same dataset and it has been noted that deep neural network achieved the highest accuracy of 99.6%.	High accuracy was achieved when full feature set was used which makes it a costly approach rather than using selected important features.