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Chronic Kidney Disease Prediction using Deep Learning

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Abstract:

Chronic Kidney Disease (CDK) it is serious lifelong the condition caused either by Renal Disease or by Impaired functions of kidneys. In this area of research, Kidney cancer is one of the deadliest and crucial importance for the survival of the patients it diagnosis and classification. Early diagnosis and proper therapy can stop or delay the development of this chronic disease into the final stage where dialysis is the way for of saving the patient. The development of the automation tool to accurately identify subtypes of Kidney cancer therefore is urgent challenge in recent. In this paper examine the ability of the Deep Learning (DL) An Deep Convolutional Neural Network has been proposed for early detection of kidney disease effectively and efficiently. Classification technology efficiency depends on the dataset.So it is easy to train and test the our CNN model. To enhance the accuracy of the classification system by the properties help to build a supervised issue classifier that discriminates between two types of issue. The experimental process on the internet for medical things platform conclude with the aid of the predictive analytic, that advanced in the machine learning which provides a frameworks for recognition of intelligent solution to proven their prediction capability which is beyond the field of kidney disease.

Keywords **—Deep Learning(DL),Convolutional Neural Network(CNN), Feature Extraction, Prediction, CKD .**

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I. INTRODUCTION

A kidney disease also called as the kidney failure.

It describe the gradual loss of the kidney function. Our Kidney filters wastes and excess fluids from our blood, which will be excreted in your urine. When a Kidney Disease reaches an advanced stage it has dangerous level of fluids in body electrolytes and wastes can build up in your body. In the early stages of Kidney disease, you may have a few sign or symptoms. Kidney disease(KD) may it not be apart until your kidney function is significantly impaired. The treatment for Chronic Kidney Disease(CKD) on slowing the progression of the kidney damage, usually by controlling the underling cause. Kidney disease can be progress to end-stage kidney failure which is fatal without Artificial filtering (Dialysis) or a kidney transplantation to that patient.

II. LITERATURE SURVEY

[1]A Human beings have a various disease As Chronic Kidney Disease (CKD) progresses slowly, early detection and effectively treatment are only cure to reduce the mortality rate. Machine Learning (ML) techniques are gaining significance in medical diagnosis because of their classification ability with high accuracy rates The accuracy of classification algorithm to reduce the dimension of datasets. In this study, SVM classification algorithm was used to diagnose Chronic Kidney Disease. To diagnose the chronic kidney disease

two essential types of features selection method namely, wrapper and filter approaches were chosen to reduce the dimension of Chronic Kidney Disease dataset. In wrapper Approach, classifier subset evaluator with greedy stepwise search engine and wrapper subset evaluator with the BFS(Breath Frist Search) engine were used. In filter approach, correlational features selection subset with greedy stepwise search engine were used. The result shown that the support vector machine (SVM) classifier by using the filtered subset evaluator with the best first search engine feature selection method has higher accuracy rate (91.5%) in diagnosis of Chronic Kidney Disease compared to other selected methods.

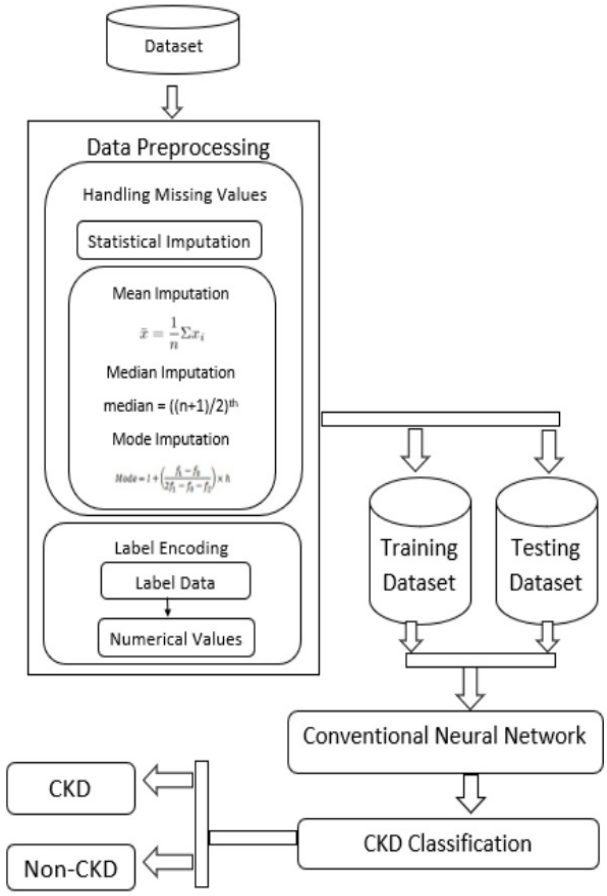
[2]Early detection and craterisation are considered to be critical factors in the management and control of Chronic Kidney Disease. Here in use of the efficient data mining techniques is shown to reveal and extract hidden information from clinical and laboratory patient data which can be helpful to assist physicians in maximizing accuracy for identification of disease severity stage. The results of applying Probabilistic Neural Networks(PNN), Multilayer Perceptron(MLP), Support Vector Machine(SVM) and Radial Basis Function (RBF) algorithms have been compared, and our findings shown that the PNN algorithm provides better classification and prediction performance for determining severity stage in CKD(Chronic Kidney Disease).

[3]The Chronic Kidney Disease (CKD) is a global health problem with high morbidity and morality rate,and it includes other disease. Since there are no obvious symptoms during the early stage of CKD, the patient often fail to notice the disease. Machine Learning (ML) model can effectively aid clinicians achieve this goal due to their fast and accurate recognition performance. In this study, he prepose a machine learning methodology for diagnosing CKD. KNN was used to fill in the missing values, which selects several complete samples with the most similar measurement to process the missing data for each incomplete sample. Missing values are usually seen in real-life medical situation because patient may miss some measurements for various reasons. After effectively filling other incomplete dataset. Six machine learning algorithm (Logistic Regression, Random Forest, Support Vector Machine(SVM), K-Nearest Neighbour, naive Bayes classifier and feed forward neural network) were to established models. Among these machine learning models, random forest achieved best performance with 95.7% diagnosis accuracy.

OBJECTIVE

The main objective of this report is to understand the Kidney Cancer in details. The primary aim of this research is to implement and compare performance of unsupervised algorithm and identify the best possible combination that can provides the best accuracy results and detection rate. Increasing the knowledge of the public on the benefits of early detection, changing attitudes and behaviours to see earl detection services, and raising awareness around kidney cancer and cancer prevention in general.

III. ARCHITECTURE



ATTRIBUTES

These are the following 25 attributes in the dataset.

Sr.no	Attribute	Description
1	Age	Age (in years)
2	Bp	Blood pressure(in mm/HG)
3	Sg	Specific gravity
4	Al	Albumin ranges from 0-5
5	Su	Sugar range from 0-5
6	Rbc	Red blood cell two values Normal or Abnormal
7	Pc	Pus cell two values Normal or Abnormal
8	Pcc	Pus cell clump two values Present or Not present
9	Ba	Bacteria two value Present or Not Present
10	Bgr	Blood glucose random in mg/dl
11	Bu	Blood urea in mg/dl
12	Sc	Serum creatine
13	Sod	Sodium
14	Pot	Potassium
15	Hemo	Hemoglobin
16	Pcv	Packet cell volume % of red blood cell in circulating blood
17	Wc	White Blood cells counts
18	Rc	Red Blood cells counts
19	Htn	Hypertension two values Yes or No
20	Dm	Diabetes mellitus two values Yes or No
21	Cad	Coronary artery disease two values Yes or No
22	Appet	Appetite two value good and poor
23	Pe	Pedal edema two values Yes or No
24	Ane	Anemia two values Yes and No
25	Class	Target Variable(CKD or Not)

STEP 1- PRE-PROCESSING

Take an sample dataset of the CKD patient training data pre-processing could be strategy that is utilized to change over the raw information into a clean dataset. It is a the basic step to train every machine learning(ML) Classifier algorithm. This technique concludes such action as handle missing values, rescaling of the dataset. When the dataset included attributes with varying transformation has been applied to convert the values into 0 and 1. All values of the every attribute are considered as 1 for above threshold value and as 0 for below the threshold. Standardized method ensures that each attribute has mean 0 and standard deviation 1.

STEP 2- FEATRUE EXTRACTION

Take an Attribute of CKD training dataset first, then perform the Pre-Processing operation. It is not always possible to obtain clear or formatted Patient

pre-processing. Using Deep Learning(DL) & while performing this operation with this data, it must be cleaned and formatted. Various operations, such as duplicate, Null values, and noise filtering are carry out in Pre-processing.

STEP 3-RESULT GENRATION

Input layer is the first layer in the CNN. A feature map is created in this layer by detecting different patterns in the input Attributes. Using thatAttribute, the result is generated, and the result is displayed as CKD present or Not.

IV. EXPECTED RESULT

It can be conclude from the results that the proposed system can be effectively used by the patients or user to check the health of itself or the family and physicians diagnose the disease more accurately. This tool is more useful for the rural areas where the experts in the medical filed may not be available. The accuracy level of Deep Learning algorithm we have used in our project is good as we want after this we can say that we have learn a lots of things from this research. We can deal our trained dataset. We can pre-processing step for the our dataset raw data applied to Deep Learning(DL) Algorithm Hope it will be vary useful to the future researchers to do such kind of research on Kidney Disease(KD).

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