EARLY DETECTION OF CHRONIC KIDNEY DISEASE USING MACHINE LEARNING

TOPIC: LITERATURE SURVEY | TEAM ID: PNT2022TMID35483

INTRODUCTION:

There are many people in the world who gets affected to kidney related diseases. Our country India ranks first in terms of people getting affected by kidney related disease. Though population plays a major factor in it, the fact that China which has higher population than us is ranking in a much lower place than us in the term of people getting affected by kidney related disease. Generally, the kidney diseases are caused by the abnormal physiological functionalities of human kidney. Therefore, the characteristic symptoms are generated based on the differentiation between normal physiological functionalities and abnormal physiological functionalities of the kidney. The difference in the functionality of kidney is mainly due to the lifestyle and the food preference people have in their life. So, the reason we were doing this project is to find the symptoms of kidney related diseases for the users and alert them before the disease becomes fatal for the patient. The main motive of this project is to find the symptom and its cure as soon as possible.

LITERATURE SURVEY:

S. NO	LITERATURE PAPER	AUTHOR	PROPOSED METHOD	ACCURACY	YEAR
1	Computer-Aided Diagnosis of Chronic Kidney Disease in Developing Countries: A Comparative Analysis of Machine Learning Techniques	Andressa C. M. Da S. Queiroz, Alvaro Sobrinho, Leandro Dias Da Silva, Evandro De Barros Costa, Maria Eliete Pinheiro, Angelo Perkusich	J48 decision tree is a suitable machine learning technique for such screening in developing countries, due to the easy interpretation of its classification results	95.00%	2020
2	Performance-Based Prediction of Chronic Kidney Disease	Alloghani, M., Al-Jumeily, D., Hussain, A., Liatsis, P., Aljaaf, A.J.	Using Machine Learning for High-Risk Cardiovascular Disease Patients	93%	2020

3	Chronic kidney diseases	S.Ramya, Dr. N.Radha	Random Forest, Back Propagation, Radial Basis Function	Random Forest 78.60% Back Propagation 80.40% Radial Basis Function 85.30%	2020
4	Chronic Kidney Disease Prediction using Machine Learning Models	S.Revathy, B.Bharathi, P.Jeyanthi, M.Ramesh	Decision tree, Random Forest and Support Vector Machine learning models are constructed to carry out the diagnosis of CKD	99.16%	2019
5	Neural network and support vector machine for the prediction of chronic kidney disease: A comparative study	Njoud Abdullah Almansour,Hajra FahimSyed,Nuha Radwan Khayat,Rawan KanaanAltheeb,Rena d Emad Juri,Jamal Alhiyafi,Saleh Alrashed,Sunday O.Olatunji	Comparative analysis was carried out on the two models-ANN and SVM	ANN - 99.75% SVM - 97.75%	2019
6	A Comprehensive Unsupervised Framework for Chronic Kidney Dis- ease Prediction;	de Almeida et al.	Applied Decision tree, Random Forest, Sup- port Vector Machine (SVM) and also used SVM with linear, polynomial, sigmoid and RBF functions.	Random Forest – 80% Decision tree – 87%	2019
7	Early detection of chronic kidney disease	Abrar, Tahmid, Samiha Tasnim, and Md Hossain	Using machine learning in Diss. Brac University	Not mentioned in their paper	2019

8	Preemptive Diagnosis of Chronic Kidney Disease Using Machine Learning Techniques	Reem A. Alassaf, Khawla A. Alsulaim, Noura Y. Alroomi, Nouf S. Alsharif, Mishael F. Aljubeir, Sunday O. Olatunji, Alaa Y. Alahmadi, Mohammed Imran, Rahma A. Alzahrani, Nora S. Alturayeif	ANN, SVM, Naïve Bayes along with k-NN comparison approach	ANN,SVM,Naïve Bayes - 98% k-NN - 93.9%	2018
9	Kidney Failure	K. R. Lakshmi, Y. Nagesh and M. VeeraKrishna	ANN, Decision Tree, Logistic Regression	ANN 93.50% Decision Tree 78.44% Logistic Regression 74.74%	2018
10	Analysis of Chronic Kidney Disease Dataset by Applying Machine Learning Methods	Yedilkhan Amirgaliyev; Shahriar Shamiluulu; Azamat Serek	12th International Conference on Application of Information and Communication Technologies (AICT)	93.16%	2018
11	Prediction of Chronic Kidney Disease Using Machine Learning Algorithm	Siddheshwar Tekale,Pranjal Shingavi,Sukanya Wandhekar,Ankit Chatorikar	Decision tree algorithms along comparison with SVM	Decision tree – 91.75% SVM-96.75%	2018
12	Chronic kidney diseases	Parul Sinha & Poonam Sinha	K-Nearest Neighbour, SVM	K-Nearest Neighbor 78.75% SVM 73.75%	2017
13	The epidemiology of chronic kidney disease	Stanifer, J. W. et al	a systematic review and meta-analysis	Not mentioned in their paper	2014

CONCLUSION:

This study is done to provide insight into the diagnosis of CKD patients to tackle their condition and receive treatment in the early stages of the disease.

In our project,

We are planning to take a dataset from Google and clean the data set. During cleaning we are planning to read the dataset, segregate numerical and categorical columns, handle the missing values by replacing the missing values using mean and mode statistical measures. Perform label encoding. Split the dataset into dependent and independent variable. Then split the dataset into training and testing set. Further build the Logistic regression model, test and evaluate the model. Subsequently create HTML files, build python code and run the app.

This deployment done in local system is planned to be deployed into IBM cloud environment also.

Based on the statistical review concluded, it is evident that early detection can not only result in lower mortality rate but better overall health outcomes and lower cost of treatment at the same time. Determining health behavior motivators across at-risk populations should be the first step in order to determine the barriers of prevention and early detection of CKD, however, the knowledge of health care staff treating related illnesses should also be reviewed.

Staff, community and health care-based education plans can create long-term positive results, reducing the number of serious, advanced cases, the utilization of health care resources, while improving the overall health outcome of the affected population. While the low detection and high morbidity rate has been already identified by researchers as the main problem in CKD care, the utilization of the explanatory theory is needed to understand why patients seek help late and why health care professionals fail to identify the condition at an early stage. The author of the current study believes that by understanding patient behaviors and health beliefs, CKD care, prevention and treatment options can be improved and the number of new cases can be reduced.

The researchers have also concluded that early detection, screening and stage 1-2 intervention, alongside with targeted education of at-risk populations to change health-related behaviors and high-risk lifestyles is the most effective approach to develop an intervention framework.