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"Prediction Of Chronic Kidney Disease"

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2022-2023

PROBLEM STATEMENT

Prediction of Chronic Kidney Disease using machine learning.
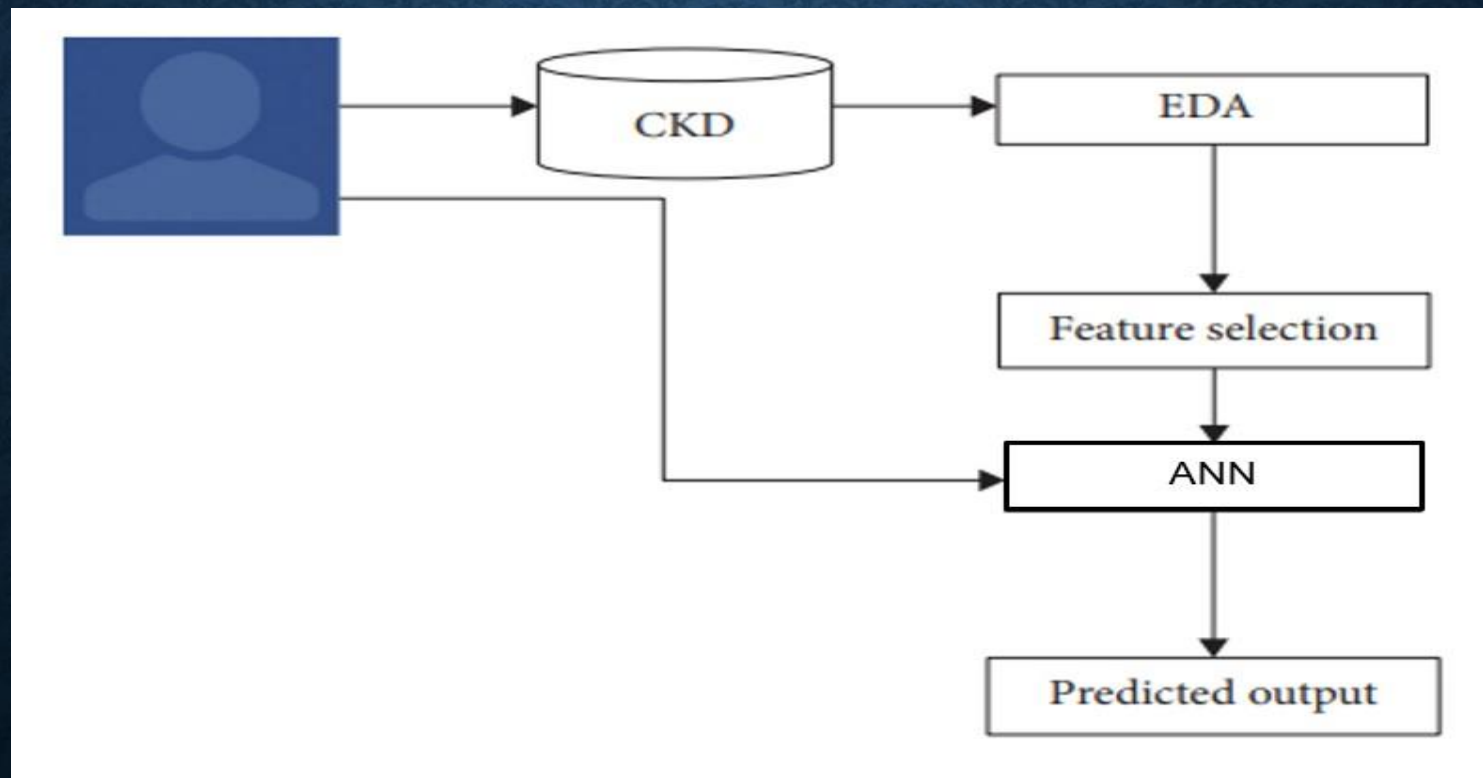
INTRODUCTION

Chronic kidney disease (CKD) is a significant public health concern worldwide, and predicting its long-term progression is essential for effective management and prevention of complications. Various ML models and deep learning algorithms have been used to predict the long-term progression of CKD. These models use different features such as demographic data, clinical and laboratory measurements, and genetic information to predict the risk of progression to end-stage renal disease (ESRD). Several studies have reported high accuracy levels of up to 95% in predicting the long-term progression of CKD using ML models. ML models have also been used to identify the most critical features for CKD progression, such as baseline estimated glomerular filtration rate (eGFR), proteinuria, blood pressure, and age. Moreover, ML models have been used to develop personalized prediction models for CKD progression, taking into account individual risk factors and comorbidities. These personalized models have shown improved accuracy compared to traditional risk prediction models.

AIMS & OBJECTIVES

- The goal is to deliver an accurate and effective treatment to CKD patients at a reduced cost.

- The death rate can be minimized due to early-stage diagnosis and patients can be treated timely.

- we are focusing on machine learning prediction models for chronic kidney disease and giving importance to accuracy.

METHODOLOGY

1. We are focusing on machine learning prediction models for chronic kidney disease.

2. we used Artificial neural network(ANN).

3. We selected some attributes that we are going to use in dataset of our model through which the model can predict our result such as, age, blood pressure, sugar level, hemoglobin, etc.

4. We used classification approach for this model.

HOW CLASSIFICATION WORKS ?

1. Classification is a supervised learning task, It involves building a model that can learn patterns and relationships from a given dataset to make predictions on new, unseen instances.

2. In classification approach, we have available output for the given input.

3. Eg. Use to predict whether it is a laptop, mobile, tablet, tv, etc.

STEPS INVOLVE IN CLASSIFICATION APPROACH

1. Data Collection

2. Data pre-processing

3. Feature Selection

4. Model Training

5. Model Evaluation

6. Prediction

ANN ALGORITHM

- ANN refers to a network of interconnected artificial neurons that can learn and make predictions from input data.

- Each neuron takes multiple input signals, applies weights to them, performs a mathematical operation on the weighted sum, and produces an output signal.

- During the training process, an ANN learns to adjust the weights assigned to each connection between neurons to minimize the difference between predicted outputs and the expected outputs.

WHY ANN ?

- ANNs are commonly used for predicting chronic kidney disease (CKD) using machine learning due to their ability to learn complex patterns and relationships from diverse and high-dimensional medical data.

- Here are some reasons why ANN is suitable for CKD prediction:
  i. **Non-linearity**
  ii. **Feature Learning**
  iii. **Handling Missing Data**
  iv. **Large dataset handling**

RESULTS AND DISCUSSION

a) Make the results easy to understand by using visuals like graphs and tables.

b) Explain the predictions in simple terms, focusing on the risk of developing CKD and its impact on the patient's health.

c) Encourage collaboration between healthcare providers and data scientists to ensure the model's accuracy and relevance.

d) Provide clear recommendations for actions or interventions based on the predictions

LITERATURE

Abeer Y. Al-Hyari proposed in their research by using Artificial Neural Network (NN), Decision Tree (DT) and Naive Bayes (NB) to predict chronic kidney disease. The proposed ANN algorithm as well as the other data mining algorithms demonstrated high potential in successful kidney disease.

FUTURE SCOPE

This study used a machine-learning algorithm, feature selection methods to select the best subset features to develop the models. It is better to see the difference in performance results using unsupervised or deep learning algorithms models. The proposed model supports the experts to give the fast decision, it is better to make it a mobile-based system that enables the experts to follow the status of the patients and help the patients to use the system to know their status.

CONCLUSION

CKD models using machine learning offer promising advancements in the diagnosis, prediction, and management of Chronic Kidney Disease. These models have the potential to improve early detection, personalize treatment plans, and enhance overall patient care. Ongoing research and collaboration between medical professionals and data scientists will further enhance the effectiveness of these models, ultimately improving outcomes for Individuals with CKD.

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THANK YOU