

Project Design Phase-I

System Architecture

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| Date | 15 October 2022 |
| Team ID | PNT2022TMID47257 |
| Project Name | Project – Early Detection of Chronic Kidney Disease Using Machine Learning |
| Maximum Marks | 4 Marks |

System Architecture:

Example - System Architecture Diagram:

Models of Machine Learning :

To predict chronic kidney disease, this study employs Decision Tree Classifiers, Random Forest Classifiers, Support Vector Machines, and Artificial Neural Networks. Among these algorithms, we attempt to construct our prediction model, and we choose the best performance by assessing their accuracy.

Support Vector Machine (SVM):

This is the most well-known and useful supervised machine-learning method, which works on classification and regression issues but is most used for classification. To segregate labelled data, SVM employed a kernel function. One of the benefits of employing kernels in SVM is that SVM applies kernel dentitions to non-vector inputs, and kernels may be built using a variety of data types.

The Decision Tree:

The decision tree algorithm is a supervised machine learning technique that can handle both classification and regression issues, however it is most employed to tackle classification problems. The Decision Tree approach solves the classification issue by turning the dataset into a tree representation through feature value sorting. Every node in a decision tree represents a feature of an instance to be categorized, and every leaf node represents a class label to which the instance belongs.

Random Forest:

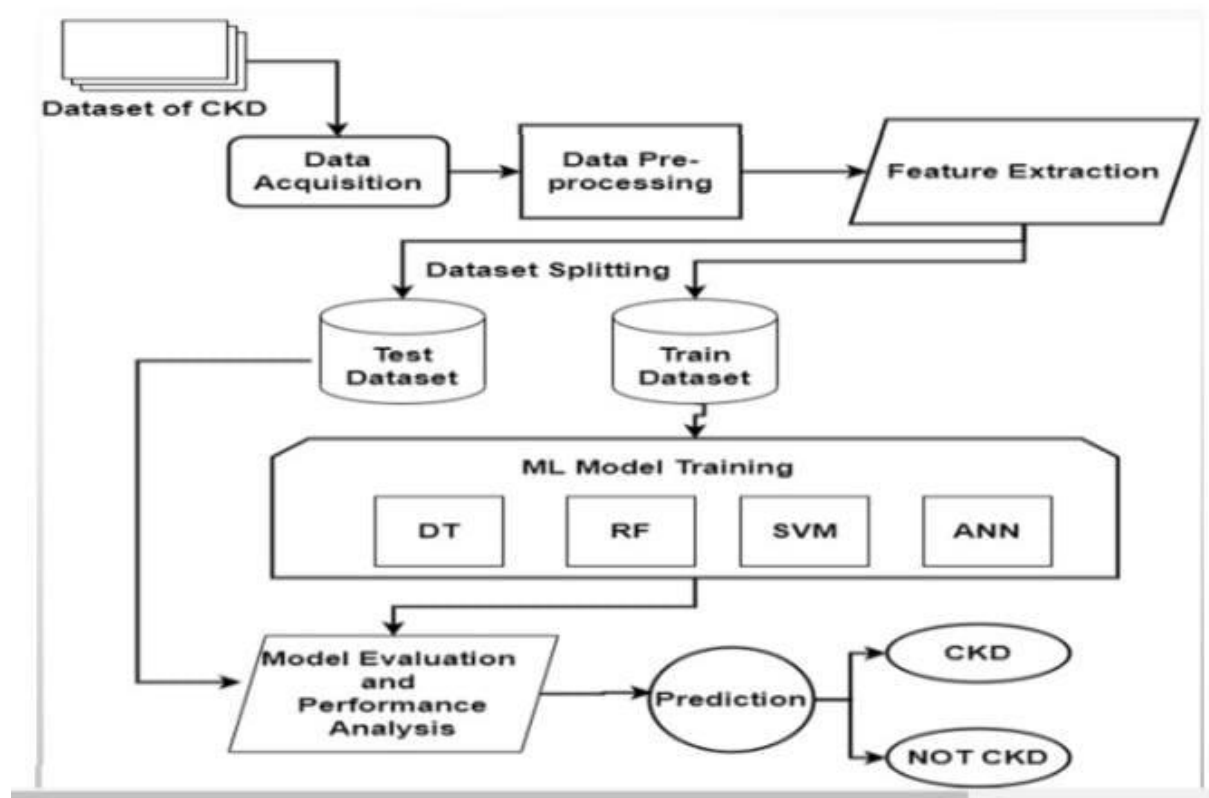
The random forest technique is a simple and adaptable supervised machine learning approach that uses diverse collections of decision trees to solve classification and regression problems. This model consists of numerous decision trees and outputs the class target that is the target with the highest selection outcomes from each tree.

Neural Network Artificial :

Artificial Neural Networks, or ANN, are essentially computational models. These computations Models are composed of a sophisticated network of fundamental components or nodes known as neurons. The nodes are connected to one another. Each node-to-node link has a weight associated with it. A neural

network's fundamental structure consists of three layers. The first layer is referred to as the input layer, the intermediate layer as the concealed layer, and the last layer as the output layer. All three layers of a neural network will almost certainly include one or more nodes. A

Figure 1: Architecture of proposed system



Reference: G. Chen et al., "Prediction of Chronic Kidney Disease Using Adaptive Hybridized Deep Convolutional Neural Network on the Internet of Medical Things Platform," IEEE Access, vol. 8, pp. 100497–100508, 2020, doi: 10.1109/ACCESS.2020.2995310.