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THE PARKINSON'S DISEASE DETECTION USING MACHINE LEARNING TECHNIQUES

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ABSTRACT: The Parkinson's disease is progressive neuro degenerative disorder that affects a lot only people significantly affecting their quality of life. It mostly affect the motor functions of human. The main motor symptoms are called "parkinsonism" or "parkinsonian syndrome". The symptoms of Parkinson's disease will occur slowly, the symptoms include shaking, rigidity, slowness of movement and difficulty with walking, Thinking and behavior change, Depression and anxiety are also common. There is a model for detecting Parkinson's using voice. The deflections in the voice will confirm the symptoms of Parkinson's disease. This project showed 73.8% efficiency. In our model, a huge amount of data is collected from the normal person and also previously affected person by Parkinson's disease. these data is trained using machine learning algorithms. From the whole data 60% is used for training and 40% is used for testing. The data of any person can be entered in db to check whether the person is affected by Parkinsons disease or not. There are 24 columns in the data set each column will indicate the symptom values of a patient except the status column. The status column has 0's and I's.those values will decide the person is effected with Parkinsons disease. I's indicate person is effected, 0's indicate normal conditions.

Key Words: Parkinson's disease; machine learning (ML), XGBoost, Decision tree.

I. INTRODUCTION:

Parkinson's disease is•a disorder of the central nervous system affecting movement and inducing tremors and stiffness a neurodegenerative disorder affecting dopamine neurons in brain. Parkinson's disease is difficult to diagnose. Common diagnostic criteria require the medication before. In this model, the huge data is collected from previously affected person and then by using machine learning algorithm will process the user input data with previous data to check he/she affected.

II. LITERATURE REVIEW:

Glenda-M.halliday,Nichola,"Parkinson's progression prediction using ml and serum cytokines". 25-July-2019. The serum samples from a clinic are tested to find Parkinson's disease and the same samples are tested using ML algorithm to detect Parkinson's disease.Blauwendraat, C., Bandres-Ciga, S. & Singleton, A. B.Predicting the progression in patients with Parkinson's disease using their voice. Lancet Neurol.2017.•Voice change is also a symptom of Parkinson's disease by applying ML algorithm. Das R. "A comparison of multi-classification methods for diagnosis of Parkinson's disease". Expert Systems With Applications"; 37:1568-1572 2010.•For methods used for testing Parkinson's disease they are ML ,DM neural, regression, decision tree in those ML show high performance.

III.OBJECTIVES

Aim of the Project:

The main aim is to test the ability of motor function of the patient with Parkinson's disease.

Scope of the Project:

The scope of this project is to show the high accuracy of detecting Parkinson's disease in early stage.

IV.DESIGN AND METHODOLOGIES:

MODULE 1:

- Data Collection

MODULE 2:

- Training and testing of data.

MODULE 3:

- Apply XGBoost algorithm.

MODULE 4:

- Cod completion.

V.IMPLEMENTATION:

•ARCHITECTURE DIAGRAM

•DATA-FLOW-DIAGRAM
•ER-DIAGRAM

•SEQUENCE DIAGRAM

ARCHITECTURE DIAGRAM:

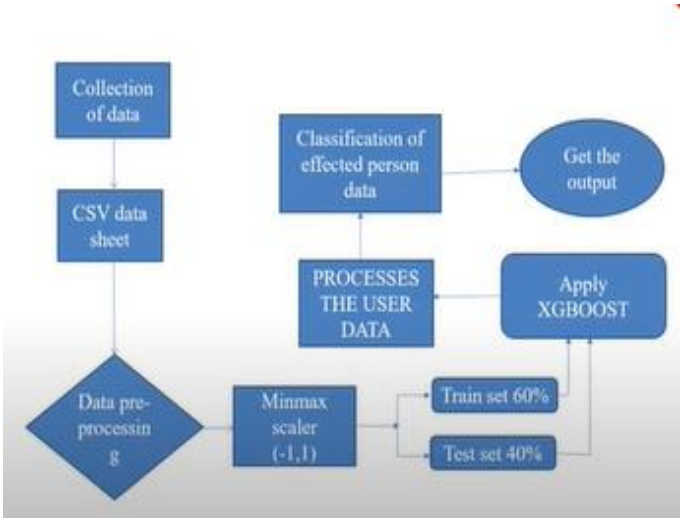

Fig.1 Architecture Diagram

DATA FLOW DIAGRAM:

Fig.2. Data Flow Diagram

ER DIAGRAM:

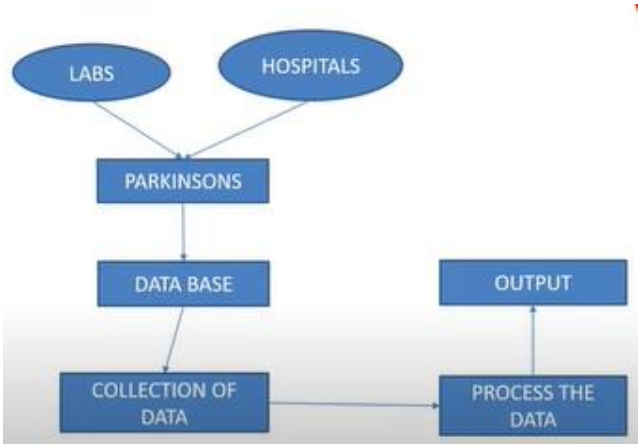

Fig.3 .ER Diagram

SEQUENCE DIAGRAM:

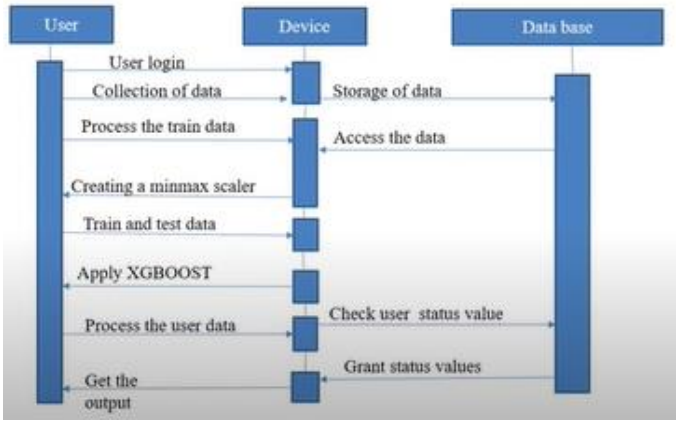

Fig.4.Sequence Diagram

VI.TESTING:

•UNIT TESTING

•INTEGRAION TESTING

•FUNCTIONAL TESTING.

UNIT TESTING:

It is the level of software testing where individual units and the components are tested. In the proposed project the data of an individual person is taken and tested. The accuracy is high 100% when tested with a single person data.

INTEGRATION TESTING

It may be level of software testing where individual units are combined and it tested as a gaggle. In the proposed project all the data is combined and tested. The accuracy level is 94.87%. This testing will test whole project at a time.It reduces the time complexity in integration testing.

• FUNCTIONAL TESTING:

Functional testing may be a sort of software testing that validates the software against the functional requirements/specifications. This testing is detecting Parkinson's will based on machine learning algorithm.ML algorithm will boost up the speed.

Typically, functional testing involves the following steps:

• Identifying the functions of that the software is expected to perform.

•Create input-data based on the function's specifications.

•It Determines the output based up on the function's specifications.

•Execute the test case.

•Compare the actual and expected outputs.

VII. INPUT AND OUTPUT:

SCREENSHOTS:

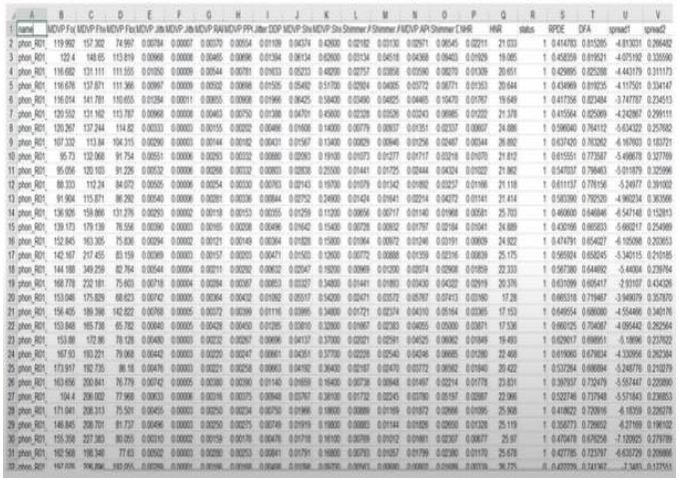

Fig.5 . Data set

Fig.6.Checking Missing values

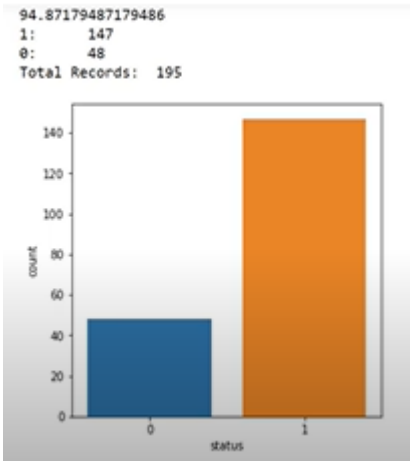

Fig.7. Graph

Here fig.7 represents the features and labels .where features are input of our data and labels are like output of our data .after apply features and labels we get 147 1's it represents the person is affected with Parkinson's disease and 48 0's it represents that the person is not not affected with Parkinson's disease

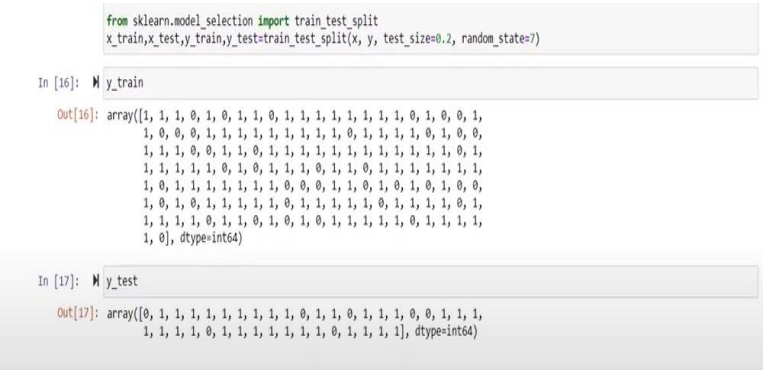

Fig.8. Training and testing data set

XGBoost:

XGBoost is an algorithm. That has recently been dominating applied gadget learning. XGBoost set of rules is an implementation of gradient boosted choice timber. That changed into the design for pace and overall performance.

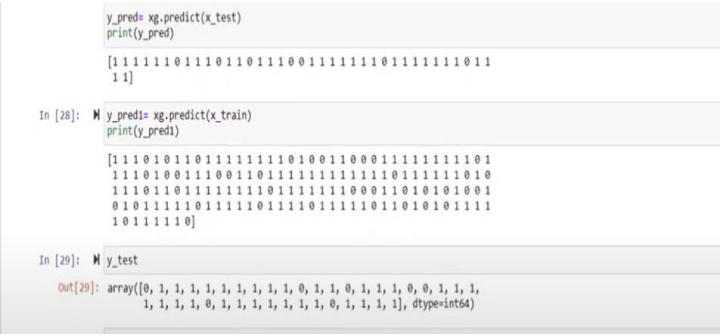

Fig.9. Predicting data values using XGB classifier

```
from sklearn.metrics import confusion_matrix
xg_cm_test=confusion_matrix(y_test,y_pred)
print(xg_cm_test)
xg_cm_train=confusion_matrix(y_train,y_pred1)
print(xg_cm_train)
```

```
[[ 6  1]
 [ 1 31]]
[[ 41   0]
 [  0 115]]
```

Fig.10.confusion matrix

Fig.10 confusion matrix is a table it predicts the correct predicted values and wrong predicted values. Here 6, 31 are correct predicted values and 1,1 are wrong predicted values

```
from sklearn.metrics import accuracy_score
accuracy = accuracy_score(y_test,y_pred)
print(accuracy)
```

```
0.9487179487179487
```

Fig.11. Accuracy by using XGBoost

Decision Tree Classifier:

It is a machine learning algorithm where the data is continuously split according to certain parameters. The two main functions are nodes and leaves as same we have imported .

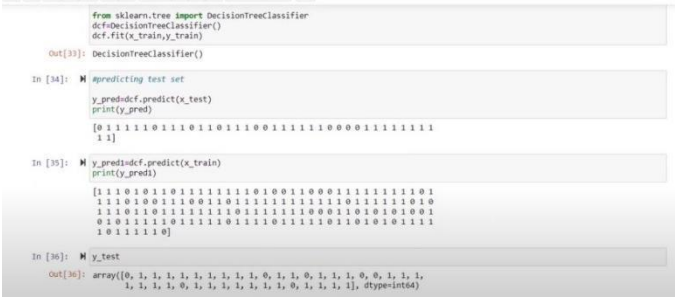

Fig.12. Predicting data set

Fig.12 represents the predicting the data set using Decision tree classifier.

```
from sklearn.metrics import confusion_matrix
dcf_cm_test=confusion_matrix(y_test,y_pred)
print(dcf_cm_test)
dcf_cm_train=confusion_matrix(y_train,y_pred1)
print(dcf_cm_train)
```

```
[[ 6  1]
 [ 4 28]]
[[ 41   0]
 [  0 115]]
```

Fig.13. Confusion matrix of the model

```
from sklearn.metrics import accuracy_score
accuracy = accuracy_score(y_test,y_pred)
print(accuracy)
```

```
0.8717948717948718
```

Fig.14.Accuracy of model using Decision tree

Navie Bayes:

It is a machine learning algorithm which based on Bayes theorem used for solving classification problems and making predictions .There are three types of models here we used Gaussian for prediction.so this also imported from sklearn library.

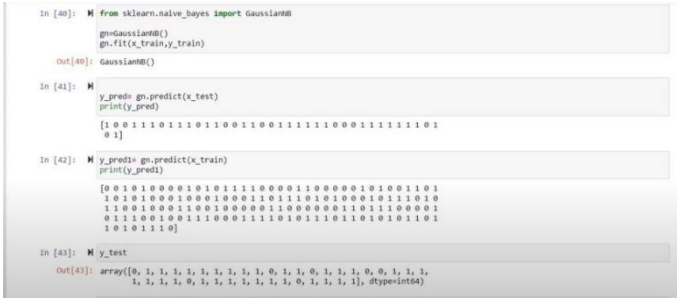

Fig.15.Predicting data sset by using navie Bayes

```
from sklearn.metrics import confusion_matrix
gn_cm_test=confusion_matrix(y_test,y_pred)
print(gn_cm_test)
gn_cm_train=confusion_matrix(y_train,y_pred1)
print(gn_cm_train)
```

```
[[ 5  2]
 [ 8 24]]
[[39  2]
 [44 71]]
```

Fig.16.Confusion Matrix for Navie bayes

```
from sklearn.metrics import accuracy_score
accuracy = accuracy_score(y_test,y_pred)
print(accuracy)
```

```
0.7435897435897436
```

Fig.17.Accuracy using Navie Bayes

VIII.CONCLUSION:

In this process we can predict the parkinsons disease in patient's body using machine learning technology and this method makes the process easy to our user.

Our analysis provides very accurate performance in detecting Parkinson's disease using XGBOOST algorithm

IX. REFERENCES:

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