AI In Health Care

Breast Cancer Detection

Submitted For

What the hAIck!

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1. INTRODUCTION

1.1 Overview

Breast cancer is the most common cancer diagnosed among women and is the second leading cause of cancer death among women after lung cancer.

Breast cancer is a menacing cancer, primarily affecting women. Continuous research is going on for detecting breast cancer in the early stage as the possibility of cure in early stages is bright. There are two main objectives of this current study, first establish statistics for breast cancer and second to provide a machine learning model helpful in the detection of the breast cancer in early stage based on previous studies.

1.2 Purpose

Breast cancer and its treatment, primarily surgery, medical therapy (anticancer chemotherapy, medical intervention, surgical intervention, and monoclonal antibodies), and radiosurgery, are associated with greater negative effects on the patient's and her family's emotional wellbeing, life quality, and financial standing. Dread of recurrence and its devastating consequences frequently leads to overmedication, which comes at a high financial and physical expense in cases where it is not necessary.

All these can be prevented to a great extent when early detection is made possible.

2. LITERATURE SURVEY

2.1 Existing problem

Breast cancer screening trials show that regular mammographic screening reduces mortality from breast cancer. Many women are hesitant to get a breast examination done. The treatment of cancer can be unpredictable in a very short period of time. In India, the mortality rate is a steep 50% because it is not diagnosed in time.

There are no specific model which has practical usage, many models are being proposed and frequently new modules with improving accuracy rate are being reported.

2.2 Proposed solution

Our proposed model is a Quantitative data model which is trained using features are computed from a digitized image of a fine needle aspirate (FNA) of a breast mass. They describe characteristics of the cell nuclei present in the image.

Which gives data of radius, texture, smoothness, compactness, area, concavity , concave points and the diagnosis wherein the range of these denote they are malignant or benign

The data consists of mean value, standard error and worst case values

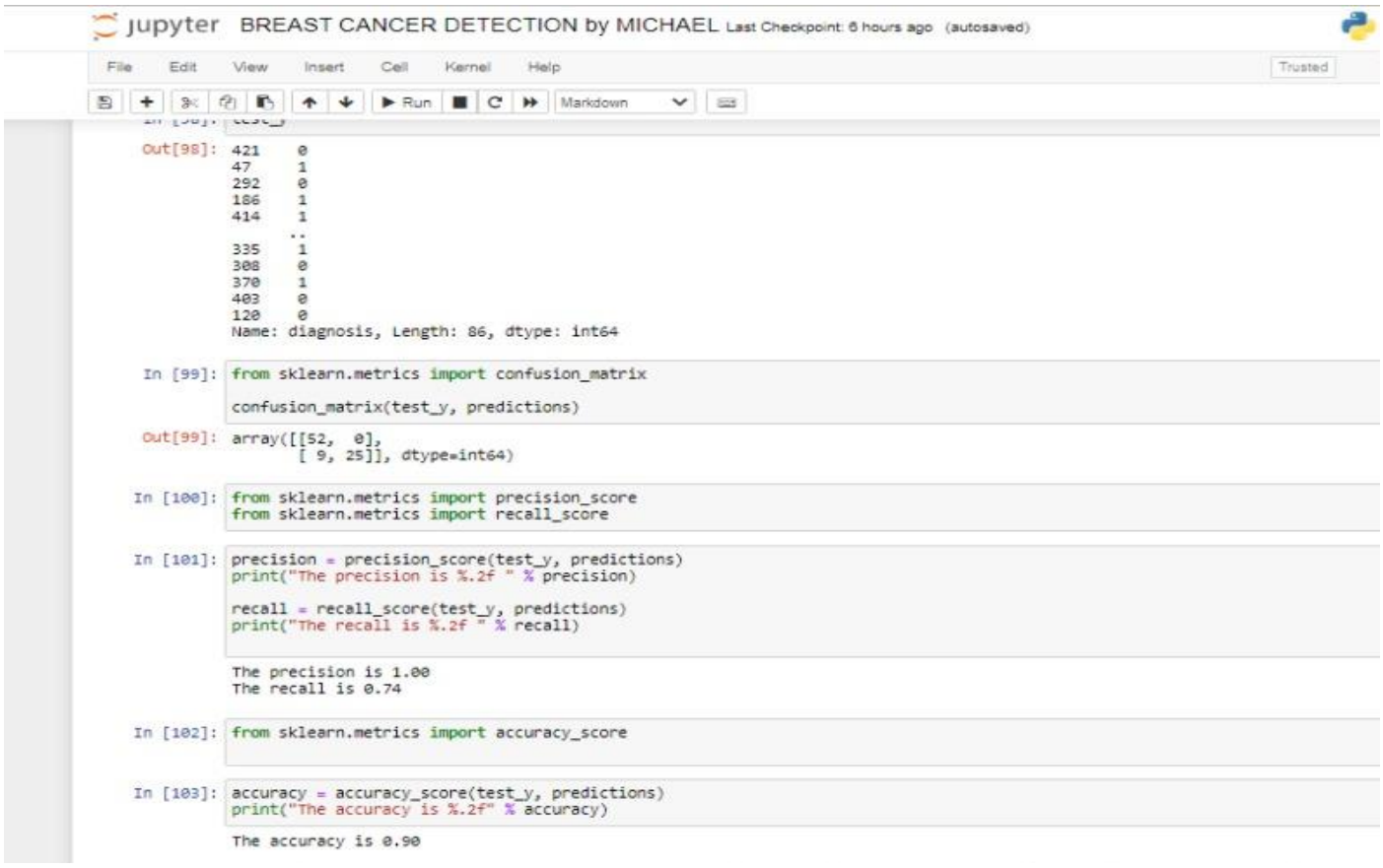
Data often contains lot of dark and irrelevant data points. Hence data cleaned is a mandatory step and we are performing it using Jupiter notebook

After the cleaned data is extracted, we group input variables and explore correlations between the mean, standard error and worst case values.

We are training the model using the explored data and using scikit package utilized for machine learning in python, which is simple to predict data analysis.

Four types of classification methods are imported and trained to know the performance metrics and see the best accuracy, precision and recall producing model.

Multi-layered perceptron (MLP , Random forest, K-Neighbors and Support Vector Machine(SVM) classifiers are deployed.The best algorithm is used to train a model and input values are asked for and using which breast cancer is detected.



3. EXPERIMENTAL INVESTIGATIONS

From the above trained models the accuracy, precision and recall is found and the found values are

For MLP classifier it is found to be,

Precision - 0.90
Recall - 0.82
Accuracy - 0.90

For Random Forest Classifier it is found to be,

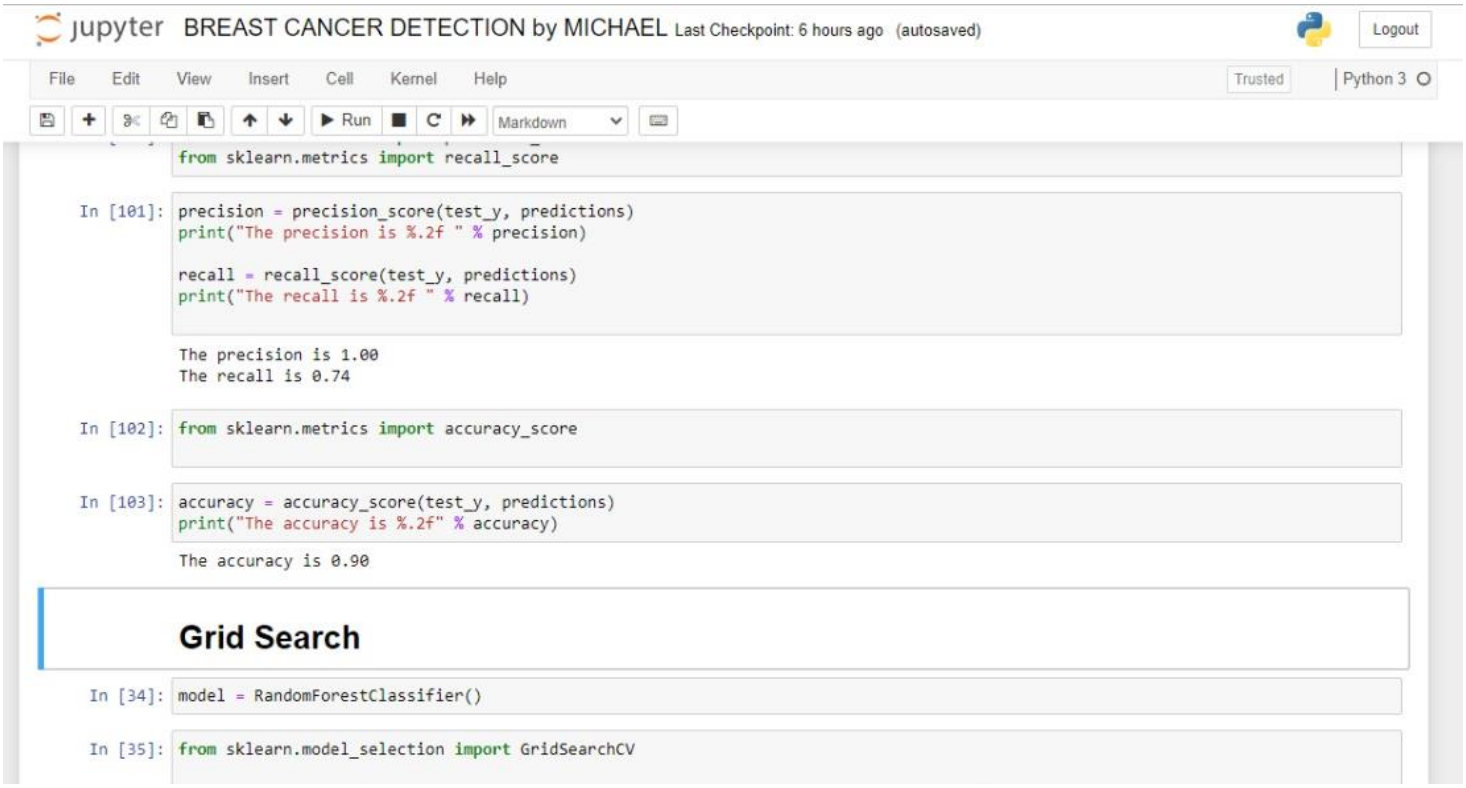
Precision - 0.97
Recall - 0.85
Accuracy - 0.93

For K Neighbors Classifier it is found to be,

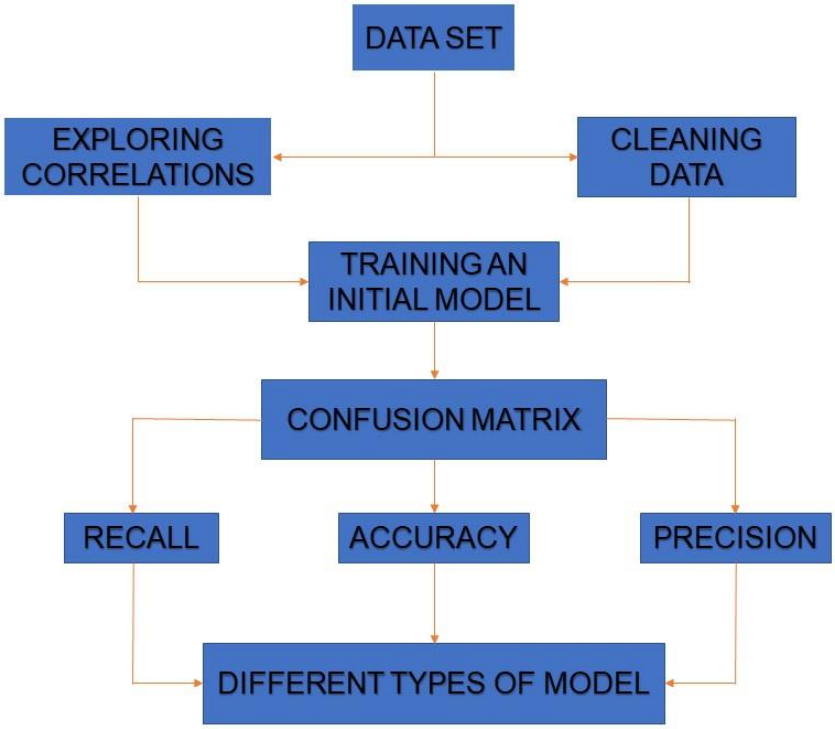
Precision - 0.96
Recall - 0.76
Accuracy - 0.90

For Support Vector Machine (SVC) it is found to be,

Precision - 1.00
Recall - 0.74
Accuracy - 0.90



4. FLOWCHART



5. RESULT

India has witnessed 30% of the cases of breast cancer during the last few years and it is likely to increase. Breast cancer in India accounts that one woman is diagnosed every two minutes and every nine minutes, one woman dies. Early detection and diagnosis can save the lives of cancer patients.

This ,model makes use of the best available machine learning classifier after through-put testing and a solution is proposed.

6. FUTURE SCOPE

The development of deep learning which is a family of machine learning techniques, has spurred much interest in its application to medical imaging problems.

Here, we develop a deep learning algorithm that can accurately detect breast cancer on screening mammograms using an “end-to-end” training approach that efficiently leverages training datasets with different models to enhance technology without examining the detection of breast cancer

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