Breast Cancer Detection With Optimized Machine Learning Techniques

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ABSTRACT

The classification of breast cancer has been the subject of interest in the fields of healthcare and bioinformatics, because it is the second main reason of cancer-related deaths in women. Breast cancer can be analyzed using a biopsy where tissue is eliminated and studied under microscope. The identification of problem is based on the qualification and experienced of the MRI, who will attention for abnormal cells. However, if the MRI is not well-trained or experienced, this may lead to wrong diagnosis. With the recent proposition in image processing and machine learning domain, there is an interest in experiment to develop a strong pattern recognition based framework to improve the quality of diagnosis. In this work, we will use the image feature extraction approach and machine learning approach for the classification of breast cancer using MRI images into benign and malignant. Using MRI image we can preprocess this image after that apply feature extraction and classify the final result using CNN Classification techniques.

Keywords— *Breast cancer Detection, CNN, Image processing.*

1. INTRODUCTION

Breast cancers are the most commonplace region and excessive aggressive cancers in women, and it is the second largest reason of cancers loss of life in women, behind lung cancers. According to the International Agency for Research on Cancer (IARC) of the World Health Organization (WHO), the form of cancers-related deaths in 2012 modified into most effective spherical 8.2 million. The range of recent times is predicted to exceed 27 million via manner of way of 2030.It is critical to assess breast cancer quickly and undergo cutting-edge cancer therapy in order to avoid breast cancer death. Examining hematoxylin and eosin (H&E) stained MRI slide preparations under a high-powered microscope of the changed region of the breast is a commonly utilized approach for diagnosing breast cancer. Breast cancer biopsy findings are manually classified into many groups by competent pathologists in medical practice (e.g. Cancerous as well as non-cancerous cells.).Come out machine learning techniques and growing picture volume built automatic system for breast cancer classification possible and may assist pathologists achieve more precise issue identification.Medical imaging tests, such as histology and radiology pictures, can be used to detect or identify breast cancer. The radiology image search can assist in locating the regions of difference. They cannot, however, be utilized to determine whether or not the region is cancerous. The only way to know for

sure if a place is carcinogenic is to do a biopsy, which entails taking a tissue sample and examining it under a microscope to see if cancer is present. Following the biopsy, the MRI will study the tissue under a microscope for abnormal or malignant cells, and the problem will be discovered. The MRI photos allow us to distinguish between the many types of cell nuclei and their flowcharts based on a certain pattern. To evaluate the malignant regions and degree of malignancy, MRI seeks for homogeneity in cell morphologies and tissue distributions. If the MRI is not properly trained, they may identify the problem incorrectly. In addition, there is a scarcity of specialists, causing the tissue sample to be put on hold for up to two months. Because MRI is a subjective discipline, there is also the question of repeatability. This is especially true among non-specialized pathologists, who may diagnose an issue differently on the same sample. As a result, there is a strong need for computer-assisted issue detection

2. NEED OF PRESENT WORK

It has been identified that one of the leading causes of death in developing countries as breast cancer. Earlier detection of cancer can reduce the death rate.
In the last five years according to the reports the survival rates of breast cancer patients is about 60% in India.
In last several years' various machine learning techniques have been developed for breast cancer classification and detection. Machine learning techniques have been proven to be very useful in early detection of Breast Cancer. Machine learning techniques are used to assess the behavior of tumor for breast cancer patients.

3. OBJECTIVES

There are scopes in the further exploration of automated breast cancer detection applications to improve the accuracy of cancer detection. We have used a deep learning model for classification of MRI image in this work.
- To classify the breast cancer MRI images into benign and malignant
- To work on MRI image dataset for breast cancer classification
- To developed features-based classification methods

4. SYSTEM ARCHITECTURE

The correct prediction of disease is the most challenging task. To overcome this problem data mining plays an important role to predict the disease. Medical science has large amount of data growth per year. Due to increase amount of data growth in medical and healthcare field the accurate analysis on medical data which has been benefits from early patient care. This system is used to predict disease according to symptoms. As shown in figure below, database containing symptoms of different diseases is fed as input to system along with current symptoms of user and medical history of patient (when patient observed same type of symptoms before). Android based system used CNN algorithm to predict disease patient is suffering from. After predicting disease system classified disease into mild, moderate and severe conditions.
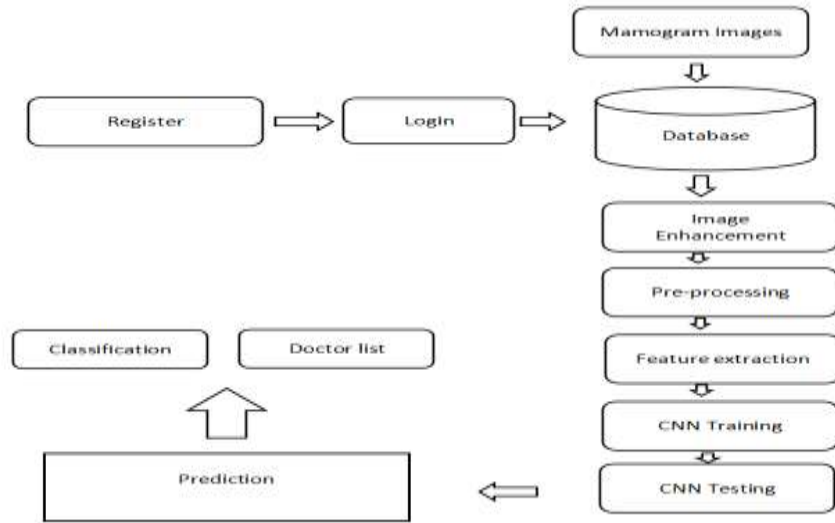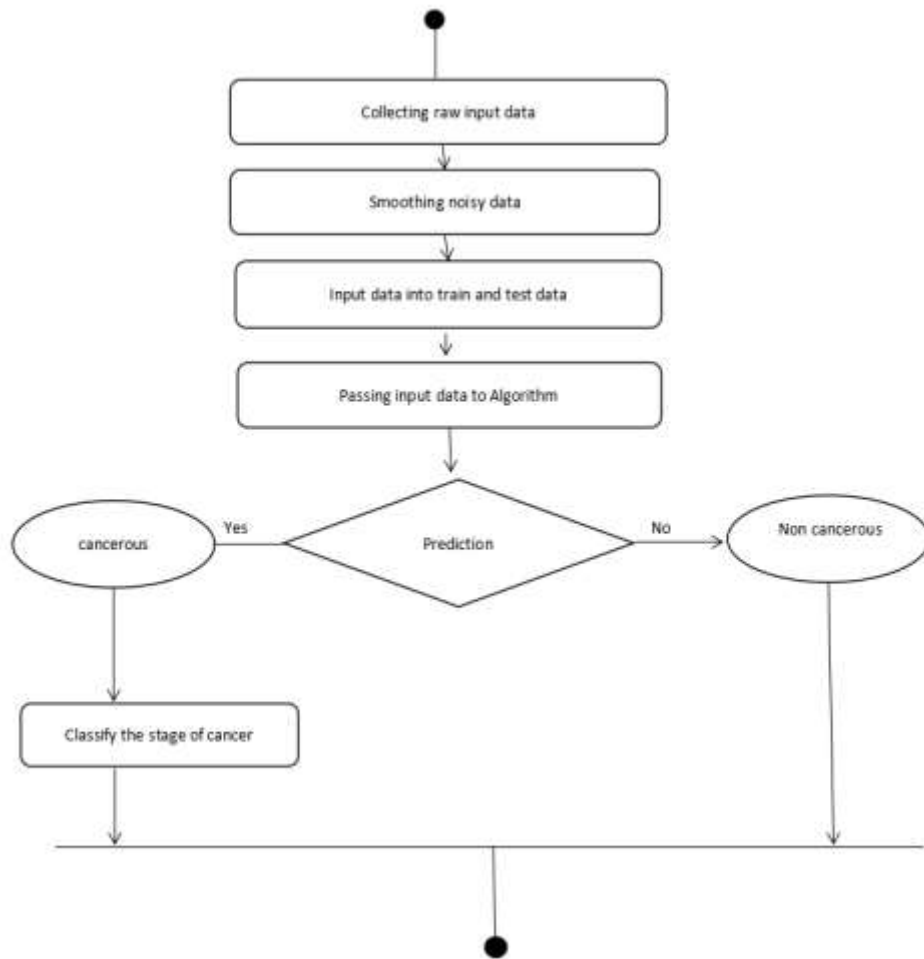
Fig -1: System Architecture

4.1 Activity Diagram

4.2 Use Case Diagram

The use case diagram as shown in figure summarizes the relationships between use cases and actors. The two main actors are farmer and server. Firstly, farmer uploads an image in application then the work of server is to process the image to detect and classify type of disease. Then message containing disease information and precaution measures is displayed on application on the user's end.
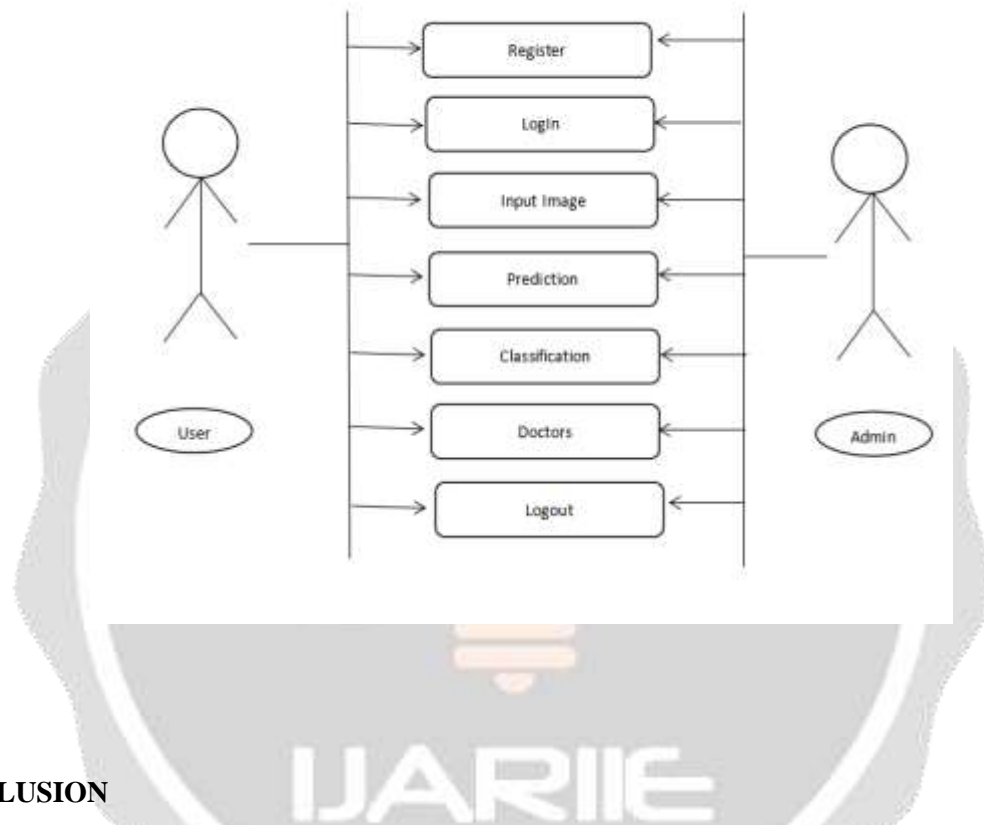
5. CONCLUSION

In this work, we work on his MRI images by using CNN Classification with various configurations for the classification of breast cancer MRI images into benign and malignant. The designed CNN Classification worked well on MRI images features in classification tasks. However, the performance of the CNN Classification is better compared to the one of the existing classification methods. CNN have become state-of-the-art, demonstrating an ability to solve challenging classification tasks. This proposed work successfully classifies using breast cancer MRI images into benign and malignant. Our system gives 99.59% accuracy. Our system is better performance than the existing system.

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