JOURNAL OF CRITICAL REVIEWS

ISSN- 2394-5125 VOL 7, ISSUE 13, 2020

AN INTELLIGENT BREAST CANCER DIAGNOSIS USING DEEP SEGMENTATION BASED ALEXNET WITH RANDOM FOREST CLASSIFICATION MODEL

[1]T. SATHYA PRIYA, [2]DR. T. RAMAPRABHA

[1]Research Scholar, Department of Computer Science, Vivekanandha College of arts and science for women. (Autonomous). Namakkal, India.

[2]Professor, Department of Computer Science, Vivekanandha College of arts and science for women. (Autonomous). Namakkal, India

[1]sathyapriyapoint@gmail.com, [2]ramaradha1971@gmail.com

Abstract

Breast cancer is treated as an important health issue among women globally. When the abnormalities in breast cancer are identified in the earlier stage, the survival rate can be considerably increased. Mammogram is treated as a proficient and widely employed model to detect and screen breast cancer. Deep learning (DL) models can be used by the radiology experts to make a precise diagnosis and helps to attain enhanced predictive outcome. This study proposes a novel deep segmentation based AlexNet with Random Forest (RF) model called DS-ANRF to detect and classify the existence of breast cancer from mammogram images. The presented DS-ANRF model comprises four processes including namely preprocessing, Faster Region based Convolution Neural Network (R-CNN) (Faster R-CNN) with Inception v2 model based segmentation, AlexNet based feature extraction and RF based classification. A comprehensive simulation process takes place and the goodness of the DS-ANRF model is validated using Mini-MIAS dataset. The experimentation outcome ensured the outstanding performance of the DS-ANRF model over the compared methods.

Keywords: Breast cancer, Classification, Segmentation, Feature extraction, Mammogram

1. Introduction

Breast cancer is general kind of cancer diagnosed in women and it is the second reason for the mortality. Based on the study, world social insurance groups in 1960's specified that the growth of breast cancer has been rapidly raised globally [1]. The initial diagnostic stage of tumor has the tendency of extending the patient survival ratio. Mammography is employed for localization, early prediction and medicating breast cancer. It has potential to find the tumor cells that exist in tiny size and more difficult to distinguish breast cancer. Breast images obtained from mammography has been concluded through the low-valued Xbeams applications and high variation [2-4]. It is also utilized to screen and analyze the breast disease. At the meantime, Full Field Advanced Mammography (FFDM) has been used for preventing the excessive biopsies.

Breast cancer has been considered to be increased exponential disease among women in western countries and from metropolitan cities in India .The American Cancer Society [5] defined that 230,480 female from America are diagnosed with breast cancer, and 39,520 females are at the earlier stage. Other latest research by National Cancer Registry Programs exposed that Breast growth is nearby 26 to 37% of other diseases in female in metropolitan cities such as Chennai, Mumbai, and Delhi so on. Biopsy needled, Mammography and Biopsy are the three methods applied to define the breast tumors. At first, mammography is utilized to examine the breast cancer [6, 7].The normal mammogram do not possess any harmful cells and the harmful cells are defined by the carcinogenic cell. The existing application of textural techniques and Machine Learning (ML) classifiers has the tendency to design other diagnosis techniques for breast cancer deduction [8].

There are two main methods involved for predicting, segmenting and classifying the automated breast cancer prediction. Some of the challenges have to be resolved in designing the effectual breast cancer prediction technique. In the classification stage, various mammogram images are transformed to feature vectors. These vectors are frequently in high definition which is necessary for converting high dimension image space to low dimension image space. Nowadays, high dimension constrained technique is utilized to predict breast cancer for the elimination of dimensionalities issues. Region of Interest (ROI) in mammogram images performs segmentation process with possible non-overlapping small squared shape of fixed