Chapter 6
An Ensemble Feature Subset Selection for Women Breast Cancer Classification

A. Kalaivani
Saveetha School of Engineering, India & Saveetha Institute of Medical and Technical Sciences, Chennai, India

ABSTRACT

Breast cancer leads to fatal diseases both in India and America and takes the lives of thousands of women in the world every year. The patients can be easily treated if the signs and symptoms are identified at the early stages. But the symptoms identified at the final stage spreads in the human body, and most of the time, the cancer is identified at the final stage. Breast cancer detected at the early stage is treated easily rather than at the advanced stage. Computer-aided diagnosis came into existence from 2000 with high expectations to improve true positive diagnosis and reduce false positive marks. Artificial intelligence revolved in computing drives the attention of deep learning for an automated breast cancer detection and diagnosis in digital mammography. The chapter focuses on automatic feature selection algorithm for diagnosis of women breast cancer from digital mammographic images achieved through multi-layer perceptron techniques.

1. INTRODUCTION

Breast cancer (BC) is the tumor that originates in the cells of women breast and grows into breast cancer. Breast Cancer tumor has a nature to spread to different parts of the body (Y.S. Hotko, 2013). Breast Cancer is a universal disease which harms the

DOI: 10.4018/978-1-7998-3092-4.ch006

Copyright © 2021, IGI Global. Copying or distributing in print or electronic forms without written permission of IGI Global is prohibited.

lives of women in the age group of 25– 50. There is a potential rise in the number of BC cases in India and America. During the past five years, the survival rates of BC patients are about 90% in the USA and whereas in India the figure reports approximately 60%. Breast Cancer projection for India suspect to reach higher rates may be two millions (S. Malvia, 2017).

Medical World identified hormonal, life style and environmental factors are the root cause for development of Breast Cancer. Around 5%–6% of breast cancer patients are due to gene mutations that went through the ages of the family. The most common factors due to which breast cancer caused are Obesity, increasing age, postmenopausal hormonal imbalances. The only mechanism to diagnose breast cancer The early detection of breast cancer can reduce the costs of the treatment as there is no prevention mechanism for breast cancer. But the early detection is difficult since most of the times it is unusual to show cancer symptoms. It is indispensable for the patients to test using digital mammograms or self-breast tests to detect any early irregularities in the breast and also to get the tumor advanced (Shallu, Rajesh Mehra, 2018).

Medical Experts only deals with the diagnosis of disease purely based on the various tests performed upon the patient. The important factors in diagnosis is based on the data evaluation of patients data and experts knowledge. The medical diagnosis focused on this paper leads to the early diagnosis of women breast cancer from digital mammographic images predicts the malignant cases in a timely manner and which increased life span of patients from 56 to 86%.

Breast Cancer shows four signs of liaisons which are micro-calcification, mass, architectural distortion, and breast asymmetries(Hazlina H,et.al., 2004). The medical modalities supported for breast cancer diagnosis are positron emission tomography (PET), magnetic resonance imaging (MRI), CT scan, X-ray, digital mammography, ultrasound, tomography of photo-acoustic, optical, electrical impedance, opto-acoustic imaging(Sulochana Wadhwani et.al., 2013). The results obtained from these methods are used to recognize the patterns, which help medical experts to classify breast cancer into malignant or benign cases.

Digital Mammography System used for early stage breast cancer replaces X-ray film by electronics produces mammographic pictures of the breast enables better picture with a lower radiation dose. The breast images are transferred to a computer for review by the radiologist and can also be used for long term storage of patient record.

As per World Health Organization report, women breast cancer found to be the common women diagnosed cancer disease which also leads to death mortality among women worldwide. On an average, a woman is diagnosed with breast cancer every two minutes and one woman dies of it every 13 minutes worldwide. Survey statistics in 2019, says an estimated 2,68,600 new cases of invasive breast cancer

11 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/an-ensemble-feature-subset-selection-for-women-breast-cancer-classification/271749

Related Content

Learning with Privileged Information for Improved Target Classification
Roman Ilin, Simon Streltsovand Rauf Izmailov (2017). *Artificial Intelligence: Concepts, Methodologies, Tools, and Applications (pp. 2128-2145).*
www.irma-international.org/chapter/learning-with-privileged-information-for-improved-target-classification/173418

Diabetic Retinopathy Severity Prediction Using Deep Learning Techniques
Victer Paul, Bivek Benoy Pauland R. Raju (2023). *International Journal of Intelligent Information Technologies (pp. 1-19).*
www.irma-international.org/article/diabetic-retinopathy-severity-prediction-using-deep-learning-techniques/329929

Automatic Classification of Impact-Echo Spectra II
Addisson Salazarand Arturo Serrano (2009). *Encyclopedia of Artificial Intelligence (pp. 199-205).*
www.irma-international.org/chapter/automatic-classification-impact-echo-spectra/10248

Multi-Agent Systems Integration in Enterprise Environments Using Web Services
Eduardo H. Ramirezand Ramón F. Brena (2006). *International Journal of Intelligent Information Technologies (pp. 72-88).*
www.irma-international.org/article/multi-agent-systems-integration-enterprise/2406

A Discriminative Locality-Sensitive Dictionary Learning With Kernel Weighted KNN Classification for Video Semantic Concepts Analysis
Benjamin Ghansah, Ben-Bright Benuwaand Augustine Monney (2021). *International Journal of Intelligent Information Technologies (pp. 1-24).*
www.irma-international.org/article/a-discriminative-locality-sensitive-dictionary-learning-with-kernel-weighted-knn-classification-for-video-semantic-concepts-analysis/272009