Computer-aided detection(CAD) of abnormalities in medical images has clinical significance but remains a challenging area because of low contrast and high noise levels in medical images. Unlike object detection in natural images, the detection of medical abnormalities is unique because they often locate in tiny local regions within a high-resolution medical image. Traditional machine learning approaches build sliding window-based detectors with manual features and are therefore limited on both efficiency and accuracy. Recent advances in deep learning shed new light on this problem, but applying it to medical image analysis faces challenges including insufficient data.

Breast cancer is one of the most common cancers in women. Typically, the course of the disease is asymptomatic in the early stages of breast cancer. The Indian Council for Medical Research published a statistical report which stated that the early detection of breast tumor will considerably decrease the mortality rates. The diagnosis of breast cancer can be done using imaging tests and biopsy. Mammography (MM) is considered as the most commonly used standard breast tumor image screening technique. In mammography screening, common abnormalities include micro-calcification (MC) and mass, which are usually found in tiny local regions within a high-resolution medical image. Most CAD approaches for calcification detection follow a common procedure: image enhancement, segmentation or extraction of region of interests (ROIs), feature computation and classification. For mass detection, algorithms first identify suspicious regions in a mammogram and then classify it as mass or normal tissues. Micro-calcifications are tiny deposits of calcium that appear as bright spots in mammograms. Filter banks were used to decompose mammogram images, followed by ROI selection and Bayesian classifications ,for detecting MCs in mammograms. They used a classical neural network to find candidate calcification regions, cleaned network output to remove thin elongated structures and used a measure of local density for final classification. A mass in mammogram is defined as a space-occupying lesion seen in more than one projection.

The general procedure for detecting mass is first to detect suspicious regions, then extract shape and texture features, and finally detect mass regions through classification or removing false positive regions. It is very necessary that huge number of mammographic images have to be processed and it probably demands the usage of image compression methods. Image compression has become an inevitable tool along with the advancing medical data acquisition and telemedicine systems.

Training deep convolutional neural networks (CNNs) directly on high-resolution images uses image compression at the input layer, which leads to the loss of information that is essential for medical abnormality detection. Therefore, instead of training on full images, the proposed approach first fine-tunes the pre-trained deep CNNs on image patches centered at medical abnormalities and then integrates them with class activation mappings and region proposal networks for building abnormality detectors.

The aim is to develop an automated approach for the diagnosis of breast cancer tumors in early stage using deep CNNs on image patches centered at medical abnormalities and then integrates them with class activation mappings and region proposal networks for building abnormality detectors.

Mrs.Neelima P,

Asst.Professor,

Sree Narayana Institute of Technology,

Kollam,

Kerala