

Computer Aided Analysis of Breast Based Diagnostic Problems from Mammograms Using Image Processing and Deep Learning Methods

Authors : Ali Berkan Ural

Abstract : This paper presents the analysis, evaluation, and pre-diagnosis of early stage breast based diagnostic problems (breast cancer, nodules or lumps) by Computer Aided Diagnosing (CAD) system from mammogram radiological images. According to the statistics, the time factor is crucial to discover the disease in the patient (especially in women) as possible as early and fast. In the study, a new algorithm is developed using advanced image processing and deep learning method to detect and classify the problem at early stage with more accuracy. This system first works with image processing methods (Image acquisition, Noise removal, Region Growing Segmentation, Morphological Operations, Breast Border Extraction, Advanced Segmentation, Obtaining Region Of Interests (ROIs), etc.) and segments the area of interest of the breast and then analyzes these partly obtained area for cancer detection/lumps in order to diagnosis the disease. After segmentation, with using the Spectrogram images, 5 different deep learning based methods (specified Convolutional Neural Network (CNN) based AlexNet, ResNet50, VGG16, DenseNet, Xception) are applied to classify the breast based problems.

Keywords : computer aided diagnosis, breast cancer, region growing, segmentation, deep learning

Conference Title : ICBBE 2023 : International Conference on Biochemical and Biomedical Engineering

Conference Location : Venice, Italy

Conference Dates : June 15-16, 2023