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Breast Cancer Detection and Classification with Mammograms using Convolutional Neural Networks.

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ABSTRACT

Breast cancer is a global concern that results in high numbers of female deaths. Early detection of the disease is vital but regular check-ups and treatments are not given enough attention in many countries, including Sri Lanka. The advancement in image processing and machine learning has improved the accuracy of cancer diagnosis through medical imaging but mammograms, which are commonly used, have low contrast, and can result in a misdiagnosis of up to 30% due to human error, fatigue, and image quality. The use of computer-aided detection systems and deep learning algorithms in breast cancer diagnosis shows promise for improving accuracy and reducing human error. Further research is needed to validate their efficacy and safety.

The COVID-19 pandemic has highlighted the importance of using computer-aided systems in the medical field, as it minimizes the risk of medical professionals meeting patients, and also ensures a more accurate diagnosis. The accuracy of these systems varies among different countries, depending on the technology and methods used.

Therefore, it is proposed that a computer-aided detection system be developed to identify breast cancer accurately and effectively. This system would use a convolutional neural network trained with transfer learning for the image classification and classify breast tissues as normal or abnormal based on statistical features also trying to analyze the stage of the breast cancer which will be help to doctors to give necessary medicine considering the stage of the cancer. It would assist radiologists and physicians in reducing human error, increase confidence in the diagnosis, and ultimately lower the number of patients suspected of having breast cancer.

Keywords: Transfer Learning, Convolutional Neural Network , Computer Aided Diagnosis systems , Image classification