

Attention-Based ResNet for Breast Cancer Classification

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Abstract : Breast cancer remains a significant health concern, necessitating advancements in diagnostic methodologies. Addressing this, our paper confronts the notable challenges in breast cancer classification, particularly the imbalance in datasets and the constraints in the accuracy and interpretability of prevailing deep learning approaches. We proposed an attention-based residual neural network (ResNet), which effectively combines the robust features of ResNet with an advanced attention mechanism. Enhanced through strategic data augmentation and positive weight adjustments, this approach specifically targets the issue of data imbalance. The proposed model is tested on the BreakHis dataset and achieved accuracies of 99.00%, 99.04%, 98.67%, and 98.08% in different magnifications (40X, 100X, 200X, and 400X), respectively. We evaluated the performance by using different evaluation metrics such as precision, recall, and F1-Score and made comparisons with other state-of-the-art methods. Our experiments demonstrate that the proposed model outperforms existing approaches, achieving higher accuracy in breast cancer classification.

Keywords : residual neural network, attention mechanism, positive weight, data augmentation

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