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Paper Title: Deep Learning Convolutional Neural Networks (CNNs) on recognition and classification of White Blood Cells (WBCs)

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Abstract

The rapid evolution of Artificial Intelligence has brought significant advancements in Deep Learning, a widely applied subfield across various industries, including healthcare. This study focuses on leveraging Deep Learning and image processing techniques to classify white blood cells (WBCs). By comparing and evaluating multiple convolution neural network (CNN) models, such as GoogLeNet, ResNet50, VGG16, and Squeezenet, including YOLO (You Only Look Once) algorithm known for its segmentation capabilities, the objective is to improve the accuracy and efficiency of WBC recognition and classification. During training, both VGG16 and ResNet50 models achieved the highest accuracies, with VGG16 at 97.70% and ResNet50 at 97.38%. However, ResNet50 was chosen as the preferred model to be utilized alongside YOLO for improved classification and segmentation advancements. The testing phase of ResNet50 utilized 10% of the dataset from the initial data and demonstrated over 90% accuracy in each class. The process showed higher efficiency and lower capital costs, making it suitable for medical applications aided by Deep Learning Convolutional Neural Networks, addressing limitations in white blood cell classification.