IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 4, March 2026
Impact Factor: 8.2

A Transfer Learning Approach for Blood Cancer Detection Using Deep Learning

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Abstract: *A type of illness that strikes blood and bone tissue is known as blood cancer, spotting it soon makes a real difference in how well someone might do. Most times specialists look at slides of blood through lenses by hand, such a method eats up hours and errors can slip in when tired eyes lose focus. With these issues piling up, automation steps in - offering steadier help during checks meant to catch problems fast.*

This research introduces a method using deep learning to spot blood cancer in microscope pictures of blood cells. Built on MobileNetV2, the system uses a convolutional neural network to sort images into one of four groups: healthy cells or three leukemia stages - Pre-B early, Pre-B, and Pro-B. With 3,242 total images, each picture goes through cleaning steps before analysis to boost clarity and uniformity across samples. To strengthen performance while limiting false patterns, extra image variations are created by shifting light levels, resizing, and mirroring left to right.

Using a pre-trained MobileNetV2 helps boost results right away. Its core ability to detect patterns stays untouched. After that comes a pooling layer, then a dense one for sorting classes. Training runs on Adam while measuring error through categorical cross-entropy.

Almost hitting 97% correct guesses, the model proves solid through high marks across precision, recall, yet steady F1 outcomes too. Performance stands clear when looking at how often it gets things right, while still keeping balance in spotting true cases without false alarms piling up.

This research suggests deep learning might assist in spotting blood cancer sooner. Doctors could face less pressure when these tools offer quicker, sharper insights. Better choices in treatment may follow from such support. Patient care stands to gain when accuracy improves alongside speed..

Keywords: Blood Cancer Detection, Deep Learning, Convolutional Neural Network (CNN), MobileNetV2, Transfer Learning, Blood Cell Classification, Microscopic Image Analysis, Leukemia Detection, Data Augmentation, Medical Image Processing

DOI: 10.48175/IJARSCT-31836