

Design a New Algorithm to Identify White Blood Cells for Classification Leukemic Blood Image using CNN

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Abstract: Image processing and deep learning techniques are employed in this research to locate and classify White Blood Cells (WBCs) based on their respective categories. The aim is to enhance efficiency and alleviate the burden on doctors, as traditional manual counting methods are tedious, monotonous, and subject to potential subjectivity. The dataset for normal blood samples is obtained from the laboratory in the biotechnology department, while the datasets used for training in the Convolutional Neural Network (CNN) are sourced from the Leukocyte Images for Segmentation and Classification (LISC) website. White Blood Cells (WBCs), also known as leukocytes or leucocytes, are immune system cells responsible for defending the body against infectious diseases and foreign substances. They play a crucial role in fighting infections by attacking bacteria, viruses, and other microorganisms that invade the body. All leukocytes are derived from multipotent cells called hematopoietic stem cells. The lifespan of WBCs in the human body is approximately three to four days. In order to extract the nucleus of a white blood cell image, segmentation techniques are necessary. Once the WBCs are classified, they are counted and compared to the standard range of WBC types found in human blood samples. This enables the prediction of normal and abnormal blood samples based on the availability of different types of WBCs. The utilization of image processing and deep learning techniques in this research enables the automated detection and classification of WBCs. By training a Convolutional Neural Network (CNN) using datasets from the LISC website, the model can accurately classify WBCs based on their categories. This eliminates the need for manual counting methods, which are not only time-consuming but also prone to subjectivity. By employing this approach, the researchers aim to improve the efficiency of WBC analysis and reduce the workload on doctors. The automated classification and counting of WBCs provide a reliable method for predicting normal and abnormal blood samples based on the composition of different types of WBCs. Overall, this research contributes to the development of advanced techniques in the field of hematology and brings about significant improvements in the analysis of blood samples.

Keywords: Magnetic Resonance Imaging (MRI), Convolutional Neural Network (CNN), Blood Cells, etc.

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