WHITE BLOOD CELLS ASSIMILATION

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Abstract: In this project, we will be focusing on White Blood Cells present in the blood images. Identification of these cells leads to detection of many types of diseases. We have carried out various processing steps to identify the WBCs using MATLAB. Processing steps like rgb to gray conversion, gray to black and white conversion are used in this project. Morphological operations are carried out for background removal and identification of cells.

Index Terms: **WBCs, Morphological operations.**

I. INTRODUCTION

White blood cells, Red blood cells, Platelets and Plasma are main components which are present in blood. From these components white blood cells, red blood cells and platelets are most important in disease diagnosis. We will be focusing on WBCs. White Blood Cells are also known as leukocytes.[5-10] White Blood Cells are easily identified because of their nucleus. WBCs nucleus is darker as compared to RBCs.[5-10] White Blood Cells consist of basophils, neutrophils, monocytes, lymphocytes and eosinophils.[10]. WBC is an important parameter in disease diagnosis. White Blood Cells help our body to fight various antigens. CBC is complete blood count that defines state of health. Blood is a health indicator for various diseases hence segmentation along with identification of blood cells is important. Removal of noise, background and unwanted elements are implemented using morphological operations.

II. ALGORITHM

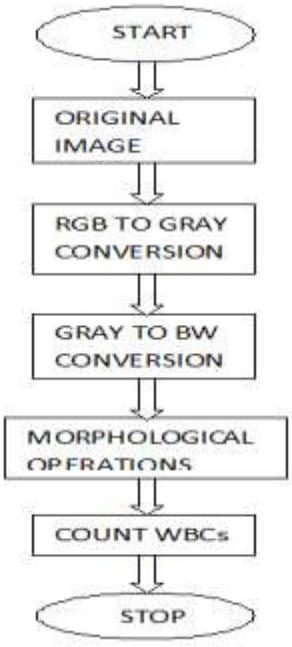

fig.1 flowchart

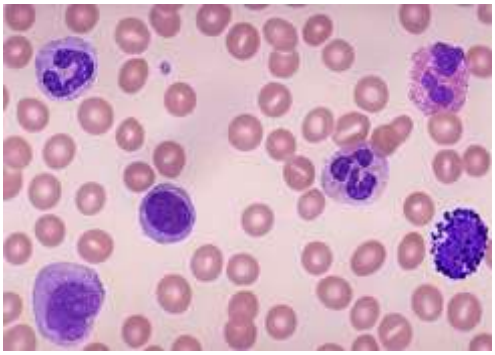

fig.2 blood image

III. PROCESSING STEPS

Step 1 : We have converted the original image to gray scale image using rgb to gray conversion. WBCs in this image are much darker thus their identification becomes easier[1,2,3].

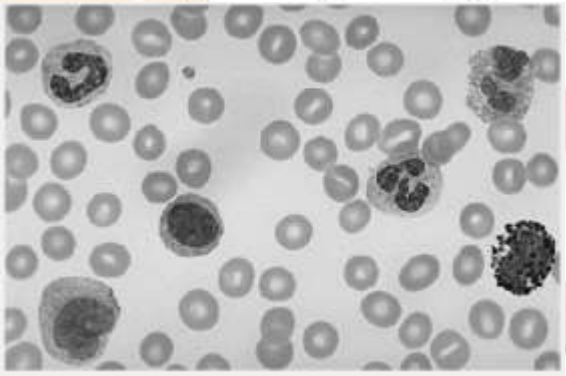

fig.3 rgb to gray conversion.

Step 2 : Gray image is converted to black and white image to remove unwanted elements like RBCs and background.

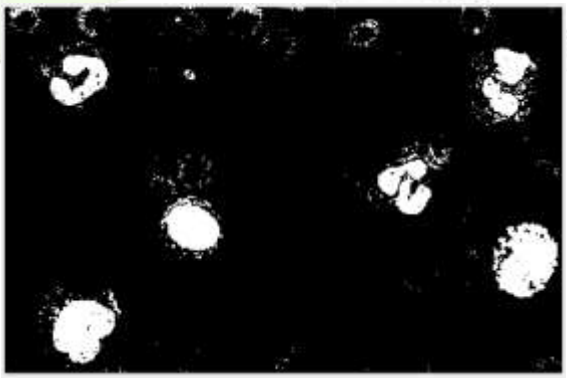

fig.4 black and white image.

Step 3 : Morphological steps like bwareaopen and imfill are used to remove the small elements still present in the image.

fig.5 cleaned image.

Step 4 : Counting of WBCs. Boundaries of the elements present are detected and are counted.[1]

IV. RESULT

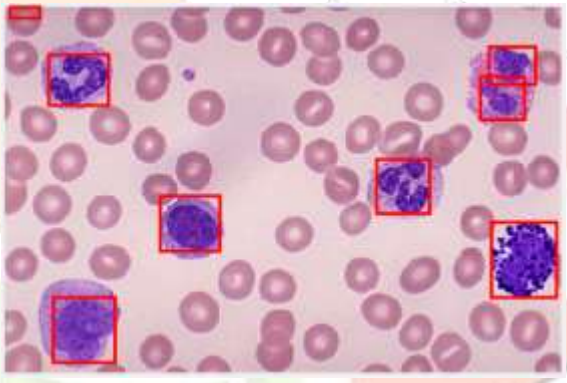

fig 6 detected WBCs.

V. CONCLUSION

This method of detection of WBCs is less time consuming has no human errors. Diagnosis of diseases is carried out easily. This paper gives a methodology to achieve an automated detection and counting of WBC in digital images using morphological operations.

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