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# Blood Cells Counting using Image Processing

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**Abstract:** The aim of this project is to count the blood cells using image processing . Computer vision methodologies develop to help improve not only image quality of blood smears but also the effectiveness of its analysis. Digital Image processing techniques is help in their analysis and diagnosis .Image processing proves the advantage to blood cell counting since it provides an experience-independent and less time consuming analysis. This paper propose two algorithm for calculating Blood cells 1. Region Growing 2. K mean Clustering.

**Keywords:** Region Growing, K mean clustering

## I. INTRODUCTION

The complete blood count (CBC ) is the Biopsy accustomed. In the blood cells the important part of immune system is white and red blood cells. Red Blood Cells (RBC's) are also called as erythrocytes and White Blood Cells (WBC's) are also called as a leukocytes. The function of the RBC's are carry oxygen and collects carbon dioxide from a lungs to the cells of body. The function of WBC's are protects body by removing viruses and bacteria in a body. Digital image processing techniques is help in their analysis and diagnosis [4]. Abnormalities of result of blood cells based from references of normal count indicate the person health is not good and they required the medical condition. Digital Image Processing is one of the growing field in the medicinal part [2]. Matlab is a good tool to used image cells segmentation techniques [1]. By using various algorithm that is help counting of blood cells. advantage of digital image processing of blood cells is that produce accurate result. There are so many image processing algorithm for calculating the blood cells like Watershed algorithm , K-mean algorithm ,Edge detection algorithm etc. In this Paper propose two algorithm for calculating blood cells 1. Region Growing 2.K mean clustering.

## II. PROPOSED METHODOLOGY

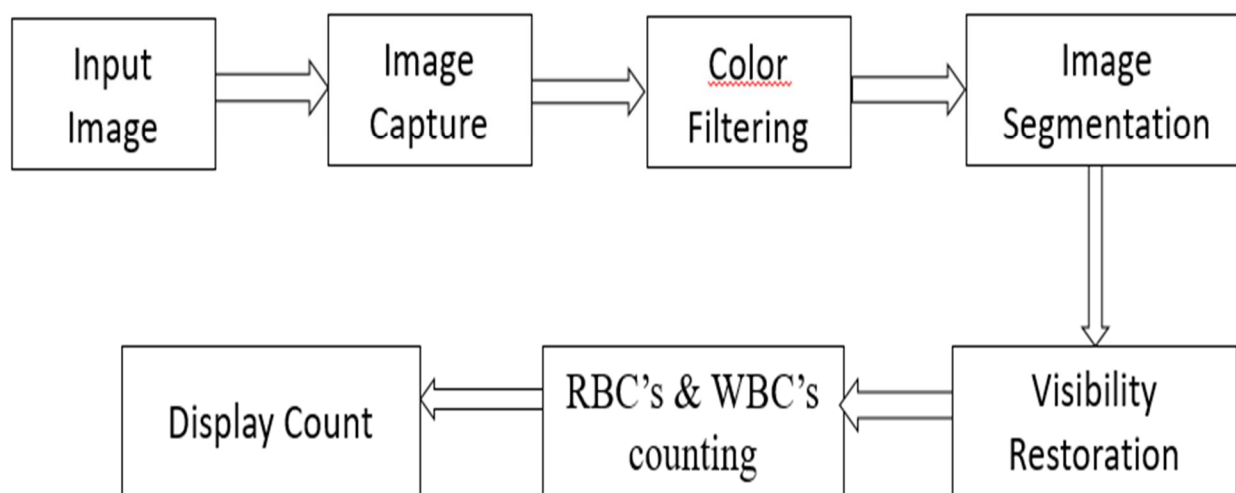


Figure 1. Block diagram

### III. METHODOLOGY

#### A. Region Growing

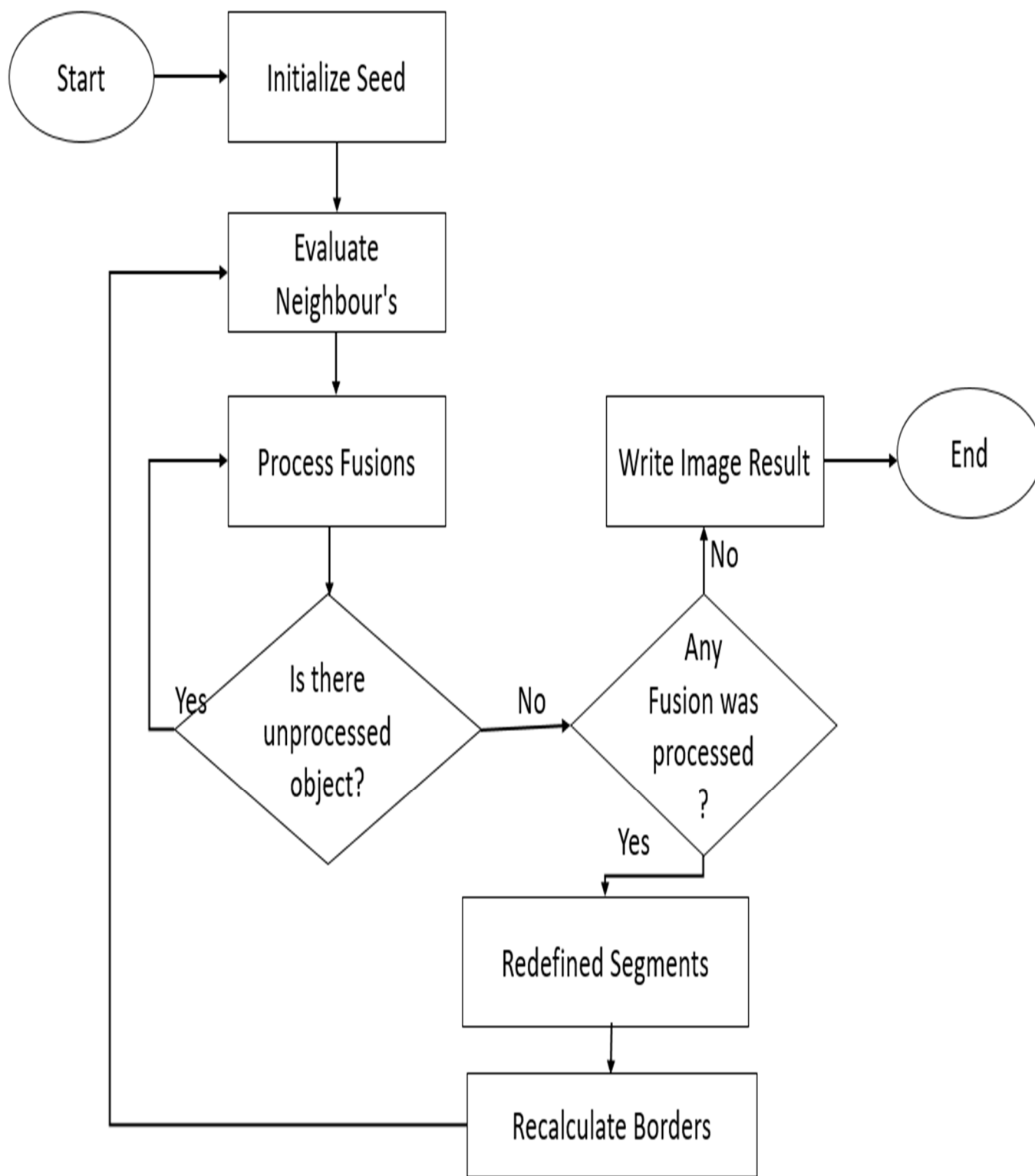


Figure 2 : Flow Chart for Region Growing

*B. K Mean Clustering*

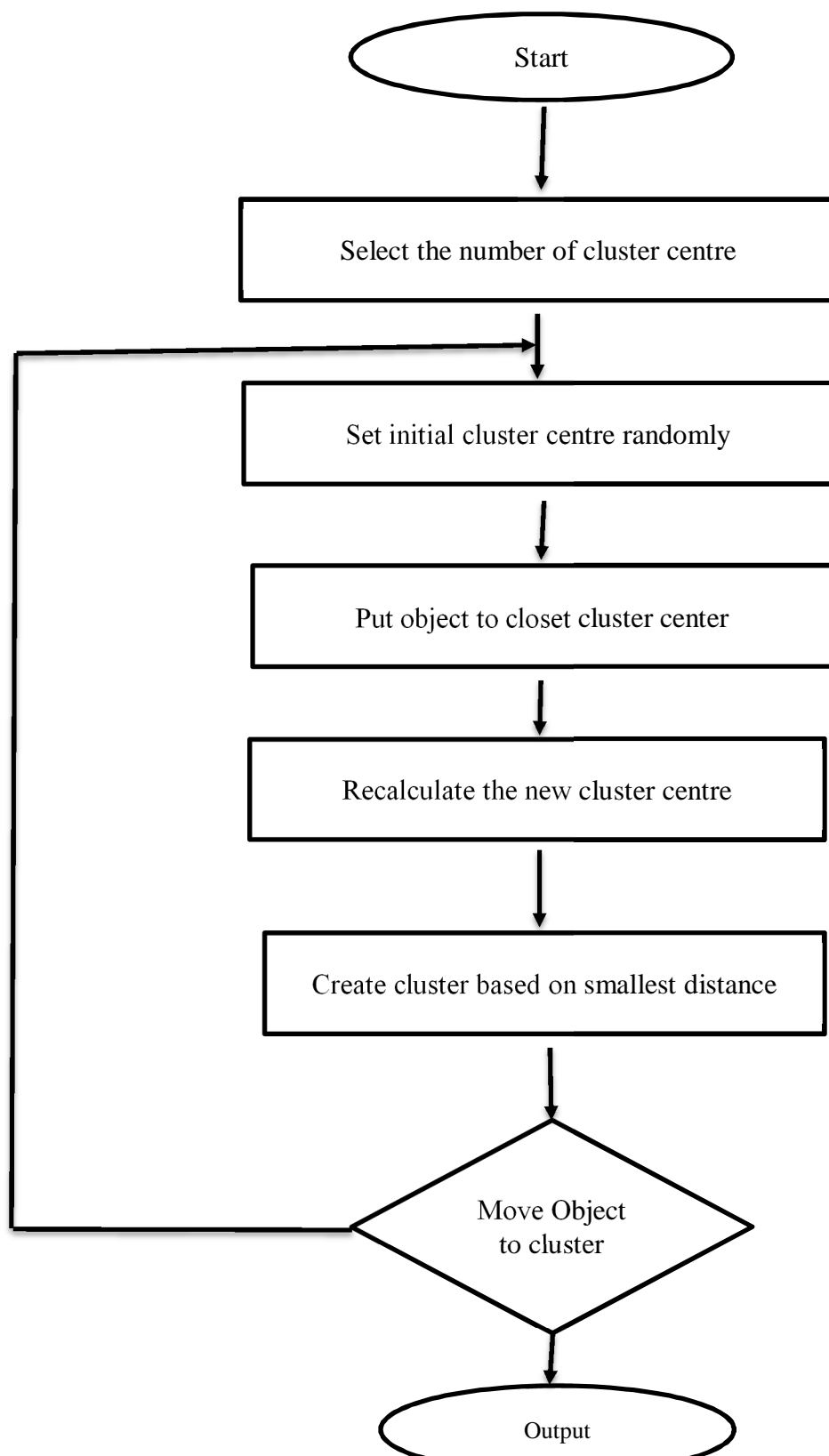


Figure 3: Flow Chart for K mean Clustering

#### IV. ALGORITHM USED

##### A. Region Growing

Region based segmentation is a technique for determining the region is based on connectivity. This technique divide the entire image into sub regions. One of the segmentation methods is the region growing approach. Region growing is a procedure that groups pixels or sub region into larger regions based on predefined criteria the criteria based on pixel intensity, grayscale texture or color . Region based segmentation is a technique the region directly also it is based on connectivity. This technique divide the entire image into sub region. In the region growing technique used the coding algorithm, there are 4 chain & 8 chain coding techniques are in coding algorithm. In the 8 chain connected neighborhood for our pixels adjacent relationship. The first step of region growing in matlab is to select a set of seed points. Seed point selection is based on some criterion [3]. The regions are then grown from these seed points to adjacent points depending on a region membership criterion and the criterion make the same pixel value. So keep examining the adjacent pixels of seed points. If the same intensity value of the seed points create then classify them into the seed points. In the region growing algorithm is iterated process, when there are no change in two successive iterative stages. This process is produced iterated for each boundary pixel in the region.

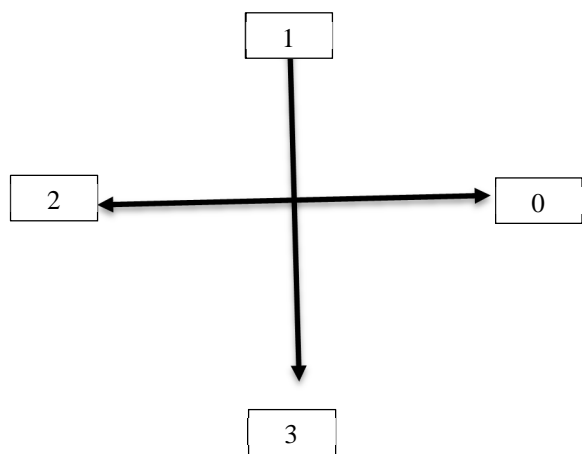


Figure 4: 4 Chain Code

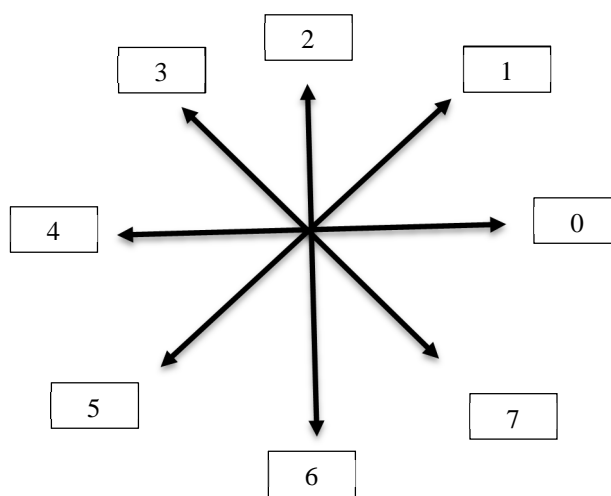


Figure 5: 8 Chain Code

##### B. K mean Clustering

Blood cells image segmentation using clustering algorithm is k mean algorithm. It is good algorithm to cluster and classify in more descriptive order [5]. K mean algorithm is an iterative algorithms that tries to partition the dataset into K predefined distinct non overlapping subgroups where each data point belongs to only one group. In the k mean clustering is simple and easy way to classify a given data set. Through a certain number of clusters is fixed a priori. The main function is to define k centers, one for each cluster. These centers is placed in cunning way because of different location for getting different result [4]. So for better result place them as much as possible away from each other. The next step is take each point belong to a given data set. When no point is pending , then first step is completed and early group age is done. At the some of point need to re – calculate k new centroids of the cluster. After that these k new centroids, a new binding is done between the same data set points and the nearest new center of cluster.

#### V. SIMULATION OUTPUT

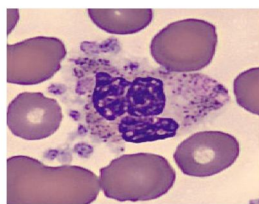


Figure 6: Sample of Blood Smear Image

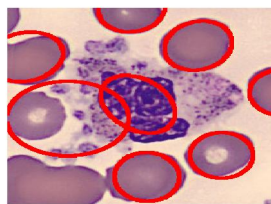


Figure 7 : Dilated Image

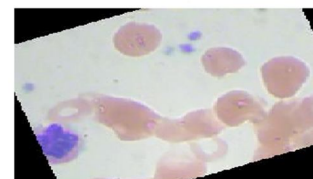


Figure 8 : Resizing Image

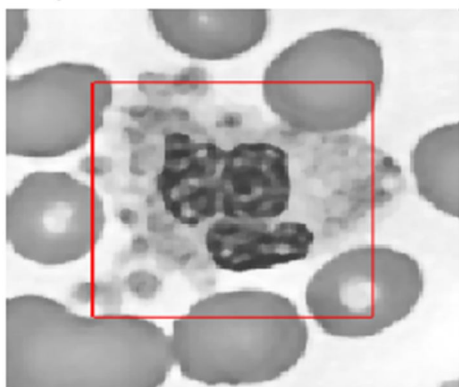


Figure 9 : Mean Luminance image

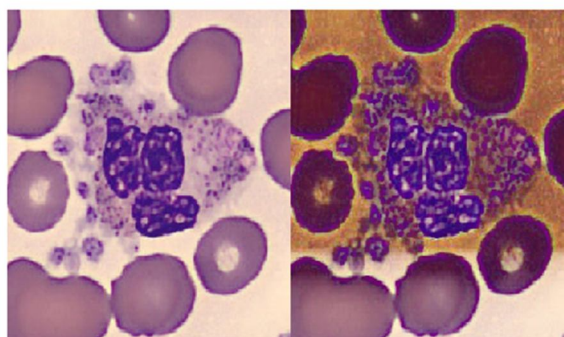


Figure 10 : Visibility Restoration

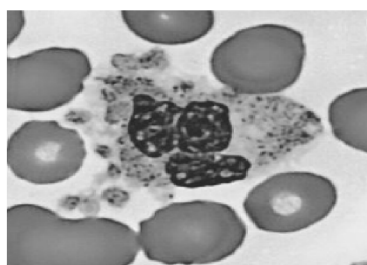
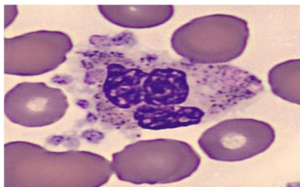
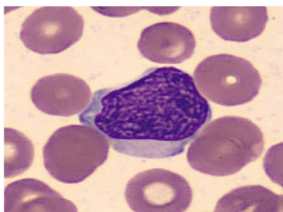


Figure 11 : Gray Scale Image



Figure 12 : Segmentation Image

### VI. RESULT

Sr. No.	Sample Image	Region Growing		K mean Clustering	
		RBC's	WBC's	RBC's	WBC's
1		300	163	284	155
2		290	297	281	289



## VII. CONCLUSION

In this paper the two algorithms are used one is based on segmentation while another is based on Clustering. It takes to the conclusion that the Region growing method uses seed pixel, region growing and K mean clustering to get the count of blood cells using image processing.

## REFERENCES

- [1] Adnan Majeed “Blood Cell Segmentation Using Matlab Nuclei , Cell Counting , Splitting Cell , SBF, LCF cell Image Processing”, International Conference of Computer Science IT Lahore 2019.
- [2] Dyanesh Varun D. , Kandhuri Reddy , Lakshmi Priya S, “Blood Cell Count using Digital images Processing” proceeding of 2018 IEEE International Conference on Current Trends toward Converging Technologies , Coimbatore 2018.
- [3] Shilpa Kamdi, R.K.Krishna, “Image Segmentation and Region Growing Algorithm”, ISSN 2249-6343.
- [4] Sivakumar .S , Ramesh . S “Automatic White Blood Cells Segmentation using K means Clustering ” ,International Journal of science and Engineering Research Vol 3 Issue April 2015.
- [5] S.S. Savkare, S.P.Narote. “Blood Cell Segmentation from Microscopic Blood Images”. IEEE 2015 ICIP, pp. 502-505, 2015.



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