Detection of Leukaemia in Microscopic Images Using Image Processing

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Abstract : The work done here is base upon dispensation of blood microscopic images to be familiar with the Leukemia. According to different categorization of leukemia, this work focuses on the Leukemia and its types that have an effect on mostly the adult and children. Premature work is done by color change of the image from RGB to CIELAB color space to make the segmentation method perform well. In segmentation process, the widely used technique is K-means algorithm. K-means is an unsupervised knowledge algorithm based on clustering of similar performance of the objects. characteristic extraction technique include the Hausdorff dimension (HD) and Local Binary Pattern. Support Vector Machine is used for classification. The evaluation of various result analysis parameters is analyze to achieve precision.

IndexTerms - Segmentation, K-means algorithm, Local Binary Pattern, Hausdorff Dimension, Support Vector Machine.

I. INTRODUCTION

The diagnosis of leukemia frequently follows a regular blood test that results in an irregular blood cell add up. Once leukemia is supposed, the doctor may take samples of bone core and blood to examine cell shape. Samples are also sent to the pathology lab to recognize proteins situated on the surface and chromosomal and change. This information is significant for diagnosis of human being patients.

LITERATURE SURVEY

Paper Name and Author: detection of leukemia using image processing
In a physical method of leukemia detection, experts make sure the microscopic images. This is long and time taking process which depends on person's skill and not have a standard accuracy. In this proposed approach of leukemia detection process Image j is a tool which is used here for understanding the process of entire detection. And this tool has an in built process for pre-processing and segmentation. Using this tool there is a facility of converting RGB image to gray colour image and convert grey colour image to binary image directly. In this tool installing macros for each step facilitate the process of detection of leukaemia. Macros can be in java or python or mat lab or integral macros. In this procedure using cell count and some other parameters like area and border leukemia can be detected and can classify whether it is ALL (or) CLL (or)Not.

Paper Name and Author: : Margarita Guenova , Gueorgui Balatzenko **Classification Of Acute Leukemia Using Image Processing And Machine Learning Techniques**
Abstract: Medical diagnosis is the procedure of identify a disease by dangerous analysis of its symptom and is often aided by a series of laboratory tests of anecdotal complexity. Accurate medical diagnosis is necessary in order to provide the most effective behavior option. The work obtainable in this thesis is focused on processing of peripheral blood smear images of patients suffering from leukemia based on blast cells morphology. Leukemia, a blood cancer, is one of the commonest malignancies touching both adults and children. It is a disease in which digital image processing and machine knowledge techniques can play a prominent role in its diagnostic process. Leukemia is classified as either acute or chronic based on the rapidity of the disease progression. sharp leukemia can be further classified to sharp lymphoblastic leukemia (ALL) and acute myeloid leukemia (AML) based on the cell lineage. The treatment protocol is allocated based on the leukemia type.
Paper Name and Author: Hayan Tareq Abdul Wahhab **and Image processing based leukemia cancer cell detection**
Abstract: Microscopic pictures are review visually by hematologists and the system is tedious and time taking which causes late detection. Therefore automatic image handling framework is compulsory that can overcome related limitations in visual investigation which provide early finding of disease and also type of cancer. The proposed strategy is effectively connected to many numbers of pictures, demonstrating accurate results for changing image standard. Distinctive picture handling calculations, for example, Image enhancement, Clustering, Mathematical process and Labeling are execute utilizing MATLAB. Utilizing a portion of the productive image handling instruments we can be familiar with and section disease cell. The segmentation helps in

knowing the precise size and shape of the cancer cell and the area. First we have utilized image enhancement strategies to improve the quality in terms of contrast and standardize the pixel values in the picture. After enhancement, segmentation is done to think on area of interest; in this case it is nucleus. K-mean segmentation is used for segmentation. At that point we apply Feature extraction after that we have connected it to classifier to get the desired results as whether the cell is cancerous or not. The algorithm is been utilized on a mixture of pictures of the cancerous cell and has continuously given us the correct desired output.

Paper Name and Author: Ashwini Rejnital, N Ashwini **Acute Lymphocytic Leukemia Detection and Classification (ALLDC) System**

Abstract: In order to get better patient diagnosis various image processing software are urbanized to extract useful information from medical images. An necessary part of the diagnosis and conduct of leukemia is the visual test of the patient's peripheral blood smear under the microscope. Morphological change in the white blood cells are commonly used to determine the nature of the malignant cells, namely blasts. Morphological analysis of blood slides are influenced by factors such as hematologists experience and tiredness, resulting in non standardized reports. So there is always a need for a cost effective and robust automated system for leukemia screening which can greatly improve the output devoid of being influenced by operator fatigue. This paper presents an application of image segmentation, feature extraction, selection and cell classification to the recognition and differentiation of normal cell from the blast cell. The system is applied for 108 images available in public image dataset for the study of leukemia. The methodology demonstrates that the application of pattern recognition is a powerful tool for the differentiation of normal cell and blast cell leading to the improvement in the early of use treatment for leukemia.

Paper Name and Author: Jamila Harbi, Rana Ali **automated detection and classification of leukemia using image processing and machine learning**

Abstract: Leukemia stands for blood cancer that begins in the fillet marrow and results in the production of abnormal cells. Leukemia is generally classified as acute lymphoblastic leukaemia (ALL), acute myeloid leukemia (AML), chronic lymphocytic leukemia (CLL) and chronic myeloid leukaemia (CML).This thesis makes an effort to devise a methodology for the detection and cataloging of Leukemia. The images have been segmented using HSV color based segmentation algorithm. The morphological components of usual and Leukemic lymphocytes differ significantly; hence different features are extract from the segmented lymphocyte images, for detection purpose. The leukaemia is classified using SVM classifier.

Paper Name and Author: Preeti Jagadev **Automated Detection of Acute Leukemia using K-mean Clustering Algorithm**

Abstract: Leukemia is a hematologic cancer which develops in blood tissue and triggers rapid production of immature and abnormal shaped white blood cells. Based on information it is found that the leukemia is one of the leading cause of bereavement in men and women alike. Microscopic examination of blood sample or bone marrow smear is the most effective method for diagnosis of leukemia. Pathologists analyze microscopic samples to make diagnostic assessments on the basis of characteristic cell features. Recently, computerized methods for cancer detection have been explored towards minimizing human intervention and providing accurate clinical information. This paper presents an algorithm for automated image based acute leukemia detection systems. The method implemented uses essential enhancement, morphology, filtering and segmenting technique to extract region of interest using k – means clustering algorithm. The proposed algorithm achieve an correctness of 92.8% and is tested with Nearest Neighbor (kNN) and Naïve Bayes Classifier on the dataset of 60 samples.

Paper Name and Author: 1Sachin Kumar, 1Sumita Mishra, 1Pallavi Asthana, 2Pragya **Automated Lukemia Detection using microscopic images**

Abstract : Leukemia occurs when lot of abnormal white blood cells produced by the bone marrow. Hematologist makes use of microscopic study of human blood, which leads to need of methods, including microscopic color imaging, segmentation, classification and clustering that can allow identification of patients suffering from Leukemia. The microscopic images will be inspected Visually by hematologists and the process is time consuming and tiring. The automatic image Processing system is urgently needed and can overcome related constraints in visual inspection. The proposed system will be on microscopic images to detect Leukemia. The early and fast identification of Leukemia greatly aids in providing the suitable treatment. Initial segmentation is done by means of Statistical parameters such as mean, standard deviation which segregates white blood cells from other Blood components i.e. erythrocytes and platelets. Geometrical features such as area, perimeter of the white blood cell nucleusis investigated for diagnostic prediction of Leukemia. The proposed method is successfully applied to a large number of images, showing promising results for varying image quality. Different image meting out algorithms such as Image Enhancement, Thresholding, Mathematical morphology and Labelling are implemented by means of Lab VIEW and MATLAB.

Paper Name and Author: Chaitali Raje, Jyoti Rangole **Detection of Leukemia in Microscopic Images Using Image Processing image Processing**

Abstract: Medical imaging is a technique for creating the visual representation of the interior body for diagnosis of diseases. It reveals the internal structure of the body to detect the diseases. A confirmation is created to store the captured image so that it will be easy to classify the diseases [2]. Blood is fundamental component to human life. A human body has in the order of 70 liters of water of which five liters are blood. Blood is essential for maintaining homeostasis. That refers to hydration, temperature regulation and ion concentration [1]. A White Blood Cell (WBC) is larger than a Red Blood Cell (RBC). White Blood Cell (WBC) composition in the blood gives valuable information in the diagnosis of different diseases. The mesoderm gives raise to the blood cells. Through hematopoietic process the blood cells are differentiated as Red Blood Cells (RBC) or White blood Cells (WBC). The immature growth in White Blood Cells (WBC) causes Leukemia. The undeveloped growth is considered about 30%

of blast cells. These cells provide the maximum defense beside infections, and their individual attention can help specialist to distinguish between the presences of pathologies [1]

Paper Name and Author: A.B.Desouza **Detection of Leukemia with Blood Microscopic Images**

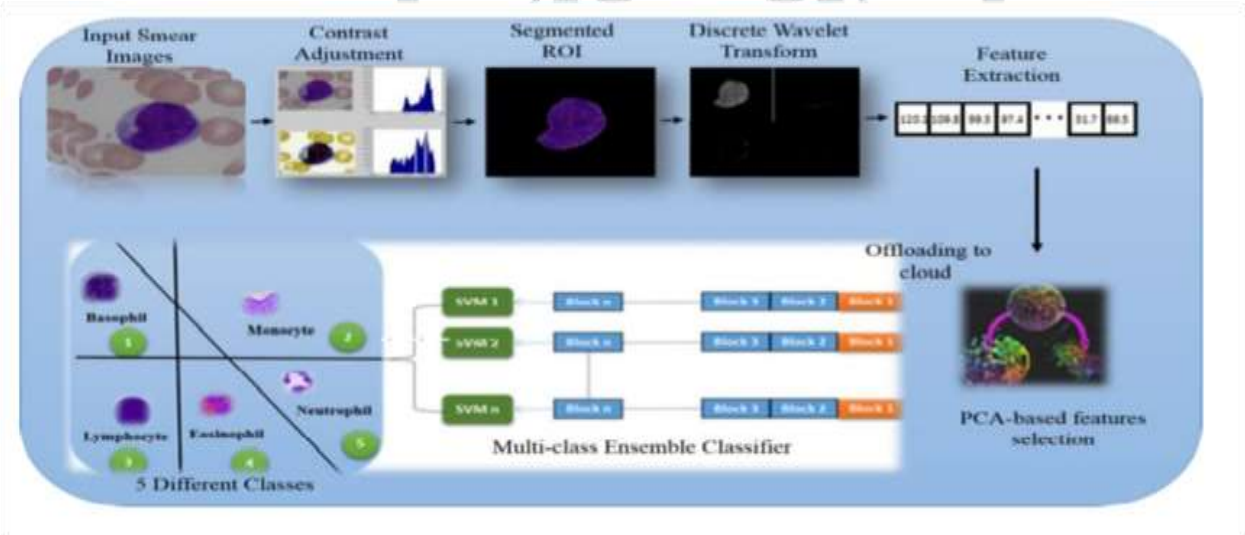
Abstract: The work done here is based upon dispensation of blood microscopic images to identify the Acute Myelogenous Leukemia. According to different classification of leukemia, this work focuses on the Acute Myelogenous Leukemia (AML) a type of acute leukemia that affects mostly the adult and children. This makes a need to detect and classify the AML automatically. untimely work is done by color conversion of the image from RGB to CIELAB color space to make the segmentation method perform well. In segmentation method, the widely used technique is K-means algorithm. K-means is an unsupervised learning algorithm based on clustering of like behavior of the objects. Feature taking out technique includes the Hausdorff dimension (HD) and Local Binary Pattern. bear Vector Machine is used for classification. The assessment of various result analysis parameters is analyzed to accomplish accuracy.

III. PROPOSED SYSTEM

The ultimate goal of blood cell segmentation is to take out the cells from complicated background and to section every cell into morphological mechanism such as nucleus, cytoplasm, and a number of others. Clustering techniques classify the pixels with same characteristics into one cluster, thus form different clusters according to coherence between pixels in a cluster. Image clustering is a means for description of image content. Because of its simplicity and efficiency, clustering approach were one of the first techniques second-hand for the segmentation of (textured) natural images

Clustering is partitioning a group of data points into a set of non-overlapped clusters. The resultant image of these techniques is compared and analyzed. The resultant image using the best performance technique among the three is applied to the mean shift algorithm to take away the background noise for better segmentation with no applying any filtering process. All processes have been applied with canny edge detector to highlight the cell boundaries for better presentation

IV. SYSTEM ARCHITECTURE



We can detect the leukemia from the microscopic image to get better the accuracy and reduce the time to detect than the manual approach. So many lives can be saved by with the proposed automated come within reach of of leukemia detection.

V.CONCLUSION

The main offer an mechanical system which can detect the leukemia on or after the microscopic image to perk up the accuracy and reduce the time to detect than the blue-collar approach. So many lives can be saved by by the future mechanical draw near of leukemia detection

VI.REFERENCES

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