

DETECTION OF LEUKEMIA USING MATLAB

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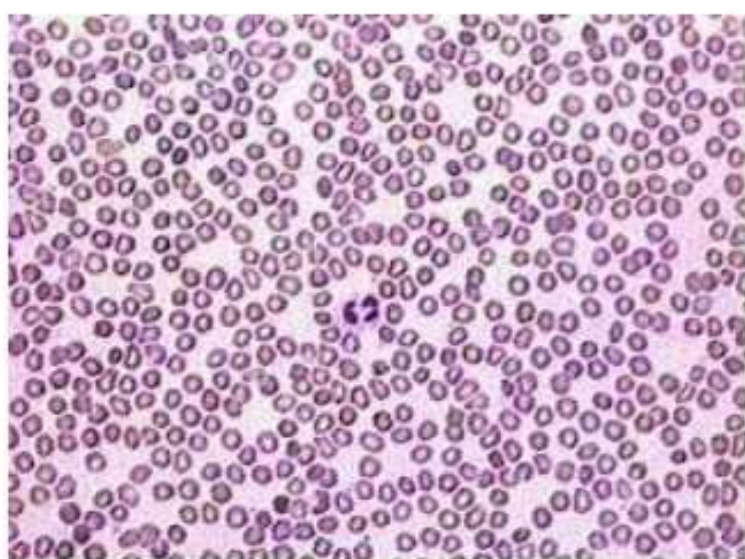
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Abstract- Leukemia disease is one of the leading causes of death among humans. Its cure rate and prognosis depend mainly on the early detection and diagnosis of the disease. Now, identification of blood disorders is through visual inspection of microscopic images by examining changes like texture, geometry, colour and statistical analysis of images. This paper describes a preliminary study of developing a detection of leukemia types using microscopic blood sample images. Image analyzing is very important role play in the diseases of leukemia can be detected and diagnosed at earlier stage. Images are used as they are cheap and do not require expensive testing and lab equipment. In this paper used detection of leukemia cells in the normal blood cells using MATLAB.

Keywords: Blood cells images, MATLAB

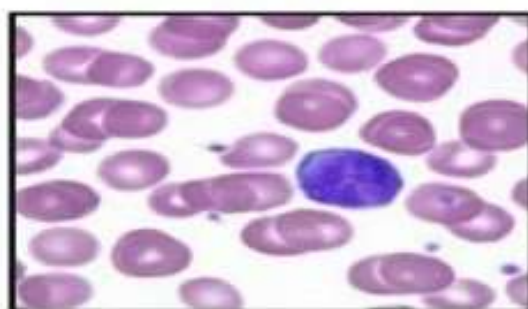
INTRODUCTION Leukemia is a type of cancer that affects the white blood cells. This affected white blood cells capture the bone marrow and the bone marrow is the soft material inside the of most bone. The abnormal white blood cells stay in bone marrow and reproducing in an uncontrolled way. In this way the normal healthy white blood cells in converted to abnormal uncontrolled cells the effect of this thing is human body is less able to fight off infections. The abnormal white blood cells also affect red blood cells and platelets. This affected red blood cells leads to less oxygen being delivered to the organs and tissues of your body it cause anaemia, and it can make to feel tired and breathless to the patient.. And affected platelets due to abnormal cells can lead to problems with the blood-clotting system, and results in bleeding and bruising much more easily than usual



In initial stage identification of the leukemia type, greatly aids in providing the appropriate treatment for the particular type. Its detection of leukemia starts with a complete blood count. If the count blood cells are abnormal, the patient is suggested to consult the doctors. Therefore, to confirm the presence of leukemic cells, a study of morphological bone marrow and peripheral blood slide analysis is done. In order to classify the abnormal cells in their particular types and subtype of leukemia, a haematologist will observe some cells under a light microscopy looking for the abnormalities presented in the nucleus or cytoplasm of the cells. The clinical behaviour of the disease can be predicted using this classification and accordingly treatment should be given to the patient. In leukemia disease, large numbers of abnormal white blood cells are produced by bone marrow due to unknown cause. In pathology manual detection of leukemia is done which is time consuming as well as costly due to high cost pathology instruments. Hence automatic technique is adopted for fast and accurate results. In this technique image of blood sample is processed and nucleus part is segmented and finally cells are classified whether they are blast or normal one.

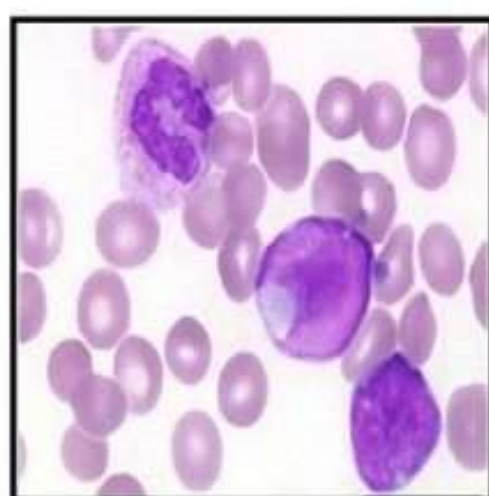
Types of Leukemia: Leukemia type based on the speed of disease develops in the human body and spreading quickly captures the human body. In generally there are two types of leukemia chronic leukemia and acute leukemia.

I. Chronic Lymphocytic Leukemia – Chronic Lymphocytic Leukemia – Chronic Lymphocytic Leukemia generally catch the older patients that mean that person who suffer last twenty to twenty-five the patient of blood pressure, diabetes this types of disease, meaning of this thing is the person whose age is more than fifty year occurs this types of leukemia. In initial stage this leukemia is not any symptoms so patient not find the leukemia in initial stage. If patient create problems like as weakness, fatigue, and weight loss patient immediately visit the doctors. Chronic Lymphocytic Leukemia cells shown in figure



Chronic Lymphocytic Leukemia (CLL)

2. Acute leukemia: The acute leukemia cells cannot do any kind of the work to normal white blood cells. In acute leukemia the number of leukemia cells increases rapidly and very quickly rich the last stage of patient that mean medical science and doctors not help the patient to fight the leukemia.



Acute Lymphocytic Leukemia (ALL)

FUNDAMENTAL STEPS IN IMAGE PROCESSING

Image Acquisition: Generally image involves pre-processing such as scaling and acquiring an image in digital form.

Image Enhancement: Enhancement is to process an image so that the result is more suitable than the original image.

Image Restoration: The principal goal of restoration techniques is to improve an image in some predefined sense. It deals with improving the appearance of an image.

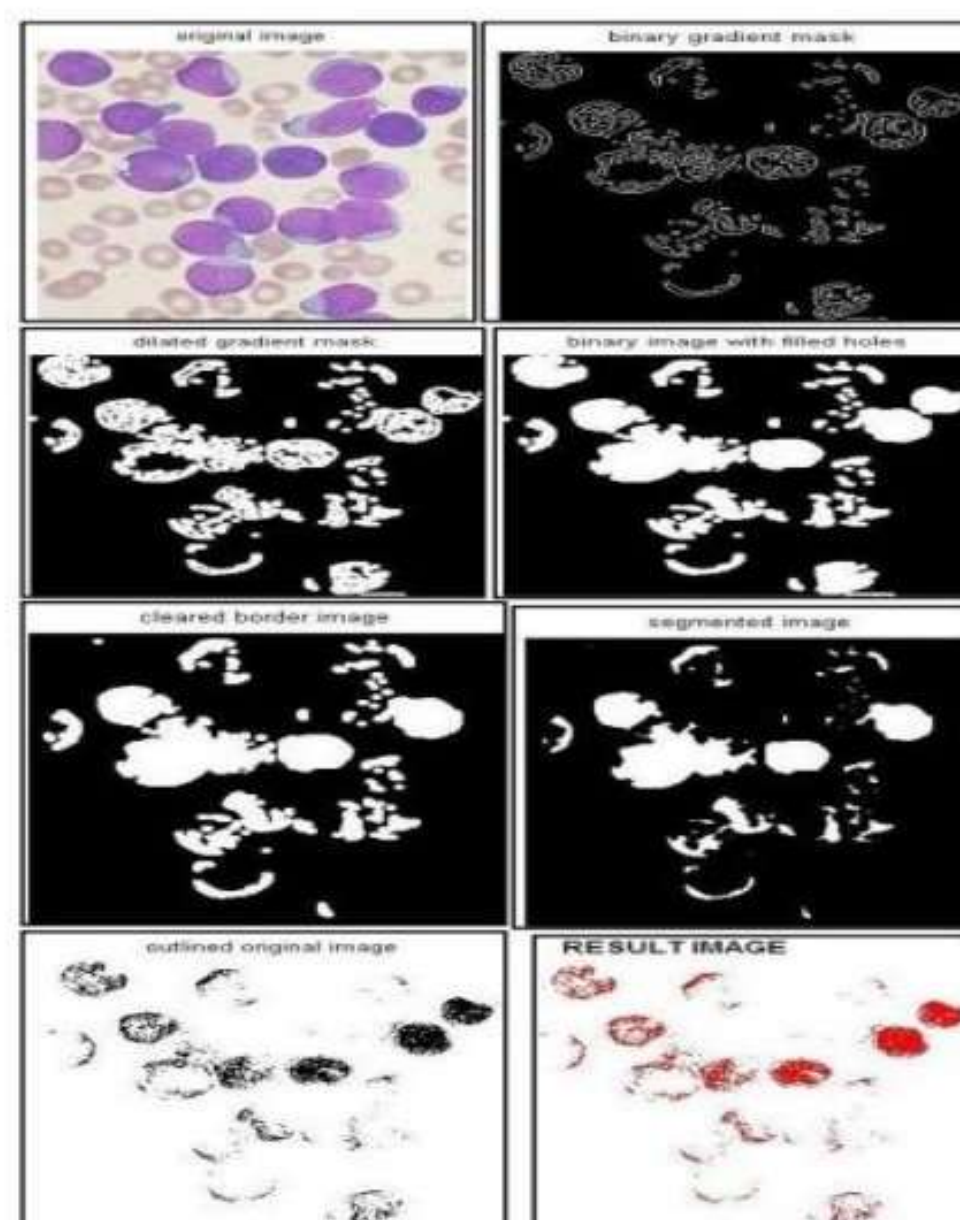
Image Compression: Compression refers to the process of reducing the amount of data required to represent a given quantity of information.

Image Segmentation: Segmentation subdivides an image into its constituent regions or objects. Segmentation is the procedure partition an image into its constituent parts or objects. The level to which the subdivision is carried depends on the problem being solved.

Colour Image Processing: Adding colour to grey scale image so as to improve description of the image and better human perception.

DESIGN The design of this project cost is very less due to the use of basic methods like clustering segmentation, for edge detection and morphological methods such as erosion and dilation for smoothing.

All these methods are low cost and simple and give us the desired output if applied in the correct sequence and in the correct way with appropriate parameters. Initially we discuss the fundamental steps for making the image more suitable for human perception and comprehension. Once we get a more detailed and descriptive image, we perform a set of operations on the image so as to predict the presence of Lymph oblasts in the collection of cells in our given sample and we try to extract that cell using morphological methods. We perform processes such as scaling, noise correction, threshold, edge detection, geometric feature extraction etc.



CONCLUSION: Above explain method use only detection of leukemia in human blood cells. In this method blood cell image processing segmentation, deletion, fill hole and clear border operations are used to obtain the edge of the cancerous blood cell. Pathological tests are costly and timely, so this process is not use for every month or short duration. Using this method process of testing is easy chip, if suspected cells are obtain then go to laboratory and check all test under the doctors observation.

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