Automatic Red Blood Cell Counting using Watershed Segmentation

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Team Peaky Builders

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Github Repo Link

https://github.com/Digital-Image-Processing-IIITH/dip-project-peaky-builders

Paper referred for the project

http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.447.8010&rep=rep1&type=pdf

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Overview

Red blood cells, also referred to as red cells, red blood corpuscles, haematids, erythroid cells or erythrocytes, are the most common type of blood cell and the vertebrate's principal means of delivering oxygen to the body tissues—via blood flow through the circulatory system. A blood test is used to evaluate our overall health and detect a wide range of disorders, including anemia, infection and leukemia. Manual counting with the help of a microscope gives an unreliable and inaccurate result depending on the clinical laboratory technician's skill. Through the paper we would implement an efficient and cost effective computer vision system for automatic red blood cell counting using image based analysis.

Goals

In the field of biomedicine, because of the cell's complex nature, it still remains a challenging task to segment cells from its background and count them automatically. Our goal is to create a system to count red blood cells (RBCs) automatically by analyzing blood cell images collected from a microscopic imaging system. So, we will make use of the properties of the blood cells like texture, color, size and morphology of the nucleus and use Image segmentation method (Otsu's approach) and a counting method for counting the number of blood cells present in the sample.

Intricacies

We will apply picture division to portray the area shape, like limits, skeletons and texture.Thresholding is one of the strategies to concentrate and portion the item from the background.After applying thresholding the picture changes over into a parallel picture.

Edge recognition performs ineffectively on cell division for blood, subsequently we apply iterative Otsu's methodology dependent on roundabout histogram for the leukocyte division. It can likewise be utilized for shading picture segmentation.Color pictures are an extremely rich source of data,since they give a superior portrayal of a scene when contrasted with grayscale pictures.

We will utilize the outcome from a few morphological procedure on RBC division result furthermore, angle size as a cover with the watershed calculation to shape a marker-controlled watershed calculation to decide the quantity of RBC alongside the Hough change procedure. We will utilize MATLAB/python as our essential language and we will execute every one of the fundamental angles utilizing them. There are a few methods referenced in the paper, with each enjoying unmistakable benefits and disservices. We will go through them, and with the legitimate calculation, we will distinguish and section red blood cells and gauge the quantity of red platelets.

Approximate Timeline

- 10 Nov- 13 Nov: In depth research of topic
- 14 Nov- 23 Nov: Implement codes for those processing techniques and try to get best results possible.
- 24 Nov-29 Nov: Testing with Image and generation of the optimal results.

- 29 Nov- 3rd December : Creation of the demo/report and work on the demonstration of the project and final presentation.

- Presentation.