

Cell image processing concept :

(To be implemented using OpenCV)

To obtain the total cell count :

- Flowchart : Refer cellCountFlowchart.jpg
- Algorithm :
 1. Import the image of the cell group.
 2. Using a pre-coded HSV limit finding tool, find the limits of the cell colour range.
 3. Filter the colours on the image to separate the background from the cells.
 4. Improve the contrast on the image by eliminating the pixels below threshold value.
 5. Erode the image to remove stray pixel groups that may interfere with the detection of a single blob (cell). i.e.; this step should clearly define the cell borders and separate individual cells from others near them.
 6. Dilate the image to make the remaining blobs more prominent.
 7. Detect the contours.
 8. Filter the contours based on area (as per what is expected from a cell image).
 9. Count the contours that match the parameters
 10. Draw the bounding boxes for these contours.
 11. Display the modified image with the bounding boxes and the cell count

Abnormal cell detection :

- Flowchart : Refer abnormalCellFlowchart.jpg
- Algorithm :
 1. Import the image of the cell group.
 2. Using a pre-coded HSV limit finding tool, find the limits of the cell colour range for the stained abnormal cells.
 3. Filter the colours on the image to isolate only the abnormal cells. Due to the change in hue, this should provide a clear enough image to detect contours on without further processing.
 4. Detect the contours.
 5. Filter the contours based on area (as per what is expected from an abnormal cell image).
 6. Count the contours that match the parameters
 7. Draw the bounding boxes for these contours.
 8. Display the modified image with the bounding boxes and the abnormal cell count