Microscope image measurement with QColor Camera

Standard Operating Procedure
Faculty Supervisor: Prof. Robert White, Mechanical Engineering (x72210)
Safety Office: Peter Nowak x73246 (Just dial this directly on any campus phone.)
**   (617)627-3246 (From off-campus or from a cell phone)**
Tufts Emergency Medical Services are at x66911.

For more information on the program ImageJ and on plug-ins for the software see:
http://rsb.info.nih.gov/ij/

Revised: October 16, 2007

1.0 Material Requirements:

    1.1 Equipment: Fisher brand microscope with attached color CCD camera, Dell computer with video capture card and "Image J" software

    1.2 Personal Protective Equipment: Nitrile gloves and eye shields (standard cleanroom protective equipment to be worn at all times while in the cleanroom)

2.0 Procedure:

Take image:

    1. Take an image from microscope as earlier described in the SOP "Microscope Image capture".

    2. Save image (recommendation: save the image with the magnification factor in the filename (e.g. 5x_great_MEMS_ device_1.jpg).

Measure distance:

    1. Start ImageJ (microscope icon on desktop).

    2. Open your previously saved image (File → Open...).

    3. In order to set the pixels /distance ratio, select "Analyze" → "set scale". Enter "distance in pixels" and "know distance" according to the objective used to take the picture (5x, 10x, 20x or 40x). The conversion ratios are found in Table 1 below. *Turn "Global" checkbox on and set units to* um.

    4. In order to measure, left click on the "Straight line selections" button in the toolbar.

    5. Locate curser to the starting point of measurement → left click, hold and drag to the desired end point of measurement. (Note: hold down shift to force the line to be at 90 degrees to the screen)

    6. Select "Analyze" → select "Measure" → window with quantities pops up. (shortcut: Ctrl-m)

Comments:

    1. ImageJ offers a number of other functions (e.g. label…), it is encouraged to further explore the program. Try "Analyze|Tools|Scale bar" to add a scale bar to your image.

    2. ImageJ offers a lot of plug-ins for a variety of image analysis problems (e.g. contact angle measurement…), please visit the website.

Objective	Distance in Pixels	Known Distance (um)	Aspect Ratio
5x	0.822	1	1
10x	1.59	1	1
20x	3.20	1	1
40x	6.24	1	1

These parameters are for the QColor CCD camera with 1x1 binning.