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BME 4783 - Medical Imaging Modalities

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```
clear all
close all
```

File loading

Load an Image into a matrix I.

```
sample = imread('cell12.jpg');
originalSample = sample;

% Convert the Image to grayscale.
sample = rgb2gray(sample);

%% Conditioning parameters.
% Pixel Neighborhood Size for median filter.
nhood = [16 16]; % Note: change each iteration?
% No. times we will median and adaptive histogram filter succesively.
filterCycles = 4;
% Binary thresholding of the grayscale image.
gray2bin = 190;

% Perform the double filtration filterCycles times.
for cycle = 1:filterCycles
    disp(cycle)
    % Apply Median Filtration pixel-wise in a n'hood of dim nhood.
    medFiltLast = medfilt2(sample, nhood);
    % Apply Adaptive Histogram Equalization.
    adaptHistEqLast = adapthisteq(medFiltLast);
    % Set the twice filtered image to be equal to the sample.
    sample = adaptHistEqLast;
end

% Create a black and white image from the grayscale image.
binSample = sample > gray2bin;

% Median Filter the BinSample to remove speckling.
binSampleFiltered = medfilt2(binSample, nhood);
```

1
2
3
4

Image Display and Visualization

```
figure(1)
imshow(originalSample)
title('Original Image')

figure(2)
imshow(medFiltLast)
title('Final Median Filtered Picture')

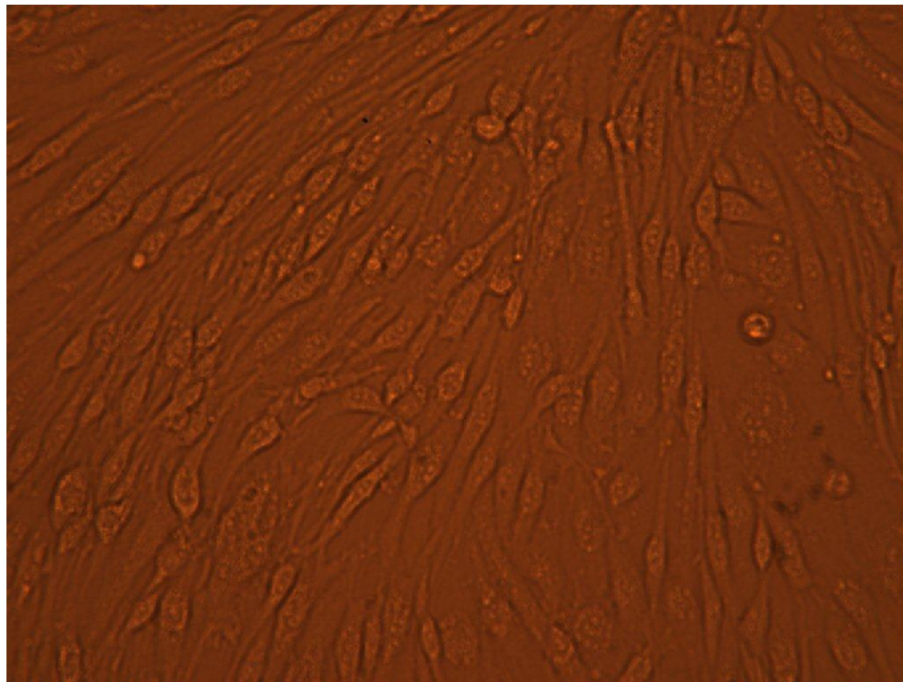
figure(3)
imshow(adaptHistEqLast)
title('Final Adaptive Histogram Equalization Picture')

figure(4)
imshow(binSample);
title('Filtered Image with Binary Thresholding Applied')

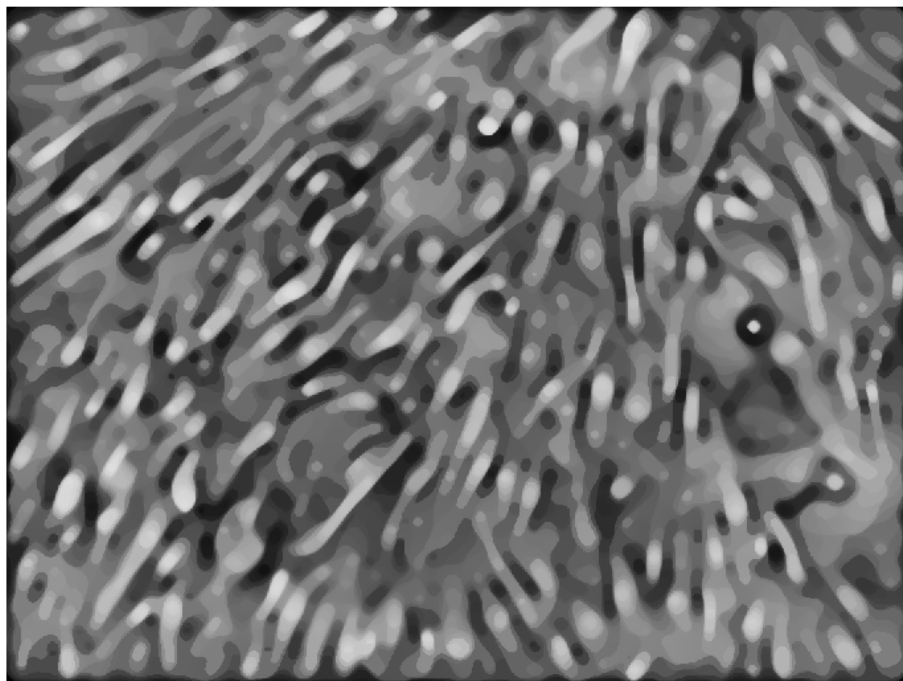
figure(5)
imshow(binSampleFiltered);
title('Filtered Image with Binary Thresholding Applied')
```

Warning: Image is too big to fit on screen; displaying at 67%
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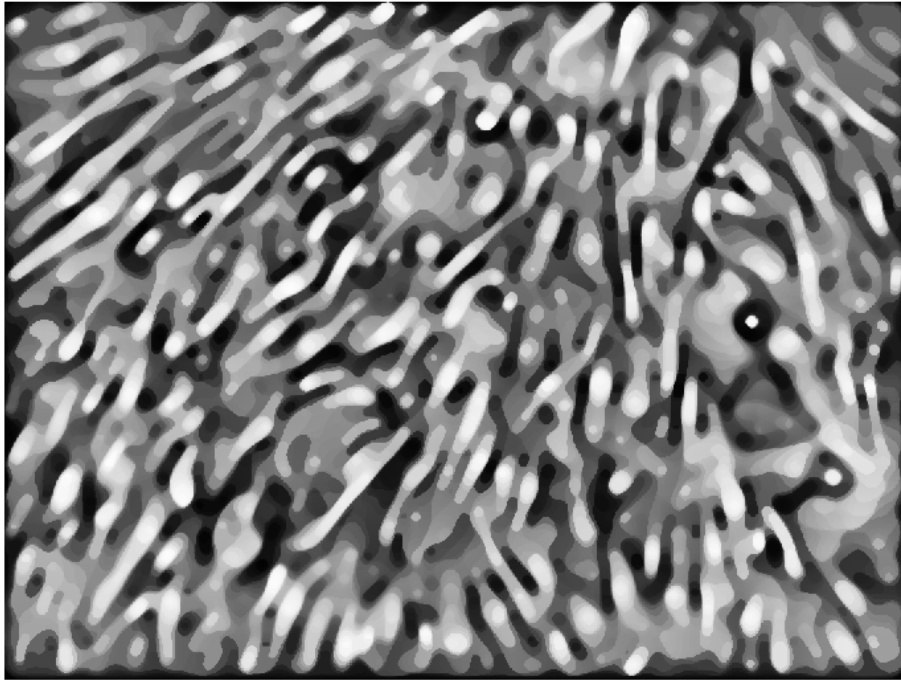
Original Image



Final Median Filtered Picture



Final Adaptive Histogram Equalization Picture



Filtered Image with Binary Thresholding Applied



Filtered Image with Binary Thresholding Applied



Perform the Cell Counting.

```
figure(6)
%B = bwboundaries(binSampleFiltered);
B = bwboundaries(binSampleFiltered);
imshow(originalImage)
title('Original Image with "Found Cells" Overlaid');
text(10,10, strcat( '\color{green}Objects Found:', num2str(length(B))))
hold on

for k = 1:length(B)
    boundary = B{k};
    plot(boundary(:,2), boundary(:,1), 'g', 'LineWidth', 0.4)
end
```

Undefined function or variable 'originalImage'.

*Error in ==> IterativeFiltration at 71
imshow(originalImage)*

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