clc;

%clear all;

close all;

%%

myDir = fullfile(pwd, '.\BloodSnearImages')

imgSet = imageSet(myDir)

methods(imgSet)

%%

togglefig('Blood Snear Images');

ax = gobjects(imgSet.Count,1);

for ii = 1 : imgSet.Count

ax(ii) = subplot(floor(sqrt(imgSet.Count)), ceil(sqrt(imgSet.Count)), ii);

[~, currName] = fileparts(imgSet.ImageLocation{ii});

imshow(read(imgSet,ii))

title([num2str(ii),')' currName], 'interpreter', 'none', 'fontsize',7);

end

expandAxes(ax);

targetImagNum = 9;

togglefig('Blood Snear Images');

[~, imName] = fileparts(imgSet.ImageLocation{targetImagNum});

set(ax, 'xcolor', 'r', 'ycolor', 'r', 'xtick', [], 'ytick', [], 'linewidth', 2, 'visible', 'off');

set(ax(targetImagNum), 'visible', 'on');

targetImage = getimage(ax(targetImagNum));

togglefig('Target Image')

clf

imshow(targetImage)

title(imName,'interpreter','none','fontsize',12);

%%

togglefig('Exploration',true) %Automatically clear the figure

grayscale = rgb2gray(targetImage);

imshow(grayscale)

%

wsImg = watershed(grayscale);

showMaskAsOverlay(0.80001, wsImg==0, 'g')

title('Classic "Oversegmentation"','fontsize',14);

%%

togglefig('Cell Mask',true)

clf

ax3(1) = subplot(1,2,1);

ds = 3;

surf(im2double(grayscale(1:ds:end,1:ds:end)));

shading interp;

rotate3d on

set(gca,'view',[0 90],...

'xlim',[0 400],'ylim',[0 335],'zlim',[0.3 1])

title('Original Grayscale','fontsize',12)

drawnow

% IMHMIN:

newGrayscale = imhmin(grayscale,13);

ax3(2) = subplot(1,2,2);

surf(im2double(newGrayscale(1:ds:end,1:ds:end)));

shading interp

rotate3d on

set(gca,'view',[0 90],...

'xlim',[0 400],'ylim',[0 335],'zlim',[0.3 1])

title('Grayscale with Suppressed Minima','fontsize',12)

linkprop(ax3,'view');

colormap(flipud(parula));

%%

togglefig('Exploration')

newGrayscale = imhmin(grayscale,25);

wsImg = watershed(newGrayscale);

showMaskAsOverlay(1,wsImg == 0, 'g');

title('Better Separation of cells','fontsize',14);

%%

togglefig('Cell Mask',true)

cellMask = segmentImageFcn(targetImage);

cellMask = bwareaopen(cellMask,30);

imshow(cellMask);

%%

togglefig('Cell Mask',true)

wsEdges = wsImg == 0;

wsEdges = bwareaopen(wsEdges,200,8);

cellMask(wsEdges) = 0;

imshow(cellMask);

%%

togglefig('Blood Snear Images')

for ii = 1:imgSet.Count

tmpMask = refinedMask2(imgSet,ii);

showMaskAsOverlay(0.5,tmpMask,'g',true,ax(ii))

drawnow

end

expandAxes(ax);