%% Measuring Diameter of circle in an image

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clc;close all;

%% Import image

obj=imread('images.jpeg');

imshow(obj)

%% Segment Image

red=obj(:,:,1);

green=obj(:,:,2);

blue=obj(:,:,3);

figure(1)

subplot(2,2,1);

imshow(obj);

title('Original Image');

subplot(2,2,2);

imshow(red);

title('Red Plane');

subplot(2,2,3);

imshow(green);

title('Green Plane');

subplot(2,2,4);

imshow(blue);

title('Blue Plane');

%% Threshold the blue plane

figure(2)

level=0.37;

bw2=im2bw(blue,level);

subplot(2,2,1);

imshow(bw2);

title('Blue Plane threshholded');

%% Remove Noise

%%Fill any holes

fill=imfill(bw2,'holes');

subplot(2,2,2);

imshow(obj);

title('Holes filled');

%%Remove any blobs on the border of the image

clear=imclearborder(fill);

subplot(2,2,3);

imshow(clear);

title('Remove blobs on border');

%% Remove blobs that are smaller than 7 pixels across

se=strel('disk',7);

open=imopen(fill,se);

subplot(2,2,4);

imshow(open);

title('Remove small blobs');

%% Measure Object Diameter

diameter=regionprops(open,'MajorAxisLength')

%%Show Result

figure(3)

imshow(obj)

d=imdistline; %includes line to physically measure the ball