

# Image Thresholding Practice

## Problem 1

How can you enhance the provided code to accurately draw circles around all blue pucks in the image (images used for this problem are Puck\_1.png, Puck\_2.png, and Puck\_3.png)?

```
% Clear the command window and workspace to start fresh
clc;
clear;

% Ask the user for the filename of the image they want to process
%this requires the filepath to be entered in the command window below, for
%instance for "Puck_1" you would copy and paste its file path -> "/MATLAB
%Drive/MATLAB - Section 06 (Teacher - File Share)/Section 06 - Part 2 -
%Image Thresholding/Data - Part 2/Puck_1.png"
filename = input('Enter the filename: ', 's');

% Read the image file
image = imread(filename);

% Get the dimensions of the image: height, width, and color channels
[height, width, color] = size(image);

% Initialize a binary mask to identify certain colors in the image
binary = false(height, width);

% Initialize variables for calculating centroid and area
row = 0;
col = 0;
count = 0;

% Iterate through each pixel in the image
for ii = 1:height
    for jj = 1:width

        % Extract the red, green, and blue color components of the pixel
        red = image(ii, jj, 1);
        green = image(ii, jj, 2);
        blue = image(ii, jj, 3);

        % Check if the pixel's color falls within a certain range
        if red > 0 && red < 65 && green > 30 && green < 100 && blue > 90 &&
blue < 170

            % If the color matches, set the corresponding pixel in the
binary mask to true
            binary(ii, jj) = 1;

            % Update variables for calculating centroid and area
```

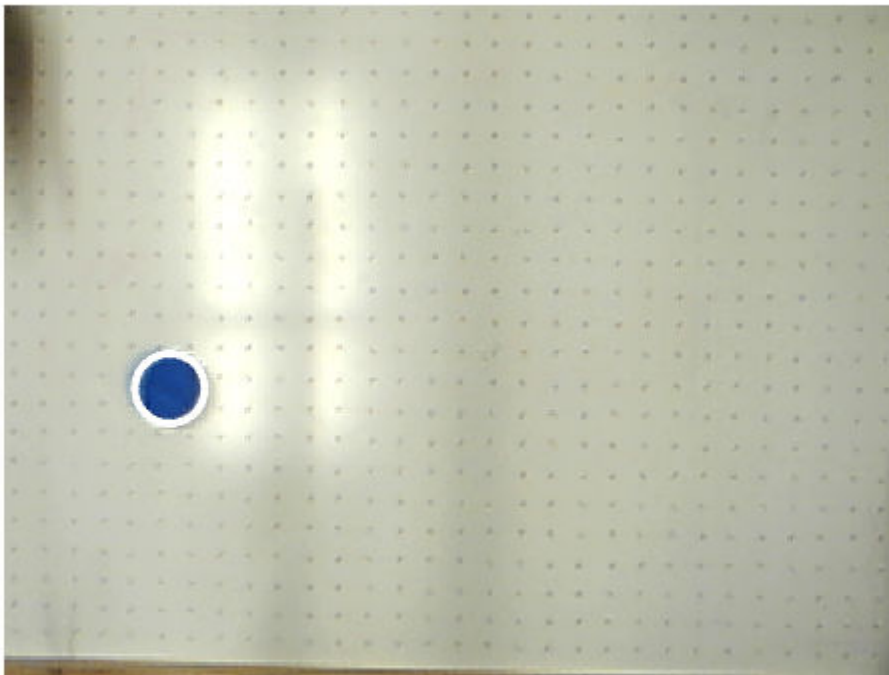
```

        row = row + ii;
        col = col + jj;
        count = count + 1;
    end
end
end

% Calculate centroid coordinates and radius based on the identified pixels
row = row / count;
col = col / count;
radius = sqrt(count / pi);
radius = 1.15 * radius;
centers = [col, row];

% Display the original image with identified circles overlaid
h1 = figure(1);
imshow(image)
h = viscircles(centers, radius, 'color', 'w');

```



```

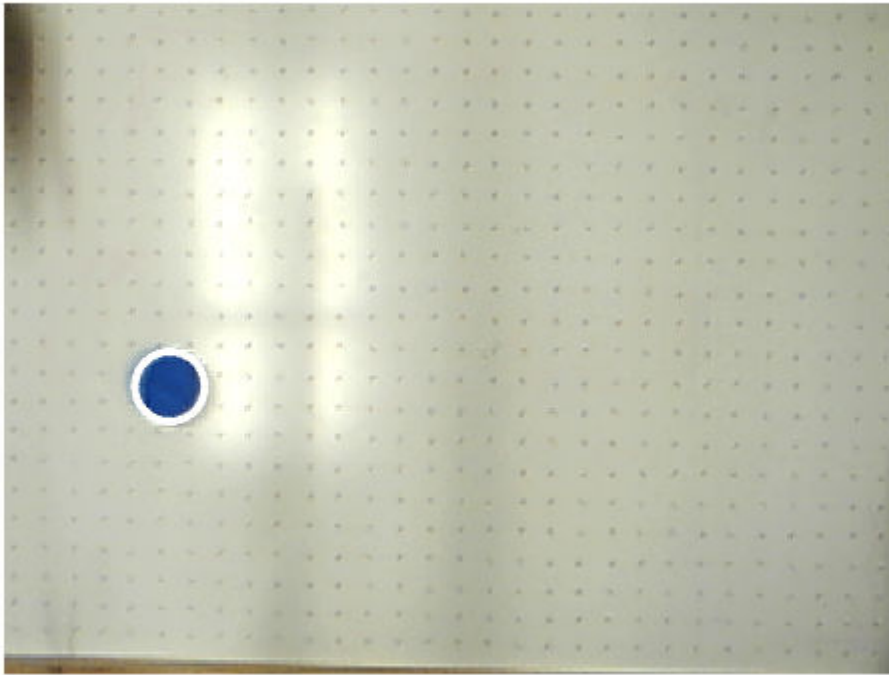
% Store centroid coordinates and radius in a cell array
var1 = {centers, radius};

```

```
% Save the outlined image to a new file
new_file = [filename(1:end-4) 'Outline.png'];
fprintf('Outline saved to %s\n', new_file);
```

Outline saved to /MATLAB Drive/MATLAB - Section 06 (Teacher - File Share)/Section 06 - Part 2 - Image Thre

```
imwrite(getframe(h1).cdata, new_file);
```



## Problem 2

Can you create a program to generate an German flag using code (It should be 900 pixels wide and 300 pixels long)?

```
% Create an empty matrix 'pix' of size 300x900x3 with data type uint8
pix = uint8(zeros(300,900,3));

% Set the red stripe: Assign the maximum intensity value (255) to the red
color channels
% for all rows and columns from 301 to 600
pix(101:200, :, 1)= 255;
```

```
% Set the yellow stripe: Assign the maximum intensity value (255) to the red
and green channels (1st and 2nd dimension)
% for all rows and columns from 601 to 900
pix(201:300, :, 1:2)=255;

% Display the generated image
imshow(pix)
```



```
% Save the generated image as 'Flag.png'
imwrite(pix, 'Flag.png');
```