Politechnika Śląska

Przetwarzanie Obrazów Cyfrowych

Raport z ćwiczenia nr. 5:
Studium przypadku - Wyznaczanie cech obiektów

Raport opracował:
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Grupa 6 Semestr 7

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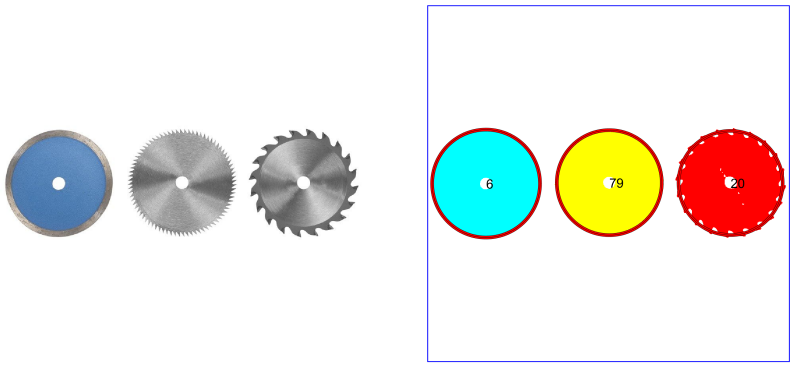

Figure 1: Ilość znalezionych zębów

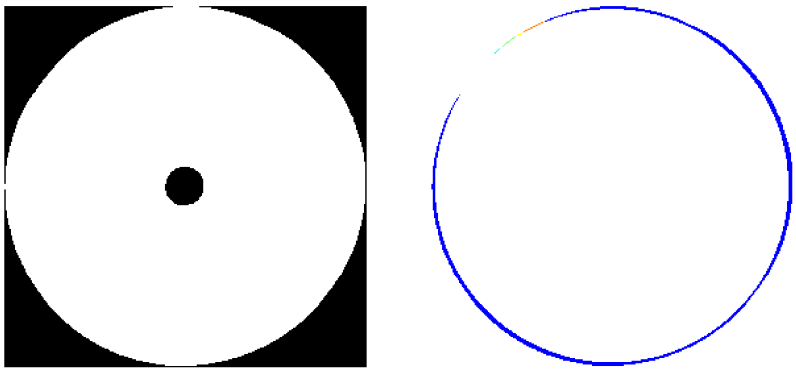

Figure 2: Znalezione zęby

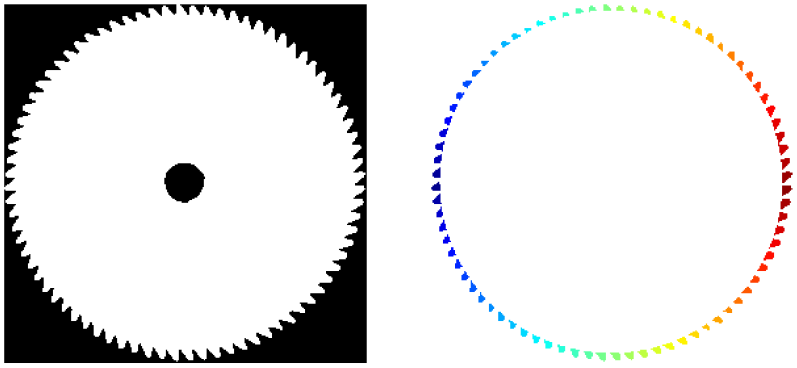

Figure 3: Znalezione zęby

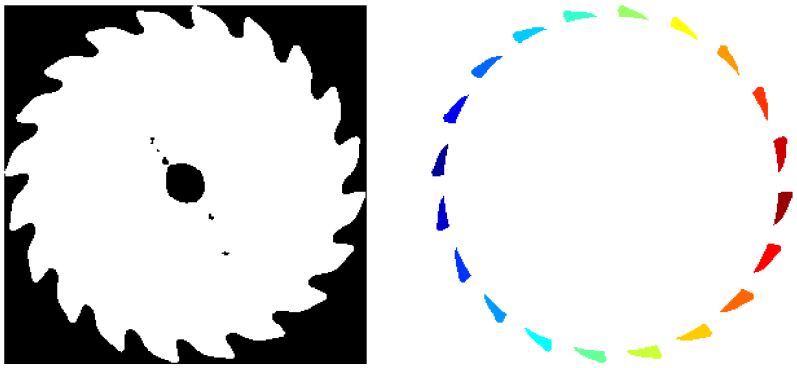

Figure 4: Znalezione zęby

Kody programów

zad1.m

```
clear all
close all
clc

mkdir("../result")


I_orig = imread("..\tarcza\z3.jpg");
I = rgb2gray(I_orig);
I = adapthisteq(I);
I = imfilter(I, fspecial("gaussian", 5, 2));
I = imbinarize(I, 0.9);
I = ~I;

I1 = bwlabel(I);
props = find_props(I);


for index = 1:length(props)
    p = props(index);

    I_cut = imcrop(I, p.BoundingBox);
    center = p.Centroid - p.BoundingBox(1:2);

    result_file = "../result/I" + index + ".png";
    count(index) = find_teeth_count(I_cut, center, p, result_file);

end

%%

disp("Count")
disp(count)

figure('units','normalized','outerposition',[0 0 1 1])
tiledlayout(1,2)
nexttile
imshow(I_orig);
nexttile
imshow(label2rgb(I1));
hold on

for index = 1:length(props)
    p = props(index);

    txt = string(count(index));
    text(p.Centroid(1),p.Centroid(2),txt,'FontSize',20);

    %viscircles(p.Centroid, p.MinorAxisLength/2);
    viscircles(p.Centroid, p.MajorAxisLength/2);
    viscircles(p.Centroid, p.MajorAxisLength/2 * 0.97);
end

```

```
54
55
56
57
58 saveas(gcf,"../result/I.png")
59
60
61 %%
62
63
64 function prop = find_props_with_max(props)
65     [~, index] = max([props.Area]);
66     prop = props(index);
67 end
68
69
70 function prop1 = find_props(I)
71     props = regionprops(I, "all");
72
73     prop1 = [];
74     for i = 1:length(props)
75         if props(i).Area > 10000
76             prop1 = [prop1, props(i)];
77         end
78     end
79
80
81 end
82
83
84
85 function count = find_teeth_count(I, center, props, filename)
86
87    big_r = (props.MajorAxisLength/2);
88    small_r = big_r * 0.97;
89
90    [X,Y] = meshgrid(1:size(I,2),1:size(I,1));
91    X = X - center(1);
92    Y = Y - center(2);
93    Circle = (X.^2 + Y.^2) < (small_r^2);
94    I1 = I & ~Circle;
95
96    figure('units','normalized','outerposition',[0 0 1 1])
97    tiledlayout(1,2);
98    nexttile;
99    imshow(I)
100   nexttile;
101   imshow(label2rgb(bwlabel(I1)));
102
103   count = length(regionprops(I1));
104   saveas(gcf,filename);
105
106 end
```