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BEBEIU17022

Result

Code

clear all

clc

close all

rgb=imread('6.jpg');

gray=rgb2gray(rgb);

gray=imresize(gray,0.2);

rgb=imresize(rgb,0.2);

figure,imshow(gray),impixelinfo

[r c] =size(gray);

for i = 1:r

for j= 1:c

if gray(i,j) > 134 && gray(i,j) < 136 %màu cam ??m,hình vuông

out\_1(i,j) = 255;

%

elseif gray(i,j) > 90 && gray(i,j) < 92 %màu cam nh?t,elip

out\_2(i,j)= 255;

%

elseif gray(i,j) > 125 && gray(i,j) < 127 %màu cam nh?t,elip

out\_3(i,j)= 255;

%

elseif gray(i,j) > 217 && gray(i,j) < 219 %màu cam nh?t,elip

out\_4(i,j)= 255;

else

out\_1(i,j) = 0;

out\_2(i,j) = 0;

out\_3(i,j) = 0;

out\_4(i,j) = 0;

end

end

end

out\_1 = bwareaopen(out\_1,20);

out\_1 = imfill(out\_1,'holes');

out\_2 = bwareaopen(out\_2,20);

out\_2 = imfill(out\_2,'holes');

out\_3 = bwareaopen(out\_3,20);

out\_3 = imfill(out\_3,'holes');

out\_4 = bwareaopen(out\_4,20);

out\_4 = imfill(out\_4,'holes');

figure,imshow(out\_1);

figure,imshow(out\_2);

figure,imshow(out\_3);

figure,imshow(out\_4);

[B\_1,L\_1] = bwboundaries(out\_1,'noholes');

[B\_2,L\_2] = bwboundaries(out\_2,'noholes');

[B\_3,L\_3] = bwboundaries(out\_3,'noholes');

[B\_4,L\_4] = bwboundaries(out\_4,'noholes');

stats\_1 = regionprops(L\_1,'Centroid');

stats\_2 = regionprops(L\_2,'Centroid');

stats\_3 = regionprops(L\_3,'Centroid');

stats\_4 = regionprops(L\_4,'Centroid');

figure,imshow(rgb);

for i=1:length(stats\_1)

text(stats\_1(i).Centroid(1),stats\_1(i).Centroid(2),'GREEN')

end

for i=1:length(stats\_2)

text(stats\_2(i).Centroid(1),stats\_2(i).Centroid(2),'RED')

end

for i=1:length(stats\_3)

text(stats\_3(i).Centroid(1),stats\_3(i).Centroid(2),'BLUE')

end

for i=1:length(stats\_4)

text(stats\_4(i).Centroid(1),stats\_4(i).Centroid(2),'YELLOW')

end

for i=1:r

for j=1:c

if (out\_1(i,j) == 0 && out\_2(i,j) == 0 && out\_3(i,j) == 0 && out\_4(i,j) == 0)

out(i,j)=0;

else

out(i,j)=255;

end

end

end

bw =out;

bw=bwareaopen(out,20);

imfill(out,'holes');

s = regionprops(bw, 'centroid');

%lay area

dt = regionprops(bw, 'area');

%lay perimeter

cv = regionprops(bw, 'perimeter');

dim = size(s);

%lay boundaries X,Y

boundaries = bwboundaries(bw);

for k=1:dim(1)

b= boundaries{k};

dim = size(b);

%Calculate the khoang cach tu centroid to each point at the boundaries

for i=1:dim(1)

khoangcach{k}(1,i) = sqrt ((b(i,2) - s(k).Centroid(1))^2 + (b(i,1) - s(k).Centroid(2))^2 );

end

%detemine the max and min khoang cach

a=max(khoangcach{k});

b=min(khoangcach{k});

%get the area from the prop command

%this is the area based on the number of pixels in the shape\

c=dt(k).Area;

d=cv(k).Perimeter;

%%CIRCLE

tron = round(pi\*a^2);

if ((abs(c-tron)/c)<0.1)

text(s(k).Centroid(1),s(k).Centroid(2)-20,'CIRCLE')

end

%%tam giac

canh\_tamgiac=round(d/3);

S\_tamgiac= round(canh\_tamgiac\*(a+b)/2);

pytago\_tamgiac = sqrt(a\*a-b\*b)

canh2\_tamgiac = canh\_tamgiac/2;

if ((abs(S\_tamgiac-c)/c <0.15) && (abs(pytago\_tamgiac-canh2\_tamgiac)/canh2\_tamgiac < 0.15))

text(s(k).Centroid(1),s(k).Centroid(2)-20,'TRIANGLE')

end

%SQUARE

canh\_square=round(d/4);

square=round(canh\_square\*canh\_square);

othercanh\_square= 2\*sqrt(a\*a-b\*b);

if ((abs(square-c)/c < 0.15) && (abs(othercanh\_square-canh\_square)/othercanh\_square <0.1))

text(s(k).Centroid(1),s(k).Centroid(2)-20,'SQUARE')

end

%%RECTANGLE

canhdai\_rectangle=round(2\*sqrt(a\*a-b\*b))

canhngan\_rectangle=round((d-2\*canhdai\_rectangle)/2);

canhngan\_rectangle2=round(2\*b);

canhdai\_rectangle2=round((d-2\*canhngan\_rectangle2)/2);

dientich\_rectangle=round(canhdai\_rectangle\*canhngan\_rectangle);

dientich\_rectangle2=round(canhdai\_rectangle\*canhngan\_rectangle2);

if ((abs(dientich\_rectangle-c)/c < 0.39) && (canhdai\_rectangle/canhngan\_rectangle>1) && (abs(dientich\_rectangle2-c)/c < 0.2) && (canhdai\_rectangle/canhngan\_rectangle2>1) && (canhdai\_rectangle2/canhngan\_rectangle2>1) && (canhdai\_rectangle2/canhngan\_rectangle2>1) && (abs(canhdai\_rectangle2-canhdai\_rectangle)/canhdai\_rectangle2<0.1)&&(abs(canhngan\_rectangle2-canhngan\_rectangle)/canhngan\_rectangle2<0.3))

text(s(k).Centroid(1),s(k).Centroid(2)-20,'RECTANGLE')

end

%%ELIP

canhdai=a;

canhngan=b;

landa = (a-b)/(a+b);

dientich=a\*b\*pi;

const=1+(3\*(landa^2))/(10+sqrt(4-3\*(landa^2)));

chuvi= pi\*(a+b)\*const;

tron = round(pi\*a^2);

if ((abs(dientich-c)/c <0.1) && (abs(chuvi-d)/d<0.013))

if (abs(tron-c)/c<0.1)

else

text(s(k).Centroid(1),s(k).Centroid(2)-20,'ELIP')

end

end

%%PENTAGON

canh=round(d/5);

canh2=round(2\*sqrt(a^2-b^2));

chuvi=canh\*5;

chuvi2=canh2\*5;

dientich=5\*canh\*b/2;

dientich2=5\*canh2\*b/2;

if (abs(dientich-c)/c<0.1 && abs(chuvi2-d)/d<0.1 && abs(chuvi-d)/d<0.05 && abs(dientich2-c)/c<0.05)

text(s(k).Centroid(1),s(k).Centroid(2)-20,'PENTAGON')

end

%%HEXAGON

canh=round(d/6);

canh2=round(2\*sqrt(a^2-b^2));

chuvi=canh\*6;

chuvi2=canh2\*6;

dientich=6\*canh\*b/2;

dientich2=6\*canh2\*b/2;

if (abs(dientich-c)/c<0.1 && abs(dientich2-c)/c<0.2 && abs(chuvi-d)/d<0.1)

text(s(k).Centroid(1),s(k).Centroid(2)-20,'HEXAGON')

end

end