

# Parmak İzi Minutiae Noktaları MATLAB Kodu :



```
clc,clear all,close all
```

```
resim=imread('parmakizi (3).png');  
resim = 110 < resim; %manuel olarak yapılan bu işlem dilenirse im2bw fonksiyonu ile otomatik yapılabilir.
```

```
inceltme=~bwmorph(resim,'skel',Inf);  
% figure;  
% imshow(inceltme);  
% title('INCELTME');
```

```
s=size(inceltme);
```

```
boyut=3;
```

```
n=(boyut-1)/2;  
r=s(1)+2*n;  
c=s(2)+2*n;  
double temp(r,c);  
gecici=zeros(r,c);  
catallanma=zeros(r,c);  
cikinti=zeros(r,c);  
gecici((n+1):(end-n),(n+1):(end-n))=inceltme(:,:);
```

```
cikti=zeros(r,c,3);
```

```
cikti(:, :, 1) = gecici .* 255;  
cikti(:, :, 2) = gecici .* 255;  
cikti(:, :, 3) = gecici .* 255;  
for x=(n+1+10):(s(1)+n-10)  
    for y=(n+1+10):(s(2)+n-10)  
        e=1;  
        for k=x-n:x+n  
            f=1;  
            for l=y-n:y+n  
                mat(e,f)=gecici(k,l);  
                f=f+1;  
            end  
            e=e+1;  
        end;  
        if(mat(2,2)==0)  
            cikinti(x,y)=sum(sum(~mat));  
            catallanma(x,y)=sum(sum(~mat));  
        end  
    end  
end;  
end;
```

```
[cikinti_x cikinti_y]=find(cikinti==2);  
len=length(cikinti_x);
```

```
for i=1:len  
    cikinti((cikinti_x(i)-3):(cikinti_x(i)+3),(cikinti_y(i)-3),2:3)=0;  
    cikinti((cikinti_x(i)-3):(cikinti_x(i)+3),(cikinti_y(i)+3),2:3)=0;  
    cikinti((cikinti_x(i)-3),(cikinti_y(i)-3):(cikinti_y(i)+3),2:3)=0;  
    cikinti((cikinti_x(i)+3),(cikinti_y(i)-3):(cikinti_y(i)+3),2:3)=0;  
  
    cikinti((cikinti_x(i)-3):(cikinti_x(i)+3),(cikinti_y(i)-3),1)=255;  
    cikinti((cikinti_x(i)-3):(cikinti_x(i)+3),(cikinti_y(i)+3),1)=255;  
    cikinti((cikinti_x(i)-3),(cikinti_y(i)-3):(cikinti_y(i)+3),1)=255;  
    cikinti((cikinti_x(i)+3),(cikinti_y(i)-3):(cikinti_y(i)+3),1)=255;  
end
```

```
[catal_x catal_y]=find(catallanma==4);  
len=length(catal_x);
```

```
for i=1:len  
    cikinti((catal_x(i)-3):(catal_x(i)+3),(catal_y(i)-3),1:2)=0;  
    cikinti((catal_x(i)-3):(catal_x(i)+3),(catal_y(i)+3),1:2)=0;  
    cikinti((catal_x(i)-3),(catal_y(i)-3):(catal_y(i)+3),1:2)=0;  
    cikinti((catal_x(i)+3),(catal_y(i)-3):(catal_y(i)+3),1:2)=0;  
  
    cikinti((catal_x(i)-3):(catal_x(i)+3),(catal_y(i)-3),3)=255;  
    cikinti((catal_x(i)-3):(catal_x(i)+3),(catal_y(i)+3),3)=255;  
    cikinti((catal_x(i)-3),(catal_y(i)-3):(catal_y(i)+3),3)=255;  
    cikinti((catal_x(i)+3),(catal_y(i)-3):(catal_y(i)+3),3)=255;  
end  
figure;imshow(cikti);  
title('Minutiae Noktaları');
```

