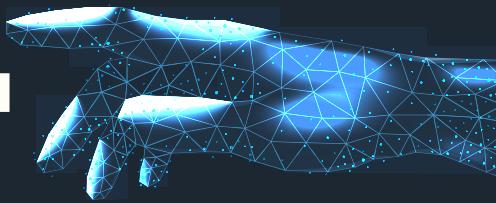


# Parmak İzi Minuate Noktaları

## 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.
```

%İNCELTME (skel ile inceltme yapıldı. istenirse thin ile yapılabilir)

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

s=size(inceltme); % size[m,n] yerine direk size kullanıldı ve boyutlar s(1),s(2) olarak alındı

```
boyut=3; %(MAVİ VE KIRMIZI KARELERİN BOYUTU)

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;
```

```
% ÇIKINTI VE BİTİŞLER
[cikinti_x cikinti_y]=find(cikinti==2);
len=length(cikinti_x);
```

```
%KARELERİ ÇİZDIRME
for i=1:len
    cikti((cikinti_x(i)-3):(cikinti_x(i)+3),(cikinti_y(i)-3),2:3)=0;
    cikti((cikinti_x(i)-3):(cikinti_x(i)+3),(cikinti_y(i)+3),2:3)=0;
    cikti((cikinti_x(i)-3),(cikinti_y(i)-3):(cikinti_y(i)+3),2:3)=0;
    cikti((cikinti_x(i)+3),(cikinti_y(i)-3):(cikinti_y(i)+3),2:3)=0;

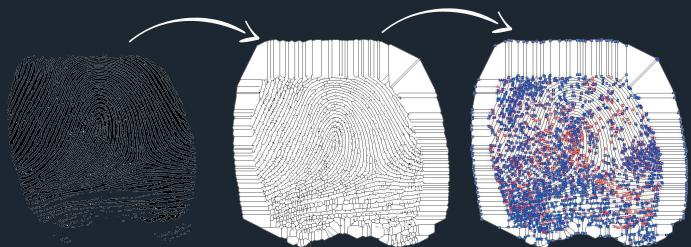
    cikti((cikinti_x(i)-3):(cikinti_x(i)+3),(cikinti_y(i)-3),1)=255;
    cikti((cikinti_x(i)-3):(cikinti_x(i)+3),(cikinti_y(i)+3),1)=255;
    cikti((cikinti_x(i)-3),(cikinti_y(i)-3):(cikinti_y(i)+3),1)=255;
    cikti((cikinti_x(i)+3),(cikinti_y(i)-3):(cikinti_y(i)+3),1)=255;
end
```

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

```
% KARELERİ ÇİZDIRME
for i=1:len
    cikti((catal_x(i)-3):(catal_x(i)+3),(catal_y(i)-3),1:2)=0;
    cikti((catal_x(i)-3):(catal_x(i)+3),(catal_y(i)+3),1:2)=0;
    cikti((catal_x(i)-3),(catal_y(i)-3):(catal_y(i)+3),1:2)=0;
    cikti((catal_x(i)+3),(catal_y(i)-3):(catal_y(i)+3),1:2)=0;
```

```
cikti((catal_x(i)-3):(catal_x(i)+3),(catal_y(i)-3),3)=255;
cikti((catal_x(i)-3):(catal_x(i)+3),(catal_y(i)+3),3)=255;
cikti((catal_x(i)-3),(catal_y(i)-3):(catal_y(i)+3),3)=255;
cikti((catal_x(i)+3),(catal_y(i)-3):(catal_y(i)+3),3)=255;
end
```

```
figure;imshow(cikti);
title('Minutiae Noktaları');
```



<https://github.com/abdullahcicekli>



<https://www.linkedin.com/in/cicekliabdullah/>



[https://www.instagram.com/cicekli\\_abdullah/](https://www.instagram.com/cicekli_abdullah/)