E4

Binarització de la imatge

Threshold global (manual)

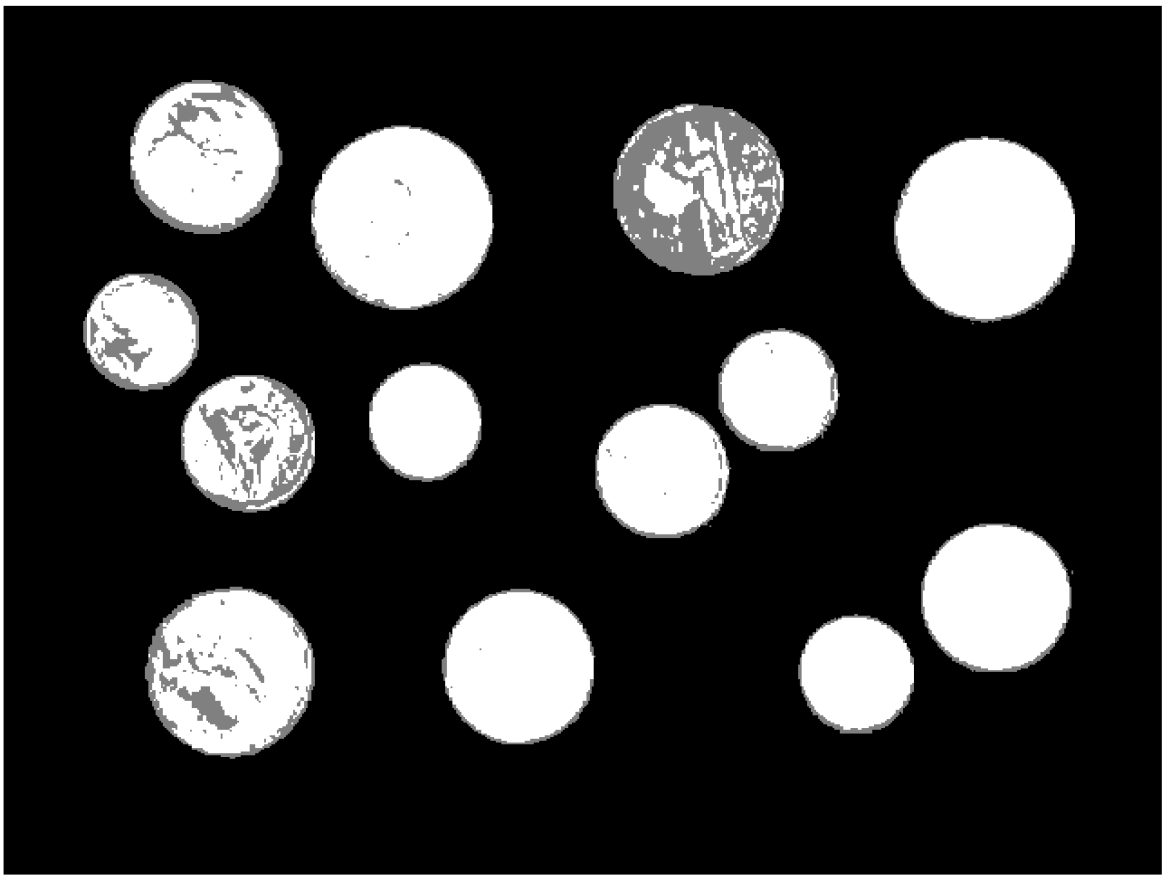
```
I = rgb2gray(imread('Che.jpg'));
imshow(I);
```

```
BW = I > 110;
imshow(BW);
```

Binarització a dos nivells

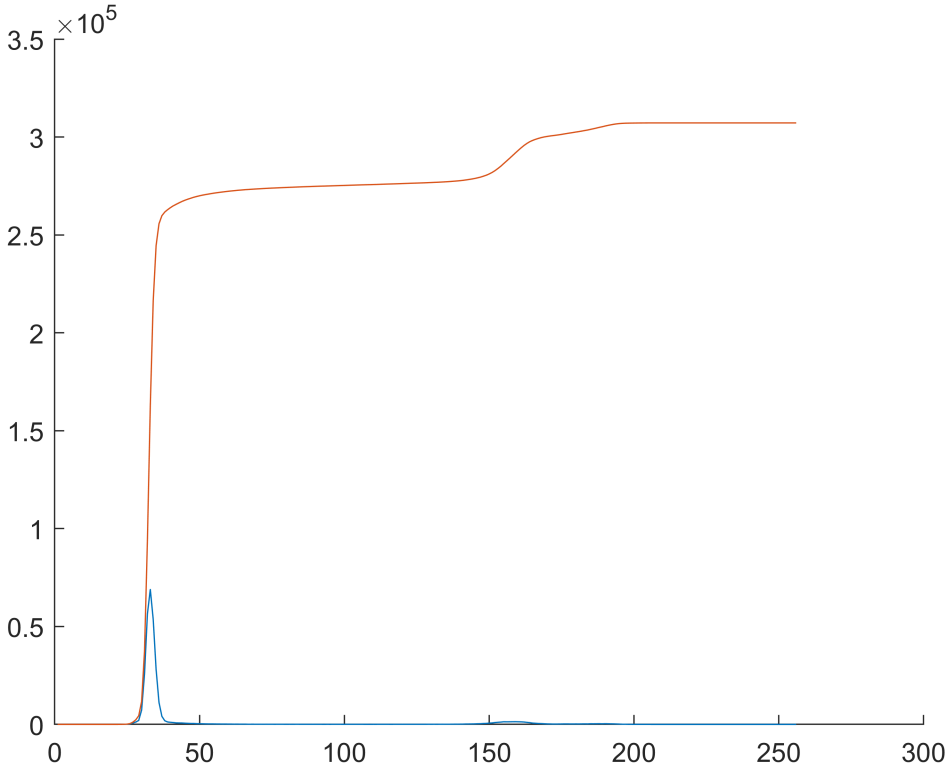
```
I = imread('money.tif');
imshow(I);
```

```
H = I > 150;
L = I < 50;
M = L == H; % a zero tant en L com en H

R = 2*H + M + 0*L;
imshow(R,[]);
```



Binarització per àrea

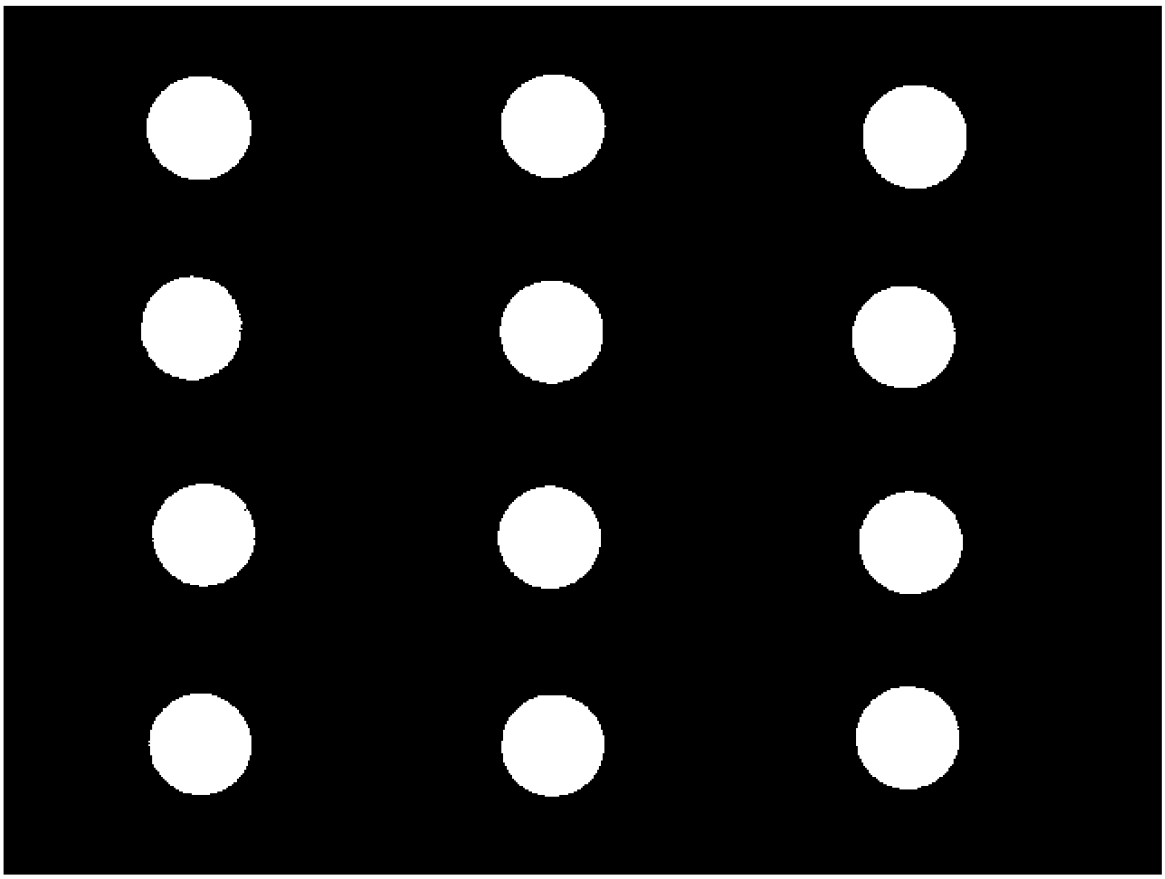
```
I = rgb2gray(imread('Blispac2.tif'));
imshow(I);
d = 95-38;
area_pastilla = pi * (d/2)^2;
area = 12 * area_pastilla;

h = imhist(I);
hacum = cumsum(h); % histograma acomulat
figure
hold on
plot (h)
plot(hacum)
hold off
```

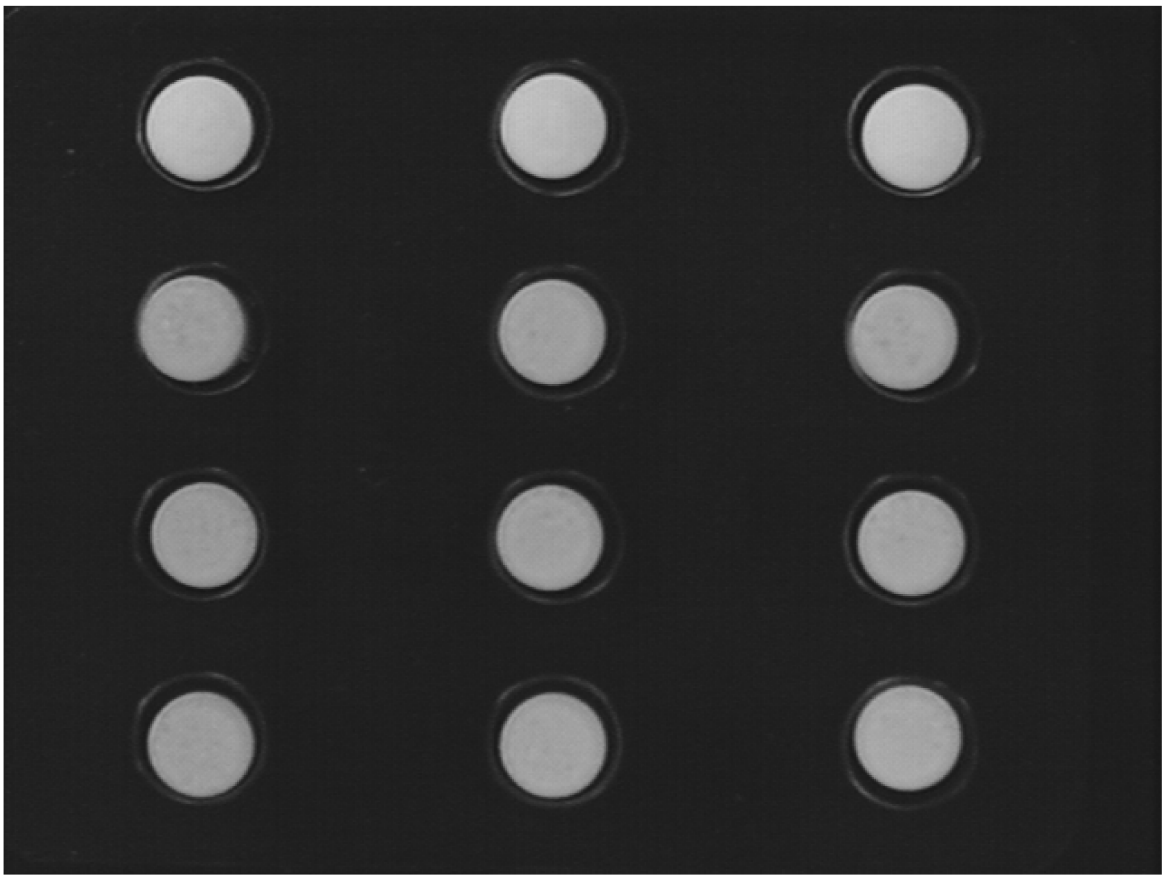



```
for i = 1:size(hacum)
    if (hacum(i) > (f*c-area))
        llindar = i
        break;
    end
end
```

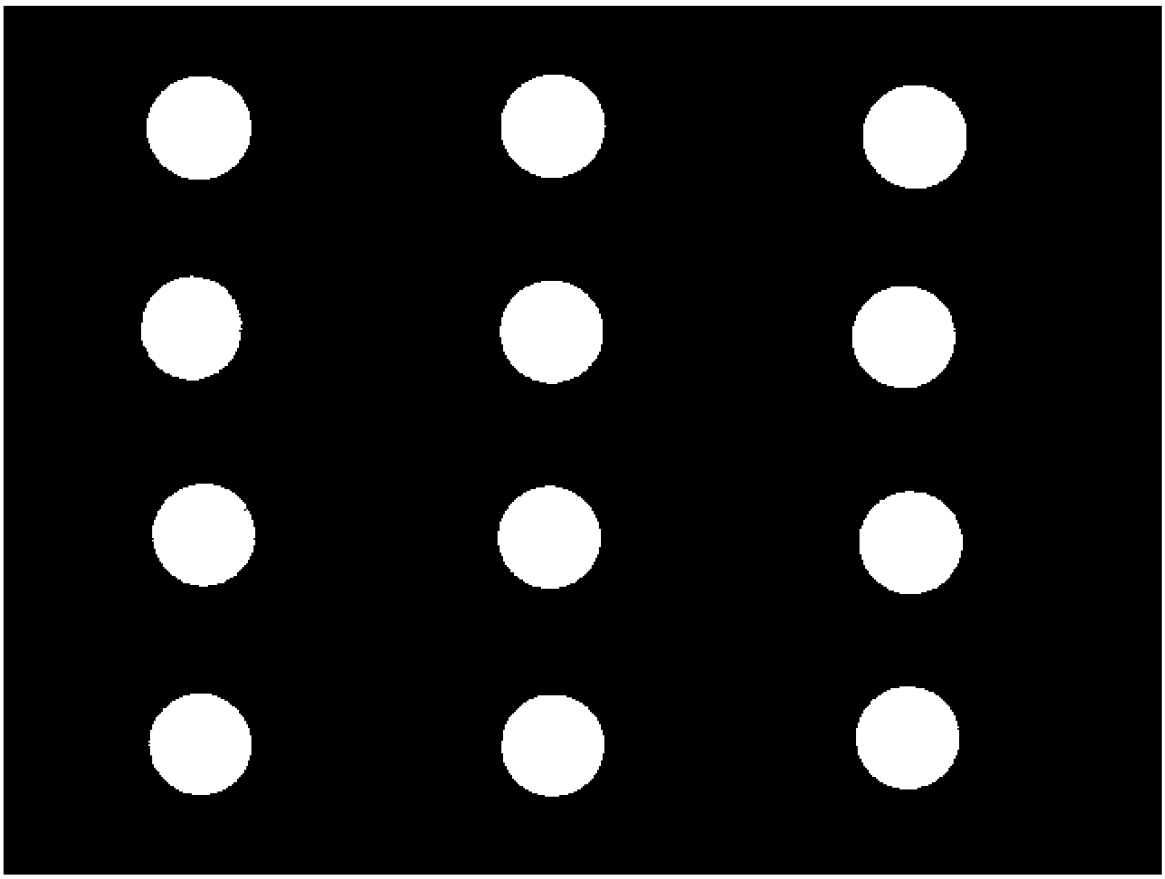
```
llindar = 128
```

```
J = I > llindar;
imshow(J);
```



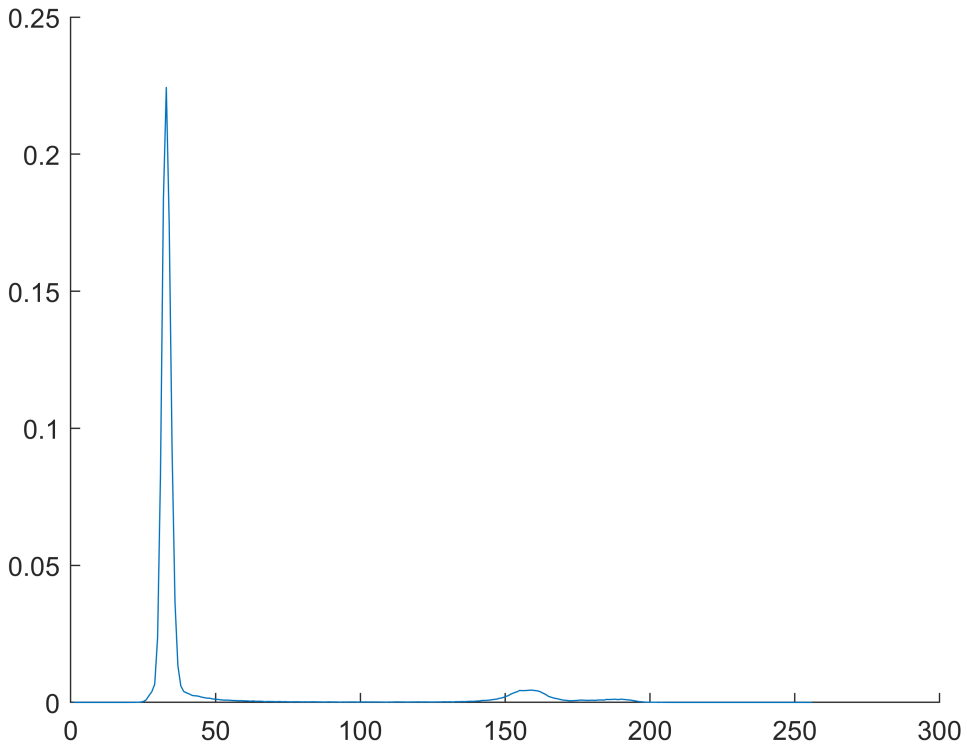


```
[f c] = size(I);
hb = hacum > (f*c-area);
llindar = find(hb,1);

I = I > llindar;
imshow(I);
```

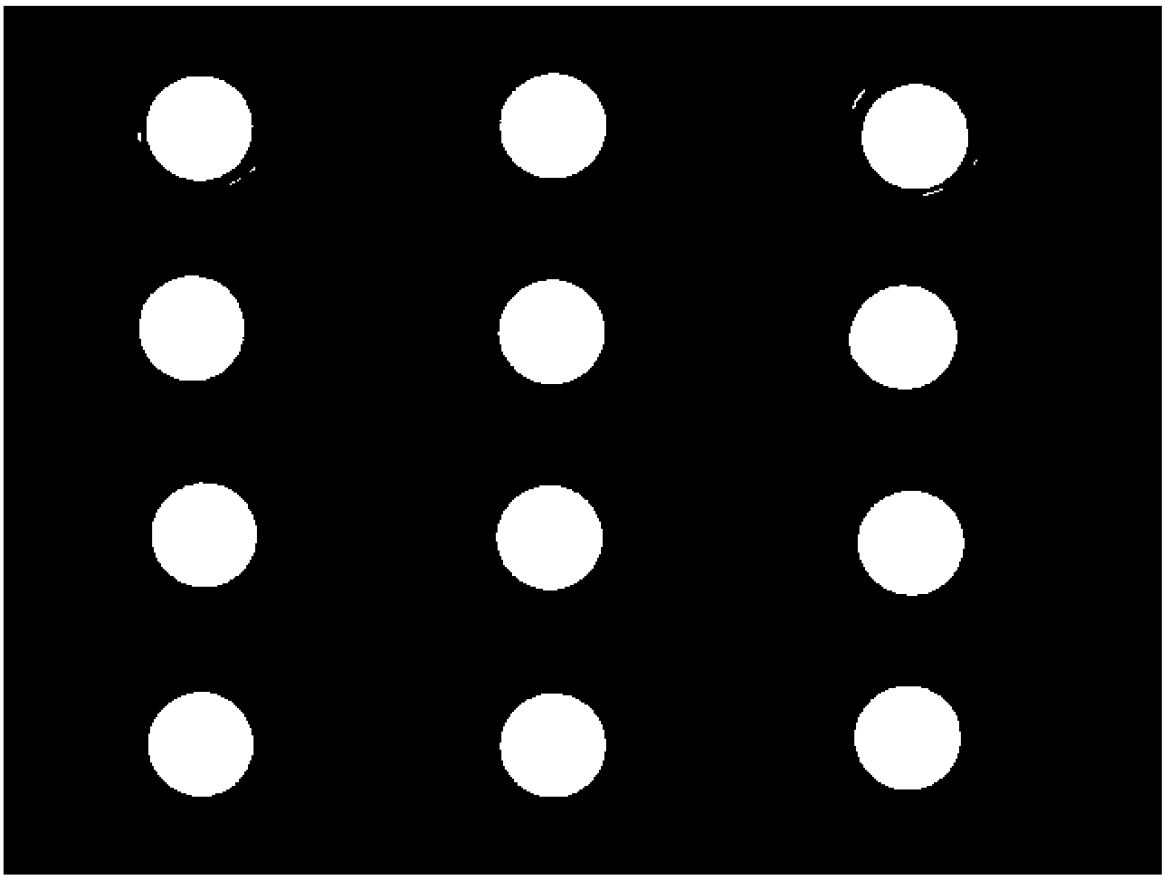


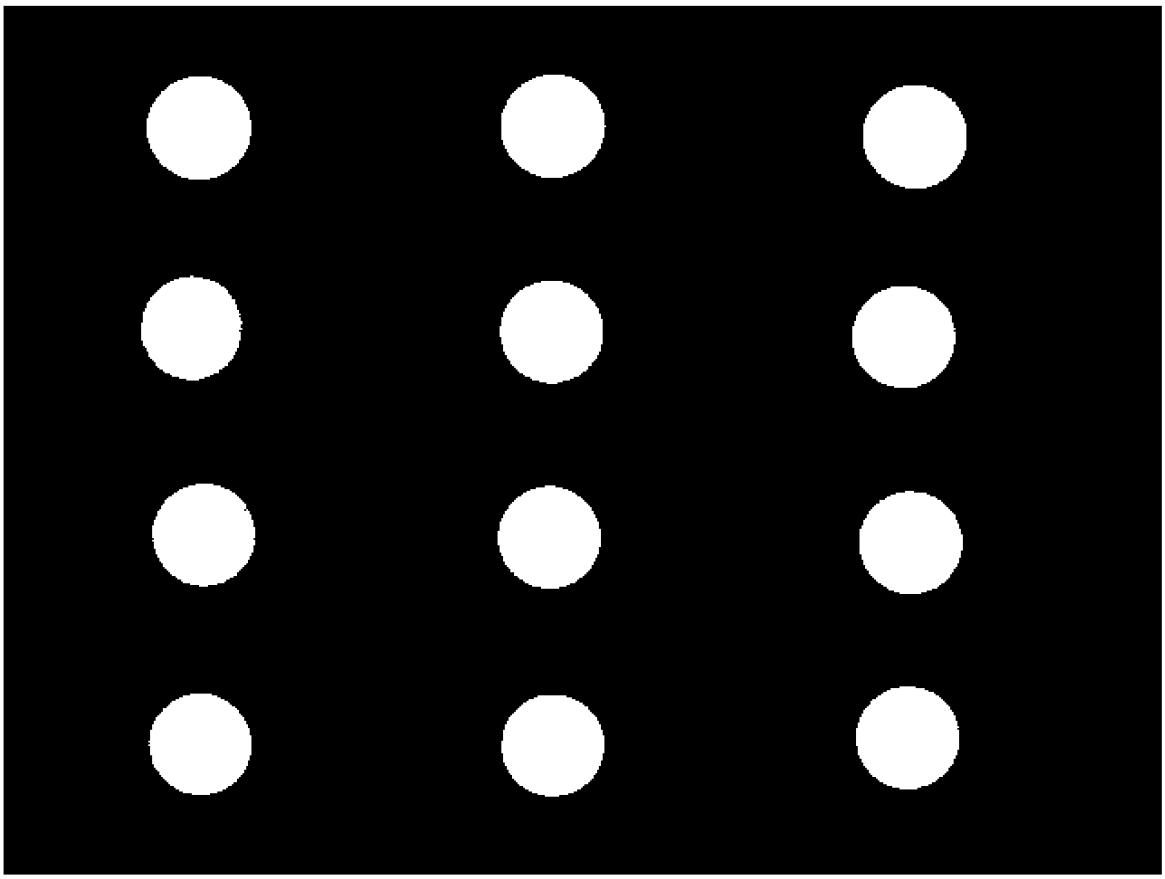
Otsu thresholding

```
I = rgb2gray(imread('Blispac2.tif'));
h = imhist(I);
[f c] = size(I);
p = h/(f*c);

figure
hold on
plot(p)
hold off
```




```
m = (0:255).*p(1:256)';
max = 0;
maxt = 0;
for t = 1:256
    w0 = sum(p(1:t));
    w1 = 1 - w0;
    nyu0 = (sum(m(1:t)))/w0;
    nyu1 = (sum(m(t:256)))/w1;
    ab = w0*w1*(nyu0-nyu1)^2;
    if (ab > max)
        maxt = t;
        max = ab;
    end
end
llindar = maxt;
BW = I > llindar;
imshow(BW);
```





Labelling

```
C = bwconncomp(BW)
```

```
C = struct with fields:
    Connectivity: 8
       ImageSize: [480 640]
      NumObjects: 19
    PixelIdxList: {1×19 cell}
```

```
CBW = BW;
CBW(C.PixelIdxList{5}) = 0;
imshow(CBW)
```