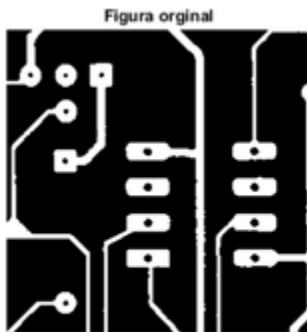

Sesión 10: Angel Prat, Haopeng Lin

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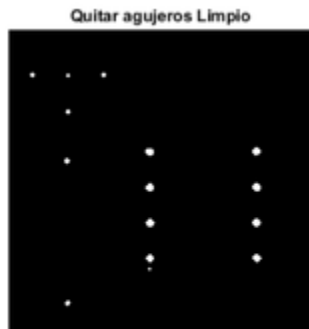
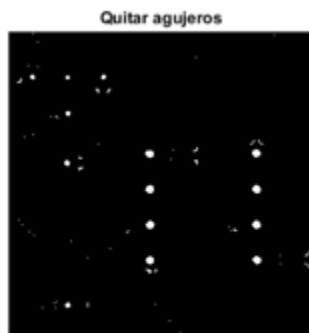
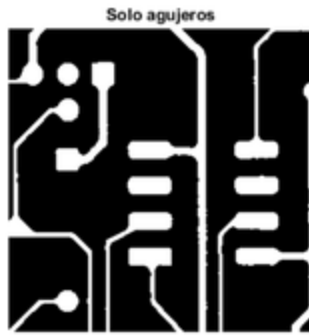
Figura original

```
im = imread('pcblbin.tif');  
figure,imshow(im),title('Figura original')
```



Quitar agujeros

```
ee = strel('disk',4,0);  
sinAgujeros = imclose(im,ee);  
figure,imshow(sinAgujeros),title('Solo agujeros')  
imres = imsubtract(sinAgujeros,im);  
figure,imshow(imres),title('Quitar agujeros')  
  
ee = strel('disk',1,0);  
imres = imopen(imres,ee);  
figure,imshow(imres),title('Quitar agujeros Limpio')
```



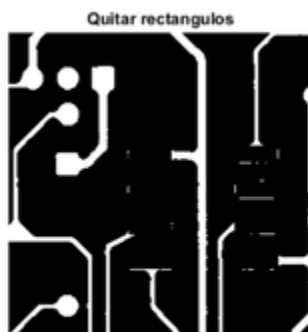
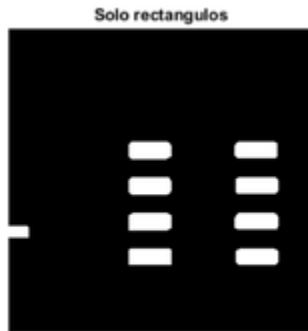
Rectangles

```
ee = strel('rectangle',[9,30]);
rectangulos = imopen(sinAgujeros,ee);
figure,imshow(rectangulos),title('Solo rectangulos')
```

```
% Eliminación de bordes
mark = rectangulos;
mark(2:end-1,2:end-1) = 0;
rec = imreconstruct(mark,rectangulos);
resRectangulos = imsubtract(rectangulos,rec);
```

```
figure,imshow(resRectangulos ),title("Eliminación de bordes rectangulos")

% Limpiar imagen original
im = imsubtract(double(sinAgujeros),double(resRectangulos));
figure,imshow(im,[]),title("Quitar rectangulos")
```

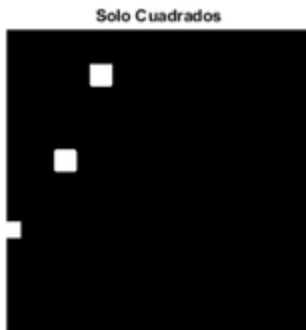


Cuadrados

```
ee = strel('square',14);
cuadrados = imopen(im,ee);
figure,imshow(cuadrados),title('Solo Cuadrados')
```

```
% Eliminación de bordes
mark = cuadrados;
mark(2:end-1,2:end-1) = 0;
rec = imreconstruct(mark,cuadrados);
resCuadrados = imsubtract(cuadrados,rec);
figure,imshow(resCuadrados),title("Eliminación de bordes Cuadrados")

% Limpiar imagen original
im = imsubtract(double(im),double(resCuadrados));
figure,imshow(im,[]),title("Quitar Cuadrados")
```

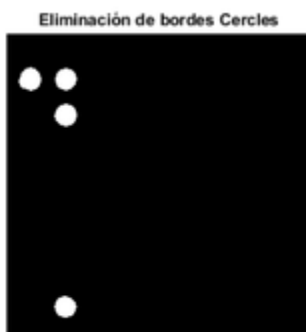
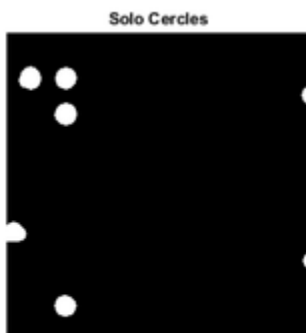


Cercles

```
ee = strel('disk',6,0);
cercles = imopen(im,ee);
figure,imshow(cercles),title('Solo Cercles')

% Eliminación de bordes
mark = cercles;
mark(2:end-1,2:end-1) = 0;
rec = imreconstruct(mark,cercles);
resCercles = imsubtract(cercles,rec);
figure,imshow(resCercles),title('Eliminación de bordes Cercles')

% Limpiar imagen original
im = imsubtract(double(im),double(resCercles));
figure,imshow(im,[],),title('Quitar Cercles')
```





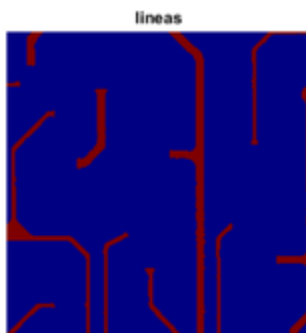
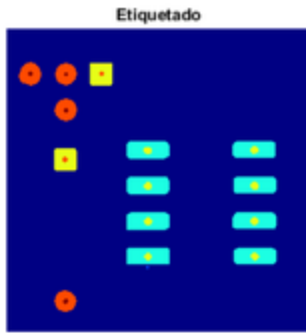
Lineas

```
ee = strel('disk',1,0);  
lineas = imopen(im,ee);  
figure,imshow(lineas),title('Solo Lineas')
```



Etiquetas

```
a = imres + 2*resRectangulos + 3*resCuadrados + 4*resCercles;  
figure,imshow(a,[]),title("Etiquetado"),colormap jet;  
  
figure,imshow(lineas,[]),title("lineas"),colormap jet;
```



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