# Laboratori 11 - Aina Garcia i Martí Ramon

```matlab
im = imread('cameraman.jpg');
bw = edge(im, 'canny');
figure, imshow(bw), title('Canny');

% r = x cosa + y sina
% a -> direccio del gradient
% r -> distancia al origen

[H,alfa,r] = hough(bw);
figure, surf(H);
figure, imshow(mat2gray(H),'XData', alfa, 'YData',
 r, 'InitialMagnification','fit');
xlabel('\alpha')
ylabel('r')
axis on
axis normal
[fila, col] = find(H==max(max(H)));
x = alfa(col);
y = r(fila);
hold on
plot(x,y,'s','color','red');
P= houghpeaks(H,3);
x = alfa(P(:,2));
y = r(P(:,1));
hold on
plot(x,y,'s','color','red');
figure, imshow(im)
lines = houghlines(bw,alfa,r,P);
hold on
for k=1:3
    xy=[lines(k).point1;lines(k).point2];
    plot(xy(:,1),xy(:,2),'Linewidth',2,'Color','green');
end
```

Canny
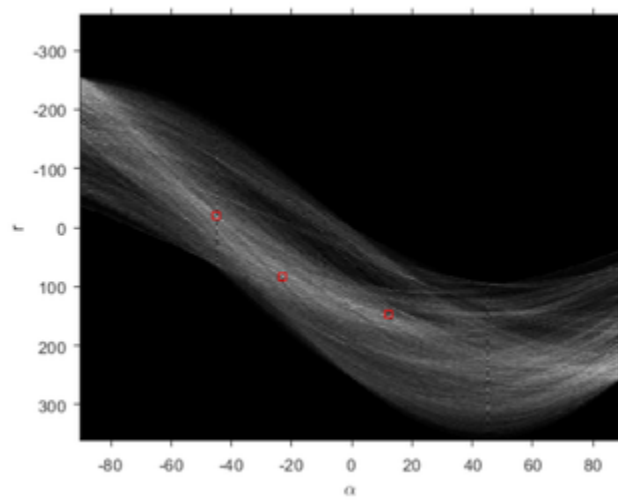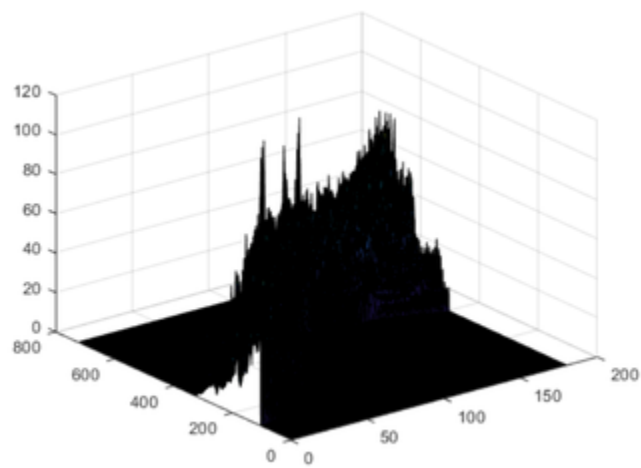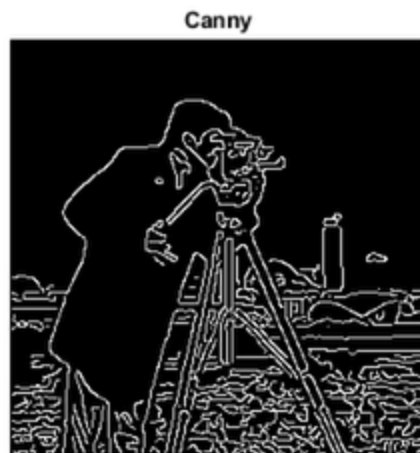
Exercici Harris

```matlab
im = imread('gear.tif');
figure, imshow(im), title('Original');
im = double(im);
k = 0.04;

dx = [-1 0 1; -1 0 1; -1 0 1]; % derivades
dy = dx';
Ix = imfilter(im, dx);
Iy = imfilter(im, dy);

Ix2 = Ix.^2;
Iy2 = Iy.^2;

% g = fspecial('gaussian', 5, 2);
% g = fspecial('sobel');
% g = fspecial('prewitt');
g = fspecial('disk', 3);


R = imfilter(Ix2, g, 'conv').*imfilter(Iy2, g, 'conv')
 - imfilter(Ix.*Iy, g, 'conv').^2 - k .* (imfilter(Ix2,
 g, 'conv')+imfilter(Iy2, g, 'conv')).^2;
figure,imshow(R, []), title('R');
colormap default

peaks = imregionalmax(R);
figure, imshow(peaks), title('peaks');
peaksD = double(peaks);

f = imfuse(im,peaksD);
figure, imshow(f,[]), title('peaks sobre imatge');
```
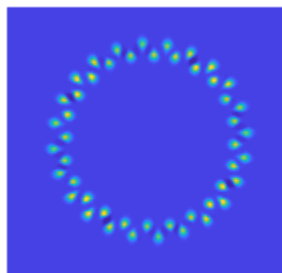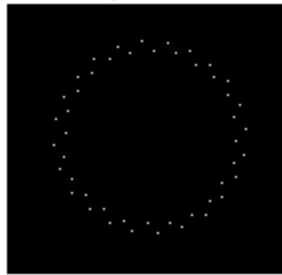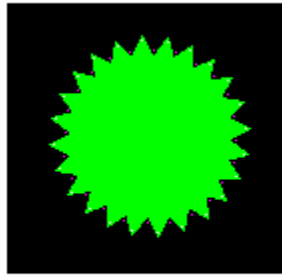
Original

R

peaks

peaks sobre imatge

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