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E5

```
im = imread('gull.tif');
imsp = imnoise(im, 'salt & pepper', 0.2);
figure, imshow(im), title('imatge original')
figure, imshow(imsp), title('soroll s&p')
h = fspecial('gaussian',7,2);
%%Filtrat gaussia
filgaus= imfilter(imsp,h);
figure, imshow(filgaus), title('filtrat gaussia');
```

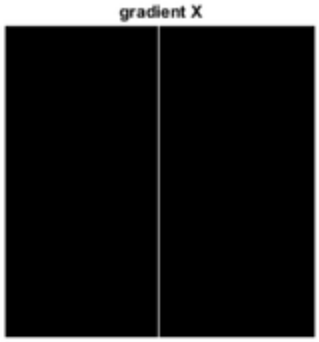
Filtrat mediana

```
filmed = medfilt2(imsp, [5,5]);
figure,imshow(filmed), title('filtrat mediana');
```

Filtrat pasa altes

```
im = zeros(256);
im(:, 128:end)= 1;
figure,imshow(im)
```

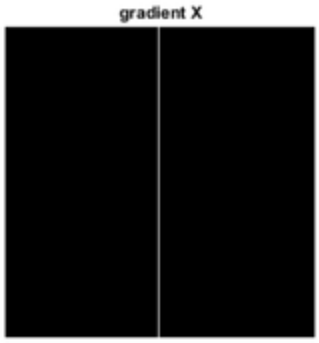
```
Gx = im(:,2:end)-im(:,1:end-1);
figure,imshow(Gx), title('gradient X');
```



Derivada [-1, 0, 1]

```
Mx = [-1, 0,1];
My = [1; 0;-1];
im = imread('rabbit.jpg');
figure, imshow(im), title("imatge original")

imX = imfilter(double(im), Mx);
figure, imshow(imX, []), title("imatge gradient horizontal")
```

```
imY = imfilter(double(im), My);
figure, imshow(imY,[]), title("imatge gradient vertical")
```



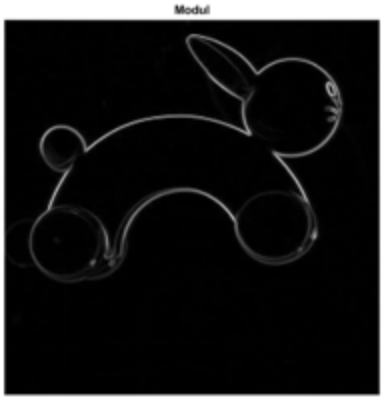
gradient Sobel

```
Sy = fspecial('sobel')/4;
Sx = Sy';

im = double(im);

imYSobel = imfilter(im, Sy);
imXSobel = imfilter(im, Sx);

figure, imshow(imYSobel,[]),title('Gradient Sobel Y')
figure, imshow(imXSobel,[]),title('Gradient Sobel X')

mod= sqrt(imXSobel.^2+imYSobel.^2);
dir= atan2(imXSobel,imYSobel);
figure, imshow(mod,[]),title('Modul')
figure, imshow(dir,[]),title('Direccio')

mask = (mod<4);
figure,imshow(mask,[]), title('poc grandient')

dir(mask) = 0;
figure,imshow(dir,[]), title('Direccio gradient importants')
colormap("parula")

figure,mesh(mod)
```

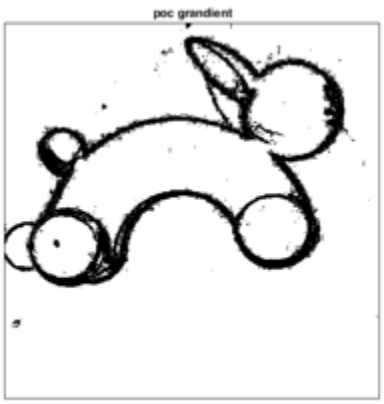

imatge gradient vertical

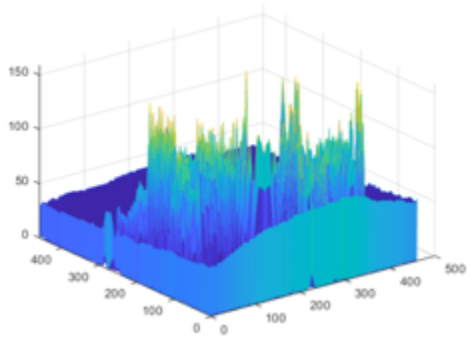

Gradient Sobel Y


Gradient Sobel X


Modul

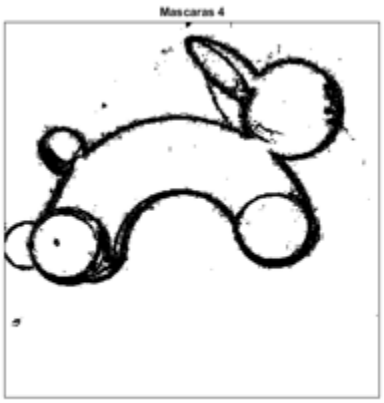

Direccio

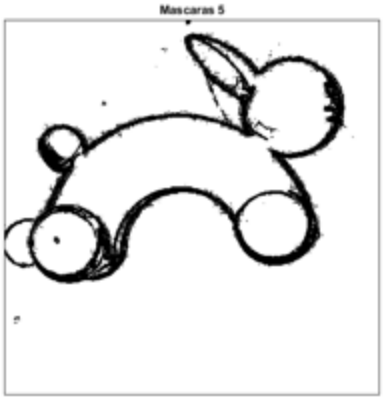

poc grandient

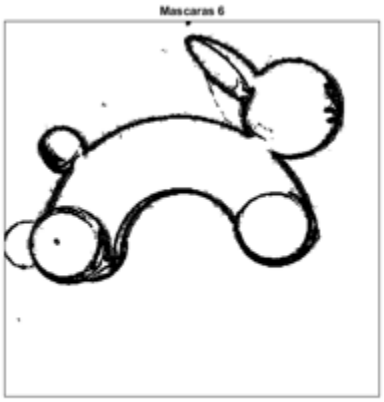


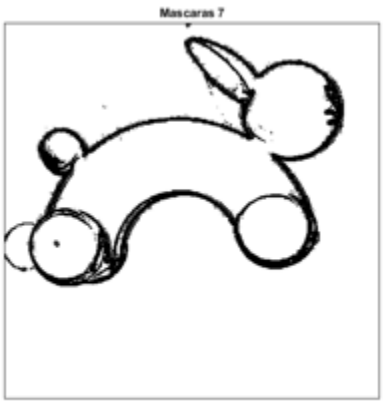
Naive Mask

```
for i = 4:20
    mask = (mod<i);
    figure,imshow(mask,[]),  title(sprintf('Mascaras %d', i));
end
```

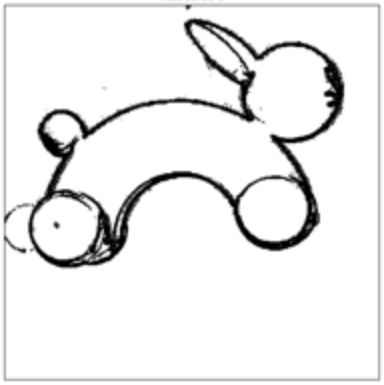



Mascaras 5

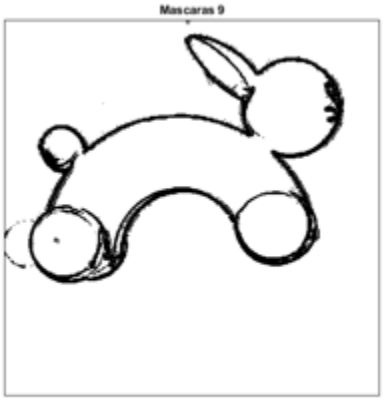

Mascaras 6


Mascaras 7

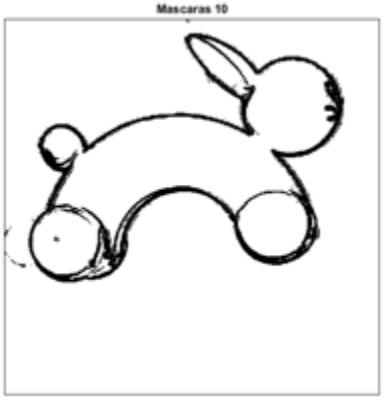
Mascaras 8



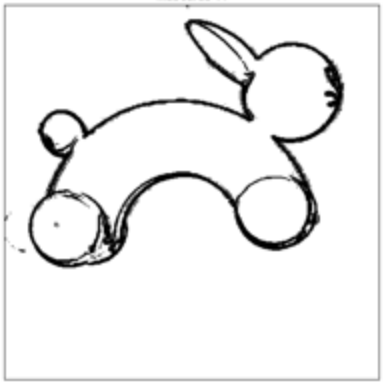
Mascaras 9



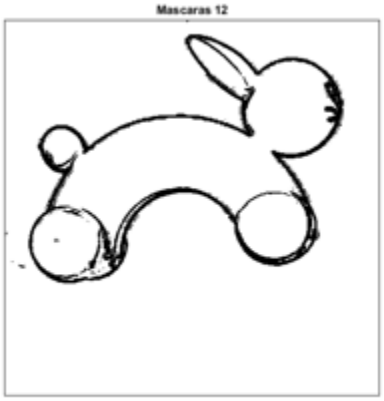
Mascaras 10



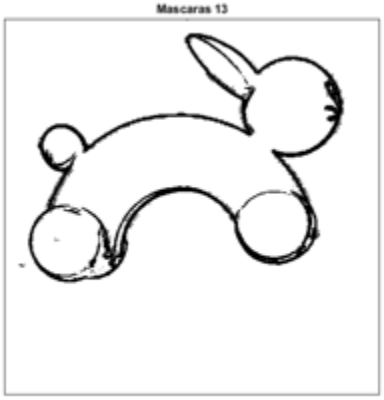
Mascaras 11



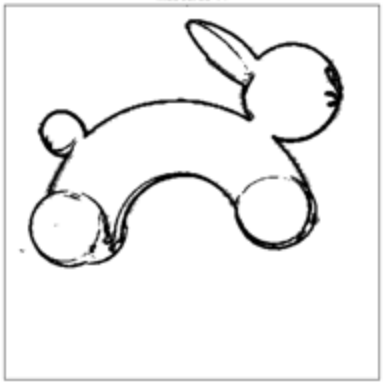
Mascaras 12



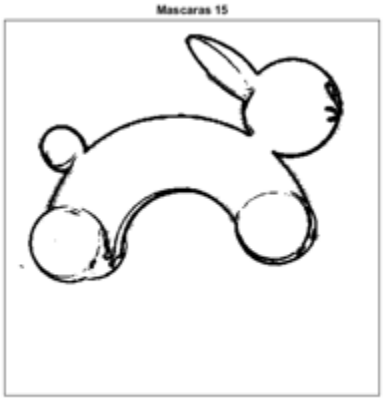
Mascaras 13



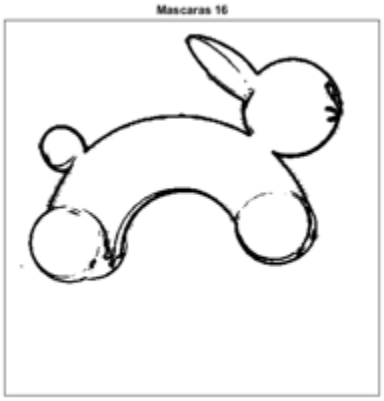
Mascaras 14



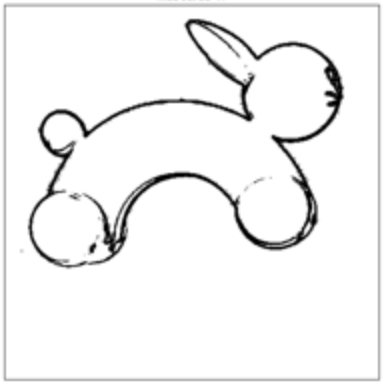
Mascaras 15



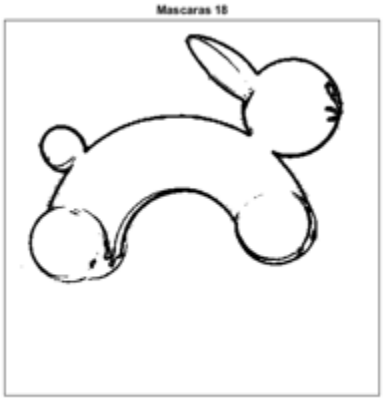
Mascaras 16



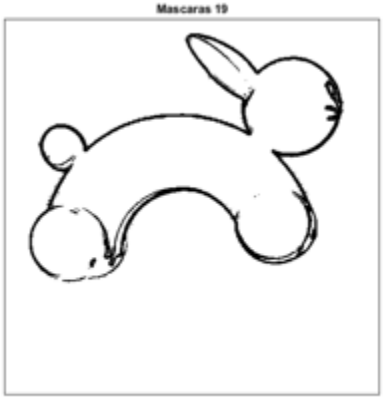
Mascaras 17

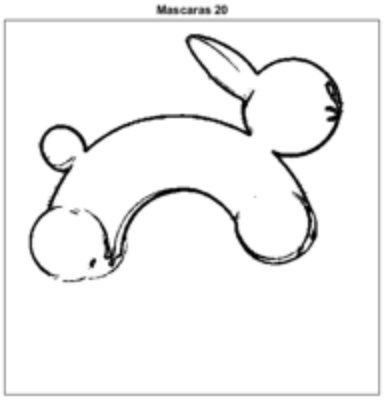


Mascaras 18



Mascaras 19





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