E12

Característiques locals III

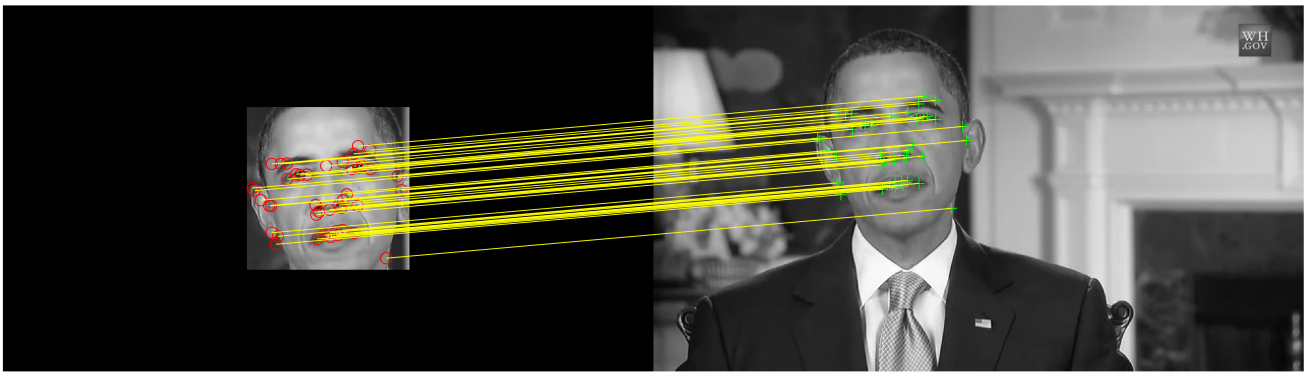
Viola-Jones

```
close all
Detector = vision.CascadeObjectDetector('FrontalFaceCART');
NoseDetector = vision.CascadeObjectDetector('Nose');
vR = VideoReader('Putin.webm');
vR.CurrentTime = 2;
while hasFrame(vR)
    I = readFrame(vR);
    bboxes = step(Detector,I);
    if size(bboxes,1) > 0
        for i = 1:size(bboxes,1)
            I2 = imcrop(I,bboxes(i,:));
            bboxes2 = step(NoseDetector,I2);
            if size(bboxes2,1) > 0
                I = insertShape(I,'Rectangle',bboxes(i,:));
                bboxes2(1,1) = bboxes2(1,1) + bboxes(i,1);
                bboxes2(1,2) = bboxes2(1,2) + bboxes(i,2);
                I = insertShape(I,'Rectangle',bboxes2(1,:));
                break;
            end
        end
    end
    % I = insertShape(I,'Rectangle',bboxes);
    imshow(I);
end
```

SIFT + Viola-Jones

```
close all
Detector = vision.CascadeObjectDetector('FrontalFaceCART');
NoseDetector = vision.CascadeObjectDetector('Nose');
vR = VideoReader('Obama.webm');
vR.CurrentTime = 3;
Im_esc = rgb2gray(readFrame(vR));
bboxes = step(Detector,Im_esc);
Im_obj = imcrop(Im_esc,bboxes);
imshow(Im_obj);
```

```
kp_obj = detectSIFTFeatures(Im_obj);
kp_obj = selectStrongest(kp_obj,50);

kp_esc = detectSIFTFeatures(Im_esc);
kp_esc = selectStrongest(kp_esc,200);

[feat_obj,kp_obj] = extractFeatures(Im_obj,kp_obj);
[feat_esc,kp_esc] = extractFeatures(Im_esc,kp_esc);

pairs = matchFeatures(feat_obj,feat_esc,'MatchThreshold',10);

m_kp_obj = kp_obj(pairs(:,1),:);
m_kp_esc = kp_esc(pairs(:,2),:);

figure
showMatchedFeatures(Im_obj,Im_esc,m_kp_obj,m_kp_esc,"montage");
```



```
T = estimateGeometricTransform2D(m_kp_obj,m_kp_esc,"affine");

[f c] = size(Im_obj);
figure
imshow(Im_obj);
box = [1,1; c,1; c,f; 1,f; 1,1];
hold on
line(box(:,1),box(:,2));
```

```
nbox = transformPointsForward(T,box);

figure
imshow(Im_esc);
hold on
line(nbox(:,1),nbox(:,2));
```


```

```