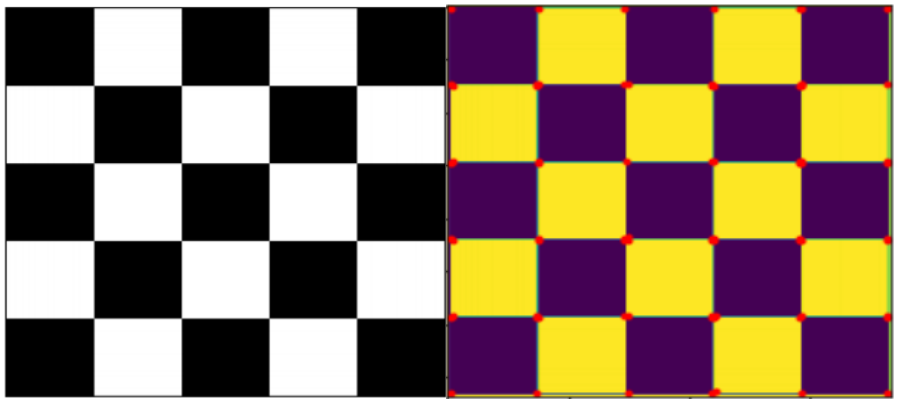
HARRIS CORNER DETECTION

INPUT-OUTPUT: Corner Detection Using Shi-Tomasi Algorithm



Steps Involved:

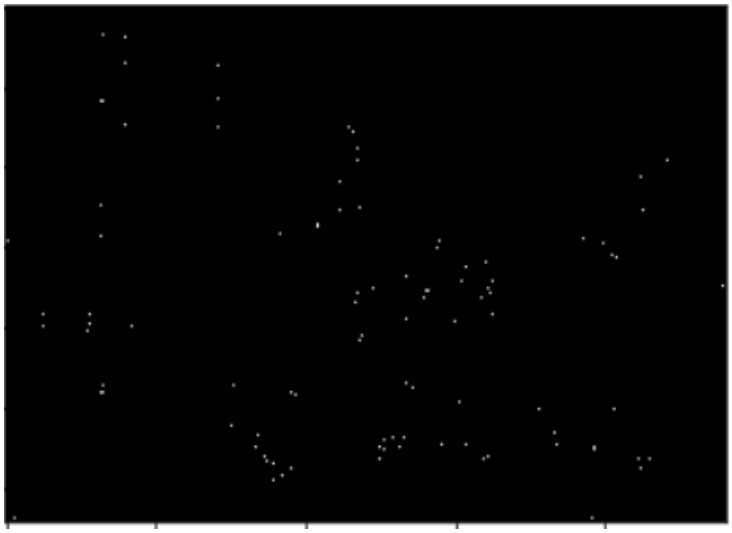
Step 1: Take an image as input

Step 2: We take the image and compute the gradient along both x-direction and y-direction at each point on the image. The function sob() returns the gradients of the image.

Step3: The function shitomasi() impliments the shi-Tomasi algorithm.We take patch of a fixed size and compute the Hessian matrix of the patch. Then the eigen values of the Hessian matrix are computed. Now we find the points with large responses (i.e) lambda_min > threshold. Fig(1) below shows the points with large responses.

Fig(1). Showing the points with large responses

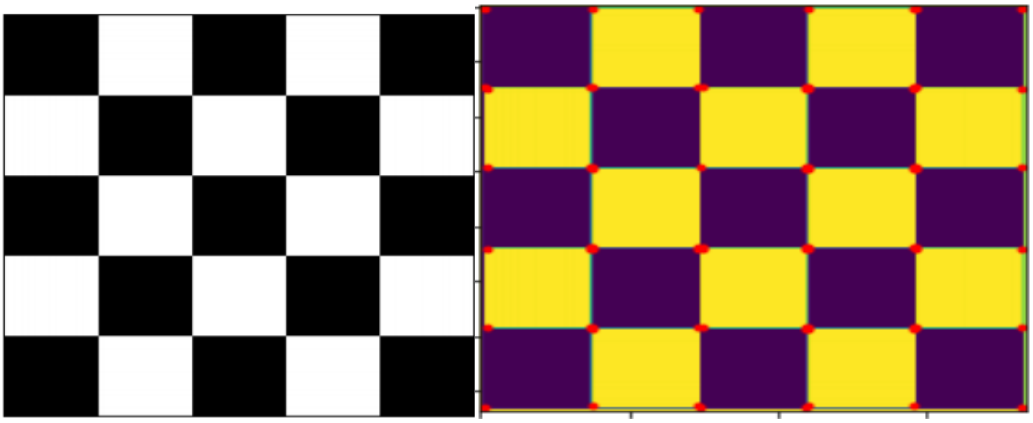
Step 4:Now we choose the points where lambda_min is a local maximum as features. For this the function maxfilter() takes the large responses as input and computes the local maximum and outputs them as features.Fig(2) shows the features obtained.



Fig(2) Showing the feature points obtained after finding local maxima of the response

Step 5: Now we Plot the features on the image which are our corner points.

INPUT_OUTPUT: Corner Detection Using Harris Corner Detection Algorithm



Steps Involved:

Step 1: Take an image as input

Step 2: We take the image and compute the gradient along both x-direction and y-direction at each point on the image. The function sob() returns the gradients of the image.

Step 3:The function HarrisCorner() implements Harris Corner Detection Algorithm.We take patch of a fixed size and compute the Hessian matrix of the patch. Then we compute determinant and trace of the hessian matrix and compute f. Where f is given by the equation

f = determinant(H) - k*(Trace(H)^2)

Now we find the points with large responses (i.e) f > threshold. Fig(3) below shows the points with large responses.

Fig(3) showing the points obtained from large responses

Step 4:Now we choose the points where lambda_min is a local maximum as features. For this the function maxfilter() takes the large responses as input and computes the local maximum and outputs them as features.Fig(4) shows the features obtained.

Fig(4) Showing the feature points obtained after finding local maxima of the response

Step 5: Now we Plot the features on the image which are our corner points