Corner Detection

We are interested in corner points of an image, rather than edge information.

1. Implement the Kanade-Tomasi/Shi-Tomasi Corner Detector.

   - ***Sobel* Gradient**
     Compute a horizontal I_x and a vertical gradient image I_y using the *Sobel* filter masks.
   - **Structure Tensor**
     Compute the structure tensor $A(x, y)$ for each image point of an area of $n \times n$:

$$A(x,y) = \sum_{u=-n/2}^{n/2} \sum_{v=-n/2}^{n/2} \begin{bmatrix} I_x(x+u,y+v)^2 & I_x(x+u,y+v)I_y(x+u,y+v) \\ I_x(x+u,y+v)I_y(x+u,y+v) & I_y(x+u,y+v)^2 \end{bmatrix}$$

   - **Kanade-Tomasi/Shi-Tomasi Corner Detection**
     Compute the eigenvalues λ_1 and λ_2 of $A(x, y)$. Mark (x, y) in the original image (use a circle or cross) if $\min(\lambda_1, \lambda_2) > t_c$, where t_c is the threshold for corner detection.
     Put all corner candidates with λ_1>threshold in a list. Sort it by λ_1. Go through the list and remove all candidates in an m×m neighborhood from the list. Then remove the current value from the list and continue until the list is empty.

2. Discuss alternatives for corner detection.