Fundamental 3D Computer Vision
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HW5 **Deadline**: 1402/10/17

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Implementation

1. Implement Canny Edge Detection from scratch and apply that on Lena.png image. The below steps must be followed in your code. (35 point)
   1. Gray scale conversion
   2. Noise reduction
   3. Gradient calculation
   4. Non-maximum suppression
   5. Double Thresholding and hysteresis

   (You must Define a function and plot the output for each step)

2. First Implement Harris key point detector from scratch and apply that on Harris.png (Slide 91). Second implement Harris using OpenCV and compare the results. (35 point)
3. Perform Maximally Stable Extremal Region (MSER) algorithm on img3.jpg. Find the best hyperparameters to detect all smallest blobs (6 blobs similar to img3_output.jpg). Feel free to use opencv library 😊. You should report the final hyperparameters. (30 point)
4. Use SIFT features to match the template.jpg to img4.jpg. Your final results should be same as img4_output.jpg. You can use opencv library. (Extra 20 point)