# CSP780 Computer Vision

Lab Assignment No 4: **Morphology and Segmentation**

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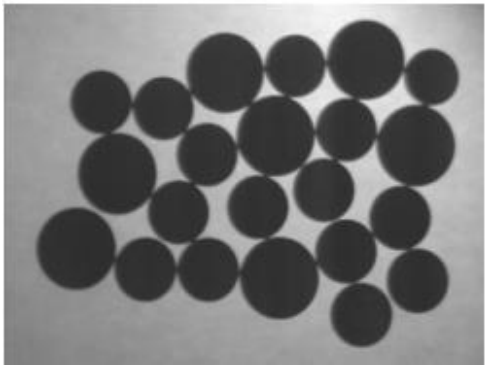
1. Erosion operation can be used for various operations
   (a) For the image coins.png given below use erosion operation to highlight distinct circles present in the image. The original image is in grayscale which can be binarized by Thresholding. Save your image as coin-erode.png. [10]

   (b) Also develop a labelling algorithm to count the number of coins present. [10]



2. Sketch the result of applying the hit-or-miss transform to the image below, using the SE shown. Indicate clearly the origin and border you selected for the structuring element. [10]


Image Structuring element

3. Opening and Closing: For the image Circles and lines given below develop opening based MF to separate lines from circles. {BONUS} [20].
   Save two files, one showing only circles and one showing only lines. Explain the structural element you have used. If you have experimented with other structural elements, describe your results and observations. Apply opening to the same image with the same structural element of different sizes. How the sizes of the structuring elements affect the results.

4. Laplacian of Gausssian/The Marr-Hildreth Edge Detector: In this assignment you will implement a second-derivative edge detector on the image north.png (first convert to grayscale) using the Laplacian of Gaussian (LoG) method described on page 724 (G&W book). Plot edges uses zero crossing. Also use a threshold of 4% similar to Fig 10.22 (pg. 728, G&W) to plot a second edge image. [10+10]

5. In this assignment you will use your image processing knowledge to implement an edge detection function that will be used in combination with a Hough-Transform for lines. The goal of the Hough-Transform step is to outline the lines correctly identify the block structure of top view of IIT Jammu. You will be graded upon the accuracy of structure shown by your lines. [20]