# Computer and Biological Vision
# ECSE-529

**Assignment #2** **Due date: October 3, 2016**

## EDGE DETECTION

1. In this assignment you will implement the Canny edge detector, also called the Canny operator.

   a. Obtain an edge image by programming and applying the Canny edge detector (as described in the reference by Jain et. al.) to the images plant.pgm, tower.pgm and city.pgm.
   b. Display the following images: magnitude, phase, non-maximum suppressed, T1, T2 and final edge images. Make sure that you normalize these images to lie between the minimum (0) and maximum color you can display (in most cases equal to 255).
   c. Briefly list the major steps involved in implementing the edge detector. Explain how edge linking (the final step of the Canny algorithm) was implemented.
   d. List the parameters that determine the performance of the algorithm. What parameter values did you use and why?

Jain, R., Kasturi, R., Schunk, B. G., Machine Vision, McGraw-Hill Inc., first edition, 1995, pp. 168-173.

Reference: Canny, J., A Computational Approach to Edge Detection, IEEE Trans. on Pattern Analysis and Machine Intelligence, vol. PAMI-8, no. 6, November 1986, pp. 679-698.

See also: http://fourier.eng.hmc.edu/e161/lectures/canny/node1.html

2. Discuss the magnitude results obtained in 1.b above by comparing them with a 3x3 and 5x5 Sobel gradient operator applied to each image.

NOTE

1. The submitted answer to the assignment should be a maximum of 2 pages plus the pertinent figures.

**2. Attempt all parts of this assignment listed above. The total mark for this assignment will be based on your response to each part.**