

Assignment 9

Deadline: Tuesday, 31.01.2011

Assignment 9.1 (5 Points)

- a) [4 Points] Compute the LoG (Laplacian of the Gaussian) Kernel for the Gaussian Kernel of the Marr-Hildreth Edge Detection section.
- b) [1 Point] If we would like to detect ellipses using the Hough Transform: how many dimensions does the dual Hough-space have?

Hint: the equation of ellipses is: $a^2 = \left(\frac{x^2 b^2}{b^2 - y^2} \right)$

Assignment 9.2 (15 Points)

- a) [7.5 Points] Implement in R the Marr-Hildreth Edge Detection algorithm using your result of the LoG Kernel. If not yet done, download an image of the university campus at

<http://www.it.uni-hildesheim.de/apps/de/webcam.htm>

create an grey-scale image from it and apply your Marr-Hildreth implementation for edge detection. Plot and compare the results for different zero crossing thresholds.

- b) [7.5 Points] Implement the Hough transform algorithm for detecting lines. Transform the best result from a) to a binary 0/1-image and run the Hough transform on that. How many lines do you detect?