Mathematical Foundations for Computer Vision and Machine Learning

Byung-Woo Hong

Computer Science Department, Chung-Ang University

Assignment 5

Jupyter Notebook

- Create a new notebook for Python 3
- Include your name and the student ID in the notebook
- Write python 3 codes for the given assignment
- Try to separate the codes into meaningful blocks
- Write a comment for each block of codes
- Plot the important intermediate results
- Write a short description for each graphical result
- Use LaTeX for mathematical comments in the notebook
- Save the notebook file as assignment05.ipynb
- Download the notebook as a PDF file assignment05.pdf

Assignment 5

github

- Start a project or a directory for the assignment05
- Include the link to the giuhub for the assignment in the notebook
- Upload the notebook assignment05.ipynb to the github after the deadline (Note that your github project is visible to public)

Assignment 5

Submission to *eclass*

- Submit the PDF file assignment05.pdf to eclass
- Deadline is 11:59 pm on next Thursday. No extension
- Score ranges from 0 to 5

Assignment 5

Score Table

- The results should be correct
- The codes should be written in a modulated way
- The comment should be made for each block of the codes
- The important intermediate results should be presented
- The link to the github project should be included

Assignment 5

Computation of Image Features using Convolution

- Define kernels for computing image gradients
- Define kernels for smoothing image
- Define kernels for your own purpose

Assignment 5

Essential Functions and Definitions: Convolution

- Definition of the convolution kernel for computing the derivative in x-direction
- Definition of the convolution kernel for computing the derivative in y-direction
- Function for computing the magnitude of the gradient
- Function for computing the direction of the gradient

Assignment 5

Essential Visualisation: Convolution

- input color image
- input gray image
- derivative in x-direction
- derivative in y-direction
- absolute value of gradient
- direction of gradient
- result image with smoothing kernel
- result image with your own kernel