

# Computer Vision

## Undergraduate Course

### Chapter 9. Image Segmentation (Practice)

**Dongbo Min**

Department of Computer Science and Engineering  
Chungnam National University, Korea



# Practice Lecture

- **Image segmentation**
  - Run the code for image segmentation in page 7-12.
  - Run the code for adaptive threshold in page 17-20.
- **Edge detection**
  - Implement Prewitt, Roberts, Sobel filters in page 25-27 using your own implementation.
  - Then, display the magnitude of the edge image.
- **Canny Edge detection**
  - Run the code for Canny edge detection in page 38.
- **Hough Transform**
  - Run the code for Hough transform in page 45-50.



# Principles for homework submission

- **MATLAB homework**

- Submit all source codes (m file) for each (sub-) problem
- If the codes do NOT work, then there will be a penalty.
- The report for MATLAB homework should include the intermediate process, reason, and final results.

- **Report homework**

- The report should include the intermediate process, reason, and final results.
- The report homework should be done **by hand, NOT using any computer software.**



# Example of Source Code

- For each problem, the source code should consist of **two functions**, as below.
  - In the 'homework\_main.m', the results should **appear** or be **saved** as below.

## homework\_main.m

```
in1 = imread('cameraman.tif');  
  
out1 = function_example(in1);  
  
imshow(out1); % or use imwrite(out1, 'output.png');
```

## function\_example.m

```
% Please make sure that there is a return variable to save an output.  
% In the example below, 'y' is the return variable.  
function y = function_example( im )  
  
% Implement your code here.  
  
end
```



# 숙제 제출 원칙

- 매트랩 숙제

- 각 세부분제 별로 모든 소스 코드를 제출
- 만약 코드가 작동하지 않을 경우, 감점
- 매트랩 숙제에 대한 보고서는 중간 결과, 이유, 최종 결과 등을 모두 포함하여 자세히 서술할 것

- 문제풀이 숙제

- 보고서는 중간 결과, 이유, 최종 결과 등을 모두 포함하여 자세히 서술할 것
- 문제풀이 숙제는 반드시 손으로 해서 낼 것 (컴퓨터 SW를 사용하지 말 것!)



# Practice Homework

1. (MATLAB) Exercise 7, 10, and 13
  - For exercises 10 and 13, you can use the MATLAB function for edge detection
2. (Report) Exercise 14, 15, and 16
  - Do NOT use any computer software.
3. (Report) In page 41 of 'cv-ch09-image segmentation.pdf', please derive the equation  $x\cos\theta + y\sin\theta = r$ .

