

Digital Image Processing Homework Submission Guideline

In this course, you are asked to write your own codes to manipulate many images so that you have to make your source codes and output images well organized. Please read this guideline carefully and obey the instructions to avoid misunderstanding while grading.

For each assignment, both source code and report are required. Please **DO NOT** submit output images in source code files but include all the resultant images in your report.

1. IMAGE FILE FORMAT, I/O, AND FUNCTIONS

Almost all the images we will use throughout this course are of **.png** format. You can use functions such as `opencv` and `PIL` of Python, or `imread()` in MATLAB to read an image file. You can also use other functions to read images, but you should specify it in your report. A grayscale image saved with **.png** format uses 3 channels as well. You can use `opencv` or `rgb2gray` in MATLAB to get the 1 channel grayscale image. TAs will offer sample I/O code for reference. As for color images, please be careful of the format you read in is RGB or BGR format.

Except I/O, plotting and basic functions, you are **NOT** allowed to call functions directly to complete your works. Please implement them by yourself.

2. PROGRAMING LANGUAGE AND README FILE

We strongly recommend you to use Python or Matlab to complete your homeworks. You are allowed to use c/cpp as well, but you should deal with `opencv` installation and I/O problems by yourself. More details are given below.

You should prepare a RUN file with the name RUN along with your source code files. It should be an executable script (or makefile, M-file...etc). TAs will use this file to execute your codes and grade your homework. You may lose points if this file is not included or not properly prepared.

The file should also include the following information:

1. Homework number
2. Your name
3. Your student ID #
4. Your email address

You can write the information with comment type as shown in the examples below.

(a) Python

You should prepare a shell script file (.sh) as the RUN file. For example, you create a RUN.sh file as below:

```
# DIP Homework Assignment #1
# Name: William Watt
# ID #: x12345678
# email: wwatt@csie.ntu.edu.tw
python hw1.py --input lena.png --output hw1_result.png
```

And TAs will run your code with “sh RUN.sh” command. Please make sure your code can be run with the RUN file.

If you are using Windows system, you can use WSL or bash in powershell to edit and run your RUN file.

(b) Matlab

You should prepare a MATLAB shell script file (.m) as the RUNfile. For example, you create a RUN.m file as below:

```
% DIP Homework Assignment #1
% Name: William Watt
% ID #: x12345678
% email: wwatt@csie.ntu.edu.tw
hw1(input_path, output_path)
```

And TAs will run your code with “RUN” command in MATLAB command line. Please make sure your code can be run with the RUN file.

(c) C/C++

You should prepare a shell script file named RUN.sh to run your cmake and make command. For example, you create a shell script of name RUN.sh as below:

```
# DIP Homework Assignment #1
# Name: William Watt
# ID : x12345678
# email: wwatt@csie.ntu.edu.tw
cmake
make
./hw1 input_image output_path
```

You can refer to [OpenCV](#) webpage for details. Please remember to link other libs you used in your makefile. TAs will run the script you offered with command “sh RUN.sh”. Please make sure your code can be run with the makefile.

SUBMISSION

(a) Source Code

You should put all files in a folder named by **hw_x_student_ID** (lowercase only), and pack the folder to a zip file with the same name. Your folder should include **RUN** file, **source code** and **original sample image folder** with sample images. **It should not contain intermediate files, executable files or output images.**

e.g

```
hw0_r08922000.zip => hw0_r08922000(folder)
    |—RUN.sh
    |—mycode.cpp
    |—SampleImage(folder)
        |—sample1.png
        |—sample2.png
        .....

```

The zip file containing your codes and RUN file should be submitted to **NTU COOL**.

(b) Report

You should also prepare a report for each homework problem. The following four parts should be included unless specified by the problem description.

- a. Your motivation and approach (include parameters)
- b. Original images
- c. Output images
- d. Discussion of results

You may be asked to include some other results in the report according to homeworks as well.

Your report should be submitted to **GradeScope**.