# Image and Video Processing – Individual Lab 3

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## Problem

In this assignment, you must implement some filtering and edge detection operations using OpenCV in C++. Your program is called by command line arguments and perform the following functions

1. Load the input image by reading it from a file.

2. Save the processed output image to a file.

3. Filter an image using average filtering. The command line is

> <Program.exe> -avg  $<k_x>$ $<k_y>$ <InputFilePath> <OutputFilePath>

where

- *Program.exe*: the name of executable file
- *InputFilePath*: the path name of the input file
- *OutputFilePath*: the path name of the output file
- *-avg*: the command name
- $k_x$: horizontal kernel size
- $k_y$: vertical kernel size

4. Filter an image using median filtering. The command line is

> <Program.exe> -med  $<k_x>$ $<k_y>$ <InputFilePath> <OutputFilePath>

where

- *Program.exe*: the name of executable file
- *InputFilePath*: the path name of the input file
- *OutputFilePath*: the path name of the output file

- *-med*: the command name
- $k_x$: horizontal kernel size
- $k_y$: vertical kernel size

5. Filter an image using Gaussian filtering. The command line is

> <Program.exe> -gau  <$k_x$> <$k_y$> <InputFilePath> <OutputFilePath>

where

- *Program.exe*: the name of executable file
- *InputFilePath*: the path name of the input file
- *OutputFilePath*: the path name of the output file
- *-gau*: the command name
- $k_x$: horizontal kernel size
- $k_y$: vertical kernel size

6. Detect edges using Sobel operator. The command line is

> <Program.exe> -sobel  <InputFilePath> <OutputFilePath>

where

- *Program.exe*: the name of executable file
- *InputFilePath*: the path name of the input file
- *OutputFilePath*: the path name of the output file
- *-sobel*: the command name

7. Detect edges using Prewitt operator. The command line is

> <Program.exe> -prew  <InputFilePath> <OutputFilePath>

where

- *Program.exe*: the name of executable file
- *InputFilePath*: the path name of the input file
- *OutputFilePath*: the path name of the output file
- *-prew*: the command name

8. Detect edges using Laplace operator. The command line is

> <Program.exe> -lap  <InputFilePath> <OutputFilePath>

where

- *Program.exe*: the name of executable file
- *InputFilePath*: the path name of the input file
- *OutputFilePath*: the path name of the output file
- *-lap*: the command name

# Submission

Your submission must organize into 2 folders and compressed in 1 file *StudentID.zip*

1. Document (contains your own report, personal inforamtion, your solution, and user guide)

2. Release (contains executed file)

3. Sources (contain source code). Your source code must be followed the template code provided in moodle.