Usage file of program Image_Processing.cpp

Software/Hardware details of the program development.

1) The development is done on Linux OS (Fedora 14).
2) The development is done in OpenCV version 2.4.5 with C/C++ API. Initially the program was build with only C API but due to some deprecation of C API in OpenCV, it was later replaced with C++ OpenCV APIs.

For successfully running the program, OpenCV needs to be installed.

The program helps in processing the image file with different filters.

Input file specification:
The original input file 'src' used in this program is: fireLeikkauksenTuloste.ppm
(but OpenCV can accept any other file format also irrespective of ASCII and binary formats). I have developed the program for processing only gray scale images. Even if the input file is a colored file the program automatically converts the colored input image file to a grayscale file.

Usage: ./a.out fireLeikkauksenTuloste.ppm

Main Filter Specifications:
My program is mainly based on two filters that are in the case 'f' and 'F' respectively.

Case 'f': I have build own linear kernel for filtering purpose which is used for line detection. Then for different steps of width the original image 'src' is processed and also with different angles.

Possible options:
-f 19 1 4 21 0.0 45.5 90.1

where,
19 is the matrix size or kernel size (that I have created) - should always be an integer value
1 is the start size of kernel linewidth - should always be an integer value
4 is the step of increase of kernel linewidth - should always be an integer value
21 is the end of kernel linewidth - should always be an integer value
0.0 is the start of angle for rotation - should always be a double value
45.5 is the step of increase of angle for rotation - should always be a double value
90.1 is the end of angle for rotation - should always be a double value

Case 'F': Here, instead of creating own filters the filter is read from image files eg. 'v1.png' or

'curevs3.png' means .png files are used. Then for different scale and angles the original 'src' image is manipulated.

Possible options:
-F curve1.png 0.30 0.5 2.5 0.5 90.3 180.0

where,
curve1.png is the input filter image file
0.30 is the start of the scale - should always be a double value
0.5 is the step of increase of scale - should always be a double value
2.5 is the end of the scale - should always be a double value
0.5 is the start of angle for rotation - should always be a double value
90.3 is the step of increase of angle for rotation - should always be a double value
180.0 is the end of angle increment for rotation - should always be a double value

Other filter Specifications:
Various types of OpenCV built-in filters are also used for processing the original image 'src' before or after the processing of main filter.

The filters used are Sobel, Laplacian, Bilateral, Median, Blur, Dilate, Erode and gaussian which are denoted with options as s or S, l or L, k or K, m or M, b or B, d or D, e or E and g or G respectively.
Darkening of the original image 'src' is also kept as an option.

Case 'p': for darkening the original image

Possible options:
-p 2 2 2 64 64 64
where
2's are the expected values of first cvSet
64's are the expected values of second cvSet

Case 'e': for erode before

Possible options:
-e 3
where
3 is parameter for Erode subroutine

Case 'E': for erode after

Possible options:

-E 3 (same as case 'e')

Case 'd': for dilate before

Possible options:
-d 3
where
3 is parameter for Dilate subroutine

Case 'D': for dilate After
Possible options:
-D 3
where
3 is parameter for Dilate subroutine

Case 'k': for bilateral filtering before

Possible options:
-k 23 23 23
where
23's are parameters for Bilateral Filtering

Case 'K': for bilateral filtering after

Possible options:
-K 23 23 23
where
23's are parameters for Bilateral Filtering

Case 'b': for blur before

Possible options:
-b 13 13
where
13's are parameters for Blur

Case 'B': for blur after

Possible options:
-B 13 13
where
13's are parameters for Blur

Case 's': for sobel before

Possible options:
-s 3
where
3 is the parameter for Sobel

Case 'S': for sobel after
Possible options:
-S 3
where
3 is the parameter for Sobel

Case 'g': for gaussian blur with standard deviation as 0 before

Possible options:
-g 13 13
where
13's are the parameter for Gaussian subroutine

Case 'G': for gaussian blur with standard deviation as 0 after

Possible options:
-G 13 13
where
13's are the parameter for Gaussian subroutine

Case 'm': for median blur before

Possible options:
-m 13 13
where
13's are the parameters for Median Blur subroutine

Case 'M': for median blur after
Possible options:
-M 13 13
where
13's are the parameters for Median Blur subroutine

Case 'I': for laplacian before

Possible options:
-I 13
where
13 is the parameter for the Laplacian subroutine

Case 'L': for laplacian after

Possible options:
-L 13
where
13 is the parameter for the Laplacian subroutine

Output File Specification:
Output file is the 'dstnew' file, which differs according to the option given.