Threads do not return values. In order them to return something we use the pthread.h library.

(Also try nested method)

For PSD computation, we use the LOMB algorithm (can be taken from WIKIPEDIA).

OPENCV uses the BGR and not RGB matrix.

Motion deblurring – Wiener filter (Know or estimate the blurring vector).

For DFT conversion, use the DFT from OPENCV.

Mat our\_name(Row\_Num,Col\_Num,CV\_Type); -> Declaration of CV Mat type

Mat RR**;**

Mat KL**;**

RR **=** FG**.**clone**();**

KL **=** FG**.**clone**();**

**for(**int x **=** 0**;** x **<** RR**.**rows**;** x**++)**

**{**

**for(**int y **=** 0**;** y **<** RR**.**cols**;** y**++)**

**{**

**if((**KL**.**at**<**uchar**>(**x**,**y**))** **>** 180**)**

**{**

FG**.**at**<**uchar**>(**x**,**y**)** **=** 255**;**

**}**

**}**

**}**

int hist**[**256**];**

Mat LL**;**

Mat LL1**;**

Mat LL2**;**

LL **=** bw**.**clone**();**

LL1 **=** bw**.**clone**();**

LL2 **=** bw**.**clone**();**

**for** **(**int i **=** 0**;** i **<** LL**.**rows**;** i**++)**

**{**

**for** **(**int j **=** 0**;** j **<** LL**.**cols**;** j**++)**

**{**

hist**[(**int**)**LL1**.**at**<**uchar**>(**i**,**j**)]** **=** hist**[(**int**)**LL2**.**at**<**uchar**>(**i**,**j**)];**

**}**

**}**

In opencv contour function will only tick (circle, square, etc…) the contour found by the Canny, Sobel, Prewitt algorithms it does not find contours by itself.

In Sobel edge detection you need to convert the gradient matrix (<https://docs.opencv.org/2.4/doc/tutorials/imgproc/imgtrans/sobel_derivatives/sobel_derivatives.html>) to binary and only then you can apply findContour (in Canny the result is already binary so you can use it straight forward with findContour)

In OPENCV you can apply WATERSHED function only BGR raw image with empty contour matrix (the result of findContour is always binary) of type CV\_32S.

Mat F = zeros(bw.size(), CV\_32S);

\*The contour matrix goes into F

findContour works only on 1-dimension binary image.

The output of the Canny function is always binary while the output of Sobel (and Prewitt) is not binary you can convert the gradient image to binary using the Threshold function

In OPENCV CANNY L1: means the threshold over which the object is defined (simple OPENCV threshold) and L2: means the standard deviation (normal distribution) from the threshold (over which histogram value the current threshold ends and the next threshold starts).

/////////////////////////////////////////////////////////////////////////////////////////

Save opencv Mat as CSV file:

#include <fstream>

ofstream myfile;

myfile.open(filename.c\_str());

myfile<< cv::format(m, cv::Formatter::FMT\_CSV) << std::endl;

myfile.close();

///////////////////////////////////////////////////////////////////////////////////

For every circular operation (FIFO, LIFO) use mudolo (mod % operator)

///////////////////////////////////////////////////////////////////////////////////

In C string is defined as a pointer to char:

Char \*fg = “Hello”;

If fg is not declared as static it is legal:

Fg[0] = “0”;

///////////////////////////////////////////////////////////////////////////////////

When they mean problem with ISR routine in 16 bit variable with 8 bit register means that the ISR will change the variable mid-way of the assembler add16 command and eventually we will get garbage data.

///////////////////////////////////////////////////////////////////////////////////

In image processing motion blur can be fixed by comparing the distorted image with the original and deleting the repeated elements. Or to apply Wiener filter on the picture with the motion vector (direction and size). (for your convenience it is better to rotate the distorted picture so the motion vector will be horizontal).

In weather distortion you also use the Wiener filter with the same weather distortion on the blur image.

///////////////////////////////////////////////////////////////////////////////////

In UBUNTU you use “/YOURFOLDER” before any C++ location string (YURFOLDER is the name of your folder) or you can just move requested folder to TERMINAL in order to receive its location and you copy the location with the / in the beginning.

For executing a C program in Linux which has a not make C libraries you should:

1. Become root: sudo –s
2. Write in the terminal: echo “/path-to-your-libs/” > /etc/ld.so.conf.d/your.conf
3. Write in the terminal: sudo ldconfig
4. For the next library you should create another .conf file
5. Write in the terminal: echo “/path-to-your-libs/” > /etc/ld.so.conf.d/your1.conf
6. Write in the terminal: sudo ldconfig

Which will make the change permenent

///////////////////////////////////////////////////////////////////////////////////

In CODE::BLOCKS use the:

project->properties->build targets

and change the type to “NATIVE” to make the application executable

///////////////////////////////////////////////////////////////////////////////////

MULTITHREADING:

In order to make OPENCV use multithreading in its functions you write at the start of your code:

SetNumThread(number\_of\_treads)

For BLOBS library and the OPENCV multithreading option you need to add –pthread in

Linker settings -> Other linker options in CODE::BLOCKS

For your own threads of OPENCV functions you need the TBB INTEL intel library

In order to link the TBB library to CODE::BLOCKS you add the –ltbb in

Linker settings -> Other linker options

In order to compile only single line in multithreading:

Tbb\_thread th1([&bw,&bot,&se]()

{

MorpologyEx();

});

Where bw, bot and se are the matrixes for MorphologyEx

If you want to call a function:

Tbb\_thread th7([&qw,&thh1,&mc]{crop(qw,thh1,mc); };

Where qw, thh1, mc is the variables of my functions.