BFIOCL

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Contents

Chapter 1

Hierarchical Index

1.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

Chapter 2

Class Index

2.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

Chapter 3

Class Documentation

3.1 BayerFilterStream Class Reference

`#include <BayerFilterStream.h>`

Public Member Functions

- BayerFilterStream (int w, int h, cl_uchar mode, float red_k=1.0, float green_k=1.0, float blue_k=1.0)
- void setFiles (std::string in, std::string out)
- void processImage (cv::Mat &source, cv::Mat &dest)
- double getAllTime ()

3.1.1 Detailed Description

Class which performs Bayer filter with coversions from int to float on input and from float to int on output.

3.1.2 Constructor & Destructor Documentation

3.1.2.1 BayerFilterStream::BayerFilterStream (int *w,* int *h,* cl_uchar *mode,* float *red_k* = `1.0`, float *green_k* = `1.0`, float *blue_k* = `1.0`)

Constructor with setting main parameters of Bayer Filter.

Parameters

w	Image width.
h	Image height.
mode	Bayer filter mode. Can be 0-3 and represents type of Bayer Filter.
red_k	Red color factor. Can be from 0 to 1. Default is 1.
green_k	Green color factor. Can be from 0 to 1. Default is 1.
blue_k	Blue color factor. Can be from 0 to 1. Default is 1.

3.1.3 Member Function Documentation

3.1.3.1 double BayerFilterStream::getAllTime ( )

Get all time consumed.

Returns

Time consumed on all execution of stream.

3.1.3.2 void BayerFilterStream::processImage (cv::Mat & *source*, cv::Mat & *dest*)

Set source and destination image. Images are in cv::Mat format.

Parameters

source	Source image.
dest	Destination image. Important, image must be allocated before for reasons of efficiency.

3.1.3.3 void BayerFilterStream::setFiles (std::string *in*, std::string *out*)

Set source and destination files and perform interpolation.

Parameters

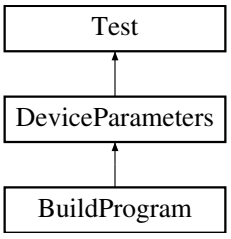
in	Source file.
out	Destination file.

The documentation for this class was generated from the following files:

- BayerFilter/BayerFilterStream.h
- BayerFilter/BayerFilterStream.cpp

3.2 BuildProgram Class Reference

Inheritance diagram for BuildProgram:



Protected Member Functions

- void **SetUp** ()

Protected Attributes

- std::string **filename**
- std::string **source**

The documentation for this class was generated from the following file:

- OpenCLDeviceTest/main.cpp

3.3 JAI::Camera Class Reference

Class implement JAI Camera interface.

`#include <Camera.h>`

Public Member Functions

- **Camera** (int8_t *index)
- bool open ()
- void close ()
- bool start ()
- void stop ()
- cv::Mat getNextFrame ()
- void getImageSize (int &x, int &y)

Static Public Member Functions

- static std::list< Camera * > getCameraList ()

3.3.1 Detailed Description

Class implement JAI Camera interface.

Example of usage: JAI::Camera *camera = JAI::Camera::getCameraList().front(); camera.open(); //check return value camera.start(); //check return value //in loop, with try and catch blocks in case of getting new image, when camera haven't return it yet. cv::Mat image = camera.getNextFrame(); //do stuff with image camera.stop(); camera.close();

Parameters

index	

3.3.2 Member Function Documentation

3.3.2.1 void Camera::close ( )

Close camera.

3.3.2.2 std::list< Camera * > Camera::getCameraList ( ) [static]

Get list of all cameras.

Returns

List of all cameras.

3.3.2.3 void Camera::getImageSize (int & *x*, int & *y*)

Get camera image size.

Parameters

x	Width of image.
y	Height of image.

3.3.2.4 cv::Mat Camera::getNextFrame ( )

Get next captured image.

Returns

New image. If no new image have been captured throw NoNewFrameException.

3.3.2.5 bool Camera::open ( )

Open camera.

Returns

true if opening was successful.

3.3.2.6 bool Camera::start ( )

Start capturing images.

Returns

true if opening was successful.

3.3.2.7 void Camera::stop ( )

Stop capturing images.

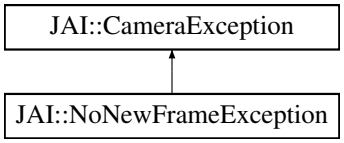
The documentation for this class was generated from the following files:

- JAICameraInterface/Camera.h
- JAICameraInterface/Camera.cpp

3.4 JAI::CameraException Class Reference

`#include <CameraException.h>`

Inheritance diagram for JAI::CameraException:



Public Member Functions

- **CameraException** (std::string mes="")
- **operator std::string** ()

3.4.1 Detailed Description

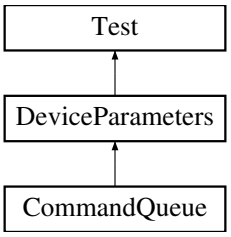
Camera exception.

The documentation for this class was generated from the following files:

- JAICameraInterface/CameraException.h
- JAICameraInterface/CameraException.cpp

3.5 CommandQueue Class Reference

Inheritance diagram for CommandQueue:



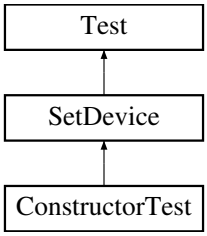
Additional Inherited Members

The documentation for this class was generated from the following file:

- OpenCLDeviceTest/main.cpp

3.6 ConstructorTest Class Reference

Inheritance diagram for ConstructorTest:



Protected Member Functions

- void **SetUp** ()
- void **TearDown** ()

Protected Attributes

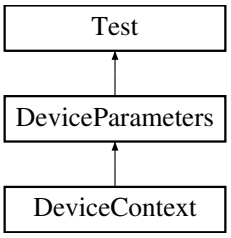
- OpenCLAlgorithm * **al_ptr**

The documentation for this class was generated from the following file:

- OpenCLAlgorithmTest/main.cpp

3.7 DeviceContext Class Reference

Inheritance diagram for DeviceContext:



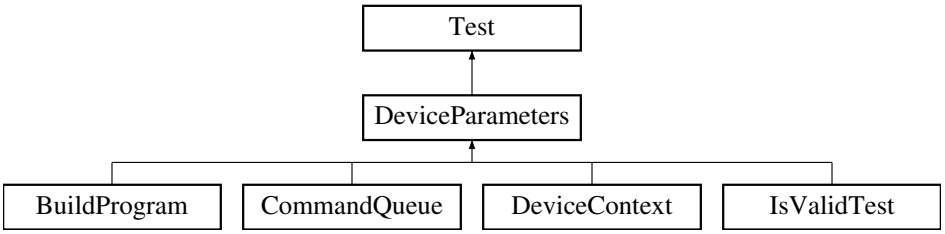
Additional Inherited Members

The documentation for this class was generated from the following file:

- OpenCLDeviceTest/main.cpp

3.8 DeviceParameters Class Reference

Inheritance diagram for DeviceParameters:



Protected Member Functions

- void **getDevs** ()
- void **SetUp** ()

Protected Attributes

- std::list< OpenCLDevice > **devs**
- OpenCLDevice **empty_device**

The documentation for this class was generated from the following file:

- OpenCLDeviceTest/main.cpp

3.9 JAI::FakeCamera Class Reference

```
#include <FakeCamera.h>
```

Public Member Functions

- **FakeCamera** (int8_t *index)
- bool **open** ()
- void **close** ()
- bool **start** ()
- void **stop** ()
- cv::Mat **getNextFrame** ()
- cv::Mat **getImageSize** (int &x, int &y)
- void **setDir** (std::string d)
- void **setPrefix** (std::string prefix)

Static Public Member Functions

- static std::list< FakeCamera * > **getCameraList** ()

3.9.1 Detailed Description

Fake camera that imitates real. It reads files and returns it like a camera.

Parameters

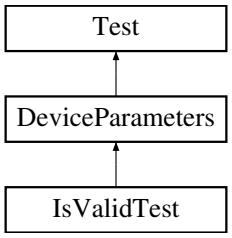
index	

The documentation for this class was generated from the following files:

- JAICameraInterface/FakeCamera.h
- JAICameraInterface/FakeCamera.cpp

3.10 IsValidTest Class Reference

Inheritance diagram for IsValidTest:



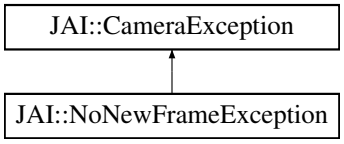
Additional Inherited Members

The documentation for this class was generated from the following file:

- OpenCLDeviceTest/main.cpp

3.11 JAI::NoNewFrameException Class Reference

Inheritance diagram for JAI::NoNewFrameException:



Additional Inherited Members

The documentation for this class was generated from the following files:

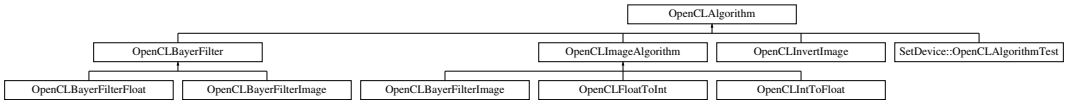
- JAICameraInterface/CameraException.h
- JAICameraInterface/CameraException.cpp

3.12 OpenCLAlgorithm Class Reference

Iterface for OpenCL algorithm.

`#include <OpenCLAlgorithm.h>`

Inheritance diagram for OpenCLAlgorithm:



Public Member Functions

- **OpenCLAlgorithm** (const OpenCLDevice &dev)
- virtual void **setDevice** (const OpenCLDevice &dev)
- virtual void **enqueueNDRangeKernelWithTimeMeasurment** (cl_uint work_dim, size_t ∗global_work_offset, const size_t ∗global_work_size, const size_t ∗local_work_size, cl_uint num_events_in_wait_list)
- double **getTimeConsumed** () const
- virtual void **prepare** (size_t di_size, size_t do_size)
- virtual void **releaseMem** ()=0
- virtual void **setParams** (const OpenCLAlgorithmParams &params)=0
- virtual void **run** (const unsigned char ∗data_input, size_t di_size, unsigned char ∗data_output, size_t do_size)=0
- virtual void **setKernelArgs** (size_t di_size, size_t do_size)=0

Protected Attributes

- OpenCLDevice **device**
- cl_kernel **kernel**
- cl_program **program**
- cl_command_queue **command_queue**
- cl_context **context**
- std::string **kernel_name**
- std::string **source_file**
- std::string **source**
- double **total_time**
- cl_mem **input**
- cl_mem **output**

3.12.1 Detailed Description

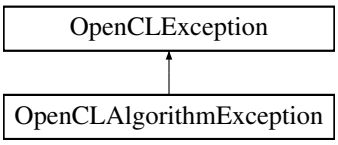
Iterface for OpenCL algorithm.

The documentation for this class was generated from the following files:

- OpenCLInterface/OpenCLAlgorithm.h
- OpenCLInterface/OpenCLAlgorithm.cpp

3.13 OpenCLAlgorithmException Struct Reference

Inheritance diagram for OpenCLAlgorithmException:



Public Member Functions

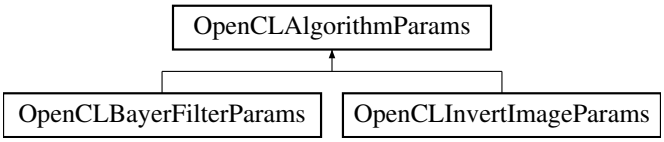
- **OpenCLAlgorithmException** (std::string m, int e=0)

The documentation for this struct was generated from the following file:

- OpenCLInterface/OpenCLAlgorithm.h

3.14 OpenCLAlgorithmParams Class Reference

Inheritance diagram for OpenCLAlgorithmParams:



The documentation for this class was generated from the following file:

- OpenCLInterface/OpenCLAlgorithm.h

3.15 OpenCLAlgorithmsStream Class Reference

Class for creating algorithms streams.

`#include <OpenCLAlgorithmsStream.h>`

Public Member Functions

- void pushAlgorithm (OpenCLImageAlgorithm *al)
- void clearAlgorithms ()
- void setDataSize (size_t w, size_t h)
- void prepare ()
- void processImage (const void *data_input, void *data_output)
- void setDevice (OpenCLDevice &d)
- double getTime ()

3.15.1 Detailed Description

Class for creating algorithms streams.

It can be used with algorithms that use cl_image_2d. Algorithm must have first parameter as input image and second parameter as output image. Other parameters can be use manually and freely in copyDataToGPUStream and setKernelArgsForStream. Input for next algorithm must be same as output for previous algorithm.

3.15.2 Member Function Documentation

3.15.2.1 void OpenCLAlgorithmsStream::clearAlgorithms ( )

Removes all algorithms from stream.

3.15.2.2 double OpenCLAlgorithmsStream::getTime ( )

Get time consumed on execution all algorithms in stream on last run.

Returns

Time in ms.

3.15.2.3 void OpenCLAlgorithmsStream::prepare ( )

Prepare algorithms for execution.

3.15.2.4 void OpenCLAlgorithmsStream::processImage (const void * *data_input*, void * *data_output*)

Execute stream. This function executes all algorithms in stream in order. Must call prepare and setDevice before.

Parameters

data_input	Pointer to data input.
data_output	Pointer to data output.

3.15.2.5 void OpenCLAlgorithmsStream::pushAlgorithm (OpenCLImageAlgorithm * *al*)

Add algorithm to stream on last position. Throws OpenCLAlgorithmsStreamException if input is differ from output of last algorithm on list.

Parameters

al	Algorithm to add.

3.15.2.6 void OpenCLAlgorithmsStream::setDataSize (size_t *w*, size_t *h*)

Set size of image.

Parameters

w	Width.
h	Height.

3.15.2.7 void OpenCLAlgorithmsStream::setDevice (OpenCLDevice & *d*)

Set device for executing.

Parameters

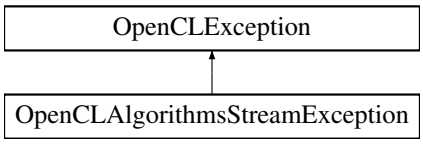
d	Device.

The documentation for this class was generated from the following files:

- OpenCLInterface/OpenCLAlgorithmsStream.h
- OpenCLInterface/OpenCLAlgorithmsStream.cpp

3.16 OpenCLAlgorithmsStreamException Struct Reference

Inheritance diagram for OpenCLAlgorithmsStreamException:



Public Member Functions

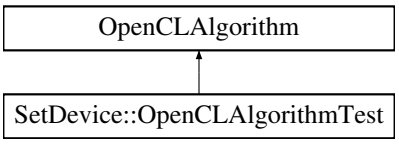
- **OpenCLAlgorithmsStreamException** (std::string m, int e=0)

The documentation for this struct was generated from the following file:

- OpenCLInterface/OpenCLAlgorithmsStream.h

3.17 SetDevice::OpenCLAlgorithmTest Class Reference

Inheritance diagram for SetDevice::OpenCLAlgorithmTest:



Public Member Functions

- **OpenCLAlgorithmTest** (const OpenCLDevice &dev)
- void **setParams** (const OpenCLAlgorithmParams &params)
- void **prepare** (size_t di_size, size_t do_size)
- void **run** (const unsigned char *data_input, size_t di_size, unsigned char *data_output, size_t do_size)
- void **setKernelArgs** (size_t di_size, size_t do_size)
- void **releaseMem** ()

Additional Inherited Members

The documentation for this class was generated from the following file:

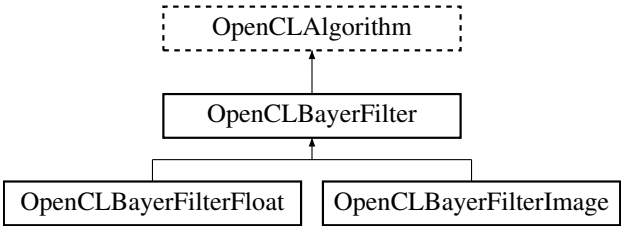
- OpenCLAlgorithmTest/main.cpp

3.18 OpenCLBayerFilter Class Reference

Abstract class for Bayer filter implementation .

`#include <OpenCLBayerFilter.h>`

Inheritance diagram for OpenCLBayerFilter:



Public Member Functions

- virtual void **setParams** (const OpenCLAlgorithmParams &params)
- void **setParams** (const OpenCLBayerFilterParams &params)
- virtual void run (const unsigned char *data_input, size_t di_size, unsigned char *data_output, size_t do_size)

Protected Member Functions

- virtual void getResult (unsigned char *data_output, size_t do_size)=0
- virtual void releaseMem ()
- virtual void copyDataToGPU (const unsigned char *data_input, size_t di_size)=0
- void **setKernelArgsForStream** ()

Protected Attributes

- OpenCLBayerFilterParams **params**
- size_t **global_work_size** [2]
- cl_uchar **kernel_params** [kernel_params_size]
- cl_mem **kparams**
- cl_mem **mem_balance**
- float **balance** [3]

Static Protected Attributes

- static const std::string **SOURCEFILE** = "bayer.cl"
- static const unsigned int **kernel_params_size** = 4

3.18.1 Detailed Description

Abstract class for Bayer filter implementation .

It has two derived class: one use cl_float and second use cl_image_2d

3.18.2 Member Function Documentation

3.18.2.1 virtual void OpenCLBayerFilter::copyDataToGPU (const unsigned char * *data_input*, size_t *di_size*) [protected], [pure virtual]

Copy data to GPU.

Parameters

data_input	Pointer to data to copy.
di_size	Size of data to copy.

3.18.2.2 virtual void OpenCLBayerFilter::getResult (unsigned char * *data_output*, size_t *do_size*) [protected], [pure virtual]

Get result.

Parameters

data_output	Pointer where to store data output.
do_size	Size of data output.

3.18.2.3 void OpenCLBayerFilter::releaseMem ( ) [protected], [virtual]

Release memory.

Implements OpenCLAlgorithm.

3.18.2.4 void OpenCLBayerFilter::run (const unsigned char * *data_input*, size_t *di_size*, unsigned char * *data_output*, size_t *do_size*) [virtual]

Run kernel.

Parameters

data_input	Pointer to input data.
di_size	Size of input data.
data_output	Pointer to output data.
do_size	Size of output data.

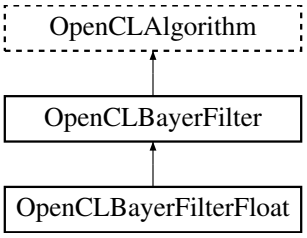
Implements OpenCLAlgorithm.

The documentation for this class was generated from the following files:

- OpenCLInterface/OpenCLBayerFilter.h
- OpenCLInterface/OpenCLBayerFilter.cpp

3.19 OpenCLBayerFilterFloat Class Reference

Inheritance diagram for OpenCLBayerFilterFloat:



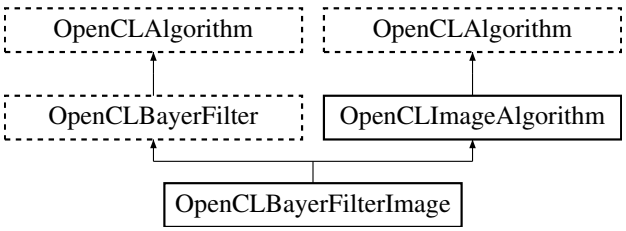
Additional Inherited Members

The documentation for this class was generated from the following files:

- OpenCLInterface/OpenCLBayerFilter.h
- OpenCLInterface/OpenCLBayerFilter.cpp

3.20 OpenCLBayerFilterImage Class Reference

Inheritance diagram for OpenCLBayerFilterImage:



Public Member Functions

- **OpenCLBayerFilterImage** (BayerFilterMask mask_type=BayerFilterMask::SQUARE)

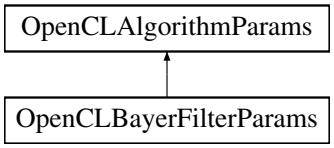
Additional Inherited Members

The documentation for this class was generated from the following files:

- OpenCLInterface/OpenCLBayerFilter.h
- OpenCLInterface/OpenCLBayerFilter.cpp

3.21 OpenCLBayerFilterParams Class Reference

Inheritance diagram for OpenCLBayerFilterParams:



Public Member Functions

- **OpenCLBayerFilterParams** (unsigned int width=0, unsigned int height=0, cl_uchar pattern=BFIOCL_PAT_-RGR, int mode=BFIOCL_MODE_BGR, float red_b=1.0, float green_b=1.0, float blue_b=1.0)

Public Attributes

- unsigned int **width**
- unsigned int **height**
- int **mode**
- cl_uchar **pattern**
- float **balance** [3]

The documentation for this class was generated from the following file:

- OpenCLInterface/OpenCLBayerFilter.h

3.22 OpenCLDevice Class Reference

Class represents CL Device.

`#include <OpenCLDevice.h>`

Public Member Functions

- OpenCLDevice (cl_platform_id pid, cl_device_id did)
- **OpenCLDevice** (const OpenCLDevice &orig)
- std::string getName ()
- std::string getPlatformName ()
- cl_context getContext ()
- cl_command_queue getCommandQueue ()
- cl_program createAndBuildProgramFromSource (std::string source)
- cl_program createAndBuildProgramFromFile (std::string filename)
- bool isValid () const
- const OpenCLDevice & **operator=** (const OpenCLDevice &)

Static Public Member Functions

- static std::list< OpenCLDevice > getDevices ()

Protected Attributes

- cl_platform_id **platform_id**
- cl_device_id **device_id**

3.22.1 Detailed Description

Class represents CL Device.

3.22.2 Constructor & Destructor Documentation

3.22.2.1 OpenCLDevice::OpenCLDevice (cl_platform_id *pid,* cl_device_id *did*)

Constructor with setting cl_platform_id and cl_device_id.

Parameters

pid	cl_platform_id .
didcl_device_id.	

3.22.3 Member Function Documentation

3.22.3.1 cl_program OpenCLDevice::createAndBuildProgramFromFile (std::string *filename*)

Create program from file.

Parameters

filename	Name in std::string of file with program source.

Returns

cl_program with program.

3.22.3.2 cl_program OpenCLDevice::createAndBuildProgramFromSource (std::string *source*)

Create program from source.

Parameters

source	Program source in std::string.

Returns

cl_program with program.

3.22.3.3 cl_command_queue OpenCLDevice::getCommandQueue ( )

Get command queue for this device.

Returns

cl_command_queue.

3.22.3.4 cl_context OpenCLDevice::getContext ( ) [inline]

Get context for this device.

Returns

cl_context.

3.22.3.5 std::list< OpenCLDevice > OpenCLDevice::getDevices ( ) [static]

Returns list of all devices.

Returns

List of all devices in system.

3.22.3.6 std::string OpenCLDevice::getName ( )

Get device name.

Returns

std::string with name;

3.22.3.7 std::string OpenCLDevice::getPlatformName ( )

Get platform name.

Returns

std::string with name.

3.22.3.8 bool OpenCLDevice::isValid ( ) const

Checks if device is valid and ready for use it.

Returns

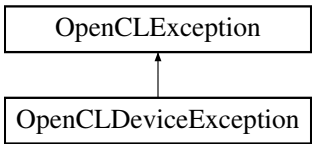
true if yes, fakse otherwise.

The documentation for this class was generated from the following files:

- OpenCLInterface/OpenCLDevice.h
- OpenCLInterface/OpenCLDevice.cpp

3.23 OpenCLDeviceException Struct Reference

Inheritance diagram for OpenCLDeviceException:



Public Member Functions

- **OpenCLDeviceException** (std::string m, int err=0)

The documentation for this struct was generated from the following file:

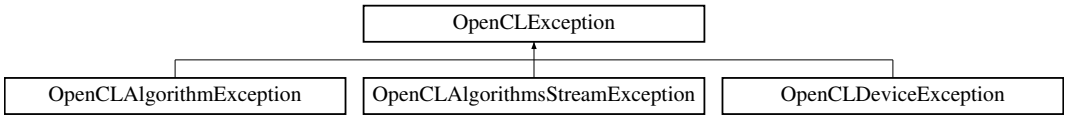
- OpenCLInterface/OpenCLDevice.h

3.24 OpenCLException Class Reference

Exception class for OpenCLInterface.

`#include <OpenCLException.h>`

Inheritance diagram for OpenCLException:



Public Member Functions

- OpenCLException (std::string m, int err)
- std::string **getFullMessage** ()

3.24.1 Detailed Description

Exception class for OpenCLInterface.

3.24.2 Constructor & Destructor Documentation

3.24.2.1 OpenCLException::OpenCLException (std::string *m,* int *err*) [inline]

Parameters

m	Message.
err	Error code. Put 0 if it is not an OpenCL internal error.

The documentation for this class was generated from the following files:

- OpenCLInterface/OpenCLException.h

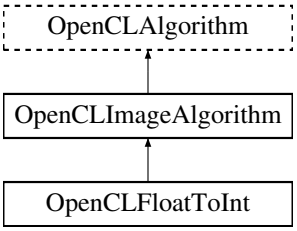
- OpenCLInterface/OpenCLException.cpp

3.25 OpenCLFloatToInt Class Reference

Algorithm performs float to int conversion.

`#include <OpenCLFloatToInt.h>`

Inheritance diagram for OpenCLFloatToInt:



Public Member Functions

- **OpenCLFloatToInt** (OpenCLFloatToIntMode mode=OpenCLFloatToIntMode::UINT8)

Additional Inherited Members

3.25.1 Detailed Description

Algorithm performs float to int conversion.

Possible output modes:

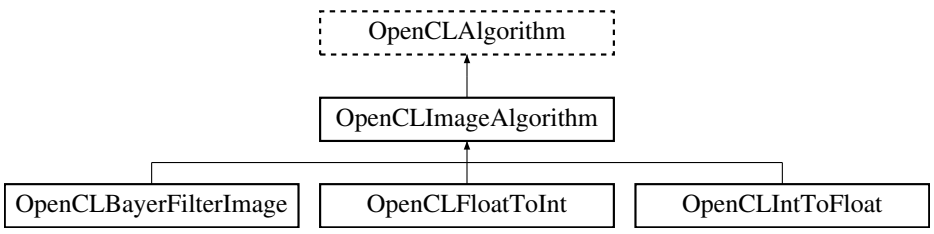
- OpenCLFloatToIntMode::UINT8 - 8 bit unsigned int
- OpenCLFloatToIntMode::UINT16 - 16 bit unsigned int
- OpenCLFloatToIntMode::UINT32 - 32 bit unsigned int

The documentation for this class was generated from the following files:

- OpenCLInterface/OpenCLFloatToInt.h
- OpenCLInterface/OpenCLFloatToInt.cpp

3.26 OpenCLImageAlgorithm Class Reference

Inheritance diagram for OpenCLImageAlgorithm:



Protected Member Functions

- virtual void **prepareForStream** (cl_command_queue cc, cl_context c)
- virtual void **runStream** (const size_t *global_work_size)
- virtual void **copyDataToGPUStream** ()=0
- virtual void **setKernelArgsForStream** ()=0

Protected Attributes

- cl_image_format **input_format**
- cl_image_format **output_format**

Friends

- class **OpenCLAlgorithmsStream**

Additional Inherited Members

The documentation for this class was generated from the following files:

- OpenCLInterface/OpenCLAlgorithm.h
- OpenCLInterface/OpenCLAlgorithm.cpp

3.27 OpenCLImageFilter Class Reference

`#include <OpenCLImageFilter.h>`

Public Member Functions

- **OpenCLImageFilter** (std::string filename, cl_uchar mode=BFIOCL_PAT_RGR)
- cv::Mat **getInputImage** () const
- cv::Mat **getOutputImage** ()
- cv::Mat **getOutputImageOpenCV** ()
- void **setInputImage** (const std::string filename)
- bool **saveOutputImage** (std::string filename)

3.27.1 Detailed Description

Example class for usage first version of OpenCLInterface.

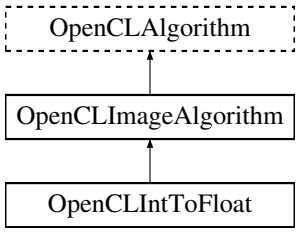
The documentation for this class was generated from the following files:

- BayerFilter/OpenCLImageFilter.h
- BayerFilter/OpenCLImageFilter.cpp

3.28 OpenCLIntToFloat Class Reference

`#include <OpenCLIntToFloat.h>`

Inheritance diagram for OpenCLIntToFloat:



Additional Inherited Members

3.28.1 Detailed Description

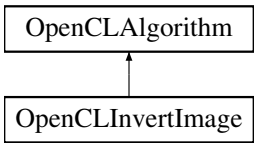
Algorithm perfoming int to float conversion.

The documentation for this class was generated from the following files:

- OpenCLInterface/OpenCLIntToFloat.h
- OpenCLInterface/OpenCLIntToFloat.cpp

3.29 OpenCLInvertImage Class Reference

Inheritance diagram for OpenCLInvertImage:



Public Member Functions

- virtual void **run** (const unsigned char ∗data_input, size_t di_size, unsigned char ∗data_output, size_t do_size)
- virtual void **prepare** ()
- virtual void **setParams** (const OpenCLAlgorithmParams &params)
- virtual void **setParams** (const OpenCLInvertImageParams &params)

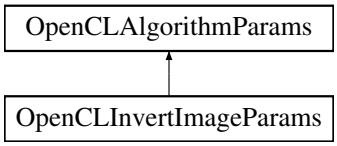
Additional Inherited Members

The documentation for this class was generated from the following files:

- OpenCLInterface/OpenCLInvertImage.h
- OpenCLInterface/OpenCLInvertImage.cpp

3.30 OpenCLInvertImageParams Class Reference

Inheritance diagram for OpenCLInvertImageParams:



Public Member Functions

- **OpenCLInvertImageParams** (unsigned int w=0, unsigned int h=0)

Public Attributes

- unsigned int **width**
- unsigned int **height**

The documentation for this class was generated from the following file:

- OpenCLInterface/OpenCLInvertImage.h

3.31 Options Class Reference

Public Member Functions

- void parseOptions (int argc, char ∗argv[])

Public Attributes

- Mode **mode**
- std::string **dirname**
- std::string **filename**
- std::string **filename_out**
- bool **opencv**

3.31.1 Member Function Documentation

3.31.1.1 void Options::parseOptions (int *argc,* char ∗ *argv[]*)

Parse options sent to applications.

Parameters

argc	Number of argument.
argv	Argument values.

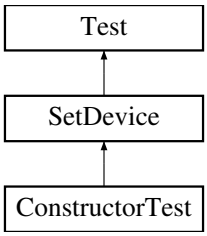
The documentation for this class was generated from the following files:

- BayerFilter/Options.h

- BayerFilter/Options.cpp

3.32 SetDevice Class Reference

Inheritance diagram for SetDevice:



Classes

- class OpenCLAlgorithmTest

Protected Member Functions

- void **SetUp** ()
- void **getDevice** ()

Protected Attributes

- OpenCLDevice **device**
- OpenCLAlgorithmTest **al**

The documentation for this class was generated from the following file:

- OpenCLAlgorithmTest/main.cpp