PhotoX - Photo Editor

Oliwia Mlonek

Generated by Doxygen 1.8.15

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

File Index

3.1 File List

Here is a list of all documented files with brief descriptions:

Chapter 4

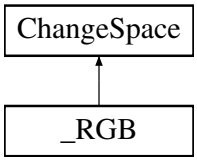
Class Documentation

4.1 _RGB Class Reference

responsible for changing the color space of the image to RGB space. Implements operations while following the base strategy (SearchFace) interface.

`#include <RBG.h>`

Inheritance diagram for _RGB:



Public Member Functions

- _RGB ()
- ~_RGB ()
- void change_space (std::list< std::shared_ptr< Mat >> &lista, std::vector< int > Vector)

4.1.1 Detailed Description

responsible for changing the color space of the image to RGB space. Implements operations while following the base strategy (SearchFace) interface.

4.1.2 Constructor & Destructor Documentation

4.1.2.1 _RGB()

```
_RGB::_RGB ( )
```

Create the _RGB object.

4.1.2.2 ~_RGB()

```
_RGB::~_RGB ( )
```

Destroys objects.

4.1.3 Member Function Documentation

4.1.3.1 change_space()

```
void _RGB::change_space (
            std::list< std::shared_ptr< Mat >> & lista,
            std::vector< int > Vector )  [virtual]
```

Function performs coversion from BGR color space to RGB.

Parameters

lista	is a list containing pointers to previously loaded images in the form of Mats.
wektor	is a vector of integers which holds the information about the previous changes of color space made to the given image.

Reimplemented from ChangeSpace.

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

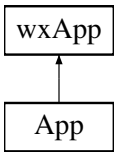
- RBG.h
- RBG.cpp

4.2 App Class Reference

Responsible for application-wide settings for GUI-only apps.

`#include <App.h>`

Inheritance diagram for App:



Public Member Functions

- virtual bool OnInit ()

4.2.1 Detailed Description

Responsible for application-wide settings for GUI-only apps.

4.2.2 Member Function Documentation

4.2.2.1 OnInit()

```
bool App::OnInit ( )  [virtual]
```

Function checks if wxOK = 1 what is crucial for creating main window, initializing image handlers and launching the app.

Returns

bool value of wxOK.

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

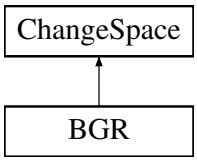
- App.h
- App.cpp

4.3 BGR Class Reference

responsible for changing the color space of the image to BGR space. Implements operations while following the base strategy (SearchFace) interface.

```
#include <BGR.h>
```

Inheritance diagram for BGR:



Public Member Functions

- BGR ()
- ~BGR ()
- void change_space (std::list< std::shared_ptr< Mat >> &lista, std::vector< int > Vector)

4.3.1 Detailed Description

responsible for changing the color space of the image to BGR space. Implements operations while following the base strategy (SearchFace) interface.

4.3.2 Constructor & Destructor Documentation

4.3.2.1 BGR()

```
BGR::BGR ( )
```

Create the BGR object.

4.3.2.2 ~BGR()

```
BGR::~BGR ( )
```

Destroys objects.

4.3.3 Member Function Documentation

4.3.3.1 change_space()

```
void BGR::change_space (
            std::list< std::shared_ptr< Mat >> & lista,
            std::vector< int > Vector )  [virtual]
```

Function performs coversion from current color space to BGR.

Parameters

lista	is a list containing pointers to previously loaded images in the form of Mats.
wektor	is a vector of integers which holds the information about the previous changes of color space made to the given image.

Reimplemented from ChangeSpace.

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

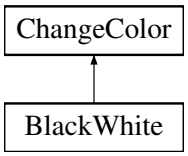
- BGR.h
- BGR.cpp

4.4 BlackWhite Class Reference

Responsible for applying black and white colour to the image. Implements operations while following the base strategy (ChangeColor) interface.

`#include <BlackWhite.h>`

Inheritance diagram for BlackWhite:



Public Member Functions

- BlackWhite ()
- ~BlackWhite ()
- void change_color (std::list< std::shared_ptr< Mat >> &lista)

4.4.1 Detailed Description

Responsible for applying black and white colour to the image. Implements operations while following the base strategy (ChangeColor) interface.

4.4.2 Constructor & Destructor Documentation

4.4.2.1 BlackWhite()

```
BlackWhite::BlackWhite ( )
```

Create the BlackWhite object.

4.4.2.2 ~BlackWhite()

```
BlackWhite::~BlackWhite ( )
```

Destroys object.

4.4.3 Member Function Documentation

4.4.3.1 change_color()

```
void BlackWhite::change_color (
            std::list< std::shared_ptr< Mat >> & lista )  [virtual]
```

Function applies the black and white colours to the first Mat found on the list .

Parameters

lista	is a list containing pointers to previously loaded images in the form of Mats.

Reimplemented from ChangeColor.

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

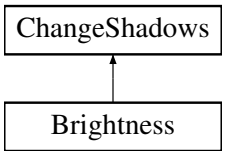
- BlackWhite.h
- BlackWhite.cpp

4.5 Brightness Class Reference

Responsible for brightening the image. Implements operations while following the base strategy (ChangeShadows) interface.

`#include <Brightness.h>`

Inheritance diagram for Brightness:



Public Member Functions

- Brightness ()
- ~Brightness ()
- void change_shadows (std::list< std::shared_ptr< Mat >> &lista, double FromSlider, std::vector< int > wektor)

4.5.1 Detailed Description

Responsible for brightening the image. Implements operations while following the base strategy (ChangeShadows) interface.

4.5.2 Constructor & Destructor Documentation

4.5.2.1 Brightness()

`Brightness::Brightness ( )`

Create the Brightness object.

4.5.2.2 ~Brightness()

```
Brightness::~Brightness ( )
```

Destroys object.

4.5.3 Member Function Documentation

4.5.3.1 change_shadows()

```
void Brightness::change_shadows (
            std::list< std::shared_ptr< Mat >> & lista,
            double FromSlider,
            std::vector< int > wektor )  [virtual]
```

Function brightens or darkens the first Mat found on the list with the selected intensity.

Parameters

lista	is a list containing pointers to previously loaded images in the form of Mats.
FromSlider	is a double variable that stores the value set by the user on the light intensity slider.
wektor	is a vector of integers which holds previously set values from slider.

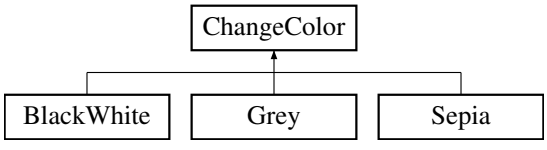
Reimplemented from ChangeShadows.

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

- Brightness.h
- Brightness.cpp

4.6 ChangeColor Class Reference

Inheritance diagram for ChangeColor:



Public Member Functions

- ChangeColor ()
- ~ChangeColor ()
- virtual void change_color (std::list< std::shared_ptr< Mat >> &lista)

4.6.1 Constructor & Destructor Documentation

4.6.1.1 ChangeColor()

```
ChangeColor::ChangeColor ( )
```

Create the ChangeColor object.

4.6.1.2 ~ChangeColor()

```
ChangeColor::~ChangeColor ( )
```

Destroys object.

4.6.2 Member Function Documentation

4.6.2.1 change_color()

```
void ChangeColor::change_color (
            std::list< std::shared_ptr< Mat >> & lista )  [virtual]
```

Function applies the chosen colours to the first Mat found on the list.

Parameters

lista	is a list containing pointers to previously loaded images in the form of Mats.

Reimplemented in BlackWhite, Grey, and Sepia.

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

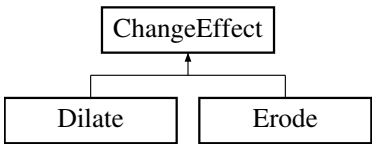
- ChangeColor.h
- ChangeColor.cpp

4.7 ChangeEffect Class Reference

An abstract class responsible for applying chosen operation to the image. The class interface declares operations common to all supported versions.

```
#include <ChangeEffect.h>
```

Inheritance diagram for ChangeEffect:



Public Member Functions

- ChangeEffect ()
- ~ChangeEffect ()
- virtual void change_effect (std::list< std::shared_ptr< Mat >> &lista, int morph)

4.7.1 Detailed Description

An abstract class responsible for applying chosen operation to the image. The class interface declares operations common to all supported versions.

4.7.2 Constructor & Destructor Documentation

4.7.2.1 ChangeEffect()

```
ChangeEffect::ChangeEffect ( )
```

Create the ChangeEffect object.

4.7.2.2 ~ChangeEffect()

```
ChangeEffect::~ChangeEffect ( )
```

Destroys object.

4.7.3 Member Function Documentation

4.7.3.1 change_effect()

```
void ChangeEffect::change_effect (
            std::list< std::shared_ptr< Mat >> & lista,
            int morph )  [virtual]
```

Function applies the chosen operation to the first Mat found on the list.

Parameters

lista	is a list containing pointers to previously loaded images in the form of Mats.
morph	informs which of the three shapes was chosen for our kernel (a fixed size array of numerical coefficeints) which is responsible for carring out the operations..

Reimplemented in Erode, and Dilate.

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

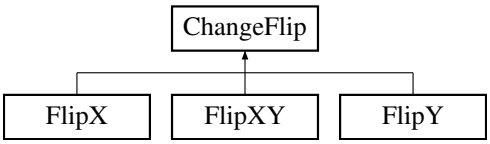
- ChangeEffect.h
- ChangeEffect.cpp

4.8 ChangeFlip Class Reference

An abstract class responsible for flipping the image. The class interface declares operations common to all supported versions.

`#include <ChangeFlip.h>`

Inheritance diagram for ChangeFlip:



Public Member Functions

- ChangeFlip ()
- ~ChangeFlip ()
- virtual void change_flip (std::list< std::shared_ptr< Mat >> &lista)

4.8.1 Detailed Description

An abstract class responsible for flipping the image. The class interface declares operations common to all supported versions.

An abstract class responsible for operations related to the image histogram. The class interface declares operations common to all supported versions.

4.8.2 Constructor & Destructor Documentation

4.8.2.1 ChangeFlip()

```
ChangeFlip::ChangeFlip ( )
```

Create the FaceDetection object.

4.8.2.2 ~ChangeFlip()

```
ChangeFlip::~ChangeFlip ( )
```

Destroys objects.

4.8.3 Member Function Documentation

4.8.3.1 change_flip()

```
void ChangeFlip::change_flip (
            std::list< std::shared_ptr< Mat >> & lista )  [virtual]
```

Function flips the image.

Parameters

lista	is a list containing pointers to previously loaded images in the form of Mats.

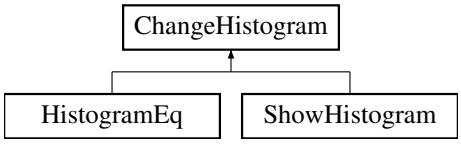
Reimplemented in FlipY, FlipX, and FlipXY.

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

- ChangeFlip.h
- ChangeFlip.cpp

4.9 ChangeHistogram Class Reference

Inheritance diagram for ChangeHistogram:



Public Member Functions

- ChangeHistogram ()
- ~ChangeHistogram ()
- virtual void change_histogram (std::list< std::shared_ptr< Mat >> &lista)

4.9.1 Constructor & Destructor Documentation

4.9.1.1 ChangeHistogram()

```
ChangeHistogram::ChangeHistogram ( )
```

Create the ChangeHistogram object.

4.9.1.2 ~ChangeHistogram()

```
ChangeHistogram::~ChangeHistogram ( )
```

Destroys objects.

4.9.2 Member Function Documentation

4.9.2.1 change_histogram()

```
void ChangeHistogram::change_histogram (
            std::list< std::shared_ptr< Mat >> & lista )  [virtual]
```

Function performs histogram-related operations.

Parameters

lista	is a list containing pointers to previously loaded images in the form of Mats.

Reimplemented in HistogramEq, and ShowHistogram.

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

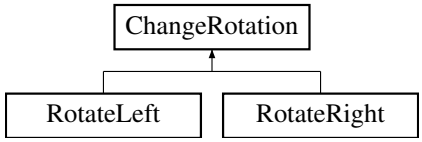
- ChangeHistogram.h
- ChangeHistogram.cpp

4.10 ChangeRotation Class Reference

An abstract class responsible for rotating the given image. The class interface declares operations common to all supported versions.

`#include <ChangeRotation.h>`

Inheritance diagram for ChangeRotation:



Public Member Functions

- ChangeRotation ()
- ~ChangeRotation ()
- virtual void change_rotation (std::list< std::shared_ptr< Mat >> &lista)

4.10.1 Detailed Description

An abstract class responsible for rotating the given image. The class interface declares operations common to all supported versions.

4.10.2 Constructor & Destructor Documentation

4.10.2.1 ChangeRotation()

```
ChangeRotation::ChangeRotation ( )
```

Create the ChangeHistogram object.

4.10.2.2 ~ChangeRotation()

```
ChangeRotation::~ChangeRotation ( )
```

Destroys objects.

4.10.3 Member Function Documentation

4.10.3.1 change_rotation()

```
void ChangeRotation::change_rotation (
            std::list< std::shared_ptr< Mat >> & lista )  [virtual]
```

Function performs image rotation.

Parameters

lista	is a list containing pointers to previously loaded images in the form of Mats.

Reimplemented in RotateRight, and RotateLeft.

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

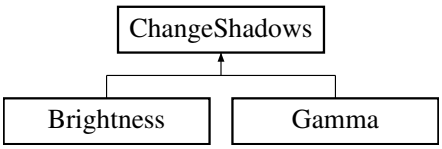
- ChangeRotation.h
- ChangeRotation.cpp

4.11 ChangeShadows Class Reference

An abstract clas responsible for applying chosen colours to the image. The class interface declares operations common to all supported versions.

`#include <ChangeColor.h>`

Inheritance diagram for ChangeShadows:



Public Member Functions

- ChangeShadows ()
- ~ChangeShadows ()
- virtual void change_shadows (std::list< std::shared_ptr< Mat >> &lista, double FromSlider, std::vector< int > wektor)

4.11.1 Detailed Description

An abstract clas responsible for applying chosen colours to the image. The class interface declares operations common to all supported versions.

An abstract clas responsible for applying chosen brightness corrections to the image. The class interface declares operations common to all supported versions.

4.11.2 Constructor & Destructor Documentation

4.11.2.1 ChangeShadows()

```
ChangeShadows::ChangeShadows ( )
```

Create the ChangeShadows object.

4.11.2.2 ~ChangeShadows()

```
ChangeShadows::~ChangeShadows ( )
```

Destroys object.

4.11.3 Member Function Documentation

4.11.3.1 change_shadows()

```
void ChangeShadows::change_shadows (
            std::list< std::shared_ptr< Mat >> & lista,
            double FromSlider,
            std::vector< int > wektor )  [virtual]
```

Function applies the chosen brightness corrections to the first Mat found on the list with the selected intensity.∗

Parameters

lista	is a list containing pointers to previously loaded images in the form of Mats.
FromSlider	is a double variable that stores the value set by the user on the light intensity slider.
wektor	is a vector of integers which holds previously set values from slider.

Reimplemented in Brightness, and Gamma.

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

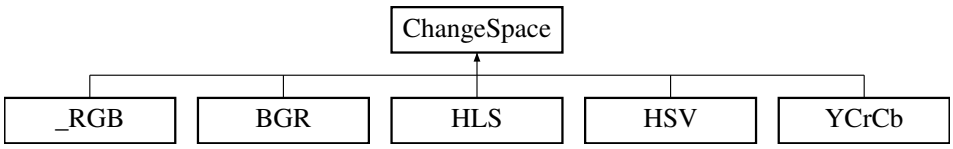
- ChangeShadows.h
- ChangeShadows.cpp

4.12 ChangeSpace Class Reference

An abstract class responsible for changing the color space of the image. The class interface declares operations common to all supported versions.

```
#include <ChangeSpace.h>
```

Inheritance diagram for ChangeSpace:



Public Member Functions

- ChangeSpace ()
- ~ChangeSpace ()
- virtual void change_space (std::list< std::shared_ptr< Mat >> &lista, std::vector< int > Vector)

4.12.1 Detailed Description

An abstract class responsible for changing the color space of the image. The class interface declares operations common to all supported versions.

4.12.2 Constructor & Destructor Documentation

4.12.2.1 ChangeSpace()

```
ChangeSpace::ChangeSpace ( )
```

Create the ChangeSpace object.

4.12.2.2 ~ChangeSpace()

```
ChangeSpace::~ChangeSpace ( )
```

Destroys objects.

4.12.3 Member Function Documentation

4.12.3.1 change_space()

```
void ChangeSpace::change_space (
            std::list< std::shared_ptr< Mat >> & lista,
            std::vector< int > Vector )  [virtual]
```

Function performs coversion from current color space to another.

Parameters

lista	is a list containing pointers to previously loaded images in the form of Mats.
wektor	is a vector of integers which holds the information about the previous changes of color space made to the given image.

Reimplemented in _RGB, BGR, HSV, HLS, and YCrCb.

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

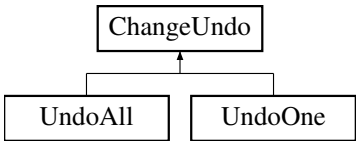
- ChangeSpace.h
- ChangeSpace.cpp

4.13 ChangeUndo Class Reference

An abstract class responsible for getting rid of images with unwanted changes. The class interface declares operations common to all supported versions.

`#include <ChangeUndo.h>`

Inheritance diagram for ChangeUndo:



Public Member Functions

- ChangeUndo ()
- ~ChangeUndo ()
- virtual void change_undo (std::list< std::shared_ptr< Mat >> &lista)

4.13.1 Detailed Description

An abstract class responsible for getting rid of images with unwanted changes. The class interface declares operations common to all supported versions.

4.13.2 Constructor & Destructor Documentation

4.13.2.1 ChangeUndo()

`ChangeUndo::ChangeUndo ( )`

Create the ChangeUndo object.

4.13.2.2 ~ChangeUndo()

```
ChangeUndo::~ChangeUndo ( )
```

Destroys objects.

4.13.3 Member Function Documentation

4.13.3.1 change_undo()

```
void ChangeUndo::change_undo (
            std::list< std::shared_ptr< Mat >> & lista )  [virtual]
```

Function erases unwanted images from a list.

Parameters

lista	is a list containing pointers to previously loaded images in the form of Mats.

Reimplemented in UndoAll, and UndoOne.

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

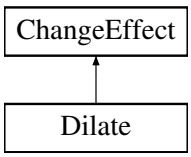
- ChangeUndo.h
- ChangeUndo.cpp

4.14 Dilate Class Reference

Responsible for applying the dilation effect to the image. Implements operations while following the base strategy (ChangeEffect) interface.

```
#include <Dilate.h>
```

Inheritance diagram for Dilate:



Public Member Functions

- Dilate ()
- ~Dilate ()
- void change_effect (std::list< std::shared_ptr< Mat >> &lista, int morph)

4.14.1 Detailed Description

Responsible for applying the dilation effect to the image. Implements operations while following the base strategy (ChangeEffect) interface.

4.14.2 Constructor & Destructor Documentation

4.14.2.1 Dilate()

```
Dilate::Dilate ( )
```

Create the ChangeEffect object.

4.14.2.2 ~Dilate()

```
Dilate::~Dilate ( )
```

Destroys object.

4.14.3 Member Function Documentation

4.14.3.1 change_effect()

```
void Dilate::change_effect (
            std::list< std::shared_ptr< Mat >> & lista,
            int morph )  [virtual]
```

Function applies the dilation effect to the first Mat found on the list.

Parameters

lista	is a list containing pointers to previously loaded images in the form of Mats.
morph	informs which of the three shapes was chosen for our kernel (a fixed size array of numerical coefficeints) which is responsible for carring out the operation.

Reimplemented from ChangeEffect.

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

- Dilate.h
- Dilate.cpp

4.15 Editor Class Reference

Class is responsible of maintaining a reference to one of the concrete strategies and communicates with this object only via the strategy interface.

`#include <Editor.h>`

Public Member Functions

- Editor ()
- ~Editor ()
- void SetPhoto (std::shared_ptr< Photo > X)
- void which_color (int which)
- void which_flip (int which)
- void which_undo (int which)
- void which_shadow (int which, double HowMuch, std::vector< int > wektor)
- void which_face ()
- void which_rotation (int which)
- void which_histogram (int which)
- void which_space (int which, std::vector< int > Vector)
- void which_effect (int which, int morph)
- bool CheckMatEquality (const cv::Mat Mat1, const cv::Mat Mat2)

4.15.1 Detailed Description

Class is responsible of maintaining a reference to one of the concrete strategies and communicates with this object only via the strategy interface.

4.15.2 Constructor & Destructor Documentation

4.15.2.1 Editor()

```
Editor::Editor ( )
```

Create the Editor object.

4.15.2.2 ~Editor()

```
Editor::~Editor ( )
```

Destroys objects.

4.15.3 Member Function Documentation

4.15.3.1 CheckMatEquality()

```
bool Editor::CheckMatEquality (
            const cv::Mat Mat1,
            const cv::Mat Mat2 )
```

The function checks if two given Mat arrays are equal (i.e. if they are exactly the same).

Parameters

Mat1	is a first Mat variable to compare with.
Mat2	is a second Mat variable to compare with.

Returns

bool value, true if they are the same, false if they are not.

4.15.3.2 SetPhoto()

```
void Editor::SetPhoto (
            std::shared_ptr< Photo > X )
```

Function assigns the pointer with the Photo object to the Editor attribute.

Parameters

X	is a shared pointer to a Photo object.

4.15.3.3 which_color()

```
void Editor::which_color (
            int which )
```

Function assigns strategies to the ChangeColor pointer depending on the user's choice, then calls the appropriate function to perform operations on the photo.

Parameters

which	is an integer variable informing about the user choice.

Exceptions

if	the list of Mats is empty.

4.15.3.4 which_effect()

```
void Editor::which_effect (
            int which,
            int morph )
```

Function assigns strategies to the ChangeEffect pointer depending on the user's choice, then calls the appropriate function to perform operations on the photo.

Parameters

which	is an integer variable informing about the user choice.
morph	informs which of the three shapes was chosen for our kernel (a fixed size array of numerical coefficeints) which is responsible for carring out the operations..

Exceptions

IsNull	if the list of images is empty.

4.15.3.5 which_face()

```
void Editor::which_face ( )
```

Function assigns strategies to the SearchFace pointer depending on the user's choice, then calls the appropriate function to perform operations on the photo.

Exceptions

IsNull	if the list of images is empty.
NoFaceFound	if no face was detected.

4.15.3.6 which_flip()

```
void Editor::which_flip (
            int which )
```

Function assigns strategies to the ChangeFlip pointer depending on the user's choice, then calls the appropriate function to perform operations on the photo.

Parameters

which	is an integer variable informing about the user choice.

Exceptions

IsNull	if the list of images is empty.

4.15.3.7 which_histogram()

```
void Editor::which_histogram (
            int which )
```

Function assigns strategies to the ChangeHistogram pointer depending on the user's choice, then calls the appropriate function to perform operations on the photo.

Parameters

which	is an integer variable informing about the user choice.

Exceptions

IsNull	if the list of images is empty.

4.15.3.8 which_rotation()

```
void Editor::which_rotation (
            int which )
```

Function assigns strategies to the ChangeRotation pointer depending on the user's choice, then calls the appropriate function to perform operations on the photo.

Parameters

which	is an integer variable informing about the user choice.

Exceptions

IsNull	if the list of images is empty.

4.15.3.9 which_shadow()

```
void Editor::which_shadow (
            int which,
            double HowMuch,
            std::vector< int > wektor )
```

Function assigns strategies to the ChangeShadows pointer depending on the user's choice, then calls the appropriate function to perform operations on the photo.

Parameters

which	is an integer variable informing about the user choice.
HowMuch	is a double variable that stores information about the intensity of the operation to be performed.
wektor	is a vector of integers which holds previously set values from slider.

Exceptions

IsNull	if the list of images is empty.

4.15.3.10 which_space()

```
void Editor::which_space (
            int which,
            std::vector< int > Vector )
```

Function assigns strategies to the ChangeHistogram pointer depending on the user's choice, then calls the appropriate function to perform operations on the photo.

Parameters

which	is an integer variable informing about the user choice.
Vector	is a vector of integers which holds the information about the previous changes of color space made to the given image.

Exceptions

IsNull	if the list of images is empty.

4.15.3.11 which_undo()

```
void Editor::which_undo (
            int which )
```

Function assigns strategies to the ChangeUndo pointer depending on the user's choice, then calls the appropriate function to perform operations on the photo.

Parameters

which	is an integer variable informing about the user choice.

Exceptions

IsNull	if the list of images is empty.
IsOneElementOnly	if the list of images has only one element.

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

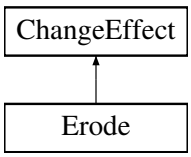
- Editor.h
- Editor.cpp

4.16 Erode Class Reference

Responsible for applying the erosion effect to the image. Implements operations while following the base strategy (ChangeEffect) interface.

`#include <Erode.h>`

Inheritance diagram for Erode:



Public Member Functions

- Erode ()
- ~Erode ()
- void change_effect (std::list< std::shared_ptr< Mat >> &lista, int morph)

4.16.1 Detailed Description

Responsible for applying the erosion effect to the image. Implements operations while following the base strategy (ChangeEffect) interface.

4.16.2 Constructor & Destructor Documentation

4.16.2.1 Erode()

```
Erode::Erode ( )
```

Create the Erode object.

4.16.2.2 ~Erode()

```
Erode::~Erode ( )
```

Destroys object.

4.16.3 Member Function Documentation

4.16.3.1 change_effect()

```
void Erode::change_effect (
            std::list< std::shared_ptr< Mat >> & lista,
            int morph )  [virtual]
```

Function applies the erosion effect to the first Mat found on the list.

Parameters

lista	is a list containing pointers to previously loaded images in the form of Mats.
morph	informs which of the three shapes was chosen for our kernel (a fixed size array of numerical coefficeints) which is responsible for carring out the operation.

Reimplemented from ChangeEffect.

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

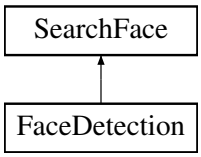
- Erode.h
- Erode.cpp

4.17 FaceDetection Class Reference

Responsible for finding human faces in the given image and outlining the area in which they are located. Implements operations while following the base strategy (SearchFace) interface.

```
#include <FaceDetection.h>
```

Inheritance diagram for FaceDetection:



Public Member Functions

- FaceDetection ()
- ~FaceDetection ()
- void find_face (std::list< std::shared_ptr< Mat >> &lista)
- Mat detectAndDraw (Mat &img, CascadeClassifier &cascade, double scale)

4.17.1 Detailed Description

Responsible for finding human faces in the given image and outlining the area in which they are located. Implements operations while following the base strategy (SearchFace) interface.

4.17.2 Constructor & Destructor Documentation

4.17.2.1 FaceDetection()

```
FaceDetection::FaceDetection ( )
```

Create the FaceDetection object.

4.17.2.2 ~FaceDetection()

```
FaceDetection::~FaceDetection ( )
```

Destroys objects.

4.17.3 Member Function Documentation

4.17.3.1 detectAndDraw()

```
Mat FaceDetection::detectAndDraw (
            Mat & img,
            CascadeClassifier & cascade,
            double scale )
```

Function that actually finds a face in a given image and contours it.

Parameters

img	is a Mat respresenting the chosen image.
cascade	is a chosen cascade classifier.

Returns

A Mat of changed image.

4.17.3.2 find_face()

```
void FaceDetection::find_face (
            std::list< std::shared_ptr< Mat >> & lista )  [virtual]
```

Function prepares necessary variables and files to perform face detection operation.

Parameters

lista	is a list containing pointers to previously loaded images in the form of Mats.

Reimplemented from SearchFace.

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

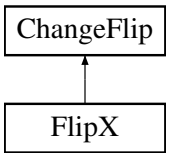
- FaceDetection.h
- FaceDetection.cpp

4.18 FlipX Class Reference

Responsible for flipping the image horizontally. Implements operations while following the base strategy (ChangeFlip) interface.

```
#include <FlipX.h>
```

Inheritance diagram for FlipX:



Public Member Functions

- FlipX ()
- ~FlipX ()
- void change_flip (std::list< std::shared_ptr< Mat >> &lista)

4.18.1 Detailed Description

Responsible for flipping the image horizontally. Implements operations while following the base strategy (ChangeFlip) interface.

Responsible for flipping the image horizontally and vertically. Implements operations while following the base strategy (ChangeFlip) interface.

4.18.2 Constructor & Destructor Documentation

4.18.2.1 FlipX()

```
FlipX::FlipX ( )
```

Create the FaceDetection object.

4.18.2.2 ~FlipX()

```
FlipX::~FlipX ( )
```

Destroys objects.

4.18.3 Member Function Documentation

4.18.3.1 change_flip()

```
void FlipX::change_flip (
            std::list< std::shared_ptr< Mat >> & lista )  [virtual]
```

Function flips the image horizontally.

Parameters

lista	is a list containing pointers to previously loaded images in the form of Mats.

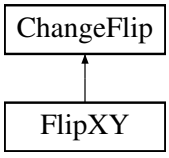
Reimplemented from ChangeFlip.

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

- FlipX.h
- FlipX.cpp

4.19 FlipXY Class Reference

Inheritance diagram for FlipXY:



Public Member Functions

- FlipXY ()
- ~FlipXY ()
- void change_flip (std::list< std::shared_ptr< Mat >> &lista)

4.19.1 Constructor & Destructor Documentation

4.19.1.1 FlipXY()

```
FlipXY::FlipXY ( )
```

Create the FaceDetection object.

4.19.1.2 ~FlipXY()

```
FlipXY::~FlipXY ( )
```

Destroys objects.

4.19.2 Member Function Documentation

4.19.2.1 change_flip()

```
void FlipXY::change_flip (
            std::list< std::shared_ptr< Mat >> & lista )  [virtual]
```

Function flips the image horizontally and vertically.

Parameters

lista	is a list containing pointers to previously loaded images in the form of Mats.

Reimplemented from ChangeFlip.

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

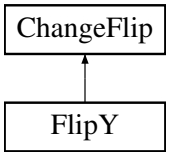
- FlipXY.h
- FlipXY.cpp

4.20 FlipY Class Reference

Responsible for flipping the image vertically. Implements operations while following the base strategy (ChangeFlip) interface.

```
#include <FlipY.h>
```

Inheritance diagram for FlipY:



Public Member Functions

- FlipY ()
- ~FlipY ()
- void change_flip (std::list< std::shared_ptr< Mat >> &lista)

4.20.1 Detailed Description

Responsible for flipping the image vertically. Implements operations while following the base strategy (ChangeFlip) interface.

4.20.2 Constructor & Destructor Documentation

4.20.2.1 FlipY()

```
FlipY::FlipY ( )
```

Create the FlipY object.

4.20.2.2 ~FlipY()

```
FlipY::~FlipY ( )
```

Destroys objects.

4.20.3 Member Function Documentation

4.20.3.1 change_flip()

```
void FlipY::change_flip (
            std::list< std::shared_ptr< Mat >> & lista )  [virtual]
```

Function flips the image vertically.

Parameters

lista	is a list containing pointers to previously loaded images in the form of Mats.

Reimplemented from ChangeFlip.

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

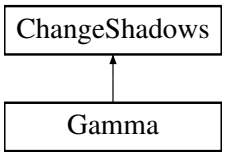
- FlipY.h
- FlipY.cpp

4.21 Gamma Class Reference

Responsible for changing the gamma correction of the image. Implements operations while following the base strategy (ChangeShadows) interface.

`#include <Gamma.h>`

Inheritance diagram for Gamma:



Public Member Functions

- Gamma ()
- ~Gamma ()
- void change_shadows (std::list< std::shared_ptr< Mat >> &lista, double FromSlider, std::vector< int > wektor)
- bool **matIsEqual** (const cv::Mat Mat1, const cv::Mat Mat2)

4.21.1 Detailed Description

Responsible for changing the gamma correction of the image. Implements operations while following the base strategy (ChangeShadows) interface.

4.21.2 Constructor & Destructor Documentation

4.21.2.1 Gamma()

`Gamma::Gamma ( )`

Create the Brightness object.

4.21.2.2 ~Gamma()

`Gamma::~Gamma ( )`

Destroys object.

4.21.3 Member Function Documentation

4.21.3.1 change_shadows()

```
void Gamma::change_shadows (
            std::list< std::shared_ptr< Mat >> & lista,
            double FromSlider,
            std::vector< int > wektor )  [virtual]
```

Function brightens or darkens the first Mat found on the list with the selected intensity by adjusting gamma correction.

Parameters

lista	is a list containing pointers to previously loaded images in the form of Mats.
FromSlider	is a double variable that stores the intensity value set by the user.
wektor	is a vector of integers which holds previously set values from slider.

Reimplemented from ChangeShadows.

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

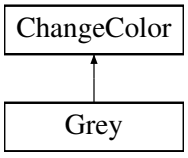
- Gamma.h
- Gamma.cpp

4.22 Grey Class Reference

Responsible for applying grey colour to the image. Implements operations while following the base strategy (ChangeColor) interface.

```
#include <Grey.h>
```

Inheritance diagram for Grey:



Public Member Functions

- Grey ()
- ~Grey ()
- void change_color (std::list< std::shared_ptr< Mat >> &lista)

4.22.1 Detailed Description

Responsible for applying grey colour to the image. Implements operations while following the base strategy (ChangeColor) interface.

4.22.2 Constructor & Destructor Documentation

4.22.2.1 Grey()

```
Grey::Grey ( )
```

Create the Grey object.

4.22.2.2 ~Grey()

```
Grey::~Grey ( )
```

Destroys object.

4.22.3 Member Function Documentation

4.22.3.1 change_color()

```
void Grey::change_color (
            std::list< std::shared_ptr< Mat >> & lista ) [virtual]
```

Function applies the grey colour to the first Mat found on the list .

Parameters

lista	is a list containing pointers to previously loaded images in the form of Mats.

Reimplemented from ChangeColor.

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

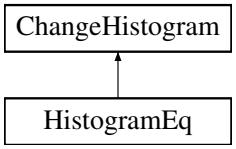
- Grey.h
- Grey.cpp

4.23 HistogramEq Class Reference

Responsible for histogram equalization. Implements operations while following the base strategy (ChangeFlip) interface.

`#include <HistogramEq.h>`

Inheritance diagram for HistogramEq:



Public Member Functions

- HistogramEq ()
- ~HistogramEq ()
- void change_histogram (std::list< std::shared_ptr< Mat >> &lista)

4.23.1 Detailed Description

Responsible for histogram equalization. Implements operations while following the base strategy (ChangeFlip) interface.

4.23.2 Constructor & Destructor Documentation

4.23.2.1 HistogramEq()

```
HistogramEq::HistogramEq ( )
```

Create the HistogramEq object.

4.23.2.2 ~HistogramEq()

```
HistogramEq::~HistogramEq ( )
```

Destroys objects.

4.23.3 Member Function Documentation

4.23.3.1 change_histogram()

```
void HistogramEq::change_histogram (
            std::list< std::shared_ptr< Mat >> & lista )  [virtual]
```

Function performs histogram equalization.

Parameters

lista	is a list containing pointers to previously loaded images in the form of Mats.

Reimplemented from ChangeHistogram.

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

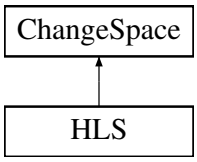
- HistogramEq.h
- HistogramEq.cpp

4.24 HLS Class Reference

responsible for changing the color space of the image to HLS space. Implements operations while following the base strategy (SearchFace) interface.

`#include <HLS.h>`

Inheritance diagram for HLS:



Public Member Functions

- HLS ()
- ~HLS ()
- void change_space (std::list< std::shared_ptr< Mat >> &lista, std::vector< int > Vector)

4.24.1 Detailed Description

responsible for changing the color space of the image to HLS space. Implements operations while following the base strategy (SearchFace) interface.

4.24.2 Constructor & Destructor Documentation

4.24.2.1 HLS()

`HLS::HLS ( )`

Create the HLS object.

4.24.2.2 ~HLS()

```
HLS::~HLS ( )
```

Destroys objects.

4.24.3 Member Function Documentation

4.24.3.1 change_space()

```
void HLS::change_space (
            std::list< std::shared_ptr< Mat >> & lista,
            std::vector< int > Vector )  [virtual]
```

Function performs coversion from BGR color space to HLS.

Parameters

lista	is a list containing pointers to previously loaded images in the form of Mats.
wektor	is a vector of integers which holds the information about the previous changes of color space made to the given image.

Reimplemented from ChangeSpace.

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

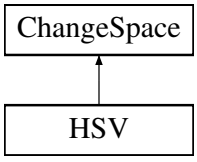
- HLS.h
- HLS.cpp

4.25 HSV Class Reference

responsible for changing the color space of the image to HSV space. Implements operations while following the base strategy (SearchFace) interface.

```
#include <HSV.h>
```

Inheritance diagram for HSV:



Public Member Functions

- HSV ()
- ~HSV ()
- void change_space (std::list< std::shared_ptr< Mat >> &lista, std::vector< int > Vector)

4.25.1 Detailed Description

responsible for changing the color space of the image to HSV space. Implements operations while following the base strategy (SearchFace) interface.

4.25.2 Constructor & Destructor Documentation

4.25.2.1 HSV()

```
HSV::HSV ( )
```

Create the HSV object.

4.25.2.2 ~HSV()

```
HSV::~HSV ( )
```

Destroys objects.

4.25.3 Member Function Documentation

4.25.3.1 change_space()

```
void HSV::change_space (
            std::list< std::shared_ptr< Mat >> & lista,
            std::vector< int > Vector )  [virtual]
```

Function performs coversion from BGR color space to HSV.

Parameters

lista	is a list containing pointers to previously loaded images in the form of Mats.
wektor	is a vector of integers which holds the information about the previous changes of color space made to the given image.

Reimplemented from ChangeSpace.

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

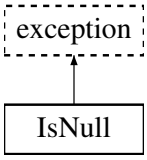
- HSV.h
- HSV.cpp

4.26 IsNull Class Reference

Responsible for throwing a message when the used list is empty.

`#include <Exceptions.h>`

Inheritance diagram for IsNull:



Public Member Functions

- IsNull ()
- virtual ~IsNull () throw ()
- virtual const char * what () const throw ()

Protected Attributes

- std::string error_message = "You did not upload any photo!!!"

  Error message.

4.26.1 Detailed Description

Responsible for throwing a message when the used list is empty.

4.26.2 Constructor & Destructor Documentation

4.26.2.1 IsNull()

`IsNull::IsNull ( ) [inline], [explicit]`

Create the IsNull object.

4.26.2.2 ~IsNull()

```
virtual IsNull::~IsNull ( ) throw ( )   [inline], [virtual]
```

Destructor. Virtual to allow for subclassing.

4.26.3 Member Function Documentation

4.26.3.1 what()

```
virtual const char* IsNull::what ( ) const throw ( )   [inline], [virtual]
```

Returns a pointer to the (constant) error description.

Returns

A pointer to a const char*.

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

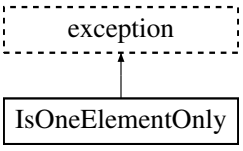
- Exceptions.h

4.27 IsOneElementOnly Class Reference

Responsible for throwing a message when the used list has only one element.

```
#include <Exceptions.h>
```

Inheritance diagram for IsOneElementOnly:



Public Member Functions

- IsOneElementOnly ()
- virtual ~IsOneElementOnly () throw ()
- virtual const char * what () const throw ()

Protected Attributes

- std::string error_message = "Nothing more to undo!"

  Error message.

4.27.1 Detailed Description

Responsible for throwing a message when the used list has only one element.

4.27.2 Constructor & Destructor Documentation

4.27.2.1 IsOneElementOnly()

```
IsOneElementOnly::IsOneElementOnly ( )  [inline], [explicit]
```

Create the IsOneElementOnly object.

4.27.2.2 ~IsOneElementOnly()

```
virtual IsOneElementOnly::~IsOneElementOnly ( ) throw ( )   [inline], [virtual]
```

Destructor. Virtual to allow for subclassing.

4.27.3 Member Function Documentation

4.27.3.1 what()

```
virtual const char* IsOneElementOnly::what ( ) const throw ( )   [inline], [virtual]
```

Returns a pointer to the (constant) error description.

Returns

A pointer to a const char*.

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

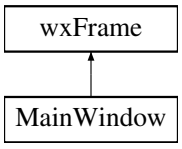
- Exceptions.h

4.28 MainWindow Class Reference

Creates and manages the project GUI.

```
#include <MainWindow.h>
```

Inheritance diagram for MainWindow:



Public Member Functions

- MainWindow (wxWindow ∗parent, wxWindowID id=-1)
- virtual ∼MainWindow ()

4.28.1 Detailed Description

Creates and manages the project GUI.

4.28.2 Constructor & Destructor Documentation

4.28.2.1 MainWindow()

```
MainWindow::MainWindow (
            wxWindow * parent,
            wxWindowID id = -1 )
```

Constructor. Create the MainWindow object.

Parameters

parent	The window parent.
id	The window identifier.

4.28.2.2 ∼MainWindow()

```
MainWindow::∼MainWindow ( )  [virtual]
```

Destructor. Destroys all child windows and menu bar if present.

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

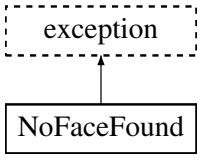
- MainWindow.h
- MainWindow.cpp

4.29 NoFaceFound Class Reference

Responsible for throwing a message when face detector cannot recognize any face.

`#include <Exceptions.h>`

Inheritance diagram for NoFaceFound:



Public Member Functions

- NoFaceFound ()
- virtual ~NoFaceFound () throw ()
- virtual const char * what () const throw ()

Protected Attributes

- std::string error_message = "No face was detected!"

  Error message.

4.29.1 Detailed Description

Responsible for throwing a message when face detector cannot recognize any face.

4.29.2 Constructor & Destructor Documentation

4.29.2.1 NoFaceFound()

```
NoFaceFound::NoFaceFound ( )  [inline], [explicit]
```

Create the IsOneElementOnly object.

4.29.2.2 ~NoFaceFound()

```
virtual NoFaceFound::~NoFaceFound ( ) throw ( )   [inline], [virtual]
```

Destructor. Virtual to allow for subclassing.

4.29.3 Member Function Documentation

4.29.3.1 what()

```
virtual const char* NoFaceFound::what ( ) const throw ( )   [inline], [virtual]
```

Returns a pointer to the (constant) error description.

Returns

A pointer to a const char*.

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

- Exceptions.h

4.30 Photo Class Reference

Class is reponsible for holding the image and the list with all with all versions of the image that was created, as well as stores data about the properties of the photo.

`#include <Photo.h>`

Public Member Functions

- Photo ()
- ~Photo ()
- std::list< std::shared_ptr< Mat > > & GetImageList ()
- std::vector< int > & GetBrightness ()
- std::vector< int > & GetSpaces ()
- void LoadImageFromFile (std::string FileName)

4.30.1 Detailed Description

Class is reponsible for holding the image and the list with all with all versions of the image that was created, as well as stores data about the properties of the photo.

4.30.2 Constructor & Destructor Documentation

4.30.2.1 Photo()

`Photo::Photo ( )`

Create the Photo object.

4.30.2.2 ~Photo()

`Photo::~Photo ( )`

Destroys object.

4.30.3 Member Function Documentation

4.30.3.1 GetBrightness()

```
std::vector< int > & Photo::GetBrightness ( )
```

Function allows the access to the private Photo's vector which stores the previous brightness values.

Returns

the vector.

4.30.3.2 GetImageList()

```
std::list< std::shared_ptr< Mat > > & Photo::GetImageList ( )
```

Function allows the access to the private Photo's list of pointers to Mats.

Returns

the list pf pointers to Mats.

4.30.3.3 GetSpaces()

```
std::vector< int > & Photo::GetSpaces ( )
```

Function allows the access to the private Photo's vector which stores the previously chosen color spaces.

Returns

the vector.

4.30.3.4 LoadImageFromFile()

```
void Photo::LoadImageFromFile (
            std::string FileName )
```

Function loades and opens chosen by the user image to a Mat array ans sets initial values in list and vectors.

Parameters

FileName	is a string variable which holds name of the image.

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

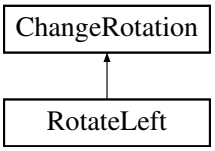
- Photo.h
- Photo.cpp

4.31 RotateLeft Class Reference

An abstract class responsible for rotating the given image 90 degrees to the left. Implements operations while following the base strategy (ChangeFlip) interface.

`#include <RotateLeft.h>`

Inheritance diagram for RotateLeft:



Public Member Functions

- RotateLeft ()
- ~RotateLeft ()
- void change_rotation (std::list< std::shared_ptr< Mat >> &lista)

4.31.1 Detailed Description

An abstract class responsible for rotating the given image 90 degrees to the left. Implements operations while following the base strategy (ChangeFlip) interface.

4.31.2 Constructor & Destructor Documentation

4.31.2.1 RotateLeft()

```
RotateLeft::RotateLeft ( )
```

Create the RotateLeft object.

4.31.2.2 ~RotateLeft()

```
RotateLeft::~RotateLeft ( )
```

Destroys objects.

4.31.3 Member Function Documentation

4.31.3.1 change_rotation()

```
void RotateLeft::change_rotation (
            std::list< std::shared_ptr< Mat >> & lista )  [virtual]
```

Function performs image rotation to the left.

Parameters

lista	is a list containing pointers to previously loaded images in the form of Mats.

Reimplemented from ChangeRotation.

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

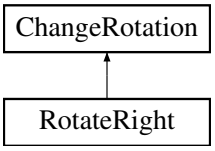
- RotateLeft.h
- RotateLeft.cpp

4.32 RotateRight Class Reference

An abstract class responsible for rotating the given image 90 degrees to the right. Implements operations while following the base strategy (ChangeFlip) interface.

`#include <RotateRight.h>`

Inheritance diagram for RotateRight:



Public Member Functions

- RotateRight ()
- ~RotateRight ()
- void change_rotation (std::list< std::shared_ptr< Mat >> &lista)

4.32.1 Detailed Description

An abstract class responsible for rotating the given image 90 degrees to the right. Implements operations while following the base strategy (ChangeFlip) interface.

4.32.2 Constructor & Destructor Documentation

4.32.2.1 RotateRight()

`RotateRight::RotateRight ( )`

Create the RotateLeft object.

4.32.2.2 ~RotateRight()

```
RotateRight::~RotateRight ( )
```

Destroys objects.

4.32.3 Member Function Documentation

4.32.3.1 change_rotation()

```
void RotateRight::change_rotation (
            std::list< std::shared_ptr< Mat >> & lista )  [virtual]
```

Function performs image rotation to the left.

Parameters

lista	is a list containing pointers to previously loaded images in the form of Mats.

Reimplemented from ChangeRotation.

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

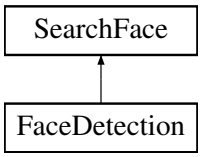
- RotateRight.h
- RotateRight.cpp

4.33 SearchFace Class Reference

An abstract clas responsible for finding human faces in the given image. The class interface declares operations common to all supported versions.

```
#include <SearchFace.h>
```

Inheritance diagram for SearchFace:



Public Member Functions

- SearchFace ()
- ~SearchFace ()
- virtual void find_face (std::list< std::shared_ptr< Mat >> &lista)

4.33.1 Detailed Description

An abstract clas responsible for finding human faces in the given image. The class interface declares operations common to all supported versions.

4.33.2 Constructor & Destructor Documentation

4.33.2.1 SearchFace()

```
SearchFace::SearchFace ( )
```

Create the SearchFace object.

4.33.2.2 ~SearchFace()

```
SearchFace::~SearchFace ( )
```

Destroys objects.

4.33.3 Member Function Documentation

4.33.3.1 find_face()

```
void SearchFace::find_face (
            std::list< std::shared_ptr< Mat >> & lista ) [virtual]
```

Function detects faces on the given image.

Parameters

lista	is a list containing pointers to previously loaded images in the form of Mats.

Reimplemented in FaceDetection.

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

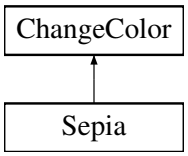
- SearchFace.h
- SearchFace.cpp

4.34 Sepia Class Reference

Responsible for applying sepia colour to the image. Implements operations while following the base strategy (ChangeColor) interface.

`#include <Sepia.h>`

Inheritance diagram for Sepia:



Public Member Functions

- Sepia ()
- ~Sepia ()
- void change_color (std::list< std::shared_ptr< Mat >> &lista)

4.34.1 Detailed Description

Responsible for applying sepia colour to the image. Implements operations while following the base strategy (ChangeColor) interface.

4.34.2 Constructor & Destructor Documentation

4.34.2.1 Sepia()

```
Sepia::Sepia ( )
```

Create the Sepia object.

4.34.2.2 ~Sepia()

```
Sepia::~Sepia ( )
```

Destroys object.

4.34.3 Member Function Documentation

4.34.3.1 change_color()

```
void Sepia::change_color (
            std::list< std::shared_ptr< Mat >> & lista )  [virtual]
```

Function applies the sepia colour to the first Mat found on the list .

Parameters

lista	is a list containing pointers to previously loaded images in the form of Mats.

Reimplemented from ChangeColor.

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

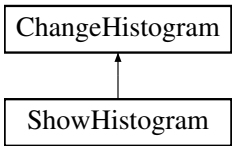
- Sepia.h
- Sepia.cpp

4.35 ShowHistogram Class Reference

Responsible for displaying histogram. Implements operations while following the base strategy (ChangeFlip) interface.

`#include <ShowHistogram.h>`

Inheritance diagram for ShowHistogram:



Public Member Functions

- ShowHistogram ()
- ~ShowHistogram ()
- void change_histogram (std::list< std::shared_ptr< Mat >> &lista)

4.35.1 Detailed Description

Responsible for displaying histogram. Implements operations while following the base strategy (ChangeFlip) interface.

4.35.2 Constructor & Destructor Documentation

4.35.2.1 ShowHistogram()

`ShowHistogram::ShowHistogram ( )`

Create the ChangeHistogram object.

4.35.2.2 ~ShowHistogram()

```
ShowHistogram::~ShowHistogram ( )
```

Destroys objects.

4.35.3 Member Function Documentation

4.35.3.1 change_histogram()

```
void ShowHistogram::change_histogram (
            std::list< std::shared_ptr< Mat >> & lista )  [virtual]
```

Function plots and displays histogram in separate window.

Parameters

lista	is a list containing pointers to previously loaded images in the form of Mats.

Reimplemented from ChangeHistogram.

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

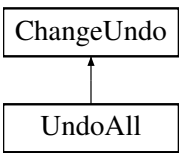
- ShowHistogram.h
- ShowHistogram.cpp

4.36 UndoAll Class Reference

responsible for getting rid of all but the last one images from the list. Implements operations while following the base strategy (SearchFace) interface.

```
#include <UndoAll.h>
```

Inheritance diagram for UndoAll:



Public Member Functions

- UndoAll ()
- ~UndoAll ()
- void change_undo (std::list< std::shared_ptr< Mat >> &lista)

4.36.1 Detailed Description

responsible for getting rid of all but the last one images from the list. Implements operations while following the base strategy (SearchFace) interface.

4.36.2 Constructor & Destructor Documentation

4.36.2.1 UndoAll()

```
UndoAll::UndoAll ( )
```

Create the UndoAll object.

4.36.2.2 ~UndoAll()

```
UndoAll::~UndoAll ( )
```

Destroys objects.

4.36.3 Member Function Documentation

4.36.3.1 change_undo()

```
void UndoAll::change_undo (
            std::list< std::shared_ptr< Mat >> & lista )  [virtual]
```

Function erases all but the last one images from the list, so the image can be displayed as it was before making any change.

Parameters

lista	is a list containing pointers to previously loaded images in the form of Mats.

Reimplemented from ChangeUndo.

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

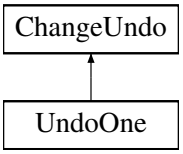
- UndoAll.h
- UndoAll.cpp

4.37 UndoOne Class Reference

responsible for getting rid of the last created image with unwanted change. Implements operations while following the base strategy (SearchFace) interface.

`#include <UndoOne.h>`

Inheritance diagram for UndoOne:



Public Member Functions

- UndoOne ()
- ~UndoOne ()
- void change_undo (std::list< std::shared_ptr< Mat >> &lista)

4.37.1 Detailed Description

responsible for getting rid of the last created image with unwanted change. Implements operations while following the base strategy (SearchFace) interface.

4.37.2 Constructor & Destructor Documentation

4.37.2.1 UndoOne()

```
UndoOne::UndoOne ( )
```

Create the UndoOne object.

4.37.2.2 ~UndoOne()

```
UndoOne::~UndoOne ( )
```

Destroys objects.

4.37.3 Member Function Documentation

4.37.3.1 change_undo()

```
void UndoOne::change_undo (
            std::list< std::shared_ptr< Mat >> & lista )  [virtual]
```

Function erases unwanted image from a beggining of a list, so the image before the last change will be displayed again.

Parameters

lista	is a list containing pointers to previously loaded images in the form of Mats.

Reimplemented from ChangeUndo.

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

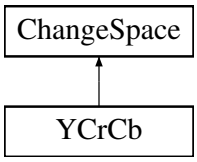
- UndoOne.h
- UndoOne.cpp

4.38 YCrCb Class Reference

responsible for changing the color space of the image to YCrCb space. Implements operations while following the base strategy (SearchFace) interface.

`#include <YCrCb.h>`

Inheritance diagram for YCrCb:



Public Member Functions

- YCrCb ()
- ~YCrCb ()
- void change_space (std::list< std::shared_ptr< Mat >> &lista, std::vector< int > Vector)

4.38.1 Detailed Description

responsible for changing the color space of the image to YCrCb space. Implements operations while following the base strategy (SearchFace) interface.

4.38.2 Constructor & Destructor Documentation

4.38.2.1 YCrCb()

`YCrCb::YCrCb ( )`

Create the YCrCb object.

4.38.2.2 ~YCrCb()

```
YCrCb::~YCrCb ( )
```

Destroys objects.

4.38.3 Member Function Documentation

4.38.3.1 change_space()

```
void YCrCb::change_space (
            std::list< std::shared_ptr< Mat >> & lista,
            std::vector< int > Vector )  [virtual]
```

Function performs coversion from BGR color space to YCrCb.

Parameters

lista	is a list containing pointers to previously loaded images in the form of Mats.
wektor	is a vector of integers which holds the information about the previous changes of color space made to the given image.

Reimplemented from ChangeSpace.

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

- YCrCb.h
- YCrCb.cpp

Chapter 5

File Documentation

5.1 App.h File Reference

The file contains class which represents the application itself .

```
#include "MainWindow.h"
```

Classes

- class App

  Responsible for application-wide settings for GUI-only apps.

5.1.1 Detailed Description

The file contains class which represents the application itself .

Author

Oliwia Mlonek

5.2 BGR.h File Reference

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by changing the color space of the image to BGR.

```
#include <opencv2/opencv.hpp>
#include <opencv2/imgproc.hpp>
#include "ChangeSpace.h"
```

Classes

- class BGR

  responsible for changing the color space of the image to BGR space. Implements operations while following the base strategy (SearchFace) interface.

5.2.1 Detailed Description

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by changing the color space of the image to BGR.

Author

Oliwia Mlonek

5.3 BlackWhite.h File Reference

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by changing the colours of the image to black and white only.

```
#include <opencv2/opencv.hpp>
#include <opencv2/imgproc.hpp>
#include "ChangeColor.h"
```

Classes

- class BlackWhite

  Responsible for applying black and white colour to the image. Implements operations while following the base strategy (ChangeColor) interface.

5.3.1 Detailed Description

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by changing the colours of the image to black and white only.

Author

Oliwia Mlonek

5.4 Brightness.h File Reference

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by changing the lighting intensity of the image.

```
#include "ChangeShadows.h"
#include "opencv2/imgcodecs.hpp"
#include "opencv2/highgui.hpp"
```

Classes

- class Brightness

  Responsible for brightening the image. Implements operations while following the base strategy (ChangeShadows) interface.

5.4.1 Detailed Description

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by changing the lighting intensity of the image.

Author

Oliwia Mlonek

5.5 ChangeColor.h File Reference

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by changing the colours of the image.

```
#include <memory>
#include <opencv2/opencv.hpp>
```

Classes

- class ChangeColor

5.5.1 Detailed Description

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by changing the colours of the image.

Author

Oliwia Mlonek

5.6 ChangeEffect.h File Reference

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by applying morphology operations.

```
#include <opencv2/opencv.hpp>
#include <unordered_map>
```

Classes

- class ChangeEffect

  An abstract class responsible for applying chosen operation to the image. The class interface declares operations common to all supported versions.

5.6.1 Detailed Description

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by applying morphology operations.

Author

Oliwia Mlonek

5.7 ChangeFlip.h File Reference

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by flipping it in three ways.

```
#include <memory>
#include <opencv2/opencv.hpp>
```

Classes

- class ChangeFlip

  An abstract class responsible for flipping the image. The class interface declares operations common to all supported versions.

5.7.1 Detailed Description

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by flipping it in three ways.

Author

Oliwia Mlonek

5.8 ChangeHistogram.h File Reference

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by executing some operations related to image histogram.

```
#include <memory>
#include <opencv2/opencv.hpp>
```

Classes

- class ChangeHistogram

5.8.1 Detailed Description

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by executing some operations related to image histogram.

Author

Oliwia Mlonek

5.9 ChangeRotation.h File Reference

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by rotating the image.

```
#include <memory>
#include <opencv2/opencv.hpp>
```

Classes

- class ChangeRotation

  An abstract class responsible for rotating the given image. The class interface declares operations common to all supported versions.

5.9.1 Detailed Description

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by rotating the image.

Author

Oliwia Mlonek

5.10 ChangeShadows.h File Reference

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by changing the lighting intensity of the image.

```
#include <memory>
#include <opencv2/opencv.hpp>
```

Classes

- class ChangeShadows

  An abstract clas responsible for applying chosen colours to the image. The class interface declares operations common to all supported versions.

5.10.1 Detailed Description

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by changing the lighting intensity of the image.

Author

Oliwia Mlonek

5.11 ChangeSpace.h File Reference

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by changing the color space of the image.

```
#include <memory>
#include <opencv2/opencv.hpp>
#include <opencv2/core/types_c.h>
```

Classes

- class ChangeSpace

  An abstract class responsible for changing the color space of the image. The class interface declares operations common to all supported versions.

5.11.1 Detailed Description

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by changing the color space of the image.

Author

Oliwia Mlonek

5.12 ChangeUndo.h File Reference

The file contains class which manipulates the list of pointers to the images represented by an n-dimensional dense numerical multi-channel array (Mat) by deleting unwanted nodes.

```
#include <memory>
#include <opencv2/opencv.hpp>
```

Classes

- class ChangeUndo

  An abstract class responsible for getting rid of images with unwanted changes. The class interface declares operations common to all supported versions.

5.12.1 Detailed Description

The file contains class which manipulates the list of pointers to the images represented by an n-dimensional dense numerical multi-channel array (Mat) by deleting unwanted nodes.

Author

Oliwia Mlonek

5.13 Dilate.h File Reference

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by applying dilation effect on it.

```
#include <opencv2/opencv.hpp>
#include <opencv2/imgproc.hpp>
#include "ChangeEffect.h"
```

Classes

- class Dilate

  Responsible for applying the dilation effect to the image. Implements operations while following the base strategy (ChangeEffect) interface.

5.13.1 Detailed Description

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by applying dilation effect on it.

Author

Oliwia Mlonek

5.14 Editor.h File Reference

The file contains class which maintains a reference to one of the concrete strategies and communicates with this object only via the strategy interface.

```
#include "Photo.h"
#include "ChangeColor.h"
#include "ChangeFlip.h"
#include "ChangeUndo.h"
#include "ChangeShadows.h"
#include "ChangeRotation.h"
#include "ChangeHistogram.h"
#include "ChangeEffect.h"
#include "ChangeSpace.h"
#include "SearchFace.h"
#include "BlackWhite.h"
#include "Grey.h"
#include "Sepia.h"
#include "FlipX.h"
#include "FlipY.h"
#include "FlipXY.h"
#include "UndoOne.h"
#include "UndoAll.h"
#include "Brightness.h"
#include "Gamma.h"
#include "FaceDetection.h"
#include "RotateRight.h"
#include "RotateLeft.h"
#include "ShowHistogram.h"
#include "HistogramEq.h"
#include "HSV.h"
#include "RBG.h"
#include "HLS.h"
#include "YCrCb.h"
#include "BGR.h"
#include "Erode.h"
#include "Dilate.h"
#include "Exceptions.h"
#include <memory>
```

Classes

- class Editor

  Class is responsible of maintaining a reference to one of the concrete strategies and communicates with this object only via the strategy interface.

5.14.1 Detailed Description

The file contains class which maintains a reference to one of the concrete strategies and communicates with this object only via the strategy interface.

Author

Oliwia Mlonek

5.15 Erode.h File Reference

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by applying erosion effect on it.

```
#include <opencv2/opencv.hpp>
#include <opencv2/imgproc.hpp>
#include "ChangeEffect.h"
```

Classes

- class Erode

  Responsible for applying the erosion effect to the image. Implements operations while following the base strategy (ChangeEffect) interface.

5.15.1 Detailed Description

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by applying erosion effect on it.

Author

Oliwia Mlonek

5.16 Exceptions.h File Reference

The file contains three classes which are thrown as exceptions when the need arises.

```
#include <iostream>
#include <exception>
```

Classes

- class IsNull

  Responsible for throwing a message when the used list is empty.
- class IsOneElementOnly

  Responsible for throwing a message when the used list has only one element.
- class NoFaceFound

  Responsible for throwing a message when face detector cannot recognize any face.

5.16.1 Detailed Description

The file contains three classes which are thrown as exceptions when the need arises.

Author

Oliwia Mlonek

5.17 FaceDetection.h File Reference

The file contains class which is designed to detect all human faces that are in a given image (represented by an n-dimensional dense numerical multi-channel array- Mat).

```
#include "SearchFace.h"
#include "opencv2/imgcodecs.hpp"
#include "opencv2/highgui.hpp"
```

Classes

- class FaceDetection

  Responsible for finding human faces in the given image and outlining the area in which they are located. Implements operations while following the base strategy (SearchFace) interface.

5.17.1 Detailed Description

The file contains class which is designed to detect all human faces that are in a given image (represented by an n-dimensional dense numerical multi-channel array- Mat).

Author

Oliwia Mlonek

5.18 FlipX.h File Reference

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by flipping it horizontally.

```
#include <opencv2/opencv.hpp>
#include <opencv2/imgproc.hpp>
#include "ChangeFlip.h"
```

Classes

- class FlipX

  Responsible for flipping the image horizontally. Implements operations while following the base strategy (ChangeFlip) interface.

5.18.1 Detailed Description

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by flipping it horizontally.

Author

Oliwia Mlonek

5.19 FlipXY.h File Reference

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by flipping it horizontally and vertically at once.

```
#include <opencv2/opencv.hpp>
#include <opencv2/imgproc.hpp>
#include "ChangeFlip.h"
```

Classes

- class FlipXY

5.19.1 Detailed Description

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by flipping it horizontally and vertically at once.

Author

Oliwia Mlonek

5.20 Gamma.h File Reference

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by changing the lighting of the image using gamma correction.

```
#include "ChangeShadows.h"
#include "opencv2/imgcodecs.hpp"
#include "opencv2/highgui.hpp"
```

Classes

- class Gamma

  Responsible for changing the gamma correction of the image. Implements operations while following the base strategy (ChangeShadows) interface.

5.20.1 Detailed Description

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by changing the lighting of the image using gamma correction.

Author

Oliwia Mlonek

5.21 Grey.h File Reference

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by changing the colours of the image to greyscale.

```
#include <opencv2/opencv.hpp>
#include <opencv2/imgproc.hpp>
#include "ChangeColor.h"
```

Classes

- class Grey

  Responsible for applying grey colour to the image. Implements operations while following the base strategy (ChangeColor) interface.

5.21.1 Detailed Description

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by changing the colours of the image to greyscale.

Author

Oliwia Mlonek

5.22 HistogramEq.h File Reference

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by executing histogram equalization in the image.

```
#include <opencv2/opencv.hpp>
#include <opencv2/imgproc.hpp>
#include "ChangeHistogram.h"
```

Classes

- class HistogramEq

  Responsible for histogram equalization. Implements operations while following the base strategy (ChangeFlip) interface.

5.22.1 Detailed Description

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by executing histogram equalization in the image.

Author

Oliwia Mlonek

5.23 HLS.h File Reference

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by changing the color space of the image to HLS.

```
#include <opencv2/opencv.hpp>
#include <opencv2/imgproc.hpp>
#include "ChangeSpace.h"
```

Classes

- class HLS

  responsible for changing the color space of the image to HLS space. Implements operations while following the base strategy (SearchFace) interface.

5.23.1 Detailed Description

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by changing the color space of the image to HLS.

Author

Oliwia Mlonek

5.24 HSV.h File Reference

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by changing the color space of the image to HSV.

```
#include <opencv2/opencv.hpp>
#include <opencv2/imgproc.hpp>
#include "ChangeSpace.h"
```

Classes

- class HSV

  responsible for changing the color space of the image to HSV space. Implements operations while following the base strategy (SearchFace) interface.

5.24.1 Detailed Description

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by changing the color space of the image to HSV.

Author

Oliwia Mlonek

5.25 MainWindow.h File Reference

The file contains class which is responsible for creating and managing the entire graphical user interface and calling appropriate actions related to image processing after actions on the part of the user in the GUI.

```
#include "Photo.h"
#include "Editor.h"
#include "Exceptions.h"
#include <iostream>
#include <stdio.h>
#include <stdlib.h>
#include <string>
#include <wx/log.h>
#include <wx/stattext.h>
#include <wx/choice.h>
#include <wx/slider.h>
#include <wx/artprov.h>
#include <wx/xrc/xmlres.h>
#include <wx/bitmap.h>
#include <wx/image.h>
#include <wx/icon.h>
#include <wx/string.h>
#include <wx/menu.h>
#include <wx/gdicmn.h>
#include <wx/font.h>
#include <wx/toolbar.h>
#include <wx/panel.h>
#include <wx/filedlg.h>
#include <wx/dcclient.h>
#include <wx/dcmemory.h>
#include <wx/button.h>
#include <wx/frame.h>
#include <wx/msgdlg.h>
#include <wx/filename.h>
#include <wx/clipbrd.h>
#include <wx/settings.h>
#include <wx/intl.h>
#include <opencv2/highgui.hpp>
#include <sstream>
```

Classes

- class MainWindow

  Creates and manages the project GUI.

5.25.1 Detailed Description

The file contains class which is responsible for creating and managing the entire graphical user interface and calling appropriate actions related to image processing after actions on the part of the user in the GUI.

Author

Oliwia Mlonek

5.26 Photo.h File Reference

The file contains class which manages the loaded image during the procces of edition.

```
#include <wx/wx.h>
#include <opencv2/opencv.hpp>
#include <wx/image.h>
#include <list>
#include <string>
#include <iostream>
#include <unordered_map>
```

Classes

- class Photo

  Class is reponsible for holding the image and the list with all with all versions of the image that was created, as well as stores data about the properties of the photo.

5.26.1 Detailed Description

The file contains class which manages the loaded image during the procces of edition.

Author

Oliwia Mlonek

5.27 RBG.h File Reference

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by changing the color space of the image to _RGB.

```
#include <opencv2/opencv.hpp>
#include <opencv2/imgproc.hpp>
#include "ChangeSpace.h"
```

Classes

- class _RGB

  responsible for changing the color space of the image to RGB space. Implements operations while following the base strategy (SearchFace) interface.

5.27.1 Detailed Description

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by changing the color space of the image to _RGB.

Author

Oliwia Mlonek

5.28 RotateLeft.h File Reference

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by rotating the image to the left.

```
#include <opencv2/opencv.hpp>
#include <opencv2/imgproc.hpp>
#include "ChangeRotation.h"
```

Classes

- class RotateLeft

  An abstract class responsible for rotating the given image 90 degrees to the left. Implements operations while following the base strategy (ChangeFlip) interface.

5.28.1 Detailed Description

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by rotating the image to the left.

Author

Oliwia Mlonek

5.29 RotateRight.h File Reference

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by rotating the image to the left.

```
#include <opencv2/opencv.hpp>
#include <opencv2/imgproc.hpp>
#include "ChangeRotation.h"
```

Classes

- class RotateRight

  An abstract class responsible for rotating the given image 90 degrees to the right. Implements operations while following the base strategy (ChangeFlip) interface.

5.29.1 Detailed Description

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by rotating the image to the left.

Author

Oliwia Mlonek

5.30 SearchFace.h File Reference

The file contains class which is designed to detect all human faces that are in a given image (represented by an n-dimensional dense numerical multi-channel array- Mat).

```
#include <memory>
#include <opencv2/opencv.hpp>
#include "opencv2/objdetect.hpp"
#include "opencv2/highgui.hpp"
#include "opencv2/imgproc.hpp"
#include <opencv2/core/core_c.h>
#include <iostream>
```

Classes

- class SearchFace

  An abstract clas responsible for finding human faces in the given image. The class interface declares operations common to all supported versions.

5.30.1 Detailed Description

The file contains class which is designed to detect all human faces that are in a given image (represented by an n-dimensional dense numerical multi-channel array- Mat).

Author

Oliwia Mlonek

5.31 Sepia.h File Reference

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by changing the colours of the image to black and white only.

```
#include <opencv2/opencv.hpp>
#include <opencv2/imgproc.hpp>
#include "ChangeColor.h"
```

Classes

- class Sepia

  Responsible for applying sepia colour to the image. Implements operations while following the base strategy (ChangeColor) interface.

5.31.1 Detailed Description

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by changing the colours of the image to black and white only.

Author

Oliwia Mlonek

5.32 ShowHistogram.h File Reference

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by plotting and displaying image histogram.

```
#include <opencv2/opencv.hpp>
#include <opencv2/imgproc.hpp>
#include "ChangeHistogram.h"
```

Classes

- class ShowHistogram

  Responsible for displaying histogram. Implements operations while following the base strategy (ChangeFlip) interface.

5.32.1 Detailed Description

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by plotting and displaying image histogram.

Author

Oliwia Mlonek

5.33 UndoAll.h File Reference

The file contains class which manipulates the list of pointers to the images represented by an n-dimensional dense numerical multi-channel array (Mat) by deleting all but the last one elements from the list.

```
#include <opencv2/opencv.hpp>
#include <opencv2/imgproc.hpp>
#include "ChangeUndo.h"
```

Classes

- class UndoAll

  responsible for getting rid of all but the last one images from the list. Implements operations while following the base strategy (SearchFace) interface.

5.33.1 Detailed Description

The file contains class which manipulates the list of pointers to the images represented by an n-dimensional dense numerical multi-channel array (Mat) by deleting all but the last one elements from the list.

Author

Oliwia Mlonek

5.34 UndoOne.h File Reference

The file contains class which manipulates the list of pointers to the images represented by an n-dimensional dense numerical multi-channel array (Mat) by deleting unwanted (first) node.

```
#include <opencv2/opencv.hpp>
#include <opencv2/imgproc.hpp>
#include "ChangeUndo.h"
```

Classes

- class UndoOne

  responsible for getting rid of the last created image with unwanted change. Implements operations while following the base strategy (SearchFace) interface.

5.34.1 Detailed Description

The file contains class which manipulates the list of pointers to the images represented by an n-dimensional dense numerical multi-channel array (Mat) by deleting unwanted (first) node.

Author

Oliwia Mlonek

5.35 YCrCb.h File Reference

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by changing the color space of the image to YCrCb.

```
#include <opencv2/opencv.hpp>
#include <opencv2/imgproc.hpp>
#include "ChangeSpace.h"
```

Classes

- class YCrCb

  responsible for changing the color space of the image to YCrCb space. Implements operations while following the base strategy (SearchFace) interface.

5.35.1 Detailed Description

The file contains class which manipulates the image represented by an n-dimensional dense numerical multi-channel array (Mat) by changing the color space of the image to YCrCb.

Author

Oliwia Mlonek