

KukaVision

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1 Namespace Index	1
1.1 Namespace List	1
2 Hierarchical Index	3
2.1 Class Hierarchy	3
3 Class Index	5
3.1 Class List	5
4 File Index	7
4.1 File List	7
5 Namespace Documentation	9
5.1 Ui Namespace Reference	9
6 Class Documentation	11
6.1 CameraStream Class Reference	11
6.1.1 Detailed Description	12
6.1.2 Constructor & Destructor Documentation	12
6.1.2.1 CameraStream()	12
6.1.3 Member Function Documentation	12
6.1.3.1 acquisitionLoop()	12
6.1.4 Member Data Documentation	13
6.1.4.1 camera	13
6.1.4.2 latestImage	13
6.1.4.3 latestImageTimestamp	13
6.1.4.4 latestObject	13
6.2 Ui::Dialog Class Reference	14
6.3 FindCameraDialog Class Reference	15
6.3.1 Detailed Description	16
6.3.2 Constructor & Destructor Documentation	16
6.3.2.1 FindCameraDialog()	16
6.3.3 Member Function Documentation	16
6.3.3.1 neoStringToQString()	16
6.3.4 Member Data Documentation	16
6.3.4.1 dialog	16
6.3.4.2 selectedIP	17
6.3.4.3 ui	17
6.4 FRAME Struct Reference	17
6.4.1 Member Data Documentation	17
6.4.1.1 A	18
6.4.1.2 B	18
6.4.1.3 C	18
6.4.1.4 X	18

6.4.1.5 Y	18
6.4.1.6 Z	18
6.5 MainWindow Class Reference	19
6.5.1 Detailed Description	21
6.5.2 Constructor & Destructor Documentation	21
6.5.2.1 MainWindow()	21
6.5.3 Member Function Documentation	21
6.5.3.1 GetAllOptions_JSON()	21
6.5.3.2 SaveOptionsInJSON()	22
6.5.4 Member Data Documentation	22
6.5.4.1 cameraStream	22
6.5.4.2 options_JSON	22
6.6 Ui::MainWindow Class Reference	22
6.7 ObjectDetails Class Reference	24
6.7.1 Detailed Description	25
6.7.2 Constructor & Destructor Documentation	25
6.7.2.1 ObjectDetails()	26
6.7.3 Member Function Documentation	26
6.7.3.1 getAngle()	26
6.7.3.2 getCenter()	26
6.7.3.3 getCorner()	26
6.7.3.4 isValid()	27
6.7.3.5 setAngle()	27
6.7.3.6 setCenter()	27
6.7.3.7 setCorner()	28
6.7.3.8 setValid()	28
6.8 Ui_Dialog Class Reference	28
6.8.1 Detailed Description	30
6.8.2 Member Function Documentation	30
6.8.2.1 retranslateUi()	30
6.8.2.2 setupUi()	30
6.8.3 Member Data Documentation	30
6.8.3.1 buttonBox	30
6.8.3.2 listWidget	30
6.9 Ui_MainWindow Class Reference	31
6.9.1 Detailed Description	34
6.9.2 Member Function Documentation	34
6.9.2.1 retranslateUi()	34
6.9.2.2 setupUi()	35
6.9.3 Member Data Documentation	35
6.9.3.1 actionExit	35
6.9.3.2 actionOpen_Console	35

6.9.3.3 actionProject_Infos	35
6.9.3.4 actionSave_Image_as	35
6.9.3.5 biningLabel	35
6.9.3.6 biningValueLineEdit	36
6.9.3.7 cameraIPLabel	36
6.9.3.8 cameraIPLineEdit	36
6.9.3.9 cameraOptions2Layout	36
6.9.3.10 cameraOptionsLabel	36
6.9.3.11 cameraOptionsLayout	36
6.9.3.12 cameraViewHeadlineLabel	36
6.9.3.13 cameraViewInfoLabel	36
6.9.3.14 cameraViewTimestampLabel	37
6.9.3.15 cameraViewVerticalLayout	37
6.9.3.16 cameraViewWidget	37
6.9.3.17 consoleWindowDockWidget	37
6.9.3.18 coordinateLabel	37
6.9.3.19 coordinatesCheckBox	37
6.9.3.20 coordinateShowLabel	37
6.9.3.21 dataSavePathLabel	37
6.9.3.22 dataSavePathLineEdit	38
6.9.3.23 dividerCameraOptionsline	38
6.9.3.24 dockWidgetContents_2	38
6.9.3.25 emptyCameraOptionsLabel	38
6.9.3.26 findCameraButton	38
6.9.3.27 findCameraLabel	38
6.9.3.28 folderDialogButton	38
6.9.3.29 formLayout	38
6.9.3.30 fpsLiveViewLabel	39
6.9.3.31 fpsLiveViewLineEdit	39
6.9.3.32 gainLabel	39
6.9.3.33 gainValueLineEdit	39
6.9.3.34 getCoordinatesButton	39
6.9.3.35 gridLayout_3	39
6.9.3.36 gridLayout_4	39
6.9.3.37 gridLayout_5	39
6.9.3.38 gridLayout_6	40
6.9.3.39 horizontalLayout	40
6.9.3.40 horizontalSpacer	40
6.9.3.41 horizontalSpacer_2	40
6.9.3.42 horizontalSpacer_4	40
6.9.3.43 horizontalSpacer_5	40
6.9.3.44 infoConsoleTextBrowser	40

6.9.3.45 line	40
6.9.3.46 line_2	41
6.9.3.47 line_3	41
6.9.3.48 line_4	41
6.9.3.49 liveCameraViewLabel	41
6.9.3.50 mainMenuWidget	41
6.9.3.51 menuAbout	41
6.9.3.52 menubar	41
6.9.3.53 menuFile	41
6.9.3.54 menuView	42
6.9.3.55 optionsWidget	42
6.9.3.56 outlinesCheckBox	42
6.9.3.57 programImageLabel	42
6.9.3.58 robotIPLabel	42
6.9.3.59 robotIPLineEdit	42
6.9.3.60 robotOptionsLabel	42
6.9.3.61 robotPortLabel	42
6.9.3.62 robotPortLineEdit	43
6.9.3.63 saveImageButton	43
6.9.3.64 start_ProgramWidget	43
6.9.3.65 startCameraViewButton	43
6.9.3.66 startProgramHeadlineLabel	43
6.9.3.67 startProgramStatusColorLabel	43
6.9.3.68 startRobotButton	43
6.9.3.69 statusbar	43
6.9.3.70 stoppCameraViewButton	44
6.9.3.71 tabWidget	44
6.9.3.72 verticalLayout_2	44
6.9.3.73 verticalLayout_4	44
6.9.3.74 verticalSpacer	44
6.9.3.75 verticalSpacer_2	44
6.9.3.76 verticalSpacer_3	44
6.9.3.77 verticalSpacer_5	44
6.9.3.78 verticalSpacer_6	45
6.9.3.79 workingAreagridLayout	45
6.9.3.80 workingAreaLabel	45
6.9.3.81 xmaxLabel	45
6.9.3.82 xmaxValueLineEdit	45
6.9.3.83 xminLabel	45
6.9.3.84 xminValueLineEdit	45
6.9.3.85 ymaxLabel	45
6.9.3.86 ymaxValueLineedit	46

6.9.3.87 yminLabel	46
6.9.3.88 yminValueLineEdit	46
6.9.3.89 zmaxLabel	46
6.9.3.90 zmaxValueLineEdit	46
6.9.3.91 zminLabel	46
6.9.3.92 zminValueLineEdit	46
6.9.3.93 zOffsetFinalLabel	46
6.9.3.94 zOffsetFinalLineEdit	47
6.9.3.95 zOffsetLabel	47
6.9.3.96 zOffsetLneEdit	47
7 File Documentation	49
7.1 /home/kukavision/KukaVision/repo/KukaVision/include/CameraStream.h File Reference	49
7.2 /home/kukavision/KukaVision/repo/KukaVision/include/EKRLServer.h File Reference	50
7.2.1 Macro Definition Documentation	52
7.2.1.1 BUFFERSIZE	52
7.2.1.2 CONNATTEMPTS	52
7.2.1.3 CONNDELAY	52
7.2.2 Function Documentation	52
7.2.2.1 bufferToFrame()	52
7.2.2.2 bufferToVar()	53
7.2.2.3 checkVerificationBuffer()	53
7.2.2.4 connectSocket()	53
7.2.2.5 frameToBuffer()	54
7.2.2.6 receiveBuffer()	54
7.2.2.7 runERKLSequence()	55
7.2.2.8 sendBuffer()	55
7.2.2.9 varToBuffer()	56
7.3 /home/kukavision/KukaVision/repo/KukaVision/include/FindCameraDialog.h File Reference	56
7.4 /home/kukavision/KukaVision/repo/KukaVision/include/MainWindow.h File Reference	57
7.4.1 Typedef Documentation	57
7.4.1.1 json	57
7.5 /home/kukavision/KukaVision/repo/KukaVision/include/MainWindowUI.h File Reference	58
7.6 /home/kukavision/KukaVision/repo/KukaVision/include/object_detection.h File Reference	59
7.6.1 Function Documentation	60
7.6.1.1 coordinateTransform()	60
7.6.1.2 findAndDrawObjects()	61
7.7 /home/kukavision/KukaVision/repo/KukaVision/include/ObjectDetails.h File Reference	61
Index	63

Chapter 1

Namespace Index

1.1 Namespace List

Here is a list of all namespaces with brief descriptions:

Ui	9
------------------------------	---

Chapter 2

Hierarchical Index

2.1 Class Hierarchy

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

CameraStream	11
FindCameraDialog	15
FRAME	17
ObjectDetails	24
Ui_Dialog	28
Ui::Dialog	14
Ui_MainWindow	31
Ui::MainWindow	22
MainWindow	19

Chapter 3

Class Index

3.1 Class List

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

CameraStream	
Class coordinates the connection to the camera, the object detection and the display of the latest image in a QLabel	11
Ui::Dialog	14
FindCameraDialog	
Dialog for searching and selecting Baumer Cameras	15
FRAME	17
MainWindow	
MainWindow Class inherits the QTDesigner-Generated Class Ui::MainWindow	19
Ui::MainWindow	22
ObjectDetails	
Details of a detected object. Includes center and corner coordinates and angle	24
Ui_Dialog	
QT-Generatred Design for FindCamera Dialog	28
Ui_MainWindow	
QT-Generatred Design for UI	31

Chapter 4

File Index

4.1 File List

Here is a list of all files with brief descriptions:

/home/kukavision/KukaVision/repo/KukaVision/include/ CameraStream.h	49
/home/kukavision/KukaVision/repo/KukaVision/include/ EKRLServer.h	50
/home/kukavision/KukaVision/repo/KukaVision/include/ FindCameraDialog.h	56
/home/kukavision/KukaVision/repo/KukaVision/include/ MainWindow.h	57
/home/kukavision/KukaVision/repo/KukaVision/include/ MainWindowUI.h	58
/home/kukavision/KukaVision/repo/KukaVision/include/ object_detection.h	59
/home/kukavision/KukaVision/repo/KukaVision/include/ ObjectDetails.h	61

Chapter 5

Namespace Documentation

5.1 Ui Namespace Reference

Classes

- class [Dialog](#)
- class [MainWindow](#)

Chapter 6

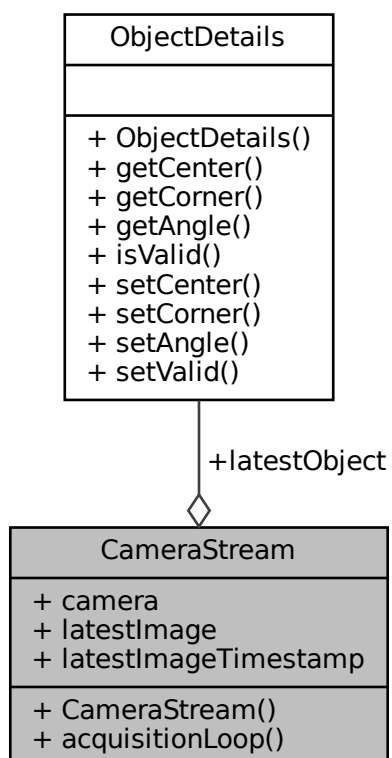
Class Documentation

6.1 CameraStream Class Reference

Class coordinates the connection to the camera, the object detection and the display of the latest image in a QLabel.

```
#include <CameraStream.h>
```

Collaboration diagram for CameraStream:



Public Member Functions

- [CameraStream](#) (string identifier)
Constructor sets up the connection the camera.
- void [acquisitionLoop](#) (QLabel *view, bool *run, bool outlines, bool coordinates)
loop that gets newest image from cam and runs image detection

Public Attributes

- Cam [camera](#) = Cam()
- Mat [latestImage](#)
- time_t [latestImageTimestamp](#)
- [ObjectDetails](#) [latestObject](#)

6.1.1 Detailed Description

Class coordinates the connection to the camera, the object detection and the display of the latest image in a QLabel.

6.1.2 Constructor & Destructor Documentation

6.1.2.1 CameraStream()

```
CameraStream::CameraStream (
    string identifier )
```

Constructor sets up the connection the camera.

Parameters

<i>identifier</i>	string IP-Address of the camera that should be connected
-------------------	--

6.1.3 Member Function Documentation

6.1.3.1 acquisitionLoop()

```
void CameraStream::acquisitionLoop (
    QLabel * view,
    bool * run,
    bool outlines,
    bool coordinates )
```

loop that gets newest image from cam and runs image detection

Parameters

<i>view</i>	QLabel* Label that is used for displaying the image
<i>run</i>	bool* stops the loop
<i>outlines</i>	bool if true, the outline of the detected object is displayed in the QLabel
<i>coordinates</i>	bool if true, the center-coordinates are displayed in the QLabel (Not implemented)

Returns

void

6.1.4 Member Data Documentation

6.1.4.1 camera

```
Cam CameraStream::camera = Cam()
```

NeoAPI Camera Object

6.1.4.2 latestImage

```
Mat CameraStream::latestImage
```

Stores the latest Image received from the camera

6.1.4.3 latestImageTimestamp

```
time_t CameraStream::latestImageTimestamp
```

Timestamp of the last received image

6.1.4.4 latestObject

```
ObjectDetails CameraStream::latestObject
```

Object Details(Coordinates, angle, etc.) of the latest received object

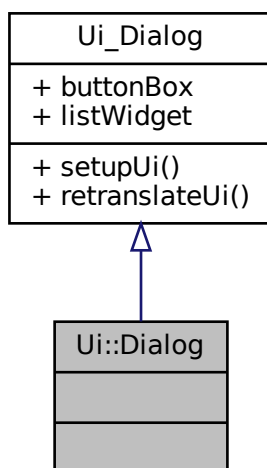
The documentation for this class was generated from the following file:

- /home/kukavision/KukaVision/repo/KukaVision/include/[CameraStream.h](#)

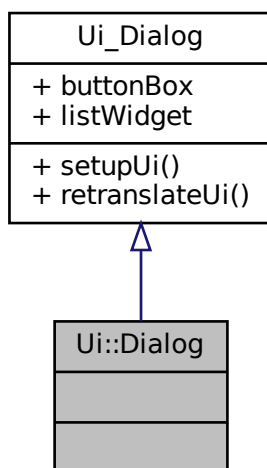
6.2 Ui::Dialog Class Reference

```
#include <FindCameraDialog.h>
```

Inheritance diagram for Ui::Dialog:



Collaboration diagram for Ui::Dialog:



Additional Inherited Members

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

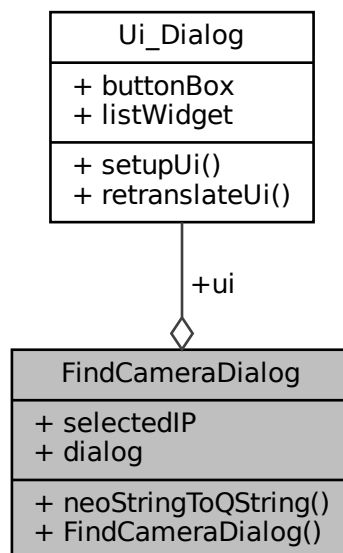
- [/home/kukavision/KukaVision/repo/KukaVision/include/FindCameraDialog.h](#)

6.3 FindCameraDialog Class Reference

Dialog for searching and selecting Baumer Cameras.

```
#include <FindCameraDialog.h>
```

Collaboration diagram for FindCameraDialog:



Public Member Functions

- `QString neoStringToQString (NeoString nString)`
Conversion from NeoString to QString.
- `FindCameraDialog ()`
Displays Dialog, searches for connected Cameras and saves selected IP-Address in "selectedIP". Stores empty String in Case of an Error.

Public Attributes

- string `selectedIP`
- `QDialog dialog`
- `Ui_Dialog ui`

6.3.1 Detailed Description

Dialog for searching and selecting Baumer Cameras.

Find Camera Dialog

6.3.2 Constructor & Destructor Documentation

6.3.2.1 FindCameraDialog()

```
FindCameraDialog::FindCameraDialog ( )
```

Displays Dialog, searches for connected Cameras and saves selected IP-Address in "selectedIP". Stores empty String in Case of an Error.

FindCameraDialog-Constructor

6.3.3 Member Function Documentation

6.3.3.1 neoStringToQString()

```
QString FindCameraDialog::neoStringToQString (
    NeoString nString )
```

Conversion from NeoString to QString.

Parameters

<i>NeoString</i>	nString : NeoString to be converted
------------------	-------------------------------------

Returns

QString

6.3.4 Member Data Documentation

6.3.4.1 dialog

```
QDialog FindCameraDialog::dialog
```


6.3.4.2 selectedIP

```
string FindCameraDialog::selectedIP
```

6.3.4.3 ui

```
Ui_Dialog FindCameraDialog::ui
```

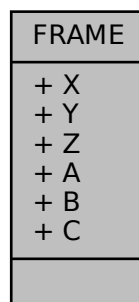
The documentation for this class was generated from the following file:

- /home/kukavision/KukaVision/repo/KukaVision/include/[FindCameraDialog.h](#)

6.4 FRAME Struct Reference

```
#include <EKRLServer.h>
```

Collaboration diagram for FRAME:



Public Attributes

- float [X](#)
- float [Y](#)
- float [Z](#)
- float [A](#)
- float [B](#)
- float [C](#)

6.4.1 Member Data Documentation

6.4.1.1 A

```
float FRAME::A
```

6.4.1.2 B

```
float FRAME::B
```

6.4.1.3 C

```
float FRAME::C
```

6.4.1.4 X

```
float FRAME::X
```

6.4.1.5 Y

```
float FRAME::Y
```

6.4.1.6 Z

```
float FRAME::Z
```

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

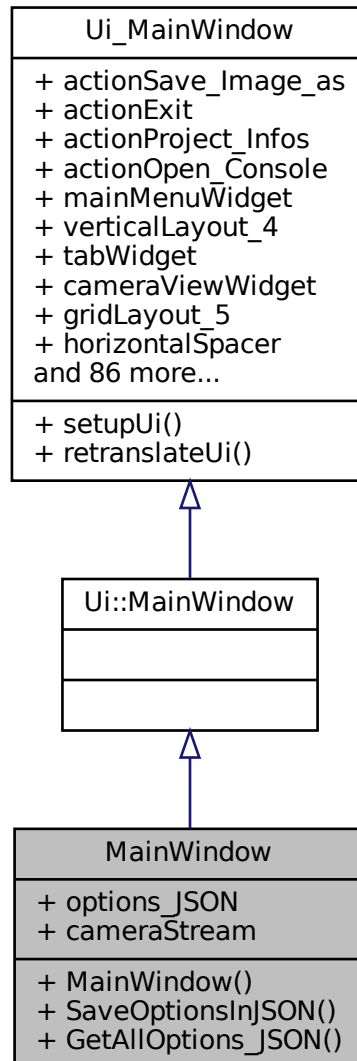
- [/home/kukavision/KukaVision/repo/KukaVision/include/EKRLServer.h](#)

6.5 MainWindow Class Reference

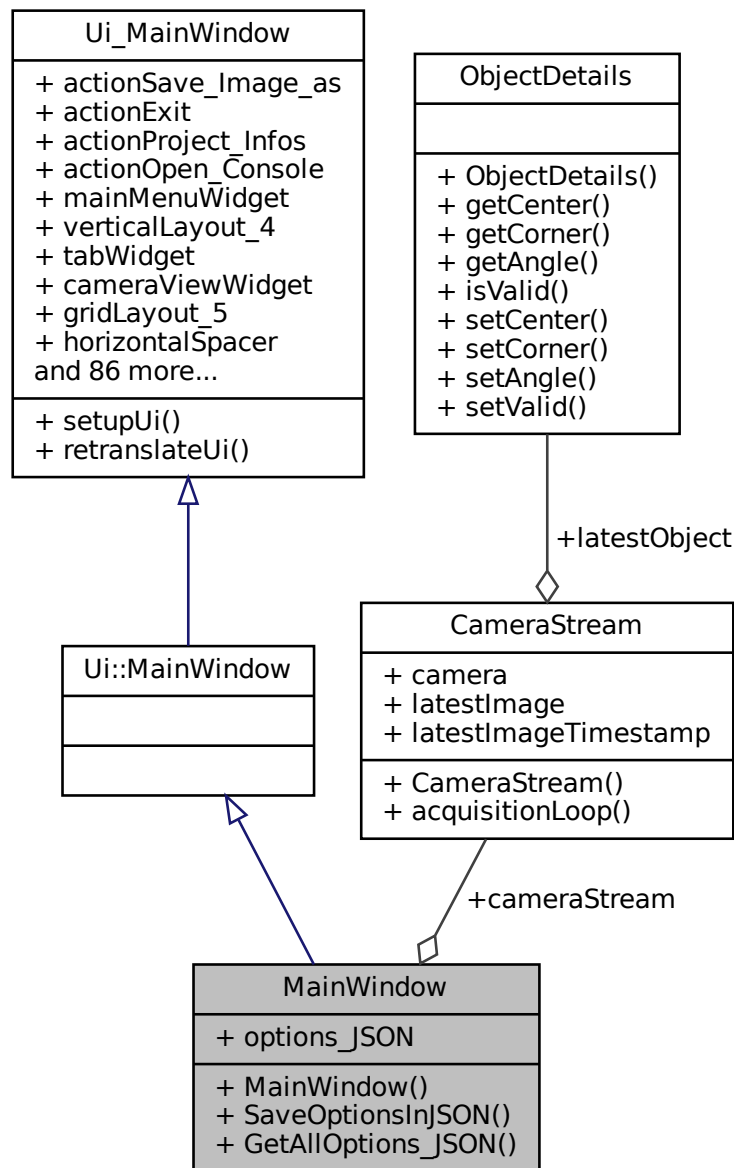
[MainWindow](#) Class inherits the QtDesigner-Generated Class [Ui::MainWindow](#).

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

Inheritance diagram for MainWindow:



Collaboration diagram for MainWindow:



Public Member Functions

- **MainWindow** (`QMainWindow *parent`)
Constructor for MainWindow-Class runs [Ui::MainWindow](#) `setup()` connects UI-Events to functions Loads Options and Initializes Options-Page sets up [CameraStream](#).
- void **SaveOptionsInJSON** (`json ¤tOptions`)
Saves JSON-Object in File Takes a JSON-Object(The Options) and stores them in "Options.json".
- void **GetAllOptions_JSON** (`json &options`)
Reads all Options from the UI and stores them in JSON-Object.

Public Attributes

- [json options_JSON](#)
- [CameraStream](#) * [cameraStream](#)

6.5.1 Detailed Description

[MainWindow](#) Class inherits the QTDesigner-Generated Class [Ui::MainWindow](#).

6.5.2 Constructor & Destructor Documentation

6.5.2.1 MainWindow()

```
MainWindow::MainWindow (
    QMainWindow * parent )
```

Constructor for MainWindow-Class runs [Ui::MainWindow](#) setup() connects UI-Events to functions Loads Options and Initializes Options-Page sets up [CameraStream](#).

Parameters

<i>parent</i>	QMainWindow* ParentWinow; Required for show Message Boxes
---------------	---

6.5.3 Member Function Documentation

6.5.3.1 GetAllOptions_JSON()

```
void MainWindow::GetAllOptions_JSON (
    json & options )
```

Reads all Options from the UI and stores them in JSON-Object.

Parameters

<i>options</i>	json& JSON-Object where options will be stored in
----------------	---

Returns

void

6.5.3.2 SaveOptionsInJSON()

```
void MainWindow::SaveOptionsInJSON (
    json & currentOptions )
```

Saves JSON-Object in File Takes a JSON-Object(The Options) and stores them in "Options.json".

Parameters

<i>currentOptions</i>	json& The JSON-Object that should be stored
-----------------------	---

Returns

void

6.5.4 Member Data Documentation

6.5.4.1 cameraStream

```
CameraStream* MainWindow::cameraStream
```

6.5.4.2 options_JSON

```
json MainWindow::options_JSON
```

JSON-Object that holds Settings

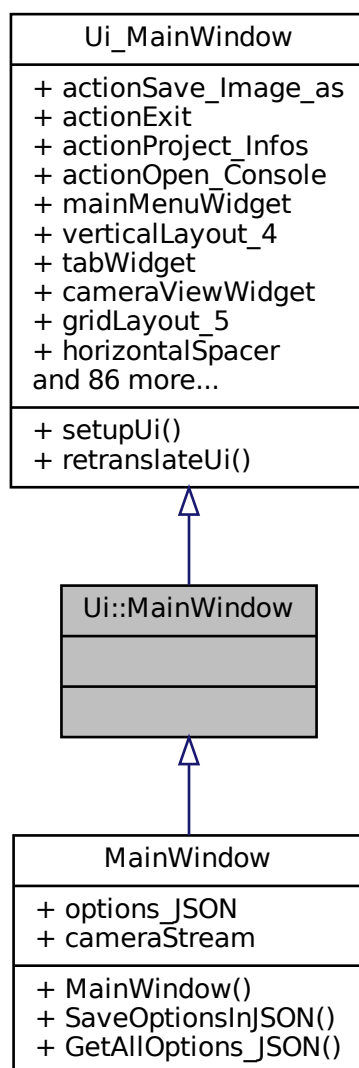
The documentation for this class was generated from the following file:

- /home/kukavision/KukaVision/repo/KukaVision/include/[MainWindow.h](#)

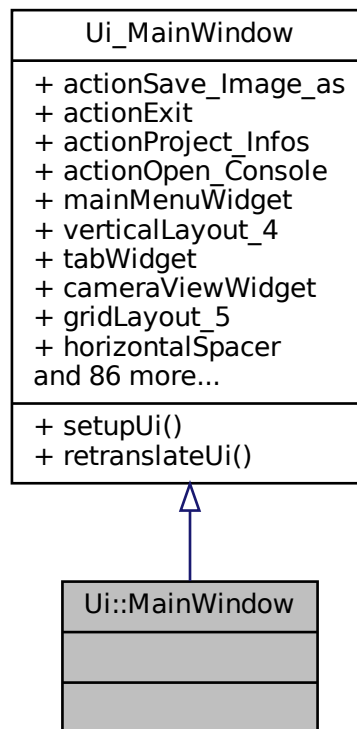
6.6 Ui::MainWindow Class Reference

```
#include <MainWindowUI.h>
```

Inheritance diagram for Ui::MainWindow:



Collaboration diagram for Ui::MainWindow:



Additional Inherited Members

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

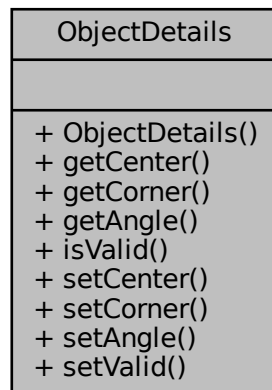
- `/home/kukavision/KukaVision/repo/KukaVision/include/MainWindowUI.h`

6.7 ObjectDetails Class Reference

Details of a detected object. Includes center and corner coordinates and angle.

```
#include <ObjectDetails.h>
```


Collaboration diagram for ObjectDetails:



Public Member Functions

- [ObjectDetails](#) ()
Constructor; Sets angle to 0 and validity to false.
- cv::Point2f [getCenter](#) () const
Returns center coordinates.
- cv::Point2f [getCorner](#) (int index) const
Returns coordinates of the corner with the given index.
- float [getAngle](#) () const
Returns angle of the object.
- bool [isValid](#) () const
Returns Object-Validity (Currently unused)
- void [setCenter](#) (const cv::Point2f ¢er)
Sets center-attribute.
- void [setCorner](#) (int index, const cv::Point2f &corner)
Sets Corner-Attribute for given corner-index.
- void [setAngle](#) (float angle)
Sets angle-attribute.
- void [setValid](#) (bool valid)
Sets Validity-Attribute.

6.7.1 Detailed Description

Details of a detected object. Includes center and corner coordinates and angle.

6.7.2 Constructor & Destructor Documentation

6.7.2.1 ObjectDetails()

```
ObjectDetails::ObjectDetails ( )
```

Constructor; Sets angle to 0 and validity to false.

6.7.3 Member Function Documentation

6.7.3.1 getAngle()

```
float ObjectDetails::getAngle ( ) const
```

Returns angle of the object.

Returns

float Object-Angle

6.7.3.2 getCenter()

```
cv::Point2f ObjectDetails::getCenter ( ) const
```

Returns center coordinates.

Returns

cv::Point2f Center-Coordinates

6.7.3.3 getCorner()

```
cv::Point2f ObjectDetails::getCorner (
    int index ) const
```

Returns coordinates of the corner with the given index.

Parameters

<i>index</i>	int Index of the corner. 0 to 3
--------------	---------------------------------

Returns

cv::Point2f Coordinates of the corner

6.7.3.4 isValid()

```
bool ObjectDetails::isValid ( ) const
```

Returns Object-Validity (Currently unused)

Returns

bool Validity

6.7.3.5 setAngle()

```
void ObjectDetails::setAngle (
    float angle )
```

Sets angle-attribute.

Parameters

<i>angle</i>	float Object-Angle
--------------	--------------------

Returns

void

6.7.3.6 setCenter()

```
void ObjectDetails::setCenter (
    const cv::Point2f & center )
```

Sets center-attribute.

Parameters

<i>center</i>	const cv::Point2f& Center-Point
---------------	---------------------------------

Returns

void

6.7.3.7 setCorner()

```
void ObjectDetails::setCorner (
    int index,
    const cv::Point2f & corner )
```

Sets Corner-Attribute for given corner-index.

Parameters

<i>index</i>	int corner-index
<i>corner</i>	const cv::Point2f& Corner-Coordinates

Returns

void

6.7.3.8 setValid()

```
void ObjectDetails::setValid (
    bool valid )
```

Sets Validity-Attribute.

Parameters

<i>valid</i>	bool Validity
--------------	---------------

Returns

void

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

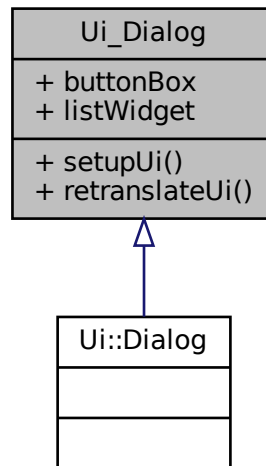
- /home/kukavision/KukaVision/repo/KukaVision/include/[ObjectDetails.h](#)

6.8 Ui_Dialog Class Reference

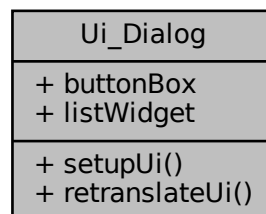
QT-Generatred Design for FindCamera Dialog.

```
#include <FindCameraDialog.h>
```

Inheritance diagram for Ui_Dialog:



Collaboration diagram for Ui_Dialog:



Public Member Functions

- void `setupUi` (QDialog *Dialog)
Sets up the UI-Elements.
- void `retranslateUi` (QDialog *Dialog)

Public Attributes

- QDialogButtonBox * `buttonBox`
- QListWidget * `listWidget`

6.8.1 Detailed Description

QT-Generatred Design for FindCamera Dialog.

6.8.2 Member Function Documentation

6.8.2.1 retranslateUi()

```
void Ui_Dialog::retranslateUi (  
    QDialog * Dialog ) [inline]
```

6.8.2.2 setupUi()

```
void Ui_Dialog::setupUi (  
    QDialog * Dialog ) [inline]
```

Sets up the UI-Elements.

Parameters

<i>Dialog</i>	QDialog* Parent QDialog
---------------	-------------------------

Returns

void

6.8.3 Member Data Documentation

6.8.3.1 buttonBox

```
QDialogButtonBox* Ui_Dialog::buttonBox
```

6.8.3.2 listWidget

```
QListWidget* Ui_Dialog::listWidget
```

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

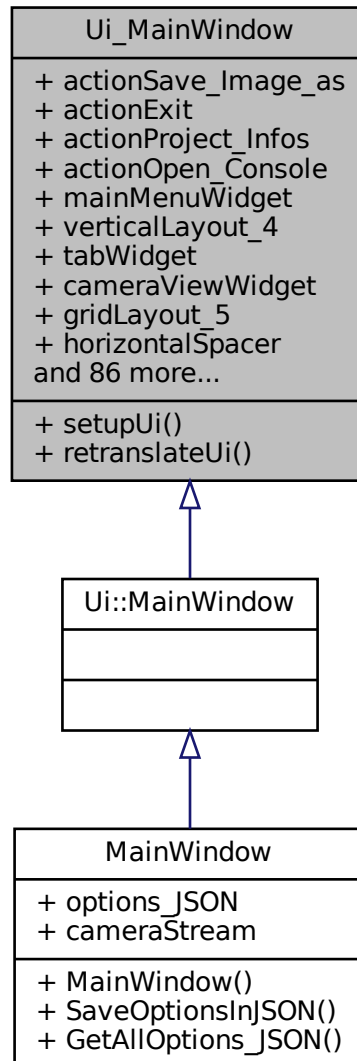
- /home/kukavision/KukaVision/repo/KukaVision/include/[FindCameraDialog.h](#)

6.9 Ui_MainWindow Class Reference

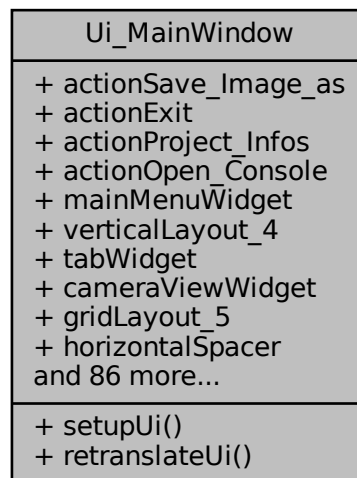
QT-Generatred Design for UI.

```
#include <MainWindowUI.h>
```

Inheritance diagram for Ui_MainWindow:



Collaboration diagram for Ui_MainWindow:



Public Member Functions

- void [setupUi](#) (QMainWindow *[MainWindow](#))
- void [retranslateUi](#) (QMainWindow *[MainWindow](#))

Public Attributes

- QAction * [actionSave_Image_as](#)
- QAction * [actionExit](#)
- QAction * [actionProject_Infos](#)
- QAction * [actionOpen_Console](#)
- QWidget * [mainMenuWidget](#)
- QVBoxLayout * [verticalLayout_4](#)
- QTabWidget * [tabWidget](#)
- QWidget * [cameraViewWidget](#)
- QGridLayout * [gridLayout_5](#)
- QSpacerItem * [horizontalSpacer](#)
- QLabel * [liveCameraViewLabel](#)
- QVBoxLayout * [cameraViewVerticalLayout](#)
- QCheckBox * [coordinatesCheckBox](#)
- QCheckBox * [outlinesCheckBox](#)
- QPushButton * [startCameraViewButton](#)
- QPushButton * [stopCameraViewButton](#)
- QPushButton * [saveImageButton](#)
- QSpacerItem * [verticalSpacer_2](#)
- QLabel * [cameraViewTimestampLabel](#)
- QLabel * [cameraViewHeadlineLabel](#)
- QLabel * [cameraViewInfoLabel](#)

- QWidget * [optionsWidget](#)
- QGridLayout * [gridLayout_3](#)
- QFormLayout * [formLayout](#)
- QLabel * [robotOptionsLabel](#)
- QSpacerItem * [horizontalSpacer_4](#)
- QLabel * [robotIPLabel](#)
- QLineEdit * [robotIPLineEdit](#)
- QLabel * [robotPortLabel](#)
- QLineEdit * [robotPortLineEdit](#)
- QLabel * [zOffsetLabel](#)
- QLineEdit * [zOffsetLineEdit](#)
- QLabel * [zOffsetFinalLabel](#)
- QLineEdit * [zOffsetFinalLineEdit](#)
- QFrame * [line_2](#)
- QGridLayout * [workingAreagridLayout](#)
- QLabel * [yminLabel](#)
- QLineEdit * [zminValueLineEdit](#)
- QLabel * [ymaxLabel](#)
- QLabel * [workingAreaLabel](#)
- QLineEdit * [xminValueLineEdit](#)
- QLineEdit * [yminValueLineEdit](#)
- QLabel * [xminLabel](#)
- QLabel * [zminLabel](#)
- QLabel * [zmaxLabel](#)
- QLabel * [xmaxLabel](#)
- QLineEdit * [xmaxValueLineEdit](#)
- QLineEdit * [ymaxValueLineEdit](#)
- QLineEdit * [zmaxValueLineEdit](#)
- QFrame * [line](#)
- QFormLayout * [cameraOptionsLayout](#)
- QLabel * [cameraOptionsLabel](#)
- QSpacerItem * [horizontalSpacer_5](#)
- QLabel * [cameraIPLabel](#)
- QLineEdit * [cameraIPLineEdit](#)
- QLabel * [fpsLiveViewLabel](#)
- QLineEdit * [fpsLiveViewLineEdit](#)
- QLabel * [biningLabel](#)
- QLineEdit * [biningValueLineEdit](#)
- QLabel * [gainLabel](#)
- QLineEdit * [gainValueLineEdit](#)
- QLabel * [emptyCameraOptionsLabel](#)
- QSpacerItem * [verticalSpacer](#)
- QGridLayout * [cameraOptions2Layout](#)
- QLabel * [dataSavePathLabel](#)
- QSpacerItem * [verticalSpacer_6](#)
- QLabel * [findCameraLabel](#)
- QPushButton * [findCameraButton](#)
- QLineEdit * [dataSavePathLineEdit](#)
- QSpacerItem * [verticalSpacer_5](#)
- QFrame * [dividerCameraOptionsline](#)
- QPushButton * [folderDialogButton](#)
- QFrame * [line_3](#)
- QFrame * [line_4](#)
- QWidget * [start_ProgramWidget](#)
- QGridLayout * [gridLayout_4](#)

- QVBoxLayout * [verticalLayout_2](#)
- QLabel * [coordinateLabel](#)
- QLabel * [coordinateShowLabel](#)
- QPushButton * [getCoordinatesButton](#)
- QPushButton * [startRobotButton](#)
- QSpacerItem * [verticalSpacer_3](#)
- QLabel * [programImageLabel](#)
- QSpacerItem * [horizontalSpacer_2](#)
- QHBoxLayout * [horizontalLayout](#)
- QLabel * [startProgramHeadlineLabel](#)
- QLabel * [startProgramStatusColorLabel](#)
- QMenuBar * [menubar](#)
- QMenu * [menuFile](#)
- QMenu * [menuAbout](#)
- QMenu * [menuView](#)
- QStatusBar * [statusbar](#)
- QDockWidget * [consoleWindowDockWidget](#)
- QWidget * [dockWidgetContents_2](#)
- QGridLayout * [gridLayout_6](#)
- QTextBrowser * [infoConsoleTextBrowser](#)

6.9.1 Detailed Description

QT-Generatred Design for UI.

6.9.2 Member Function Documentation

6.9.2.1 retranslateUi()

```
void Ui_MainWindow::retranslateUi (
    QMainWindow * MainWindow ) [inline]
```

Here is the caller graph for this function:



6.9.2.2 setupUi()

```
void Ui_MainWindow::setupUi (
    QMainWindow * MainWindow ) [inline]
```

Here is the call graph for this function:



6.9.3 Member Data Documentation

6.9.3.1 actionExit

```
QAction* Ui_MainWindow::actionExit
```

6.9.3.2 actionOpen_Console

```
QAction* Ui_MainWindow::actionOpen_Console
```

6.9.3.3 actionProject_Infos

```
QAction* Ui_MainWindow::actionProject_Infos
```

6.9.3.4 actionSave_Image_as

```
QAction* Ui_MainWindow::actionSave_Image_as
```

6.9.3.5 biningLabel

```
QLabel* Ui_MainWindow::binningLabel
```

6.9.3.6 binningValueLineEdit

```
QLineEdit* Ui_MainWindow::binningValueLineEdit
```

6.9.3.7 cameraIPLabel

```
QLabel* Ui_MainWindow::cameraIPLabel
```

6.9.3.8 cameraIPLineEdit

```
QLineEdit* Ui_MainWindow::cameraIPLineEdit
```

6.9.3.9 cameraOptions2Layout

```
QGridLayout* Ui_MainWindow::cameraOptions2Layout
```

6.9.3.10 cameraOptionsLabel

```
QLabel* Ui_MainWindow::cameraOptionsLabel
```

6.9.3.11 cameraOptionsLayout

```
QFormLayout* Ui_MainWindow::cameraOptionsLayout
```

6.9.3.12 cameraViewHeadlineLabel

```
QLabel* Ui_MainWindow::cameraViewHeadlineLabel
```

6.9.3.13 cameraViewInfoLabel

```
QLabel* Ui_MainWindow::cameraViewInfoLabel
```

6.9.3.14 cameraViewTimestampLabel

```
QLabel* Ui_MainWindow::cameraViewTimestampLabel
```

6.9.3.15 cameraViewVerticalLayout

```
QVBoxLayout* Ui_MainWindow::cameraViewVerticalLayout
```

6.9.3.16 cameraViewWidget

```
QWidget* Ui_MainWindow::cameraViewWidget
```

6.9.3.17 consoleWindowDockWidget

```
QDockWidget* Ui_MainWindow::consoleWindowDockWidget
```

6.9.3.18 coordinateLabel

```
QLabel* Ui_MainWindow::coordinateLabel
```

6.9.3.19 coordinatesCheckBox

```
QCheckBox* Ui_MainWindow::coordinatesCheckBox
```

6.9.3.20 coordinateShowLabel

```
QLabel* Ui_MainWindow::coordinateShowLabel
```

6.9.3.21 dataSavePathLabel

```
QLabel* Ui_MainWindow::dataSavePathLabel
```

6.9.3.22 dataSavePathLineEdit

```
QLineEdit* Ui_MainWindow::dataSavePathLineEdit
```

6.9.3.23 dividerCameraOptionsline

```
QFrame* Ui_MainWindow::dividerCameraOptionsline
```

6.9.3.24 dockWidgetContents_2

```
QWidget* Ui_MainWindow::dockWidgetContents_2
```

6.9.3.25 emptyCameraOptionsLabel

```
QLabel* Ui_MainWindow::emptyCameraOptionsLabel
```

6.9.3.26 findCameraButton

```
QPushButton* Ui_MainWindow::findCameraButton
```

6.9.3.27 findCameraLabel

```
QLabel* Ui_MainWindow::findCameraLabel
```

6.9.3.28 folderDialogButton

```
QPushButton* Ui_MainWindow::folderDialogButton
```

6.9.3.29 formLayout

```
QFormLayout* Ui_MainWindow::formLayout
```

6.9.3.30 fpsLiveViewLabel

```
QLabel* Ui_MainWindow::fpsLiveViewLabel
```

6.9.3.31 fpsLiveViewLineEdit

```
QLineEdit* Ui_MainWindow::fpsLiveViewLineEdit
```

6.9.3.32 gainLabel

```
QLabel* Ui_MainWindow::gainLabel
```

6.9.3.33 gainValueLineEdit

```
QLineEdit* Ui_MainWindow::gainValueLineEdit
```

6.9.3.34 getCoordinatesButton

```
QPushButton* Ui_MainWindow::getCoordinatesButton
```

6.9.3.35 gridLayout_3

```
QGridLayout* Ui_MainWindow::gridLayout_3
```

6.9.3.36 gridLayout_4

```
QGridLayout* Ui_MainWindow::gridLayout_4
```

6.9.3.37 gridLayout_5

```
QGridLayout* Ui_MainWindow::gridLayout_5
```

6.9.3.38 `gridLayout_6`

```
QGridLayout* Ui_MainWindow::gridLayout_6
```

6.9.3.39 `horizontalLayout`

```
QHBoxLayout* Ui_MainWindow::horizontalLayout
```

6.9.3.40 `horizontalSpacer`

```
QSpacerItem* Ui_MainWindow::horizontalSpacer
```

6.9.3.41 `horizontalSpacer_2`

```
QSpacerItem* Ui_MainWindow::horizontalSpacer_2
```

6.9.3.42 `horizontalSpacer_4`

```
QSpacerItem* Ui_MainWindow::horizontalSpacer_4
```

6.9.3.43 `horizontalSpacer_5`

```
QSpacerItem* Ui_MainWindow::horizontalSpacer_5
```

6.9.3.44 `infoConsoleTextBrowser`

```
QTextBrowser* Ui_MainWindow::infoConsoleTextBrowser
```

6.9.3.45 `line`

```
QFrame* Ui_MainWindow::line
```


6.9.3.46 line_2

```
QFrame* Ui_MainWindow::line_2
```

6.9.3.47 line_3

```
QFrame* Ui_MainWindow::line_3
```

6.9.3.48 line_4

```
QFrame* Ui_MainWindow::line_4
```

6.9.3.49 liveCameraViewLabel

```
QLabel* Ui_MainWindow::liveCameraViewLabel
```

6.9.3.50 mainMenuWidget

```
QWidget* Ui_MainWindow::mainMenuWidget
```

6.9.3.51 menuAbout

```
QMenu* Ui_MainWindow::menuAbout
```

6.9.3.52 menubar

```
QMenuBar* Ui_MainWindow::menubar
```

6.9.3.53 menuFile

```
QMenu* Ui_MainWindow::menuFile
```

6.9.3.54 menuView

```
QMenu* Ui_MainWindow::menuView
```

6.9.3.55 optionsWidget

```
QWidget* Ui_MainWindow::optionsWidget
```

6.9.3.56 outlinesCheckBox

```
QCheckBox* Ui_MainWindow::outlinesCheckBox
```

6.9.3.57 programImageLabel

```
QLabel* Ui_MainWindow::programImageLabel
```

6.9.3.58 robotIPLabel

```
QLabel* Ui_MainWindow::robotIPLabel
```

6.9.3.59 robotIPLineEdit

```
QLineEdit* Ui_MainWindow::robotIPLineEdit
```

6.9.3.60 robotOptionsLabel

```
QLabel* Ui_MainWindow::robotOptionsLabel
```

6.9.3.61 robotPortLabel

```
QLabel* Ui_MainWindow::robotPortLabel
```

6.9.3.62 robotPortLineEdit

```
QLineEdit* Ui_MainWindow::robotPortLineEdit
```

6.9.3.63 saveImageButton

```
QPushButton* Ui_MainWindow::saveImageButton
```

6.9.3.64 start_ProgramWidget

```
QWidget* Ui_MainWindow::start_ProgramWidget
```

6.9.3.65 startCameraViewButton

```
QPushButton* Ui_MainWindow::startCameraViewButton
```

6.9.3.66 startProgramHeadlineLabel

```
QLabel* Ui_MainWindow::startProgramHeadlineLabel
```

6.9.3.67 startProgramStatusColorLabel

```
QLabel* Ui_MainWindow::startProgramStatusColorLabel
```

6.9.3.68 startRobotButton

```
QPushButton* Ui_MainWindow::startRobotButton
```

6.9.3.69 statusbar

```
QStatusBar* Ui_MainWindow::statusbar
```

6.9.3.70 stoppCameraViewButton

QPushButton* Ui_MainWindow::stoppCameraViewButton

6.9.3.71 tabWidget

QTabWidget* Ui_MainWindow::tabWidget

6.9.3.72 verticalLayout_2

QVBoxLayout* Ui_MainWindow::verticalLayout_2

6.9.3.73 verticalLayout_4

QVBoxLayout* Ui_MainWindow::verticalLayout_4

6.9.3.74 verticalSpacer

QSpacerItem* Ui_MainWindow::verticalSpacer

6.9.3.75 verticalSpacer_2

QSpacerItem* Ui_MainWindow::verticalSpacer_2

6.9.3.76 verticalSpacer_3

QSpacerItem* Ui_MainWindow::verticalSpacer_3

6.9.3.77 verticalSpacer_5

QSpacerItem* Ui_MainWindow::verticalSpacer_5

6.9.3.78 verticalSpacer_6

```
QSpacerItem* Ui_MainWindow::verticalSpacer_6
```

6.9.3.79 workingAreagridLayout

```
QGridLayout* Ui_MainWindow::workingAreagridLayout
```

6.9.3.80 workingAreaLabel

```
QLabel* Ui_MainWindow::workingAreaLabel
```

6.9.3.81 xmaxLabel

```
QLabel* Ui_MainWindow::xmaxLabel
```

6.9.3.82 xmaxValueLineEdit

```
QLineEdit* Ui_MainWindow::xmaxValueLineEdit
```

6.9.3.83 xminLabel

```
QLabel* Ui_MainWindow::xminLabel
```

6.9.3.84 xminValueLineEdit

```
QLineEdit* Ui_MainWindow::xminValueLineEdit
```

6.9.3.85 ymaxLabel

```
QLabel* Ui_MainWindow::ymaxLabel
```

6.9.3.86 ymaxValueLineEdit

```
QLineEdit* Ui_MainWindow::ymaxValueLineEdit
```

6.9.3.87 yminLabel

```
QLabel* Ui_MainWindow::yminLabel
```

6.9.3.88 yminValueLineEdit

```
QLineEdit* Ui_MainWindow::yminValueLineEdit
```

6.9.3.89 zmaxLabel

```
QLabel* Ui_MainWindow::zmaxLabel
```

6.9.3.90 zmaxValueLineEdit

```
QLineEdit* Ui_MainWindow::zmaxValueLineEdit
```

6.9.3.91 zminLabel

```
QLabel* Ui_MainWindow::zminLabel
```

6.9.3.92 zminValueLineEdit

```
QLineEdit* Ui_MainWindow::zminValueLineEdit
```

6.9.3.93 zOffsetFinalLabel

```
QLabel* Ui_MainWindow::zOffsetFinalLabel
```

6.9.3.94 zOffsetFinalLineEdit

```
QLineEdit* Ui_MainWindow::zOffsetFinalLineEdit
```

6.9.3.95 zOffsetLabel

```
QLabel* Ui_MainWindow::zOffsetLabel
```

6.9.3.96 zOffsetLneEdit

```
QLineEdit* Ui_MainWindow::zOffsetLneEdit
```

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

- [/home/kukavision/KukaVision/repo/KukaVision/include/MainWindowUI.h](#)

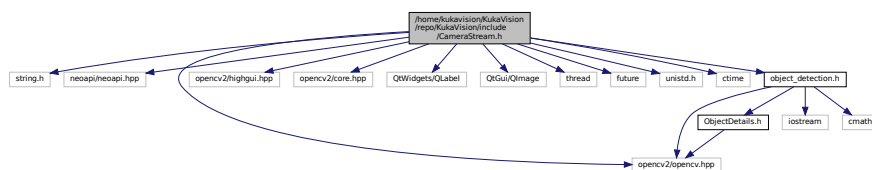
Chapter 7

File Documentation

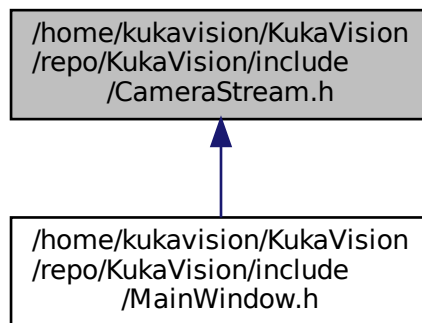
7.1 /home/kukavision/KukaVision/repo/KukaVision/include/CameraStream.h File Reference

```
#include <string.h>
#include "neoapi/neoapi.hpp"
#include <opencv2/opencv.hpp>
#include <opencv2/highgui.hpp>
#include <opencv2/core.hpp>
#include <QtWidgets/QLabel>
#include <QtGui/QImage>
#include <thread>
#include <future>
#include <unistd.h>
#include <ctime>
#include "object_detection.h"
```

Include dependency graph for CameraStream.h:



This graph shows which files directly or indirectly include this file:



Classes

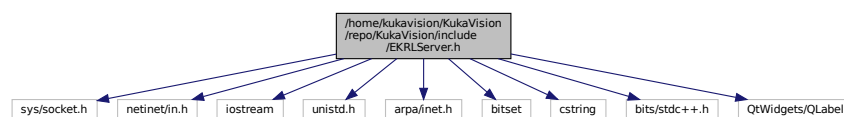
- class [CameraStream](#)

Class coordinates the connection to the camera, the object detection and the display of the latest image in a QLabel.

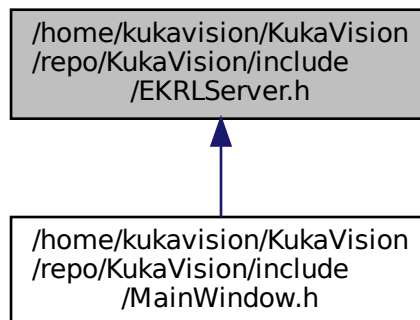
7.2 `/home/kukavision/KukaVision/repo/KukaVision/include/↵` EKRLServer.h File Reference

```
#include <sys/socket.h>
#include <netinet/in.h>
#include <iostream>
#include <unistd.h>
#include <arpa/inet.h>
#include <bitset>
#include <cstring>
#include <bits/stdc++.h>
#include <QtWidgets/QLabel>
```

Include dependency graph for EKRLServer.h:



This graph shows which files directly or indirectly include this file:



Classes

- struct [FRAME](#)

Macros

- #define [BUFFERSIZE](#) 64
- #define [CONNATTEMPTS](#) 5
- #define [CONNDELAY](#) 5

Functions

- template<typename T >
int [bufferToVar](#) (char *buffer, int bufferSize, T &var)
convert the buffer-data to a c++ variable
- template<typename T >
int [varToBuffer](#) (char *buffer, int bufferSize, T &var)
convert a variable to a char-buffer
- int [connectSocket](#) (const char *ipAddress, int port, int &clientSocket)
connect to socket based on ip and port
- int [sendBuffer](#) (char *buffer, int bufferSize, int &clientSocket)
Send buffer to client socket.
- int [receiveBuffer](#) (char *buffer, int bufferSize, int &clientSocket)
Receive a buffer send by the client.
- bool [checkVerificationBuffer](#) (char *buffer, int bufferSize)
Checks whether buffer is a single True bit. Is used to verify completion of Robot-Program-Sections.
- int [frameToBuffer](#) ([FRAME](#) &position, char *buffer, int bufferSize)
Converts Frame struct into char-buffer. Used for KUKA-Positions.
- int [bufferToFrame](#) ([FRAME](#) &position, char *buffer, int bufferSize)
Convert a char-buffer into a Frame struct. Used for KUKA-Positions.
- void [runERKLSequence](#) (string ipAddress, int port, QLabel *statusLabel, float x, float y, float zTravel, float zGripping, float a)
Runs Robot-Program-Sequence Connect to Robot, sends relevant Points and updates Progress-Information on UI.

7.2.1 Macro Definition Documentation

7.2.1.1 BUFFERSIZE

```
#define BUFFERSIZE 64
```

Size of the buffer

7.2.1.2 CONNATTEMPTS

```
#define CONNATTEMPTS 5
```

Amount of connection attempts before aborting the connection

7.2.1.3 CONNDELAY

```
#define CONNDELAY 5
```

delay in seconds between connection attempts

7.2.2 Function Documentation

7.2.2.1 bufferToFrame()

```
int bufferToFrame (  
    FRAME & position,  
    char * buffer,  
    int bufferSize )
```

Convert a char-buffer into a Frame struct. Used for KUKA-Positions.

Parameters

<i>position</i>	FRAME&
<i>buffer</i>	char*
<i>bufferSize</i>	int

Returns

int Conversion success; 0 = success; -1 = error

7.2.2.2 bufferToVar()

```
template<typename T >
int bufferToVar (
    char * buffer,
    int bufferSize,
    T & var )
```

convert the buffer-data to a c++ variable

Parameters

<i>buffer</i>	char* Buffer-Data
<i>bufferSize</i>	int
<i>var</i>	T& Variable that the data should be stored in

Returns

int success of the conversion. 0 = success, -1 = error

7.2.2.3 checkVerificationBuffer()

```
bool checkVerificationBuffer (
    char * buffer,
    int bufferSize )
```

Checks whether buffer is a single True bit. Is used to verify completion of Robot-Program-Sections.

Parameters

<i>buffer</i>	char*
<i>bufferSize</i>	int

Returns

bool true if buffer checks out.

7.2.2.4 connectSocket()

```
int connectSocket (
    const char * ipAddress,
    int port,
    int & clientSocket )
```

connect to socket based on ip and port

Parameters

<i>ipAddress</i>	const char* ipAddress as char-array
<i>port</i>	int
<i>clientSocket</i>	int& socket-variable

Returns

int connection success. 0 = success, -1 = error

7.2.2.5 frameToBuffer()

```
int frameToBuffer (
    FRAME & position,
    char * buffer,
    int bufferSize )
```

Converts Frame struct into char-buffer. Used for KUKA-Positions.

Parameters

<i>position</i>	FRAME&
<i>buffer</i>	char*
<i>bufferSize</i>	int

Returns

int Conversion success; 0 = success; -1 = error

7.2.2.6 receiveBuffer()

```
int receiveBuffer (
    char * buffer,
    int bufferSize,
    int & clientSocket )
```

Receive a buffer send by the client.

Parameters

<i>buffer</i>	char*
<i>bufferSize</i>	int
<i>clientSocket</i>	int&

Returns

int Number of bytes received; -1 = Error

7.2.2.7 runERKLSequence()

```
void runERKLSequence (
    string ipAddress,
    int port,
    QLabel * statusLabel,
    float x,
    float y,
    float zTravel,
    float zGripping,
    float a )
```

Runs Robot-Program-Sequence Connect to Robot, sends relevant Points and updates Progress-Information on UI.

Parameters

<i>ipAddress</i>	string Robot-IP
<i>port</i>	int Robot-Port
<i>statusLabel</i>	QLabel* QLabel used to display to progress of the program-execution
<i>x</i>	float X-Coordinate of the detected cube-center
<i>y</i>	float Y-Coordinate of the detected cube-center
<i>zTravel</i>	float Safe travel height for the robot
<i>zGripping</i>	float Gripping height
<i>a</i>	float Angle of the detected cube

Returns

void

7.2.2.8 sendBuffer()

```
int sendBuffer (
    char * buffer,
    int bufferSize,
    int & clientSocket )
```

Send buffer to client socket.

Parameters

<i>buffer</i>	char*
<i>bufferSize</i>	int
<i>clientSocket</i>	int& Reference to client Socket

Returns

int Number of bytes send; -1 = Error

7.2.2.9 varToBuffer()

```
template<typename T >
int varToBuffer (
    char * buffer,
    int bufferSize,
    T & var )
```

convert a variable to a char-buffer

Parameters

<i>buffer</i>	char*
<i>bufferSize</i>	int
<i>var</i>	T& variable that should be converted

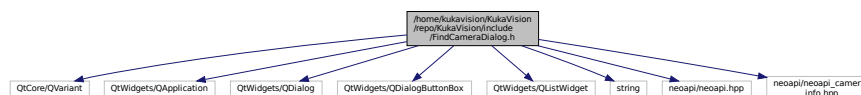
Returns

int success of the conversion. 0 = success, -1 = error

7.3 /home/kukavision/KukaVision/repo/KukaVision/include/FindCameraDialog.h File Reference ↩

```
#include <QtCore/QVariant>
#include <QtWidgets/QApplication>
#include <QtWidgets/QDialog>
#include <QtWidgets/QDialogButtonBox>
#include <QtWidgets/QListWidget>
#include <string>
#include "neoapi/neoapi.hpp"
#include <neoapi/neoapi_camera_info.hpp>
```

Include dependency graph for FindCameraDialog.h:

**Classes**

- class [Ui_Dialog](#)
QT-Generatred Design for FindCamera Dialog.
- class [FindCameraDialog](#)
Dialog for searching and selecting Baumer Cameras.
- class [Ui::Dialog](#)

Namespaces

- [Ui](#)

7.4 /home/kukavision/KukaVision/repo/KukaVision/include/MainWindow.h File Reference

```
#include "MainWindowUI.h"
#include <string>
#include <stdexcept>
#include <iostream>
#include <fstream>
#include <iomanip>
#include <QtWidgets/QFileDialog>
#include <QtWidgets/QMessageBox>
#include <nlohmann/json.hpp>
#include "CameraStream.h"
#include "EKRLServer.h"
Include dependency graph for MainWindow.h:
```



Classes

- class [MainWindow](#)
MainWindow Class inherits the QTDesigner-Generated Class [Ui::MainWindow](#).

Typedefs

- using [json](#) = nlohmann::json

7.4.1 Typedef Documentation

7.4.1.1 json

```
using json = nlohmann::json
```

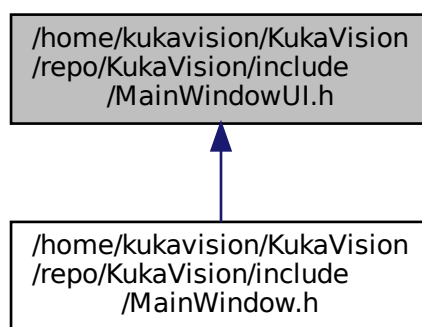
7.5 /home/kukavision/KukaVision/repo/KukaVision/include/MainWindowUI.h File Reference

```
#include <QtCore/QVariant>
#include <QtWidgets/QAction>
#include <QtWidgets/QApplication>
#include <QtWidgets/QCheckBox>
#include <QtWidgets/QDockWidget>
#include <QtWidgets/QFormLayout>
#include <QtWidgets/QFrame>
#include <QtWidgets/QGridLayout>
#include <QtWidgets/QHBoxLayout>
#include <QtWidgets/QLabel>
#include <QtWidgets/QLineEdit>
#include <QtWidgets/QMainWindow>
#include <QtWidgets/QMenu>
#include <QtWidgets/QMenuBar>
#include <QtWidgets/QPushButton>
#include <QtWidgets/QSpacerItem>
#include <QtWidgets/QStatusBar>
#include <QtWidgets/QTabWidget>
#include <QtWidgets/QTextBrowser>
#include <QtWidgets/QVBoxLayout>
#include <QtWidgets/QWidget>
```

Include dependency graph for MainWindowUI.h:



This graph shows which files directly or indirectly include this file:



Classes

- class [Ui_MainWindow](#)
QT-Generatred Design for UI.
- class [Ui::MainWindow](#)

Namespaces

- [Ui](#)

7.6 /home/kukavision/KukaVision/repo/KukaVision/include/object_detection.h File Reference

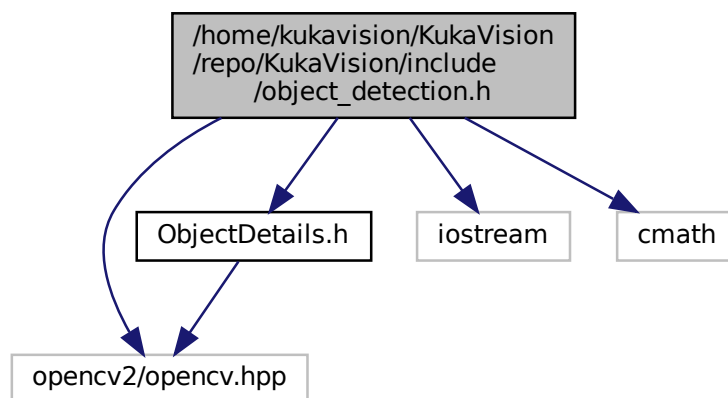
```
#include <opencv2/opencv.hpp>
```

```
#include "ObjectDetails.h"
```

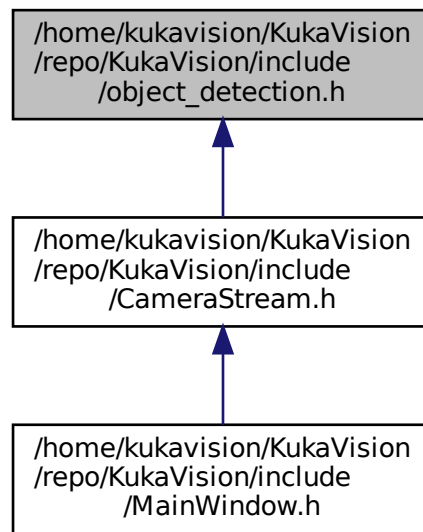
```
#include <iostream>
```

```
#include <cmath>
```

Include dependency graph for object_detection.h:



This graph shows which files directly or indirectly include this file:



Functions

- `cv::Mat` [findAndDrawObjects](#) (const `cv::Mat` &base, const `cv::Mat` &test, [ObjectDetails](#) &objectDetails)
Detect objects in test-Image and marks them in Image.
- `cv::Point2f` [coordinateTransform](#) (float angle, `cv::Point2f` VA, `cv::Point2f` PB)
Transform point in coordinate system to another system that is shifted and rotated.

7.6.1 Function Documentation

7.6.1.1 coordinateTransform()

```

cv::Point2f coordinateTransform (
    float angle,
    cv::Point2f VA,
    cv::Point2f PB )

```

Transform point in coordinate system to another system that is shifted and rotated.

Parameters

<i>angle</i>	float Angle between the two coordinate systems
<i>VA</i>	<code>cv::Point2f</code> Vector from the origin of the second coordinate system to the origin of the first
<i>PB</i>	<code>cv::Point2f</code> Point that should be transformed into second coordinate system

Returns

cv::Point2f Transformed point

7.6.1.2 findAndDrawObjects()

```
cv::Mat findAndDrawObjects (
    const cv::Mat & base,
    const cv::Mat & test,
    ObjectDetails & objectDetails )
```

Detect objects in test-Image and marks them in Image.

Parameters

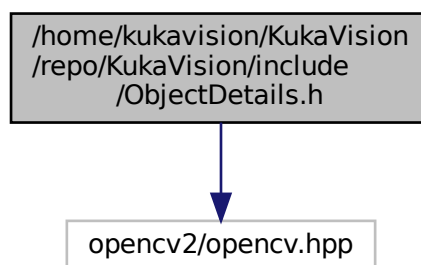
<i>base</i>	const cv::Mat& Reference image of the workarea without any objects
<i>test</i>	const cv::Mat& Image in which the objects should be detected
<i>objectDetails</i>	ObjectDetails & Information about last detected object. Includes the coordinate and angle of the object.

Returns

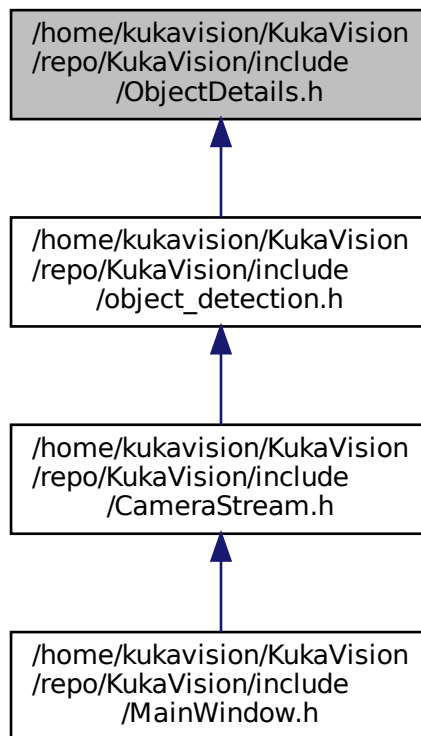
cv::Mat Test-Image with marked detected objects

7.7 /home/kukavision/KukaVision/repo/KukaVision/include/ObjectDetails.h File Reference ↩

```
#include <opencv2/opencv.hpp>
Include dependency graph for ObjectDetails.h:
```



This graph shows which files directly or indirectly include this file:



Classes

- class [ObjectDetails](#)

Details of a detected object. Includes center and corner coordinates and angle.

Index

/home/kukavision/KukaVision/repo/KukaVision/include/CameraStream.h, 36
49
/home/kukavision/KukaVision/repo/KukaVision/include/EKRLServer.h, 36
50
/home/kukavision/KukaVision/repo/KukaVision/include/FindCameraDialog.h, 36
56
/home/kukavision/KukaVision/repo/KukaVision/include/MainWindow.h, 36
57
/home/kukavision/KukaVision/repo/KukaVision/include/MainWindow.h, 36
58
/home/kukavision/KukaVision/repo/KukaVision/include/ObjectDetection.h, 12
61
/home/kukavision/KukaVision/repo/KukaVision/include/object_detection.h, 13
59

A
FRAME, 17
acquisitionLoop
CameraStream, 12
actionExit
Ui_MainWindow, 35
actionOpen_Console
Ui_MainWindow, 35
actionProject_Infos
Ui_MainWindow, 35
actionSave_Image_as
Ui_MainWindow, 35

B
FRAME, 18
biningLabel
Ui_MainWindow, 35
biningValueLineEdit
Ui_MainWindow, 35
BUFFERSIZE
EKRLServer.h, 52
bufferToFrame
EKRLServer.h, 52
bufferToVar
EKRLServer.h, 52
buttonBox
Ui_Dialog, 30

C
FRAME, 18
camera
CameraStream, 13
cameraIPLabel
Ui_MainWindow, 36
cameraIPLineEdit
Ui_MainWindow, 36
cameraOptions2Layout
Ui_MainWindow, 36
cameraOptionsLabel
Ui_MainWindow, 36
cameraOptionsLayout
Ui_MainWindow, 36
CameraStream, 11
connectionLoop, 12
camera, 13
CameraStream, 12
latestImage, 13
latestImageTimestamp, 13
latestObject, 13
cameraStream
MainWindow, 22
cameraViewHeadlineLabel
Ui_MainWindow, 36
cameraViewInfoLabel
Ui_MainWindow, 36
cameraViewTimestampLabel
Ui_MainWindow, 36
cameraViewVerticalLayout
Ui_MainWindow, 37
cameraViewWidget
Ui_MainWindow, 37
checkVerificationBuffer
EKRLServer.h, 53
CONNATTEMPTS
EKRLServer.h, 52
CONNDELAY
EKRLServer.h, 52
connectSocket
EKRLServer.h, 53
consoleWindowDockWidget
Ui_MainWindow, 37
coordinateLabel
Ui_MainWindow, 37
coordinatesCheckBox
Ui_MainWindow, 37
coordinateShowLabel
Ui_MainWindow, 37
coordinateTransform
object_detection.h, 60
dataSavePathLabel
Ui_MainWindow, 37
dataSavePathLineEdit
Ui_MainWindow, 37
dialog

- FindCameraDialog, 16
- dividerCameraOptionsline
 - Ui_MainWindow, 38
- dockWidgetContents_2
 - Ui_MainWindow, 38
- EKRLServer.h
 - BUFFERSIZE, 52
 - bufferToFrame, 52
 - bufferToVar, 52
 - checkVerificationBuffer, 53
 - CONNATTEMPTS, 52
 - CONNDELAY, 52
 - connectSocket, 53
 - frameToBuffer, 54
 - receiveBuffer, 54
 - runERKLSequence, 55
 - sendBuffer, 55
 - varToBuffer, 56
- emptyCameraOptionsLabel
 - Ui_MainWindow, 38
- findAndDrawObjects
 - object_detection.h, 61
- findCameraButton
 - Ui_MainWindow, 38
- FindCameraDialog, 15
 - dialog, 16
 - FindCameraDialog, 16
 - neoStringToQString, 16
 - selectedIP, 16
 - ui, 17
- findCameraLabel
 - Ui_MainWindow, 38
- folderDialogButton
 - Ui_MainWindow, 38
- formLayout
 - Ui_MainWindow, 38
- fpsLiveViewLabel
 - Ui_MainWindow, 38
- fpsLiveViewLineEdit
 - Ui_MainWindow, 39
- FRAME, 17
 - A, 17
 - B, 18
 - C, 18
 - X, 18
 - Y, 18
 - Z, 18
- frameToBuffer
 - EKRLServer.h, 54
- gainLabel
 - Ui_MainWindow, 39
- gainValueLineEdit
 - Ui_MainWindow, 39
- GetAllOptions_JSON
 - MainWindow, 21
- getAngle
 - ObjectDetails, 26
- getCenter
 - ObjectDetails, 26
- getCoordinatesButton
 - Ui_MainWindow, 39
- getCorner
 - ObjectDetails, 26
- gridLayout_3
 - Ui_MainWindow, 39
- gridLayout_4
 - Ui_MainWindow, 39
- gridLayout_5
 - Ui_MainWindow, 39
- gridLayout_6
 - Ui_MainWindow, 39
- horizontalLayout
 - Ui_MainWindow, 40
- horizontalSpacer
 - Ui_MainWindow, 40
- horizontalSpacer_2
 - Ui_MainWindow, 40
- horizontalSpacer_4
 - Ui_MainWindow, 40
- horizontalSpacer_5
 - Ui_MainWindow, 40
- infoConsoleTextBrowser
 - Ui_MainWindow, 40
- isValid
 - ObjectDetails, 27
- json
 - MainWindow.h, 57
- latestImage
 - CameraStream, 13
- latestImageTimestamp
 - CameraStream, 13
- latestObject
 - CameraStream, 13
- line
 - Ui_MainWindow, 40
- line_2
 - Ui_MainWindow, 40
- line_3
 - Ui_MainWindow, 41
- line_4
 - Ui_MainWindow, 41
- listWidget
 - Ui_Dialog, 30
- liveCameraViewLabel
 - Ui_MainWindow, 41
- mainMenuWidget
 - Ui_MainWindow, 41
- MainWindow, 19
 - cameraStream, 22
 - GetAllOptions_JSON, 21

- MainWindow, [21](#)
 - options_JSON, [22](#)
 - SaveOptionsInJSON, [21](#)
- MainWindow.h
 - json, [57](#)
- menuAbout
 - Ui_MainWindow, [41](#)
- menubar
 - Ui_MainWindow, [41](#)
- menuFile
 - Ui_MainWindow, [41](#)
- menuView
 - Ui_MainWindow, [41](#)
- neoStringToQString
 - FindCameraDialog, [16](#)
- object_detection.h
 - coordinateTransform, [60](#)
 - findAndDrawObjects, [61](#)
- ObjectDetails, [24](#)
 - getAngle, [26](#)
 - getCenter, [26](#)
 - getCorner, [26](#)
 - isValid, [27](#)
 - ObjectDetails, [25](#)
 - setAngle, [27](#)
 - setCenter, [27](#)
 - setCorner, [28](#)
 - setValid, [28](#)
- options_JSON
 - MainWindow, [22](#)
- optionsWidget
 - Ui_MainWindow, [42](#)
- outlinesCheckBox
 - Ui_MainWindow, [42](#)
- programImageLabel
 - Ui_MainWindow, [42](#)
- receiveBuffer
 - EKRLServer.h, [54](#)
- retranslateUi
 - Ui_Dialog, [30](#)
 - Ui_MainWindow, [34](#)
- robotIPLabel
 - Ui_MainWindow, [42](#)
- robotIPLineEdit
 - Ui_MainWindow, [42](#)
- robotOptionsLabel
 - Ui_MainWindow, [42](#)
- robotPortLabel
 - Ui_MainWindow, [42](#)
- robotPortLineEdit
 - Ui_MainWindow, [42](#)
- runERKLSequence
 - EKRLServer.h, [55](#)
- savelImageButton
 - Ui_MainWindow, [43](#)
- SaveOptionsInJSON
 - MainWindow, [21](#)
- selectedIP
 - FindCameraDialog, [16](#)
- sendBuffer
 - EKRLServer.h, [55](#)
- setAngle
 - ObjectDetails, [27](#)
- setCenter
 - ObjectDetails, [27](#)
- setCorner
 - ObjectDetails, [28](#)
- setupUi
 - Ui_Dialog, [30](#)
 - Ui_MainWindow, [34](#)
- setValid
 - ObjectDetails, [28](#)
- start_ProgramWidget
 - Ui_MainWindow, [43](#)
- startCameraViewButton
 - Ui_MainWindow, [43](#)
- startProgramHeadlineLabel
 - Ui_MainWindow, [43](#)
- startProgramStatusColorLabel
 - Ui_MainWindow, [43](#)
- startRobotButton
 - Ui_MainWindow, [43](#)
- statusbar
 - Ui_MainWindow, [43](#)
- stoppCameraViewButton
 - Ui_MainWindow, [43](#)
- tabWidget
 - Ui_MainWindow, [44](#)
- Ui, [9](#)
- ui
 - FindCameraDialog, [17](#)
- Ui::Dialog, [14](#)
- Ui::MainWindow, [22](#)
- Ui_Dialog, [28](#)
 - buttonBox, [30](#)
 - listWidget, [30](#)
 - retranslateUi, [30](#)
 - setupUi, [30](#)
- Ui_MainWindow, [31](#)
 - actionExit, [35](#)
 - actionOpen_Console, [35](#)
 - actionProject_Infos, [35](#)
 - actionSave_Image_as, [35](#)
 - binningLabel, [35](#)
 - binningValueLineEdit, [35](#)
 - cameraIPLabel, [36](#)
 - cameraIPLineEdit, [36](#)
 - cameraOptions2Layout, [36](#)
 - cameraOptionsLabel, [36](#)
 - cameraOptionsLayout, [36](#)
 - cameraViewHeadlineLabel, [36](#)

- cameraViewInfoLabel, 36
- cameraViewTimestampLabel, 36
- cameraViewVerticalLayout, 37
- cameraViewWidget, 37
- consoleWindowDockWidget, 37
- coordinateLabel, 37
- coordinatesCheckBox, 37
- coordinateShowLabel, 37
- dataSavePathLabel, 37
- dataSavePathLineEdit, 37
- dividerCameraOptionsline, 38
- dockWidgetContents_2, 38
- emptyCameraOptionsLabel, 38
- findCameraButton, 38
- findCameraLabel, 38
- folderDialogButton, 38
- formLayout, 38
- fpsLiveViewLabel, 38
- fpsLiveViewLineEdit, 39
- gainLabel, 39
- gainValueLineEdit, 39
- getCoordinatesButton, 39
- gridLayout_3, 39
- gridLayout_4, 39
- gridLayout_5, 39
- gridLayout_6, 39
- horizontalLayout, 40
- horizontalSpacer, 40
- horizontalSpacer_2, 40
- horizontalSpacer_4, 40
- horizontalSpacer_5, 40
- infoConsoleTextBrowser, 40
- line, 40
- line_2, 40
- line_3, 41
- line_4, 41
- liveCameraViewLabel, 41
- mainMenuWidget, 41
- menuAbout, 41
- menubar, 41
- menuFile, 41
- menuView, 41
- optionsWidget, 42
- outlinesCheckBox, 42
- programImageLabel, 42
- retranslateUi, 34
- robotIPLabel, 42
- robotIPLineEdit, 42
- robotOptionsLabel, 42
- robotPortLabel, 42
- robotPortLineEdit, 42
- saveImageButton, 43
- setupUi, 34
- start_ProgramWidget, 43
- startCameraViewButton, 43
- startProgramHeadlineLabel, 43
- startProgramStatusLabel, 43
- startRobotButton, 43
- statusbar, 43
- stoppCameraViewButton, 43
- tabWidget, 44
- verticalLayout_2, 44
- verticalLayout_4, 44
- verticalSpacer, 44
- verticalSpacer_2, 44
- verticalSpacer_3, 44
- verticalSpacer_5, 44
- verticalSpacer_6, 44
- workingAreagridLayout, 45
- workingAreaLabel, 45
- xmaxLabel, 45
- xmaxValueLineEdit, 45
- xminLabel, 45
- xminValueLineEdit, 45
- ymaxLabel, 45
- ymaxValueLineedit, 45
- yminLabel, 46
- yminValueLineEdit, 46
- zmaxLabel, 46
- zmaxValueLineEdit, 46
- zminLabel, 46
- zminValueLineEdit, 46
- zOffsetFinalLabel, 46
- zOffsetFinalLineEdit, 46
- zOffsetLabel, 47
- zOffsetLneEdit, 47
- varToBuffer
 - EKRLServer.h, 56
- verticalLayout_2
 - Ui_MainWindow, 44
- verticalLayout_4
 - Ui_MainWindow, 44
- verticalSpacer
 - Ui_MainWindow, 44
- verticalSpacer_2
 - Ui_MainWindow, 44
- verticalSpacer_3
 - Ui_MainWindow, 44
- verticalSpacer_5
 - Ui_MainWindow, 44
- verticalSpacer_6
 - Ui_MainWindow, 44
- workingAreagridLayout
 - Ui_MainWindow, 45
- workingAreaLabel
 - Ui_MainWindow, 45
- X
 - FRAME, 18
- xmaxLabel
 - Ui_MainWindow, 45
- xmaxValueLineEdit
 - Ui_MainWindow, 45
- xminLabel
 - Ui_MainWindow, 45

xminValueLineEdit
 Ui_MainWindow, [45](#)

Y

 FRAME, [18](#)
ymaxLabel
 Ui_MainWindow, [45](#)
ymaxValueLineEdit
 Ui_MainWindow, [45](#)
yminLabel
 Ui_MainWindow, [46](#)
yminValueLineEdit
 Ui_MainWindow, [46](#)

Z

 FRAME, [18](#)
zmaxLabel
 Ui_MainWindow, [46](#)
zmaxValueLineEdit
 Ui_MainWindow, [46](#)
zminLabel
 Ui_MainWindow, [46](#)
zminValueLineEdit
 Ui_MainWindow, [46](#)
zOffsetFinalLabel
 Ui_MainWindow, [46](#)
zOffsetFinalLineEdit
 Ui_MainWindow, [46](#)
zOffsetLabel
 Ui_MainWindow, [47](#)
zOffsetLineEdit
 Ui_MainWindow, [47](#)