# MhdOrientation

Generated by Doxygen 1.7.6.1

Sun Sep 8 2013 22:20:33

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# Namespace Documentation

## 5.1 Mhd Namespace Reference

Namespace Mhd referred to the classes and methods defined in the project Mhd-Orientation.

### Classes

- class MhdFactory

  *The factory tha collects different MhdOrientation.*
- class MhdOrientation

  *Base class that contains methods to perform the RAS conversion.*
- class AIL

  *Derived class to perform AIL->RAS conversion.*
- class ASL
- class RAI
- class LSA
- class MhdProxy

  *A proxy used to build an object MhdOrientation and to register it in the factory.*
- class MhdPythonOrientation

  *The class used for the Python interface.*

### Typedefs

- typedef std::unique_ptr < MhdOrientation >(* MhdBuilder )()

  *A typedef to the builder that returns a unique_ptr to a MhdOrientation object.*

## Functions

- char * MhdFileReader (char *InputFile)

  *Read from a file the AnatomicalOrientation parameter.*
- ostream & operator<< (ostream &out, const MhdOrientation &K)

### 5.1.1 Detailed Description

Namespace Mhd referred to the classes and methods defined in the project MhdOrientation.

### 5.1.2 Typedef Documentation

#### 5.1.2.1 typedef std::unique_ptr<MhdOrientation >(* Mhd::MhdBuilder)()

A typedef to the builder that returns a unique_ptr to a MhdOrientation object.

### 5.1.3 Function Documentation

#### 5.1.3.1 char * Mhd::MhdFileReader ( char * *InputFile* )

Read from a file the AnatomicalOrientation parameter.

**Parameters**

| | |
|---|---|
| *InputFile* | Input .mhd file |

**Returns**

a string containing the orientation

#### 5.1.3.2 ostream& Mhd::operator<< ( ostream & *out,* const MhdOrientation & *K* )

**Parameters**

| | |
|---|---|
| *out* | Ostream for .mhd file writing |
| *K* | The object used to write the .mhd file |

**Returns**

ofstream to write the object

# Chapter 6

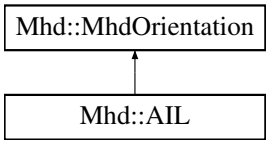
# Class Documentation

## 6.1 Mhd::AIL Class Reference

Derived class to perform AIL->RAS conversion.

`#include <MhdOrientationRules.hxx>`

Inheritance diagram for Mhd::AIL:




### Public Member Functions

- AIL ()
- ~AIL ()
- void ConvertToRas (size_t i=1)

  *Perform orientation to RAS.*
- virtual MhdOrientation * Create () const

  *Construction of the object returning a pointer to the base class.*

### 6.1.1 Detailed Description

Derived class to perform AIL->RAS conversion.

### 6.1.2 Constructor & Destructor Documentation

#### 6.1.2.1 Mhd::AIL::AIL ( )

#### 6.1.2.2 Mhd::AIL::~AIL ( )

### 6.1.3 Member Function Documentation

#### 6.1.3.1 void Mhd::AIL::ConvertToRas ( size_t *i* = 1 ) [virtual]

Perform orientation to RAS.

**Parameters**

| | |
|---|---|
| *i* | i-th angle of rotation |

Implements Mhd::MhdOrientation.

#### 6.1.3.2 MhdOrientation * Mhd::AIL::Create ( ) const [virtual]

Construction of the object returning a pointer to the base class.

**Returns**

Pointer to the base class

Implements Mhd::MhdOrientation.

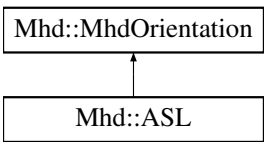
The documentation for this class was generated from the following files:

- lib/include/MhdOrientationRules.hxx
- lib/src/MhdOrientationRules.cxx

## 6.2 Mhd::ASL Class Reference

`#include <MhdOrientationRules.hxx>`

Inheritance diagram for Mhd::ASL:




### Public Member Functions

- ASL ()
- ~ASL ()

- void ConvertToRas (size_t i=1)

  *Perform orientation to RAS.*
- virtual MhdOrientation * Create () const

  *Construction of the object returning a pointer to the base class.*

### 6.2.1 Constructor & Destructor Documentation

#### 6.2.1.1 Mhd::ASL::ASL ( )

#### 6.2.1.2 Mhd::ASL::~ASL ( )

### 6.2.2 Member Function Documentation

#### 6.2.2.1 void Mhd::ASL::ConvertToRas ( size_t *i* = `1` ) `[virtual]`

Perform orientation to RAS.

**Parameters**

| | |
|---|---|
| *i* | i-th angle of rotation |

Implements Mhd::MhdOrientation.

#### 6.2.2.2 MhdOrientation * Mhd::ASL::Create ( ) const `[virtual]`

Construction of the object returning a pointer to the base class.

**Returns**

Pointer to the base class

Implements Mhd::MhdOrientation.

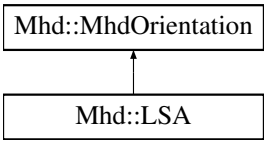
The documentation for this class was generated from the following files:

- lib/include/MhdOrientationRules.hxx
- lib/src/MhdOrientationRules.cxx

## 6.3 Mhd::LSA Class Reference

`#include <MhdOrientationRules.hxx>`

Inheritance diagram for Mhd::LSA:




### Public Member Functions

- LSA ()
- ∼LSA ()
- void ConvertToRas (size_t i=1)

  *Perform orientation to RAS.*
- virtual MhdOrientation ∗ Create () const

  *Construction of the object returning a pointer to the base class.*

## 6.3.1 Constructor & Destructor Documentation

### 6.3.1.1 Mhd::LSA::LSA ( )

### 6.3.1.2 Mhd::LSA::∼LSA ( )

## 6.3.2 Member Function Documentation

### 6.3.2.1 void Mhd::LSA::ConvertToRas ( size_t *i* = `1` ) [virtual]

Perform orientation to RAS.

**Parameters**

| | |
|---|---|
| *i* | i-th angle of rotation |

Implements Mhd::MhdOrientation.

### 6.3.2.2 MhdOrientation ∗ Mhd::LSA::Create ( ) const [virtual]

Construction of the object returning a pointer to the base class.

**Returns**

Pointer to the base class

Implements Mhd::MhdOrientation.

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

- lib/include/MhdOrientationRules.hxx
- lib/src/MhdOrientationRules.cxx

## 6.4 Mhd::MhdFactory Class Reference

The factory tha collects different MhdOrientation.

`#include <MhdFactory.hxx>`

### Public Types

- typedef map< string, MhdBuilder > Collector

  *Collector of the orientations.*

### Public Member Functions

- unique_ptr< MhdOrientation > Get (string const &Name) const

  *Get an object of the factory.*
- void Register (string const &Name, MhdBuilder const &Func) throw (invalid_argument)

  *Registers in the factory the orientation given.*
- vector< string > Registered () const

  *List all the orientations contained in the factory.*
- void Unset (string const &Name)

  *Remove the given orientation from the factory.*
- ~MhdFactory ()
- MhdFactory ()

### Static Public Member Functions

- static MhdFactory & Instance ()

### 6.4.1 Detailed Description

The factory tha collects different MhdOrientation.

### 6.4.2 Member Typedef Documentation

#### 6.4.2.1 typedef map<string,MhdBuilder> Mhd::MhdFactory::Collector

Collector of the orientations.

### 6.4.3 Constructor & Destructor Documentation

#### 6.4.3.1 Mhd::MhdFactory::~MhdFactory ( )

#### 6.4.3.2 Mhd::MhdFactory::MhdFactory ( )

### 6.4.4 Member Function Documentation

#### 6.4.4.1 unique_ptr< MhdOrientation > Mhd::MhdFactory::Get ( string const & *Name* ) const

Get an object of the factory.

**Parameters**

| | |
|---|---|
| *Name* | Name of the orientation selected |

**Returns**

The orientation with the Name chosen

**Exceptions**

| | |
|---|---|
| *invalid_argument* | |

#### 6.4.4.2 MhdFactory & Mhd::MhdFactory::Instance ( ) [static]

**Returns**

#### 6.4.4.3 void Mhd::MhdFactory::Register ( string const & *Name,* MhdBuilder const & *Func* ) throw (invalid_argument)

Registers in the factory the orientation given.

**Parameters**

| | |
|---|---|
| *Name* | Name of the orientation to be registered |
| *Func* | The builder used |

**Exceptions**

| | |
|---|---|
| *invalid_argument* | |

#### 6.4.4.4 vector< string > Mhd::MhdFactory::Registered ( ) const

List all the orientations contained in the factory.

**Returns**

a vector<string> containing the orientations

#### 6.4.4.5 void Mhd::MhdFactory::Unset ( string const & *Name* )

Remove the given orientation from the factory.

**Parameters**

| | |
|---|---|
| *Name* | Name of the orientation to be removed |

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

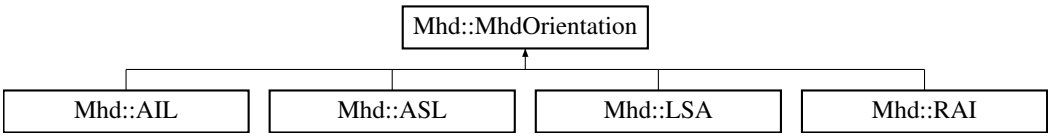
- lib/include/MhdFactory.hxx
- lib/src/MhdFactory.cxx

## 6.5 Mhd::MhdOrientation Class Reference

Base class that contains methods to perform the RAS conversion.

`#include <MhdOrientation.hxx>`

Inheritance diagram for Mhd::MhdOrientation:




### Public Member Functions

- void OrientationReader (char *InputFile)

  *Read from a .mhd files the parameters.*
- void OrientationWriter (char *OutputFile)

  *Write on a file the parameters in .mhd format.*
- virtual void ConvertToRas (size_t i=1)=0

  *Virtual declaration of the method used to convert the orientation to RAS orientation.*
- virtual MhdOrientation * Create () const =0

  *Virtual constructor.*

- void ComputeAngles ()

  *Compute the rotation angles from the TransformMatrix.*
- void ComputeRotation (float *angles)

  *Compute from the angle given the TransformMatrix.*
- float R (size_t i, size_t j)

  *Returns the element (i,j) of the TransformMatrix.*
- float O (size_t i)

  *Returns i-th element of Offset.*
- float C (size_t i)

  *Returns i-th element of CenterOfRotation.*
- const char * AO ()

  *Returns the stored AnatomicalOrientaion.*

### Protected Attributes

- vector< float > TransformMatrix
- vector< float > Offset
- vector< float > CenterOfRotation
- string AnatomicalOrientation
- string ObjectType
- size_t NDims
- size_t CompressedDataSize
- string BinaryData
- string BinaryDataByteOrderMSB
- string CompressedData
- vector< float > ElementSpacing
- vector< size_t > DimSize
- string ElementType
- string ElementDataFile
- pair< vector< float >, vector < float > > Angles

### Friends

- ostream & operator<< (ostream &out, const MhdOrientation &K)

  *Overloading of the operator <<.*

#### 6.5.1 Detailed Description

Base class that contains methods to perform the RAS conversion.

### 6.5.2 Member Function Documentation

#### 6.5.2.1 const char* Mhd::MhdOrientation::AO ( ) [inline]

Returns the stored AnatomicalOrientaion.

**Returns**

the orientation

#### 6.5.2.2 float Mhd::MhdOrientation::C ( size_t *i* ) [inline]

Returns i-th element of CenterOfRotation.

**Parameters**

| | |
|---|---|
| *i* | The i-th element of CenterOfRotation |

**Returns**

float element of the CenterOfRotation

#### 6.5.2.3 void Mhd::MhdOrientation::ComputeAngles ( )

Compute the rotation angles from the TransformMatrix.

#### 6.5.2.4 void Mhd::MhdOrientation::ComputeRotation ( float * *angles* )

Compute from the angle given the TransformMatrix.

**Parameters**

| | |
|---|---|
| *angles* | The angle used to compute the TransformMatrix |

#### 6.5.2.5 virtual void Mhd::MhdOrientation::ConvertToRas ( size_t *i* = 1 ) [pure virtual]

Virtual declaration of the method used to convert the orientation to RAS orientation.

**Parameters**

| | |
|---|---|
| *i* | Select the i-th angle to perform the conversion |

Implemented in Mhd::LSA, Mhd::RAI, Mhd::ASL, and Mhd::AIL.

#### 6.5.2.6 virtual MhdOrientation* Mhd::MhdOrientation::Create ( ) const [pure virtual]

Virtual constructor.

Implemented in Mhd::LSA, Mhd::RAI, Mhd::ASL, and Mhd::AIL.

#### 6.5.2.7 float Mhd::MhdOrientation::O ( size_t *i* ) [inline]

Returns i-th element of Offset.

**Parameters**

| | |
|---|---|
| *i* | The i-th element of Offset |

**Returns**

float element of the Offset

#### 6.5.2.8 void Mhd::MhdOrientation::OrientationReader ( char * *InputFile* )

Read from a .mhd files the parameters.

**Parameters**

| | |
|---|---|
| *InputFile* | Input .mhd file |

#### 6.5.2.9 void Mhd::MhdOrientation::OrientationWriter ( char * *OutputFile* )

Write on a file the parameters in .mhd format.

**Parameters**

| | |
|---|---|
| *OutputFile* | Output .mhd file |

#### 6.5.2.10 float Mhd::MhdOrientation::R ( size_t *i*, size_t *j* ) [inline]

Returns the element (i,j) of the TransformMatrix.

**Parameters**

| | |
|---|---|
| *i* | Row index of the TransformMatrix |
| *j* | Column index of the TransformMatrix |

**Returns**

float element of the TransformMatrix

### 6.5.3 Friends And Related Function Documentation

#### 6.5.3.1 ostream& operator<< ( ostream & *out,* const MhdOrientation & *K* ) [friend]

Overloading of the operator <<.

**Parameters**

| | |
|---|---|
| *out* | Ostream for .mhd file writing |
| *K* | The object used to write the .mhd file |

**Returns**

ofstream to write the object

### 6.5.4 Member Data Documentation

#### 6.5.4.1 string Mhd::MhdOrientation::AnatomicalOrientation [protected]

#### 6.5.4.2 pair< vector<float>, vector<float> > Mhd::MhdOrientation::Angles [protected]

#### 6.5.4.3 string Mhd::MhdOrientation::BinaryData [protected]

#### 6.5.4.4 string Mhd::MhdOrientation::BinaryDataByteOrderMSB [protected]

#### 6.5.4.5 vector<float> Mhd::MhdOrientation::CenterOfRotation [protected]

#### 6.5.4.6 string Mhd::MhdOrientation::CompressedData [protected]

#### 6.5.4.7 size_t Mhd::MhdOrientation::CompressedDataSize [protected]

#### 6.5.4.8 vector<size_t> Mhd::MhdOrientation::DimSize [protected]

#### 6.5.4.9 string Mhd::MhdOrientation::ElementDataFile [protected]

#### 6.5.4.10 vector<float> Mhd::MhdOrientation::ElementSpacing [protected]

#### 6.5.4.11 string Mhd::MhdOrientation::ElementType [protected]

#### 6.5.4.12 size_t Mhd::MhdOrientation::NDims [protected]

#### 6.5.4.13 string Mhd::MhdOrientation::ObjectType [protected]

#### 6.5.4.14 vector<float> Mhd::MhdOrientation::Offset [protected]

#### 6.5.4.15 vector<float> Mhd::MhdOrientation::TransformMatrix [protected]

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

- lib/include/MhdOrientation.hxx
- lib/src/MhdOrientation.cxx

## 6.6 Mhd::MhdProxy< T > Class Template Reference

A proxy used to build an object MhdOrientation and to register it in the factory.

`#include <MhdProxy.hxx>`

### Public Member Functions

- MhdProxy (char const *const &Name)

  *Constructor of the MhdProxy that perform the ragistration of the MhdOrientation in the class.*
- ~MhdProxy ()

### Static Public Member Functions

- static unique_ptr< MhdOrientation > Build ()

  *The builder of the object.*

### 6.6.1 Detailed Description

**template<typename T>class Mhd::MhdProxy< T >**

A proxy used to build an object MhdOrientation and to register it in the factory.

**Template Parameters**

| | |
|---|---|
| *T* | The string indicating thr orientation rule to be build and to be registered |

### 6.6.2 Constructor & Destructor Documentation

#### 6.6.2.1 template<typename T > Mhd::MhdProxy< T >::MhdProxy ( char const *const & *Name* )

Constructor of the MhdProxy that perform the ragistration of the MhdOrientation in the class.

**Parameters**

| | |
|---|---|
| *Name* | String containing the name of the orientation to be registered |

#### 6.6.2.2 template<typename T > Mhd::MhdProxy< T >::~MhdProxy ( ) [inline]

### 6.6.3 Member Function Documentation

#### 6.6.3.1 template<typename T > unique_ptr< MhdOrientation > Mhd::MhdProxy< T >::Build ( ) [static]

The builder of the object.

**Returns**

A static unique_ptr<MhdOrientation>

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

- lib/include/MhdProxy.hxx

## 6.7 Mhd::MhdPythonOrientation Class Reference

The class used for the Python interface.

`#include <MhdPythonOrientation.hxx>`

### Public Member Functions

- void OrientationReader (char *InputFile)

  *Read from a .mhd file the parameters.*
- void OrientationWriter (char *OutputFile)

  *Write on a file the parameters in .mhd format.*
- void ConvertToRas (size_t i=1)

  *Method used to convert the orientation to RAS orientation.*
- void ComputeAngles ()

  *Compute the rotation angles from the TransformMatrix.*
- void ComputeRotation (float *angles)

  *Compute from the angle given the TransformMatrix.*

- float R (size_t i, size_t j)

  *Returns the element (i,j) of the TransformMatrix.*
- float O (size_t i)

  *Returns i-th element of Offset.*
- float C (size_t i)

  *Returns i-th element of CenterOfRotation.*
- const char * AO ()

  *Returns the stored AnatomicalOrientaion.*

### 6.7.1 Detailed Description

The class used for the Python interface.

### 6.7.2 Member Function Documentation

#### 6.7.2.1 const char* Mhd::MhdPythonOrientation::AO ( ) [inline]

Returns the stored AnatomicalOrientaion.

**Returns**

the orientation

#### 6.7.2.2 float Mhd::MhdPythonOrientation::C ( size_t *i* ) [inline]

Returns i-th element of CenterOfRotation.

**Parameters**

| | |
|---|---|
| *i* | The i-th element of CenterOfRotation |

**Returns**

float element of the CenterOfRotation

#### 6.7.2.3 void Mhd::MhdPythonOrientation::ComputeAngles ( )

Compute the rotation angles from the TransformMatrix.

#### 6.7.2.4 void Mhd::MhdPythonOrientation::ComputeRotation ( float * *angles* )

Compute from the angle given the TransformMatrix.

**Parameters**

| | |
|---|---|
| *angles* | The angle used to compute the TransformMatrix |

#### 6.7.2.5 void Mhd::MhdPythonOrientation::ConvertToRas ( size_t *i* = 1 )

Method used to convert the orientation to RAS orientation.

**Parameters**

| | |
|---|---|
| *i* | Select the i-th to perform the conversion |

#### 6.7.2.6 float Mhd::MhdPythonOrientation::O ( size_t *i* ) [inline]

Returns i-th element of Offset.

**Parameters**

| | |
|---|---|
| *i* | The i-th element of Offset |

**Returns**

float element of the Offset

#### 6.7.2.7 void Mhd::MhdPythonOrientation::OrientationReader ( char * *InputFile* )

Read from a .mhd file the parameters.

**Parameters**

| | |
|---|---|
| *InputFile* | Input .mhd file |

#### 6.7.2.8 void Mhd::MhdPythonOrientation::OrientationWriter ( char * *OutputFile* )

Write on a file the parameters in .mhd format.

**Parameters**

| | |
|---|---|
| *OutputFile* | |

#### 6.7.2.9 float Mhd::MhdPythonOrientation::R ( size_t *i*, size_t *j* ) [inline]

Returns the element (i,j) of the TransformMatrix.

**Parameters**

| | |
|---|---|
| *i* | Row index of the TransformMatrix |
| *j* | Column index of the TransformMatrix |

**Returns**

float element of the TransformMatrix

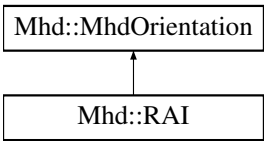
The documentation for this class was generated from the following files:

- lib/include/MhdPythonOrientation.hxx
- lib/src/MhdPythonOrientation.cxx

## 6.8 Mhd::RAI Class Reference

`#include <MhdOrientationRules.hxx>`

Inheritance diagram for Mhd::RAI:




### Public Member Functions

- RAI ()
- ~RAI ()
- void ConvertToRas (size_t i=1)

  *Perform orientation to RAS.*
- virtual MhdOrientation * Create () const

  *Construction of the object returning a pointer to the base class.*

### 6.8.1 Constructor & Destructor Documentation

#### 6.8.1.1 Mhd::RAI::RAI ( )

#### 6.8.1.2 Mhd::RAI::~RAI ( )

### 6.8.2 Member Function Documentation

#### 6.8.2.1 void Mhd::RAI::ConvertToRas ( size_t *i* = `1` ) `[virtual]`

Perform orientation to RAS.

**Parameters**

| | |
|---|---|
| *i* | i-th angle of rotation |

Implements Mhd::MhdOrientation.

#### 6.8.2.2 MhdOrientation * Mhd::RAI::Create ( ) const [virtual]

Construction of the object returning a pointer to the base class.

**Returns**

Pointer to the base class

Implements Mhd::MhdOrientation.

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

- lib/include/MhdOrientationRules.hxx
- lib/src/MhdOrientationRules.cxx

# Chapter 7

# File Documentation

## 7.1 lib/include/MHD.hxx File Reference

Header to be included to use the library.

```
#include "MhdOrientation.hxx"    #include "MhdOrientation-
Rules.hxx"
```

### 7.1.1 Detailed Description

Header to be included to use the library.

**Author**

Matteo Manica

**Date**

2013-09-08

## 7.2 lib/include/MhdFactory.hxx File Reference

File containing the factory of MhdOrientations.

```
#include "MhdOrientation.hxx"   #include <map>   #include
<stdexcept>   #include <memory>   #include <algorithm> ×
#include <iterator>
```

### Classes

- class Mhd::MhdFactory

  *The factory tha collects different MhdOrientation.*

### Namespaces

- namespace Mhd

  *Namespace Mhd referred to the classes and methods defined in the project MhdOrientation.*

### Typedefs

- typedef std::unique_ptr < MhdOrientation >(* Mhd::MhdBuilder )()

  *A typedef to the builder that returns a unique_ptr to a MhdOrientation object.*

#### 7.2.1 Detailed Description

File containing the factory of MhdOrientations.

**Author**

Matteo Manica

**Date**

2013-09-08

## 7.3 lib/include/MhdOrientation.hxx File Reference

File containing the base class MhdOrientation.

```
#include <fstream> #include <iostream> #include <vector> x
#include <cstdlib> #include <string> #include <cstring>
#include <cmath> #include <utility>
```

### Classes

- class Mhd::MhdOrientation

  *Base class that contains methods to perform the RAS conversion.*

### Namespaces

- namespace Mhd

  *Namespace Mhd referred to the classes and methods defined in the project MhdOrientation.*

### Defines

- #define PI 3.14159265

### Functions

- char * Mhd::MhdFileReader (char *InputFile)

  *Read from a file the AnatomicalOrientation parameter.*

### 7.3.1 Detailed Description

File containing the base class MhdOrientation.

**Author**

Matteo Manica

**Date**

2013-09-08

### 7.3.2 Define Documentation

#### 7.3.2.1 #define PI 3.14159265

## 7.4 lib/include/MhdOrientationRules.hxx File Reference

File containing the derived classes to perform the orientation starting from the string AnatomicalOrientation stored.

```
#include "MhdOrientation.hxx" #include "MhdProxy.hxx"
```

### Classes

- class Mhd::AIL

  *Derived class to perform AIL->RAS conversion.*
- class Mhd::ASL
- class Mhd::RAI
- class Mhd::LSA

### Namespaces

- namespace Mhd

  *Namespace Mhd referred to the classes and methods defined in the project Mhd-Orientation.*

### Defines

- #define MHDIORIENTATIONRULES_HXX 1

### 7.4.1 Detailed Description

File containing the derived classes to perform the orientation starting from the string AnatomicalOrientation stored.

**Author**

Matteo Manica

**Date**

2013-09-08

### 7.4.2 Define Documentation

#### 7.4.2.1 #define MHDIORIENTATIONRULES_HXX 1

## 7.5 lib/include/MhdProxy.hxx File Reference

File containing a proxy to build the object MhdOrientation and that manage its automatic registration in the factory.

```
#include "MhdFactory.hxx"  #include "MhdOrientation.hxx" ×
#include <typeinfo>
```

### Classes

- class Mhd::MhdProxy< T >

  *A proxy used to build an object MhdOrientation and to register it in the factory.*

### Namespaces

- namespace Mhd

  *Namespace Mhd referred to the classes and methods defined in the project Mhd-Orientation.*

### 7.5.1 Detailed Description

File containing a proxy to build the object MhdOrientation and that manage its automatic registration in the factory.

**Author**

Matteo Manica

**Date**

2013-09-08

## 7.6 lib/include/MhdPythonOrientation.hxx File Reference

Declaration of the class MhdPythonOrientation used for the Python interface.

```
#include <fstream> #include <iostream> #include <vector> ×
#include <cstdlib> #include <string> #include <cstring>
#include <cmath> #include <utility>
```

### Classes

- class Mhd::MhdPythonOrientation

  *The class used for the Python interface.*

### Namespaces

- namespace Mhd

  *Namespace Mhd referred to the classes and methods defined in the project Mhd-Orientation.*

### Defines

- #define PI 3.14159265

### 7.6.1 Detailed Description

Declaration of the class MhdPythonOrientation used for the Python interface.

**Author**

Matteo Manica

**Date**

2013-09-08

### 7.6.2 Define Documentation

#### 7.6.2.1 #define PI 3.14159265

## 7.7 lib/pymodule/mhd.py File Reference

Module for the interface with Python using ctypes.

### Classes

- class mhd.MhdOrientation

  *Class MhdOrientation imported in Python.*

### Namespaces

- namespace mhd

### Variables

- tuple mhd.lib = ctypes.CDLL('./libMhdOrientation.so',mode=ctypes.RTLD_GLOBAL)

#### 7.7.1 Detailed Description

Module for the interface with Python using ctypes.

**Author**

Matteo Manica

**Date**

2013-09-08

## 7.8 lib/src/MhdFactory.cxx File Reference

Implementation of the factory.

```
#include "MhdFactory.hxx"
```

### Namespaces

- namespace Mhd

  *Namespace Mhd referred to the classes and methods defined in the project MhdOrientation.*

#### 7.8.1 Detailed Description

Implementation of the factory.

**Author**

Matteo Manica

**Date**

2013-09-08

## 7.9 lib/src/MhdFileReader.cxx File Reference

File containing the function that reads a .mhd file to get the AnatomicalOrientation parameter.

```
#include "MhdOrientation.hxx"
```

### Namespaces

- namespace Mhd

  *Namespace Mhd referred to the classes and methods defined in the project MhdOrientation.*

### Functions

- char * Mhd::MhdFileReader (char *InputFile)

  *Read from a file the AnatomicalOrientation parameter.*

### 7.9.1 Detailed Description

File containing the function that reads a .mhd file to get the AnatomicalOrientation parameter.

**Author**

Matteo Manica

**Date**

2013-09-08

## 7.10 lib/src/MhdOrientation.cxx File Reference

Implementation of the base class MhdOrientation.

```
#include "MhdOrientation.hxx"
```

### Namespaces

- namespace Mhd

  *Namespace Mhd referred to the classes and methods defined in the project Mhd-Orientation.*

### Functions

- ostream & Mhd::operator<< (ostream &out, const MhdOrientation &K)

#### 7.10.1 Detailed Description

Implementation of the base class MhdOrientation.

**Author**

Matteo Manica

**Date**

2013-09-08

## 7.11 lib/src/MhdOrientationRules.cxx File Reference

Implementation of the class derived from MhdOrientation.

```
#include "MhdOrientationRules.hxx"
```

### Namespaces

- namespace Mhd

  *Namespace Mhd referred to the classes and methods defined in the project Mhd-Orientation.*

#### 7.11.1 Detailed Description

Implementation of the class derived from MhdOrientation.

**Author**

Matteo Manica

**Date**

2013-09-08

## 7.12 lib/src/MhdPythonOrientation.cxx File Reference

Implementation of MhdPythonOrientation used for the Python interface.

```
#include "MhdPythonOrientation.hxx"
```

### Namespaces

- namespace Mhd

  *Namespace Mhd referred to the classes and methods defined in the project Mhd-Orientation.*

### 7.12.1 Detailed Description

Implementation of MhdPythonOrientation used for the Python interface.

**Author**

Matteo Manica

**Date**

2013-09-08

## 7.13 lib/src/MhdPythonWrapper.cxx File Reference

Implementation of the wrapping in Python.

```
#include "MhdPythonOrientation.hxx"
```

### Functions

- Mhd::MhdPythonOrientation * MhdOrientation_Python ()

  *Declaration of the functions that will be exported in Python using ctypes.*
- void MhdOrientation_OrientationReader (Mhd::MhdPythonOrientation *mo, char *InputFile)

  *MhdPythonOrientation::OrientationReader in Python.*
- void MhdOrientation_OrientationWriter (Mhd::MhdPythonOrientation *mo, char *OutputFile)

  *MhdPythonOrientation::OrientatioWriter in Python.*
- void MhdOrientation_ConvertToRas (Mhd::MhdPythonOrientation *mo, size_t i)

  *MhdPythonOrientation::ConvertToRas in Python.*
- void MhdOrientation_ComputeAngles (Mhd::MhdPythonOrientation *mo)

  *MhdPythonOrientation::ComputeAngles in Python.*

- void MhdOrientation_ComputeRotation (Mhd::MhdPythonOrientation *mo, float *angles)

  *MhdPythonOrientation::ComputeRotation in Python.*
- void MhdOrientation_R (Mhd::MhdPythonOrientation *mo, size_t i, size_t j)

  *MhdPythonOrientation::R in Python.*
- void MhdOrientation_O (Mhd::MhdPythonOrientation *mo, size_t i)

  *MhdPythonOrientation::O in Python.*
- void MhdOrientation_C (Mhd::MhdPythonOrientation *mo, size_t i)

  *MhdPythonOrientation::C in Python.*
- void MhdOrientation_AO (Mhd::MhdPythonOrientation *mo)

  *MhdPythonOrientation::AO in Python.*

### 7.13.1 Detailed Description

Implementation of the wrapping in Python.

**Author**

Matteo Manica

**Date**

2013-09-08

### 7.13.2 Function Documentation

#### 7.13.2.1 void MhdOrientation_AO ( Mhd::MhdPythonOrientation * *mo* )

MhdPythonOrientation::AO in Python.

**Parameters**

| | |
|---|---|
| *mo* | Object MhdPythonOrientation |

#### 7.13.2.2 void MhdOrientation_C ( Mhd::MhdPythonOrientation * *mo*, size_t *i* )

MhdPythonOrientation::C in Python.

**Parameters**

| | |
|---|---|
| *mo* | Object MhdPythonOrientation |
| *i* | i-th element of CenterOfRotation |

#### 7.13.2.3 void MhdOrientation_ComputeAngles ( Mhd::MhdPythonOrientation * *mo* )

MhdPythonOrientation::ComputeAngles in Python.

**Parameters**

| | |
|---|---|
| *mo* | Object MhdPythonOrientation |

#### 7.13.2.4 void MhdOrientation_ComputeRotation ( Mhd::MhdPythonOrientation * *mo*, float * *angles* )

MhdPythonOrientation::ComputeRotation in Python.

**Parameters**

| | |
|---|---|
| *mo* | Object MhdPythonOrientation |
| *angles* | Angle used to compute the rotation |

#### 7.13.2.5 void MhdOrientation_ConvertToRas ( Mhd::MhdPythonOrientation * *mo*, size_t *i* )

MhdPythonOrientation::ConvertToRas in Python.

**Parameters**

| | |
|---|---|
| *mo* | Object MhdPythonOrientation |
| *i* | Angle selected for the conversion |

#### 7.13.2.6 void MhdOrientation_O ( Mhd::MhdPythonOrientation * *mo*, size_t *i* )

MhdPythonOrientation::O in Python.

**Parameters**

| | |
|---|---|
| *mo* | Object MhdPythonOrientation |
| *i* | i-th element of Offset |

#### 7.13.2.7 void MhdOrientation_OrientationReader ( Mhd::MhdPythonOrientation * *mo*, char * *InputFile* )

MhdPythonOrientation::OrientationReader in Python.

**Parameters**

| | |
|---|---|
| *mo* | Object MhdPythonOrientation |
| *InputFile* | Input .mhd file |

#### 7.13.2.8 void MhdOrientation_OrientationWriter ( Mhd::MhdPythonOrientation * *mo,* char * *OutputFile* )

MhdPythonOrientation::OrientatioWriter in Python.

**Parameters**

| | |
|---|---|
| *mo* | Object MhdPythonOrientation |
| *OutputFile* | Output in .mhd format |

#### 7.13.2.9 Mhd::MhdPythonOrientation* MhdOrientation_Python ( )

Declaration of the functions that will be exported in Python using ctypes.

Constructor of MhdPythonOrientation

**Returns**

Pointer to MhdPythonOrientation

#### 7.13.2.10 void MhdOrientation_R ( Mhd::MhdPythonOrientation * *mo,* size_t *i,* size_t *j* )

MhdPythonOrientation::R in Python.

**Parameters**

| | |
|---|---|
| *mo* | Object MhdPythonOrientation |
| *i* | i-th row of the TransformMatrix |
| *j* | j-th column of the TransformMatrix |