

`mogasens_csv`

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Chapter 5

Namespace Documentation

5.1 cl Namespace Reference

Namespaces

- [fs](#)

Classes

- struct [col_traits](#)
- struct [data_set_accessor](#)
- class [DataPoint](#)
- class [DataSet](#)
- class [Error](#)
- class [Exception](#)
- class [Process](#)

Typedefs

- template<Column Col>
using [column_type](#) = typename [col_traits](#)< Col >::type
- template<typename Ty >
using [Expected](#) = tl::expected< Ty, [Error](#) >

Enumerations

- enum [Channel](#) : std::uint64_t { [Channel::CL_CHANNEL_X](#), [Channel::CL_CHANNEL_Y](#) }
- enum [Column](#) : std::size_t {
[Column::Time](#), [Column::HardwareTimestamp](#), [Column::ExtractId](#), [Column::Trigger](#),
[Column::AccelerometerX](#), [Column::AccelerometerY](#), [Column::AccelerometerZ](#), [Column::GyroscopeX](#),
[Column::GyroscopeY](#), [Column::GyroscopeZ](#), [Column::SamplingRate](#) }
- enum [CsvFileKind](#) { [CsvFileKind::Raw](#), [CsvFileKind::Fixed](#) }
- enum [Sensor](#) : std::uint64_t { [Sensor::CL_SENSOR_X](#), [Sensor::CL_SENSOR_Y](#) }

Functions

- `DataSet::ChannelAccessor dataSetAccessor (Channel channel)`
- `std::ostream & operator<< (std::ostream &os, Channel channel)`
- `bool isAccelerometer (Channel channel)`
- `bool isGyroscope (Channel channel)`
- `long double threshold (Channel channel)`
- `CL_SPECIALIZE_COL_TRAITS (Column::Time, long double)`
- `CL_SPECIALIZE_COL_TRAITS (Column::HardwareTimestamp, std::uint64_t)`
- `CL_SPECIALIZE_COL_TRAITS (Column::ExtractId, Sensor)`
- `CL_SPECIALIZE_COL_TRAITS (Column::Trigger, std::uint64_t)`
- `CL_SPECIALIZE_COL_TRAITS (Column::AccelerometerX, long double)`
- `CL_SPECIALIZE_COL_TRAITS (Column::AccelerometerY, long double)`
- `CL_SPECIALIZE_COL_TRAITS (Column::AccelerometerZ, long double)`
- `CL_SPECIALIZE_COL_TRAITS (Column::GyroscopeX, long double)`
- `CL_SPECIALIZE_COL_TRAITS (Column::GyroscopeY, long double)`
- `CL_SPECIALIZE_COL_TRAITS (Column::GyroscopeZ, long double)`
- `CL_SPECIALIZE_COL_TRAITS (Column::SamplingRate, std::uint64_t)`
- `std::vector< pl::byte > dos2unix (const void *p, std::size_t size)`

Converts DOS / Microsoft Windows line endings to UNIX line endings.
- `Expected< std::vector< std::vector< std::string > > > readCsvFile (pl::string_view csvFilePath, std::vector< std::string > *columnNames=nullptr, CsvFileKind csvFileKind=CsvFileKind::Fixed) noexcept`
- `template<typename Integer> Expected< Integer > s2n (const std::string &str, std::size_t *pos=nullptr, [[maybe_unused]] int base=10)`
- `std::ostream & operator<< (std::ostream &os, Sensor sensor)`
- `template<typename Ty> std::string to_string (const Ty &ty)`
- `void useUnbufferedIo ()`
- `std::ostream & operator<< (std::ostream &os, const DataPoint &dataPoint)`
- `std::ostream & operator<< (std::ostream &os, const Error &error)`

Variables

- `constexpr std::size_t channelCount`
- `constexpr std::array< Channel, channelCount > channels`
- `template<Channel Chan> constexpr CL_CHANNEL DataSet::ChannelAccessor data_set_accessor_v = data_set_accessor<Chan>::f`
- `constexpr long double accelerometerThreshold {1.99L}`
- `constexpr long double gyroscopeThreshold {1999.99L}`
- `template<Column Col> constexpr std::size_t column_index = col_traits<Col>::index`
- `constexpr std::array< Sensor, 4 > sensors`

5.1.1 Typedef Documentation

5.1.1.1 column_type

```
template<Column Col>
using cl::column_type = typedef typename col_traits<Col>::type
```

Definition at line 49 of file column.hpp.

5.1.1.2 Expected

```
template<typename Ty >
using cl::Expected = typedef tl::expected<Ty, Error>
```

Definition at line 64 of file error.hpp.

5.1.2 Enumeration Type Documentation

5.1.2.1 Channel

```
enum cl::Channel : std::uint64_t [strong]
```

Enumerator

CL_CHANNEL←_X	
CL_CHANNEL	

Definition at line 20 of file channel.hpp.

5.1.2.2 Column

```
enum cl::Column : std::size_t [strong]
```

Enumerator

Time	
HardwareTimestamp	
ExtractId	
Trigger	
AccelerometerX	
AccelerometerY	
AccelerometerZ	
GyroscopeX	
GyroscopeY	
GyroscopeZ	
SamplingRate	

Definition at line 9 of file column.hpp.

5.1.2.3 CsvFileKind

```
enum cl::CsvFileKind [strong]
```

Enumerator

Raw	
Fixed	

Definition at line 11 of file read_csv_file.hpp.

5.1.2.4 Sensor

```
enum cl::Sensor : std::uint64_t [strong]
```

Enumerator

CL_SENSOR_X	
CL_SENSOR_Y	

Definition at line 15 of file sensor.hpp.

5.1.3 Function Documentation

5.1.3.1 CL_SPECIALIZE_COL_TRAITS() [1/11]

```
cl::CL_SPECIALIZE_COL_TRAITS (
    Column::AccelerometerX ,
    long double )
```

5.1.3.2 CL_SPECIALIZE_COL_TRAITS() [2/11]

```
cl::CL_SPECIALIZE_COL_TRAITS (
    Column::AccelerometerY ,
    long double )
```

5.1.3.3 CL_SPECIALIZE_COL_TRAITS() [3/11]

```
cl::CL_SPECIALIZE_COL_TRAITS (
    Column::AccelerometerZ ,
    long double   )
```

5.1.3.4 CL_SPECIALIZE_COL_TRAITS() [4/11]

```
cl::CL_SPECIALIZE_COL_TRAITS (
    Column::ExtractId ,
    Sensor   )
```

5.1.3.5 CL_SPECIALIZE_COL_TRAITS() [5/11]

```
cl::CL_SPECIALIZE_COL_TRAITS (
    Column::GyroscopeX ,
    long double   )
```

5.1.3.6 CL_SPECIALIZE_COL_TRAITS() [6/11]

```
cl::CL_SPECIALIZE_COL_TRAITS (
    Column::GyroscopeY ,
    long double   )
```

5.1.3.7 CL_SPECIALIZE_COL_TRAITS() [7/11]

```
cl::CL_SPECIALIZE_COL_TRAITS (
    Column::GyroscopeZ ,
    long double   )
```

5.1.3.8 CL_SPECIALIZE_COL_TRAITS() [8/11]

```
cl::CL_SPECIALIZE_COL_TRAITS (
    Column::HardwareTimestamp ,
    std::uint64_t   )
```

5.1.3.9 CL_SPECIALIZE_COL_TRAITS() [9/11]

```
cl::CL_SPECIALIZE_COL_TRAITS (
    Column::SamplingRate ,
    std::uint64_t )
```

5.1.3.10 CL_SPECIALIZE_COL_TRAITS() [10/11]

```
cl::CL_SPECIALIZE_COL_TRAITS (
    Column::Time ,
    long double )
```

5.1.3.11 CL_SPECIALIZE_COL_TRAITS() [11/11]

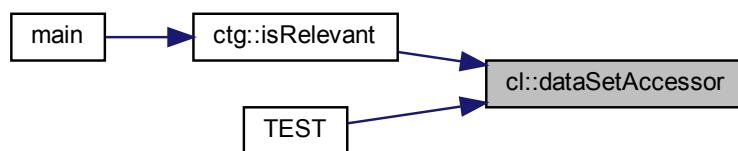
```
cl::CL_SPECIALIZE_COL_TRAITS (
    Column::Trigger ,
    std::uint64_t )
```

5.1.3.12 dataSetAccessor()

```
DataSet::ChannelAccessor cl::dataSetAccessor (
    Channel channel )
```

Definition at line 15 of file channel.cpp.

Here is the caller graph for this function:



5.1.3.13 dos2unix()

```
std::vector< pl::byte > cl::dos2unix (
    const void * p,
    std::size_t size )
```

Converts DOS / Microsoft Windows line endings to UNIX line endings.

Parameters

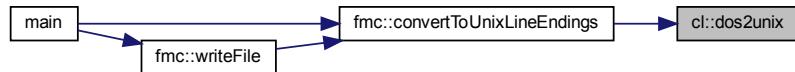
<i>p</i>	The beginning of the data to convert.
<i>size</i>	The size of the data to convert in bytes.

Returns

The resulting byte array.

Definition at line 4 of file dos2unix.cpp.

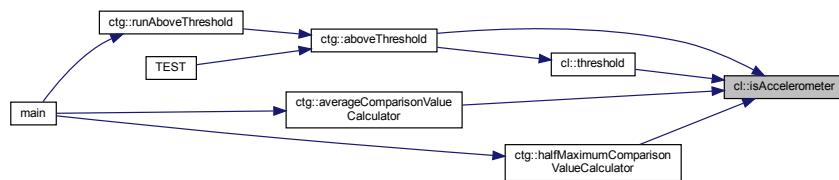
Here is the caller graph for this function:

**5.1.3.14 isAccelerometer()**

```
bool cl::isAccelerometer (
    Channel channel )
```

Definition at line 45 of file channel.cpp.

Here is the caller graph for this function:

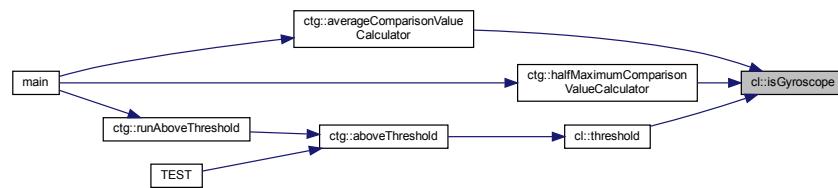


5.1.3.15 `isGyroscope()`

```
bool cl::isGyroscope (
    Channel channel )
```

Definition at line 50 of file channel.cpp.

Here is the caller graph for this function:



5.1.3.16 `operator<<()` [1/4]

```
std::ostream & cl::operator<< (
    std::ostream & os,
    Channel channel )
```

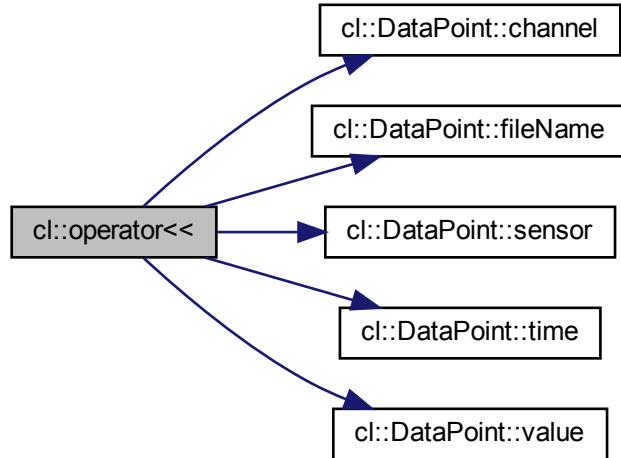
Definition at line 32 of file channel.cpp.

5.1.3.17 `operator<<()` [2/4]

```
std::ostream& cl::operator<< (
    std::ostream & os,
    const DataPoint & dataPoint )
```

Definition at line 10 of file data_point.cpp.

Here is the call graph for this function:

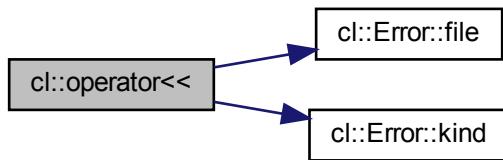


5.1.3.18 `operator<<()` [3/4]

```
std::ostream& cl::operator<< (
    std::ostream & os,
    const Error & error )
```

Definition at line 30 of file error.cpp.

Here is the call graph for this function:



5.1.3.19 operator<<() [4/4]

```
std::ostream & cl::operator<< (
    std::ostream & os,
    Sensor sensor )
```

Definition at line 8 of file sensor.cpp.

Here is the call graph for this function:

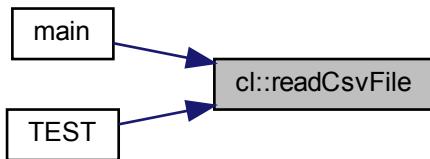


5.1.3.20 readCsvFile()

```
Expected< std::vector< std::vector< std::string > > > cl::readCsvFile (
    pl::string_view csvFilePath,
    std::vector< std::string > * columnNames = nullptr,
    CsvFileKind csvFileKind = CsvFileKind::Fixed ) [noexcept]
```

Definition at line 50 of file read_csv_file.cpp.

Here is the caller graph for this function:



5.1.3.21 s2n()

```
template<typename Integer >
Expected<Integer> cl::s2n (
    const std::string & str,
    std::size_t * pos = nullptr,
    [[maybe_unused]] int base = 10 ) [inline]
```

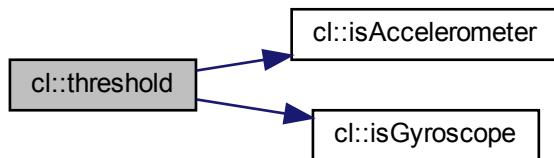
Definition at line 16 of file s2n.hpp.

5.1.3.22 threshold()

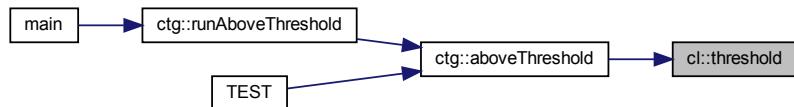
```
long double cl::threshold (
    Channel channel )
```

Definition at line 55 of file channel.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:

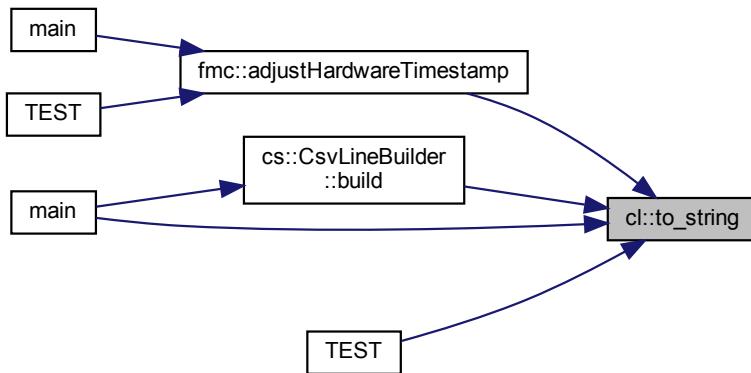


5.1.3.23 `to_string()`

```
template<typename Ty >
std::string cl::to_string (
    const Ty & ty ) [inline]
```

Definition at line 16 of file `to_string.hpp`.

Here is the caller graph for this function:



5.1.3.24 `useUnbufferedIo()`

```
void cl::useUnbufferedIo ( )
```

Definition at line 9 of file `use_unbuffered_io.cpp`.

Here is the caller graph for this function:



5.1.4 Variable Documentation

5.1.4.1 accelerometerThreshold

```
constexpr long double cl::accelerometerThreshold {1.99L} [inline], [constexpr]
```

Definition at line 61 of file channel.hpp.

5.1.4.2 channelCount

```
constexpr std::size_t cl::channelCount [inline], [constexpr]
```

Initial value:

```
{0  
#define CL_CHANNEL_X(enumerator, value, dataSetAccessor)  
    CL_CHANNEL  
}
```

Definition at line 26 of file channel.hpp.

5.1.4.3 channels

```
constexpr std::array<Channel, channelCount> cl::channels [inline], [constexpr]
```

Initial value:

```
{  
#define CL_CHANNEL_X(enm, v, a)  
    CL_CHANNEL  
} }
```

Definition at line 32 of file channel.hpp.

5.1.4.4 column_index

```
template<Column Col>  
constexpr std::size_t cl::column_index = col_traits<Col>::index [inline], [constexpr]
```

Definition at line 46 of file column.hpp.

5.1.4.5 data_set_accessor_v

```
template<Channel Chan>  
constexpr CL_CHANNEL DataSet::ChannelAccessor cl::data_set_accessor_v = data_set_accessor<Chan>↔  
::f [inline], [constexpr]
```

Definition at line 51 of file channel.hpp.

5.1.4.6 gyroscopeThreshold

```
constexpr long double cl::gyroscopeThreshold {1999.99L} [inline], [constexpr]
```

Definition at line 62 of file channel.hpp.

5.1.4.7 sensors

```
constexpr std::array<Sensor, 4> cl::sensors [inline], [constexpr]
```

Initial value:

```
{}  
#define CL_SENSOR_X(enm, v)  
    CL_SENSOR  
){}
```

Definition at line 21 of file sensor.hpp.

5.2 cl::fs Namespace Reference

Classes

- class [File](#)
Represents a file.
- class [FileStream](#)
A binary file stream.
- class [Path](#)
A filesystem path.

Enumerations

- enum [DirectoryListingOption](#) { [DirectoryListingOption::None](#), [DirectoryListingOption::ExcludeDotAndDotDot](#) }
Options for directoryListing.

Functions

- [Expected< std::vector< Path > > directoryListing](#) (const [Path](#) &directoryPath, [DirectoryListingOption](#) directoryListingOption=[DirectoryListingOption::ExcludeDotAndDotDot](#))
Creates a listing of the contents of a directory.
- [std::wstring utf8ToUtf16](#) ([pl::string_view](#) utf8)
Converts a UTF-8 encoded string to a UTF-16 encoded wstring.
- [std::string utf16ToUtf8](#) ([pl::wstring_view](#) utf16)
Converts a UTF-16 encoded wide character string to UTF-8 string.
- [std::wstring formatError](#) (DWORD errorCode)
Formats a WINAPI error code to a UTF-16 encoded wide character string.
- [std::ostream & operator<<](#) ([std::ostream](#) &os, const [Path](#) &path)
- [bool operator<](#) (const [Path](#) &lhs, const [Path](#) &rhs) noexcept
- [bool operator==](#) (const [Path](#) &lhs, const [Path](#) &rhs) noexcept

5.2.1 Enumeration Type Documentation

5.2.1.1 DirectoryListingOption

```
enum cl::fs::DirectoryListingOption [strong]
```

Options for directoryListing.

Enumerator

None	No option
ExcludeDotAndDotDot	Exclude the . and .. directories

Definition at line 13 of file directory_listing.hpp.

5.2.2 Function Documentation

5.2.2.1 directoryListing()

```
Expected< std::vector< Path > > cl::fs::directoryListing (
    const Path & directoryPath,
    DirectoryListingOption directoryListingOption = DirectoryListingOption::ExcludeDotAndDotDot
)
```

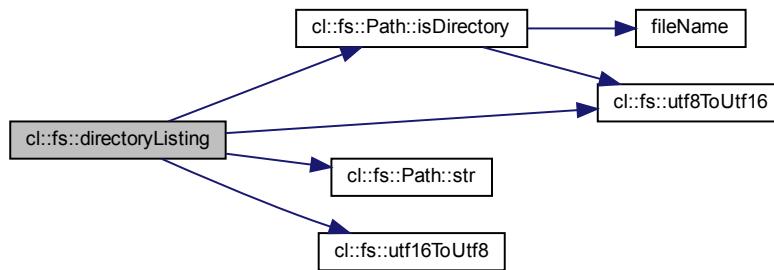
Creates a listing of the contents of a directory.

Parameters

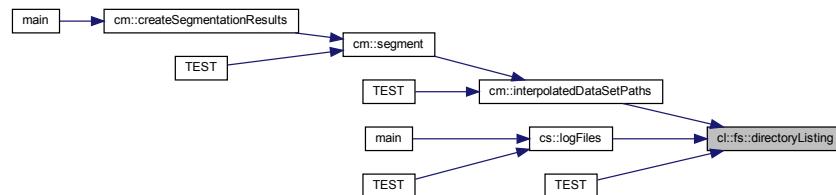
<i>directoryPath</i>	The directory to list.
<i>directoryListingOption</i>	The option to use.

Definition at line 24 of file directory_listing.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:



5.2.2.2 formatError()

```
std::wstring cl::fs::formatError (
    DWORD errorCode )
```

Formats a WINAPI error code to a UTF-16 encoded wide character string.

Parameters

<code>errorCode</code>	The WINAPI error code.
------------------------	------------------------

Returns

The resulting UTF-16 encoded wide character string.

Note

Most WINAPIs expect UTF-16 encoded wide character strings, but we don't want to pollute the code base with UTF-16 strings.

Warning

Wide characters are only 16 bit wide on Microsoft Windows, they're 32 bit on GNU / Linux.

Definition at line 89 of file windows.cpp.

5.2.2.3 operator<()

```
bool cl::fs::operator< (
    const Path & lhs,
    const Path & rhs ) [noexcept]
```

Parameters

<i>lhs</i>	The left hand side operand.
<i>rhs</i>	The right hand side operand.

Returns

true if lhs < rhs; otherwise false.

Definition at line 27 of file path.cpp.

5.2.2.4 operator<<()

```
std::ostream& cl::fs::operator<< (
    std::ostream & os,
    const Path & path )
```

Parameters

<i>os</i>	the ostream to print to.
<i>path</i>	The path to print.

Returns

os

Definition at line 22 of file path.cpp.

5.2.2.5 operator==()

```
bool cl::fs::operator== (
    const Path & lhs,
    const Path & rhs ) [noexcept]
```

Parameters

<i>lhs</i>	The left hand side operand.
<i>rhs</i>	The right hand side operand.

Returns

true if *lhs* and *rhs* are equal.

Definition at line 32 of file path.cpp.

5.2.2.6 utf16ToUtf8()

```
std::string cl::fs::utf16ToUtf8 (
    pl::wstring_view utf16 )
```

Converts a UTF-16 encoded wide character string to UTF-8 string.

Parameters

<i>utf16</i>	The UTF-16 encoded wide character string to convert.
--------------	--

Returns

The resulting UTF-8 string.

Note

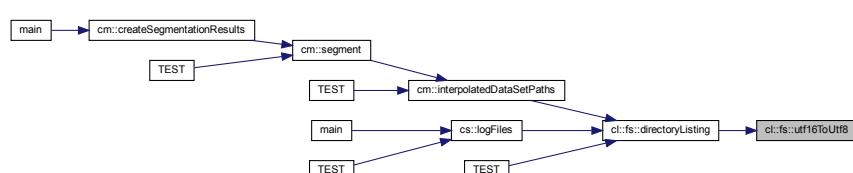
Most WINAPIs expect UTF-16 encoded wide character strings, but we don't want to pollute the code base with UTF-16 strings.

Warning

Wide characters are only 16 bit wide on Microsoft Windows, they're 32 bit on GNU / Linux.

Definition at line 61 of file windows.cpp.

Here is the caller graph for this function:



5.2.2.7 utf8ToUtf16()

```
std::wstring cl::fs::utf8ToUtf16 (
    pl::string_view utf8 )
```

Converts a UTF-8 encoded string to a UTF-16 encoded wstring.

Parameters

<i>utf8</i>	The UTF-8 encoded string to convert.
-------------	--------------------------------------

Returns

The resulting UTF-16 string.

Note

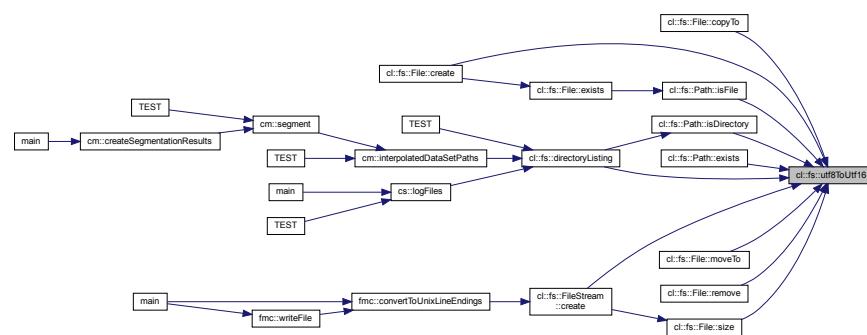
Most WINAPIs expect UTF-16 encoded wide character strings, but we don't want to pollute the code base with UTF-16 strings.

Warning

Wide characters are only 16 bit wide on Microsoft Windows, they're 32 bit on GNU / Linux.

Definition at line 35 of file windows.cpp.

Here is the caller graph for this function:



5.3 cm Namespace Reference

Classes

- class [Configuration](#)

Represents a possible configuration for the Python segmentor.
- struct [ConfigWithDistanceScore](#)
- struct [ConfigWithTotalConfusionMatrix](#)

A [Configuration](#) with a [ConfusionMatrix](#).
- class [ConfusionMatrix](#)

Type to represent a confusion matrix.
- class [CsvFileInfo](#)

Type to hold the hardware timestamps of a CSV file.
- class [ManualSegmentationPoint](#)

Type used to represent a manual segmentation point.

Enumerations

- enum `DataSetIdentifier` { `DataSetIdentifier::CM_DATA_SET_IDENTIFIER_X`, `DataSetIdentifier::CM_DATA_SET_IDENTIFIER_Y` }
- enum `Imu` { `Imu::CM_IMU_X`, `Imu::CM_IMU_Y` }

Scoped enum type for the IMUs.

Functions

- std::uint64_t `closestOne` (std::uint64_t algorithmicallyDeterminedSegmentationPoint, const std::vector<std::uint64_t> &manualSegmentationPoints)

Finds the segmentation point in manualSegmentationPoints that is the closest to algorithmicallyDeterminedSegmentationPoint.
- CM_SORTER (truePositives, >)

Sorts ConfigWithTotalConfusionMatrix objects by true positives (highest first)
- CM_SORTER (trueNegatives, >)

Sorts ConfigWithTotalConfusionMatrix objects by true negatives (highest first)
- CM_SORTER (falsePositives, <)

Sorts ConfigWithTotalConfusionMatrix objects by false positives (lowest first)
- CM_SORTER (falseNegatives, <)

Sorts ConfigWithTotalConfusionMatrix objects by false negatives (lowest first)
- std::vector< ConfigWithTotalConfusionMatrix > `confusionMatrixBestConfigs` (const std::unordered_map<DataSetIdentifier, std::vector< std::uint64_t >> &manualSegmentationPoints, const std::unordered_map< Configuration, std::unordered_map< cl::fs::Path, std::vector< std::uint64_t >>> &algorithmicallyDeterminedSegmentationPoints, const std::function< bool(const ConfigWithTotalConfusionMatrix &, const ConfigWithTotalConfusionMatrix &)> &sorter)

Determines the 'best' configurations.
- std::unordered_map< cm::Configuration, std::unordered_map< cl::fs::Path, std::vector< std::uint64_t > > > `createSegmentationResults` ()

Invokes Python to generate the segmentation points algorithmically.
- std::ostream & `operator<<` (std::ostream &os, `DataSetIdentifier` dsi)

Prints a DataSetIdentifier to an ostream.
- `DataSetIdentifier toDataSetIdentifier` (const `cl::fs::Path` &path)

Converts a path to a CSV file to the corresponding DataSetIdentifier.
- std::uint64_t `distance` (std::uint64_t a, std::uint64_t b)

Calculates the distance between a and b.
- std::uint64_t `distanceScore` (const std::unordered_map< cl::fs::Path, std::vector< std::uint64_t >> &segmentationPointsForConfig, const std::unordered_map< DataSetIdentifier, std::vector< std::uint64_t >> &manualSegmentationPoints)
- template<typename Map , typename Key >
 auto `fetch` (const Map &map, const Key &key)

Fetches a value from a map for a given key.
- std::ostream & `operator<<` (std::ostream &os, `Imu` imu)

Prints imu to os.
- std::vector< `cl::fs::Path` > `interpolatedDataSetPaths` ()

Returns the paths to the interpolated data sets.
- bool `operator<` (const `ConfigWithDistanceScore` &lhs, const `ConfigWithDistanceScore` &rhs) noexcept
- std::ostream & `operator<<` (std::ostream &os, const `ConfigWithDistanceScore` &configWithDistScore)
- std::vector< `ConfigWithDistanceScore` > `orderConfigurationsByQuality` (const std::unordered_map< DataSetIdentifier, std::vector< std::uint64_t >> &manualSegmentationPoints, const std::unordered_map< Configuration, std::unordered_map< cl::fs::Path, std::vector< std::uint64_t >>> &algorithmicallyDeterminedSegmentationPoints)

- std::string [pythonOutput](#) (const [cl::fs::Path](#) &csvFilePath, const [Configuration](#) &segmentorConfiguration)
Runs the Python segmentor on path.
- std::unordered_map< [cl::fs::Path](#), std::vector< std::uint64_t > > [segment](#) (const [Configuration](#) &segmentorConfiguration)
- std::vector< std::string > [splitString](#) (std::string string, pl::string_view splitBy)
Splits string by splitBy.
- bool [operator==](#) (const [Configuration](#) &lhs, const [Configuration](#) &rhs) noexcept
- bool [operator<](#) (const [Configuration](#) &lhs, const [Configuration](#) &rhs) noexcept
- std::ostream & [operator<<](#) (std::ostream &os, const [Configuration](#) &config)
- std::ostream & [operator<<](#) (std::ostream &os, const [ConfigWithTotalConfusionMatrix](#) &obj)
- bool [operator==](#) (const [ManualSegmentationPoint](#) &lhs, const [ManualSegmentationPoint](#) &rhs) noexcept
- bool [operator!=](#) (const [ManualSegmentationPoint](#) &lhs, const [ManualSegmentationPoint](#) &rhs) noexcept
- std::ostream & [operator<<](#) (std::ostream &os, const [ManualSegmentationPoint](#) &manualSegmentationPoint)

Variables

- struct {
} [disregardTrueNegativesSorter](#)

Sorter to sort [ConfigWithTotalConfusionMatrix](#) objects by the count of true positives minus the count of false positives minus the count of false negatives.

- struct {
} [addTrueSubtractFalseSorter](#)

Sorter to sort [ConfigWithTotalConfusionMatrix](#) objects by the sum of true positives and true negatives minus the false positives minus the false negatives.

- constexpr std::size_t [imuCount](#)
The amount of IMUs.
- constexpr std::array< [Imu](#), [imuCount](#) > [imus](#)
An array of the IMU enumerators.

5.3.1 Enumeration Type Documentation

5.3.1.1 [DataSetIdentifier](#)

enum [cm::DataSetIdentifier](#) [strong]

Enumerator

CM_DATA_SET_IDENTIFIER	↔	X	
CM_DATA_SET_IDENTIFIER			

Definition at line 30 of file `data_set_identifier.hpp`.

5.3.1.2 Imu

```
enum cm::Imu [strong]
```

Scoped enum type for the IMUs.

Enumerator

CM_IMU↔_X	
CM_IMU	

Definition at line 17 of file imu.hpp.

5.3.2 Function Documentation

5.3.2.1 closestOne()

```
std::uint64_t cm::closestOne (
    std::uint64_t algorithmicallyDeterminedSegmentationPoint,
    const std::vector< std::uint64_t > & manualSegmentationPoints )
```

Finds the segmentation point in `manualSegmentationPoints` that is the closest to `algorithmicallyDeterminedSegmentationPoint`.

Parameters

<code>algorithmicallyDeterminedSegmentationPoint</code>	The segmentation point to find the closest one to.
<code>manualSegmentationPoints</code>	The manual segmentation points.

Returns

The manual segmentation point that the the closest to `algorithmicallyDeterminedSegmentationPoint`.

Exceptions

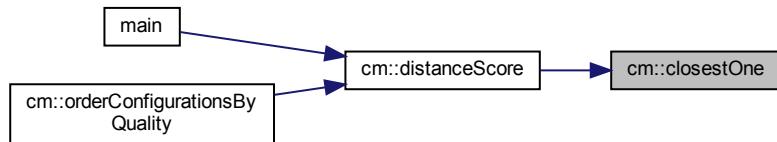
<code>cl::Exception</code>	if no segmentation point was found.
----------------------------	-------------------------------------

Definition at line 11 of file closest_one.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:



5.3.2.2 CM_SORTER() [1/4]

```
cm::CM_SORTER (  
    falseNegatives )
```

Sorts [ConfigWithTotalConfusionMatrix](#) objects by false negatives (lowest first)

5.3.2.3 CM_SORTER() [2/4]

```
cm::CM_SORTER (  
    falsePositives )
```

Sorts [ConfigWithTotalConfusionMatrix](#) objects by false positives (lowest first)

5.3.2.4 CM_SORTER() [3/4]

```
cm::CM_SORTER (  
    trueNegatives )
```

Sorts [ConfigWithTotalConfusionMatrix](#) objects by true negatives (highest first)

5.3.2.5 CM_SORTER() [4/4]

```
cm::CM_SORTER (
    truePositives )
```

Sorts [ConfigWithTotalConfusionMatrix](#) objects by true positives (highest first)

5.3.2.6 confusionMatrixBestConfigs()

```
std::vector< ConfigWithTotalConfusionMatrix > cm::confusionMatrixBestConfigs (
    const std::unordered_map< DataSetIdentifier, std::vector< std::uint64_t >> &
manualSegmentationPoints,
    const std::unordered_map< Configuration, std::unordered_map< cl::fs::Path, std::vector< std::uint64_t >>> & algorithmicallyDeterminedSegmentationPoints,
    const std::function< bool(const ConfigWithTotalConfusionMatrix &, const ConfigWithTotalConfusionMatrix &) > & sorter )
```

Determines the 'best' configurations.

Parameters

<i>manualSegmentationPoints</i>	The manual segmentation points (ground truth).
<i>algorithmicallyDeterminedSegmentationPoints</i>	The segmentation points found by the Python application.
<i>sorter</i>	The sorter to use.

Returns

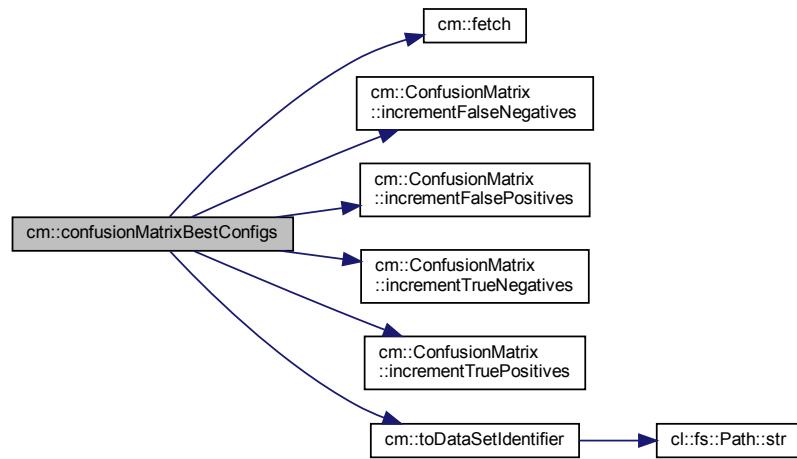
A vector of [ConfigWithTotalConfusionMatrix](#) objects sorted by *sorter*.

Exceptions

cl::Exception	if <i>sorter</i> does not contain a valid target.
-------------------------------	---

Definition at line 100 of file `confusion_matrix_best_configs.cpp`.

Here is the call graph for this function:



Here is the caller graph for this function:



5.3.2.7 createSegmentationResults()

```
std::unordered_map< Configuration, std::unordered_map< cl::fs::Path, std::vector< std::uint64_t > > > cm::createSegmentationResults( )
```

Invokes Python to generate the segmentation points algorithmically.

Returns

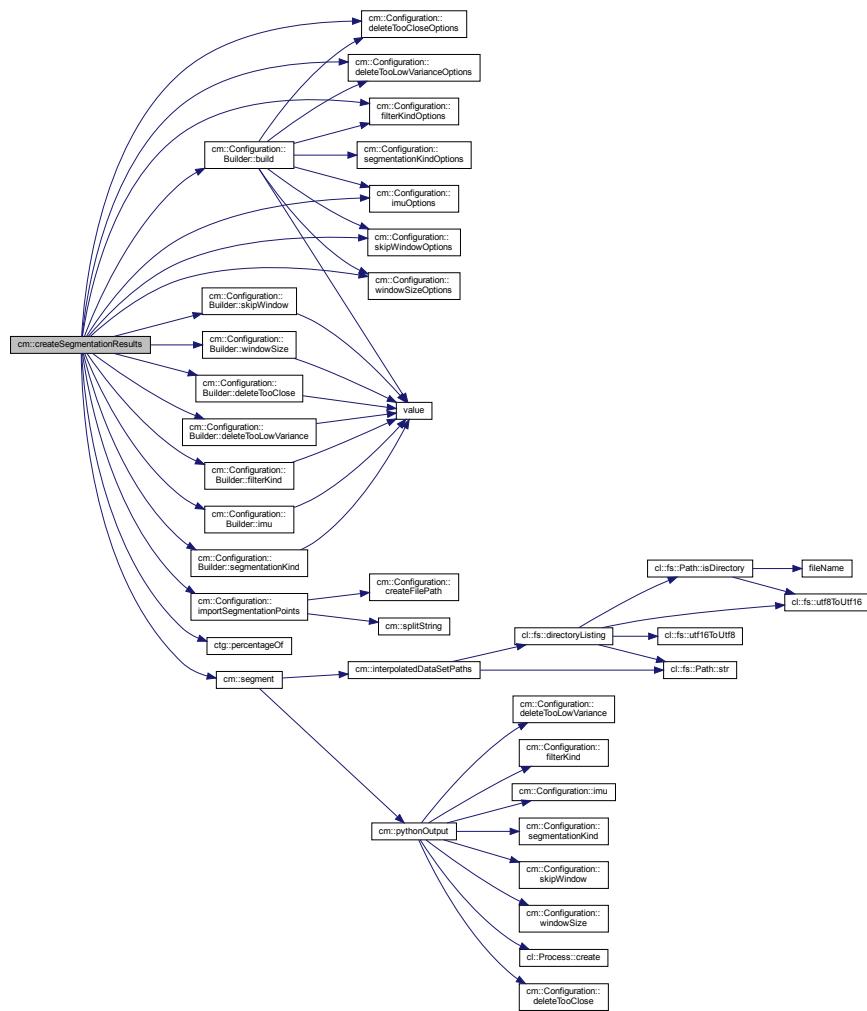
A map that maps the configurations to maps that map CSV file paths to segmentation points.

Exceptions

<i>cl::Exception</i>	on error.
----------------------	-----------

Definition at line 42 of file `create_segmentation_results.cpp`.

Here is the call graph for this function:



Here is the caller graph for this function:



5.3.2.8 distance()

```
std::uint64_t cm::distance (
    std::uint64_t a,
    std::uint64_t b )
```

Calculates the distance between a and b.

Parameters

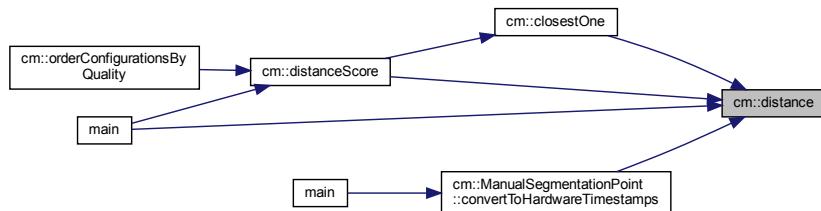
<i>a</i>	The first parameter.
<i>b</i>	The second parameter.

Returns

The difference between a and b.

Definition at line 6 of file `distance.cpp`.

Here is the caller graph for this function:

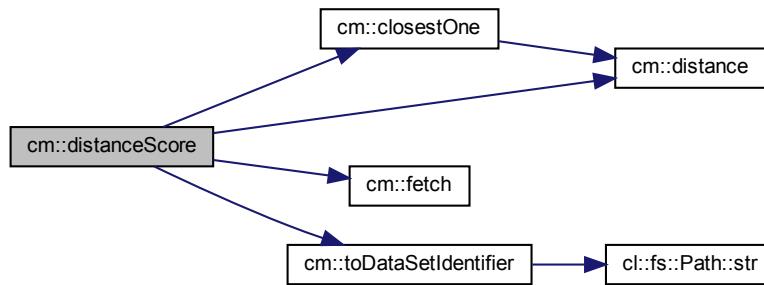


5.3.2.9 distanceScore()

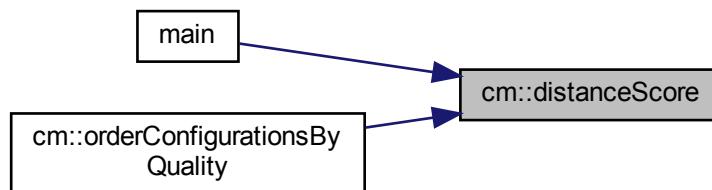
```
std::uint64_t cm::distanceScore (
    const std::unordered_map< cl::fs::Path, std::vector< std::uint64_t >> & segmentationPointsForConfig,
    const std::unordered_map< DataSetIdentifier, std::vector< std::uint64_t >> & manualSegmentationPoints )
```

Definition at line 7 of file `distance_score.cpp`.

Here is the call graph for this function:



Here is the caller graph for this function:



5.3.2.10 `fetch()`

```

template<typename Map , typename Key >
auto cm::fetch (
    const Map & map,
    const Key & key )
  
```

Fetches a value from a map for a given key.

Template Parameters

<code>Map</code>	The type of the map.
<code>Key</code>	The type of the Key.

Parameters

<code>map</code>	The map to fetch from.
------------------	------------------------

Parameters

<code>key</code>	The key to find the value for in <code>map</code> .
------------------	---

Returns

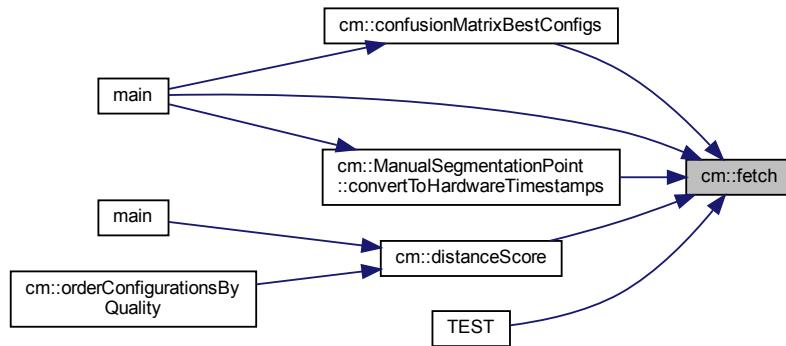
The value for `key` in `map`.

Exceptions

<code>cl::Exception</code>	if <code>key</code> is not found in <code>map</code> .
----------------------------	--

Definition at line 16 of file `fetch.hpp`.

Here is the caller graph for this function:

**5.3.2.11 interpolatedDataSetPaths()**

```
std::vector< cl::fs::Path > cm::interpolatedDataSetPaths( )
```

Returns the paths to the interpolated data sets.

Returns

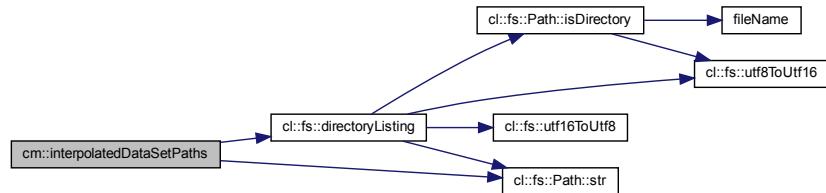
The interpolated data set paths.

Exceptions

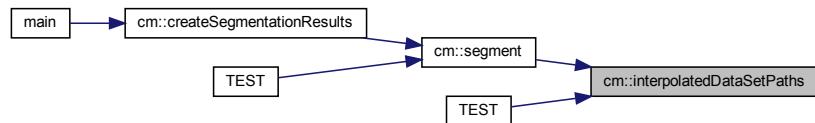
<code>cl::Exception</code>	on error.
----------------------------	-----------

Definition at line 61 of file interpolated_data_set_paths.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:



5.3.2.12 operator"!=()

```
bool cm::operator!= (
    const ManualSegmentationPoint & lhs,
    const ManualSegmentationPoint & rhs ) [noexcept]
```

Parameters

<i>lhs</i>	The first operand.
<i>rhs</i>	The second operand.

Returns

true if *lhs* is considered not equal to *rhs*; false otherwise.

Definition at line 187 of file manual_segmentation_point.cpp.

5.3.2.13 operator<() [1/2]

```
bool cm::operator< (
    const Configuration & lhs,
    const Configuration & rhs ) [noexcept]
```

Parameters

<i>lhs</i>	The first operand.
<i>rhs</i>	The second operand.

Returns

true if *lhs* is considered less than *rhs*; otherwise false.

Definition at line 213 of file configuration.cpp.

5.3.2.14 operator<() [2/2]

```
bool cm::operator< (
    const ConfigWithDistanceScore & lhs,
    const ConfigWithDistanceScore & rhs ) [noexcept]
```

Definition at line 20 of file order_configurations_by_quality.cpp.

5.3.2.15 operator<<() [1/6]

```
std::ostream& cm::operator<< (
    std::ostream & os,
    const Configuration & config )
```

Parameters

<i>os</i>	The ostream to print to.
<i>config</i>	The Configuration to print.

Returns

os

Definition at line 233 of file configuration.cpp.

5.3.2.16 operator<<() [2/6]

```
std::ostream & cm::operator<< (
    std::ostream & os,
    const ConfigWithDistanceScore & configWithDistScore )
```

Definition at line 27 of file order_configurations_by_quality.cpp.

5.3.2.17 operator<<() [3/6]

```
std::ostream& cm::operator<< (
    std::ostream & os,
    const ConfigWithTotalConfusionMatrix & obj )
```

Parameters

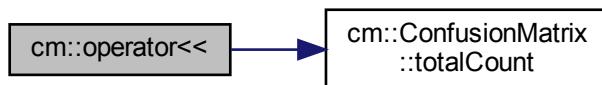
<i>os</i>	The ostream to print to.
<i>obj</i>	The ConfigWithTotalConfusionMatrix to print.

Returns

os

Definition at line 69 of file `confusion_matrix_best_configs.cpp`.

Here is the call graph for this function:



5.3.2.18 operator<<() [4/6]

```
std::ostream& cm::operator<< (
    std::ostream & os,
    const ManualSegmentationPoint & manualSegmentationPoint )
```

Parameters

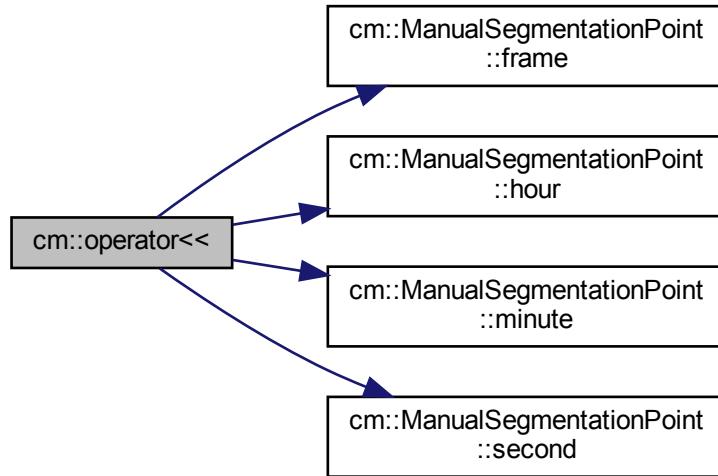
<i>os</i>	The ostream to print to
<i>manualSegmentationPoint</i>	The ManualSegmentationPoint to print.

Returns

os

Definition at line 194 of file `manual_segmentation_point.cpp`.

Here is the call graph for this function:



5.3.2.19 operator<<() [5/6]

```
std::ostream & cm::operator<< (
    std::ostream & os,
    DataSetIdentifier dsi )
```

Prints a DataSetIdentifier to an ostream.

Parameters

<code>os</code>	The ostream to print to.
<code>dsi</code>	The DataSetIdentifier to print.

Returns

`os`

Definition at line 33 of file data_set_identifier.cpp.

5.3.2.20 operator<<() [6/6]

```
std::ostream & cm::operator<< (
    std::ostream & os,
    Imu imu )
```

Prints `imu` to `os`.

Parameters

<i>os</i>	The ostream to print to
<i>imu</i>	The IMU enumerator to print.

Returns

```
os
```

Definition at line 35 of file imu.cpp.

5.3.2.21 operator==() [1/2]

```
bool cm::operator== (
    const Configuration & lhs,
    const Configuration & rhs ) [noexcept]
```

Parameters

<i>lhs</i>	The first operand.
<i>rhs</i>	The second operand.

Returns

true if *lhs* and *rhs* are considered to be equal.

Definition at line 193 of file configuration.cpp.

5.3.2.22 operator==() [2/2]

```
bool cm::operator== (
    const ManualSegmentationPoint & lhs,
    const ManualSegmentationPoint & rhs ) [noexcept]
```

Parameters

<i>lhs</i>	The first operand.
<i>rhs</i>	The second operand.

Returns

true if *lhs* is considered equal to *rhs*; false otherwise.

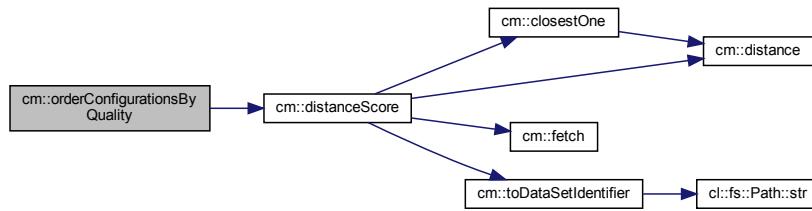
Definition at line 179 of file manual_segmentation_point.cpp.

5.3.2.23 orderConfigurationsByQuality()

```
std::vector< ConfigWithDistanceScore > cm::orderConfigurationsByQuality (
    const std::unordered_map< DataSetIdentifier, std::vector< std::uint64_t >> &
manualSegmentationPoints,
    const std::unordered_map< Configuration, std::unordered_map< cl::fs::Path, std::vector< std::uint64_t >>> & algorithmicallyDeterminedSegmentationPoints )
```

Definition at line 38 of file `order_configurations_by_quality.cpp`.

Here is the call graph for this function:



5.3.2.24 pythonOutput()

```
std::string cm::pythonOutput (
    const cl::fs::Path & csvFilePath,
    const Configuration & segmentorConfiguration )
```

Runs the Python segmentor on `path`.

Parameters

<code>path</code>	The path to the CSV file to segment.
<code>segmentorConfiguration</code>	The configuration to use.

Returns

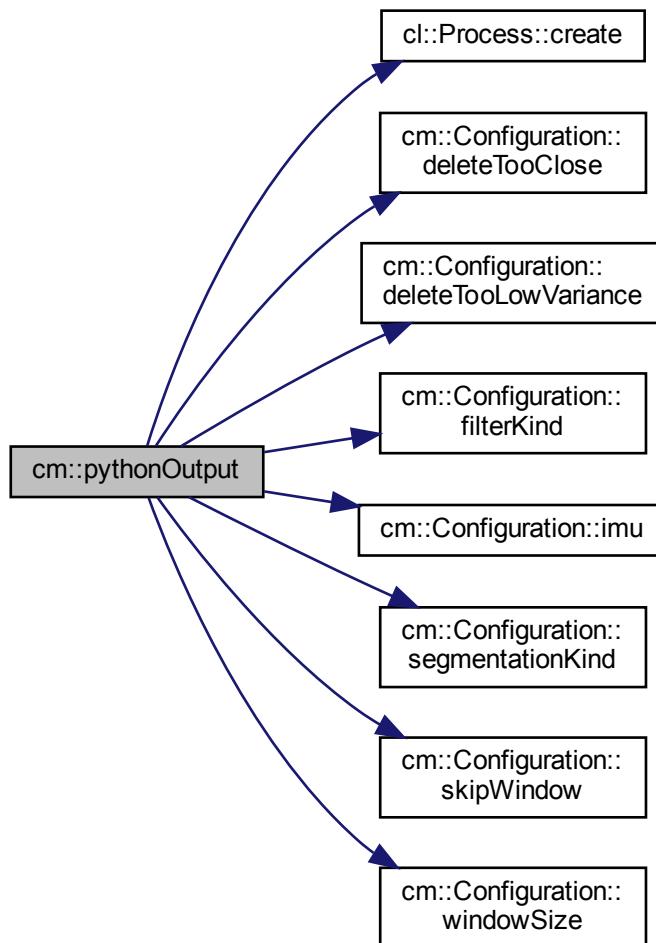
The output of the Python application.

Exceptions

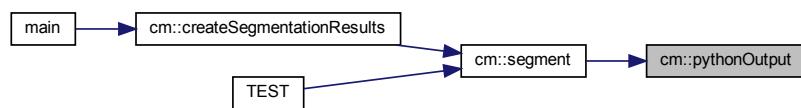
<code>cl::Exception</code>	if creating the process failed.
----------------------------	---------------------------------

Definition at line 32 of file `python_output.cpp`.

Here is the call graph for this function:



Here is the caller graph for this function:



5.3.2.25 segment()

```
std::unordered_map< cl::fs::Path, std::vector< std::uint64_t > > cm::segment (
    const Configuration & segmentorConfiguration )
```

Invokes Python to segment the interpolated data sets.

Parameters

<i>segmentorConfiguration</i>	The Configuration to use for the Python segmentor.
-------------------------------	--

Returns

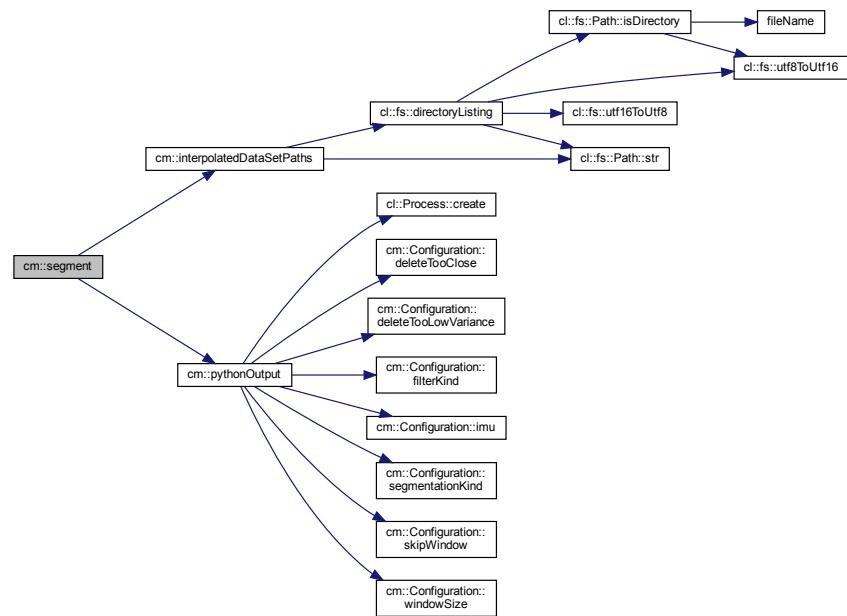
A map that maps the paths to the interpolated data sets to vectors of the hardware timestamps (in milliseconds) that are segmentation points.

Exceptions

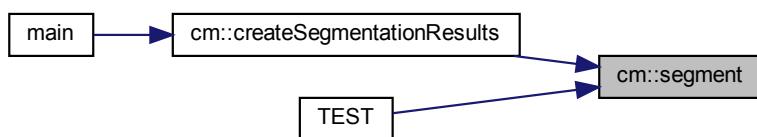
cl::Exception	if an error occurs.
-------------------------------	---------------------

Definition at line 64 of file segment.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:



5.3.2.26 splitString()

```
std::vector< std::string > cm::splitString (
    std::string string,
    pl::string_view splitBy )
```

Splits string by splitBy.

Parameters

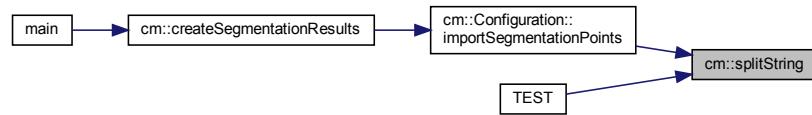
<i>string</i>	The string to split.
<i>splitBy</i>	What to split string by.

Returns

The resulting strings.

Definition at line 8 of file `split_string.cpp`.

Here is the caller graph for this function:



5.3.2.27 toDataSetIdentifier()

```
DataSetIdentifier cm::toDataSetIdentifier (
    const cl::fs::Path & path )
```

Converts a path to a CSV file to the corresponding DataSetIdentifier.

Parameters

<i>path</i>	The path.
-------------	-----------

Returns

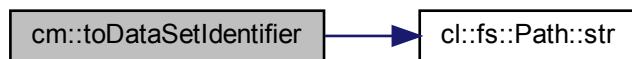
The resulting DataSetIdentifier.

Exceptions

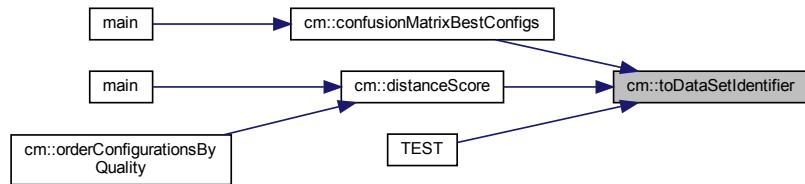
`cl::Exception` if path is unrecognized.

Definition at line 38 of file `data_set_identifier.cpp`.

Here is the call graph for this function:



Here is the caller graph for this function:



5.3.3 Variable Documentation

5.3.3.1 addTrueSubtractFalseSorter

```
constexpr { ... } cm::addTrueSubtractFalseSorter
```

Sorter to sort `ConfigWithTotalConfusionMatrix` objects by the sum of true positives and true negatives minus the false positives minus the false negatives.

5.3.3.2 disregardTrueNegativesSorter

```
constexpr { ... } cm::disregardTrueNegativesSorter
```

Sorter to sort `ConfigWithTotalConfusionMatrix` objects by the count of true positives minus the count of false positives minus the count of false negatives.

5.3.3.3 imuCount

```
constexpr std::size_t cm::imuCount [inline], [constexpr]
```

Initial value:

```
{0
#define CM_IMU_X(enm)
    CM_IMU
}
```

The amount of IMUs.

Definition at line 26 of file imu.hpp.

5.3.3.4 imus

```
constexpr std::array<Imu, imuCount> cm::imus [inline], [constexpr]
```

Initial value:

```
{{
#define CM_IMU_X(enm)
    CM_IMU
}}
```

An array of the IMU enumerators.

Definition at line 35 of file imu.hpp.

5.4 cs Namespace Reference

Classes

- class [CsvLineBuilder](#)
Builder for a CSV line.
- struct [data_set_info](#)
Meta function for data set tags.
- class [LogInfo](#)
Information about a log file.
- class [LogLine](#)
A line out of a log file.

Enumerations

- enum [FilterKind](#) { [FilterKind::Butterworth](#), [FilterKind::MovingAverage](#) }
Type for the different kinds of filters.
- enum [SegmentationKind](#) : pl::byte { [SegmentationKind::Minima](#) = 0b0000'0001, [SegmentationKind::Maxima](#) = 0b0000'0010, [SegmentationKind::Both](#) = Minima | Maxima }
The segmentation kind.

Functions

- `PL_DEFINE_EXCEPTION_TYPE` (`NoSuchDataSetException`, `std::logic_error`)
- `CS_SPECIALIZE_DATA_SET_INFO` (`Felix1`, "11.17.39", 24)
- `CS_SPECIALIZE_DATA_SET_INFO` (`Felix2`, "12.50.00", 20)
- `CS_SPECIALIZE_DATA_SET_INFO` (`Felix3`, "13.00.09", 15)
- `CS_SPECIALIZE_DATA_SET_INFO` (`Marcelle1`, "14.59.59", 10)
- `CS_SPECIALIZE_DATA_SET_INFO` (`Marcelle2`, "15.13.22", 16)
- `CS_SPECIALIZE_DATA_SET_INFO` (`Marcelle3`, "15.31.36", 18)
- `CS_SPECIALIZE_DATA_SET_INFO` (`Mike1`, "14.07.33", 26)
- `CS_SPECIALIZE_DATA_SET_INFO` (`Mike2`, "14.14.32", 22)
- `CS_SPECIALIZE_DATA_SET_INFO` (`Mike3`, "14.20.28", 18)
- `CS_SPECIALIZE_DATA_SET_INFO` (`Andre1`, "Andre_liegestuetzen1", 27)
- `CS_SPECIALIZE_DATA_SET_INFO` (`Andre2`, "Andre_liegestuetzen2", 20)
- `CS_SPECIALIZE_DATA_SET_INFO` (`Andre3`, "Andre_liegestuetzen3", 17)
- `CS_SPECIALIZE_DATA_SET_INFO` (`AndreSquats1`, "Andre_Squats", 30)
- `CS_SPECIALIZE_DATA_SET_INFO` (`AndreSquats2`, "Andre_Squats2", 49)
- `CS_SPECIALIZE_DATA_SET_INFO` (`Jan1`, "Jan_liegestuetzen1", 25)
- `CS_SPECIALIZE_DATA_SET_INFO` (`Jan2`, "Jan_liegestuetzen2", 19)
- `CS_SPECIALIZE_DATA_SET_INFO` (`Jan3`, "Jan_liegestuetzen3", 13)
- `CS_SPECIALIZE_DATA_SET_INFO` (`Lucas1`, "Lucas_liegestuetzen1", 24)
- `CS_SPECIALIZE_DATA_SET_INFO` (`Lucas2`, "Lucas_liegestuetzen2", 19)
- `CS_SPECIALIZE_DATA_SET_INFO` (`Lucas3`, "Lucas_liegestuetzen3", 11)
- `std::uint64_t repetitionCount (pl::string_view dataSet)`

Fetches the repetition count for a given data set identified by its string.
- `std::ostream & operator<< (std::ostream &os, FilterKind filterKind)`

Prints a FilterKind to an ostream.
- `cl::Expected< std::vector< cl::fs::Path > > logFiles (pl::string_view directoryPath)`

Fetches the paths to the log files in the given directory.
- `std::ostream & operator<< (std::ostream &os, SegmentationKind segmentationKind)`

Prints a SegmentationKind to an ostream.
- `bool operator== (const LogInfo &lhs, const LogInfo &rhs) noexcept`
- `bool operator!= (const LogInfo &lhs, const LogInfo &rhs) noexcept`
- `std::ostream & operator<< (std::ostream &os, const LogInfo &logInfo)`

Variables

- `constexpr pl::string_view logPath {"segmentation_comparison/logs"}`

Relative path to the directory containing the preprocessed log files.
- `constexpr pl::string_view oldLogPath {"segmentation_comparison/logs/old"}`

Relative path to the directory containing the old log files.

5.4.1 Enumeration Type Documentation

5.4.1.1 FilterKind

```
enum cs::FilterKind [strong]
```

Type for the different kinds of filters.

Enumerator

Butterworth	
MovingAverage	

Definition at line 9 of file filter_kind.hpp.

5.4.1.2 SegmentationKind

```
enum cs::SegmentationKind : pl::byte [strong]
```

The segmentation kind.

Enumerator

Minima	Segmentation by local minima
Maxima	Segmentation by local maxima
Both	Segmentation by both local extrema

Definition at line 12 of file segmentation_kind.hpp.

5.4.2 Function Documentation**5.4.2.1 CS_SPECIALIZE_DATA_SET_INFO() [1/20]**

```
cs::CS_SPECIALIZE_DATA_SET_INFO (
    Andre1 ,
    "Andre_liegestuetzen1" ,
    27 )
```

5.4.2.2 CS_SPECIALIZE_DATA_SET_INFO() [2/20]

```
cs::CS_SPECIALIZE_DATA_SET_INFO (
    Andre2 ,
    "Andre_liegestuetzen2" ,
    20 )
```

5.4.2.3 CS_SPECIALIZE_DATA_SET_INFO() [3/20]

```
cs::CS_SPECIALIZE_DATA_SET_INFO (
    Andre3 ,
    "Andre_liegestuetzen3" ,
    17 )
```

5.4.2.4 CS_SPECIALIZE_DATA_SET_INFO() [4/20]

```
cs::CS_SPECIALIZE_DATA_SET_INFO (
    AndreSquats1 ,
    "Andre_Squats" ,
    30 )
```

5.4.2.5 CS_SPECIALIZE_DATA_SET_INFO() [5/20]

```
cs::CS_SPECIALIZE_DATA_SET_INFO (
    AndreSquats2 ,
    "Andre_Squats2" ,
    49 )
```

5.4.2.6 CS_SPECIALIZE_DATA_SET_INFO() [6/20]

```
cs::CS_SPECIALIZE_DATA_SET_INFO (
    Felix1 ,
    "11.17.39" ,
    24 )
```

5.4.2.7 CS_SPECIALIZE_DATA_SET_INFO() [7/20]

```
cs::CS_SPECIALIZE_DATA_SET_INFO (
    Felix2 ,
    "12.50.00" ,
    20 )
```

5.4.2.8 CS_SPECIALIZE_DATA_SET_INFO() [8/20]

```
cs::CS_SPECIALIZE_DATA_SET_INFO (
    Felix3 ,
    "13.00.09" ,
    15 )
```

5.4.2.9 CS_SPECIALIZE_DATA_SET_INFO() [9/20]

```
cs::CS_SPECIALIZE_DATA_SET_INFO (
    Jan1 ,
    "Jan_liegestuetzen1" ,
    25  )
```

5.4.2.10 CS_SPECIALIZE_DATA_SET_INFO() [10/20]

```
cs::CS_SPECIALIZE_DATA_SET_INFO (
    Jan2 ,
    "Jan_liegestuetzen2" ,
    19  )
```

5.4.2.11 CS_SPECIALIZE_DATA_SET_INFO() [11/20]

```
cs::CS_SPECIALIZE_DATA_SET_INFO (
    Jan3 ,
    "Jan_liegestuetzen3" ,
    13  )
```

5.4.2.12 CS_SPECIALIZE_DATA_SET_INFO() [12/20]

```
cs::CS_SPECIALIZE_DATA_SET_INFO (
    Lucas1 ,
    "Lucas_liegestuetzen1" ,
    24  )
```

5.4.2.13 CS_SPECIALIZE_DATA_SET_INFO() [13/20]

```
cs::CS_SPECIALIZE_DATA_SET_INFO (
    Lucas2 ,
    "Lucas_liegestuetzen2" ,
    19  )
```

5.4.2.14 CS_SPECIALIZE_DATA_SET_INFO() [14/20]

```
cs::CS_SPECIALIZE_DATA_SET_INFO (
    Lucas3 ,
    "Lucas_liegestuetzen3" ,
    11  )
```

5.4.2.15 CS_SPECIALIZE_DATA_SET_INFO() [15/20]

```
cs::CS_SPECIALIZE_DATA_SET_INFO (
    Marcelle1 ,
    "14.59.59" ,
    10   )
```

5.4.2.16 CS_SPECIALIZE_DATA_SET_INFO() [16/20]

```
cs::CS_SPECIALIZE_DATA_SET_INFO (
    Marcelle2 ,
    "15.13.22" ,
    16   )
```

5.4.2.17 CS_SPECIALIZE_DATA_SET_INFO() [17/20]

```
cs::CS_SPECIALIZE_DATA_SET_INFO (
    Marcelle3 ,
    "15.31.36" ,
    18   )
```

5.4.2.18 CS_SPECIALIZE_DATA_SET_INFO() [18/20]

```
cs::CS_SPECIALIZE_DATA_SET_INFO (
    Mike1 ,
    "14.07.33" ,
    26   )
```

5.4.2.19 CS_SPECIALIZE_DATA_SET_INFO() [19/20]

```
cs::CS_SPECIALIZE_DATA_SET_INFO (
    Mike2 ,
    "14.14.32" ,
    22   )
```

5.4.2.20 CS_SPECIALIZE_DATA_SET_INFO() [20/20]

```
cs::CS_SPECIALIZE_DATA_SET_INFO (
    Mike3 ,
    "14.20.28" ,
    18   )
```

5.4.2.21 logFiles()

```
cl::Expected< std::vector< cl::fs::Path > > cs::logFiles (
```

```
    pl::string_view directoryPath )
```

Fetches the paths to the log files in the given directory.

Parameters

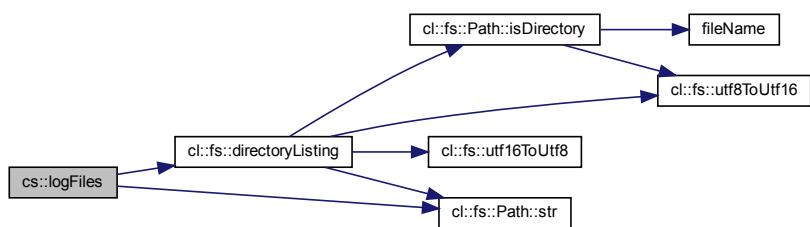
<i>directoryPath</i>	The path to a directory to search for log files.
----------------------	--

Returns

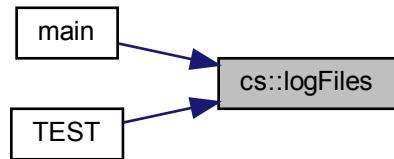
The log files found or an error.

Definition at line 9 of file log_files.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:



5.4.2.22 operator"!=()

```

bool cs::operator!= (
    const LogInfo & lhs,
    const LogInfo & rhs ) [noexcept]

```

Parameters

<i>lhs</i>	The left hand side operand.
<i>rhs</i>	The right hand side operand.

Returns

true if lhs and rhs are considered not equal; otherwise false.

Definition at line 287 of file log_info.cpp.

5.4.2.23 operator<<() [1/3]

```
std::ostream& cs::operator<< (
    std::ostream & os,
    const LogInfo & logInfo )
```

Parameters

<i>os</i>	The ostream to print to.
<i>logInfo</i>	The LogInfo to print.

Returns

os

Definition at line 292 of file log_info.cpp.

5.4.2.24 operator<<() [2/3]

```
std::ostream & cs::operator<< (
    std::ostream & os,
    FilterKind filterKind )
```

Prints a FilterKind to an ostream.

Parameters

<i>os</i>	The ostream to print to.
<i>filterKind</i>	The FilterKind to print.

Returns

os

Definition at line 6 of file filter_kind.cpp.

5.4.2.25 operator<<() [3/3]

```
std::ostream & cs::operator<< (
    std::ostream & os,
    SegmentationKind segmentationKind )
```

Prints a SegmentationKind to an ostream.

Parameters

<i>os</i>	The ostream to print to.
<i>segmentationKind</i>	The SegmentationKind to print.

Returns

os

Definition at line 6 of file segmentation_kind.cpp.

5.4.2.26 operator==()

```
bool cs::operator== (
    const LogInfo & lhs,
    const LogInfo & rhs ) [noexcept]
```

Parameters

<i>lhs</i>	The left hand side operand.
<i>rhs</i>	The right hand side operand.

Returns

true if *lhs* and *rhs* are considered equal; otherwise false.

Definition at line 264 of file log_info.cpp.

5.4.2.27 PL_DEFINE_EXCEPTION_TYPE()

```
cs::PL_DEFINE_EXCEPTION_TYPE (
    NoSuchDataSetException ,
    std::logic_error )
```

5.4.2.28 repetitionCount()

```
std::uint64_t cs::repetitionCount (
    pl::string_view dataSet )
```

Fetches the repetition count for a given data set identified by its string.

Parameters

<code>dataSet</code>	The data set to fetch the repetition count of.
----------------------	--

Returns

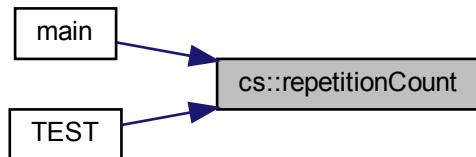
The repetition count of `dataSet`.

Warning

`dataSet` may not be invalid!

Definition at line 10 of file `data_set_info.cpp`.

Here is the caller graph for this function:



5.4.3 Variable Documentation

5.4.3.1 logPath

```
constexpr pl::string_view cs::logPath {"segmentation_comparison/logs"} [inline], [constexpr]
```

Relative path to the directory containing the preprocessed log files.

Definition at line 9 of file `paths.hpp`.

5.4.3.2 oldLogPath

```
constexpr pl::string_view cs::oldLogPath {"segmentation_comparison/logs/old"} [inline], [constexpr]
```

Relative path to the directory containing the old log files.

Definition at line 14 of file `paths.hpp`.

5.5 ctg Namespace Reference

Functions

- `std::vector< cl::DataPoint > aboveThreshold (const cl::DataSet &dataSet, long double accelerometerThreshold, long double gyroscopeThreshold)`
- `long double averageComparisonValueCalculator (cl::Sensor sensor, cl::Channel channel, const cl::DataSet &dataSet)`
- `long double halfMaximumComparisonValueCalculator (cl::Sensor sensor, cl::Channel channel, const cl::DataSet &dataSet)`
- `template<typename ComparisonValueCalculator> bool isRelevant (cl::Sensor sensor, cl::Channel channel, const cl::DataSet &dataSet, ComparisonValueCalculator comparisonValueCalculator)`
- `constexpr long double percentageOf (std::size_t amount, std::size_t totalCount) noexcept`
- `void runAboveThreshold (std::ostream &aboveThresholdLogFileStream, const cl::DataSet &dataSet)`

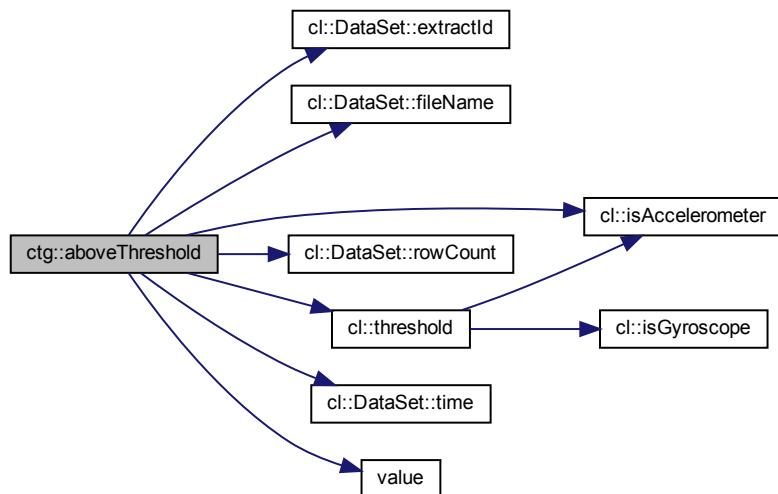
5.5.1 Function Documentation

5.5.1.1 aboveThreshold()

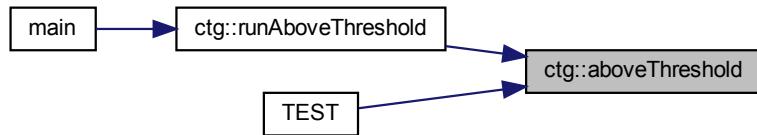
```
std::vector< cl::DataPoint > ctg::aboveThreshold (
    const cl::DataSet & dataSet,
    long double accelerometerThreshold,
    long double gyroscopeThreshold )
```

Definition at line 28 of file above_threshold.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:



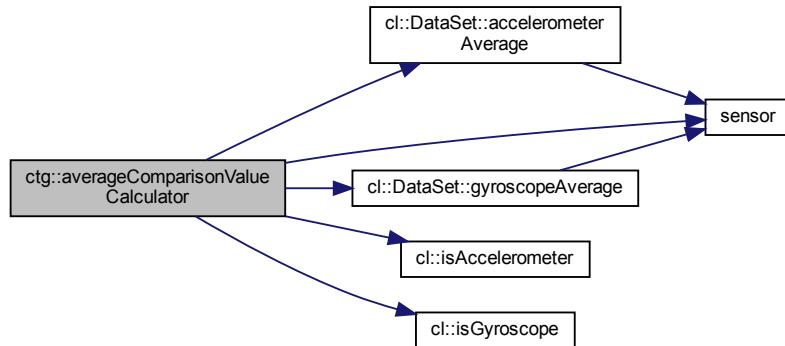
5.5.1.2 averageComparisonValueCalculator()

```

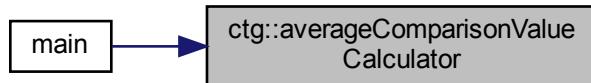
long double ctg::averageComparisonValueCalculator (
    cl::Sensor sensor,
    cl::Channel channel,
    const cl::DataSet & dataSet )
  
```

Definition at line 10 of file average_comparison_value_calculator.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:

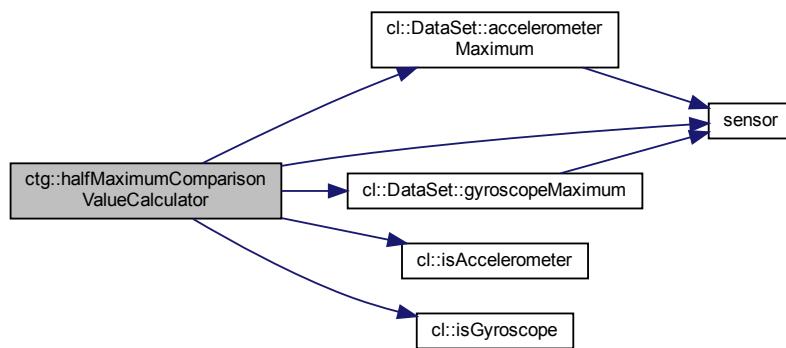


5.5.1.3 halfMaximumComparisonValueCalculator()

```
long double ctg::halfMaximumComparisonValueCalculator (
    cl::Sensor sensor,
    cl::Channel channel,
    const cl::DataSet & dataSet )
```

Definition at line 10 of file half_maximum_comparison_value_calculator.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:

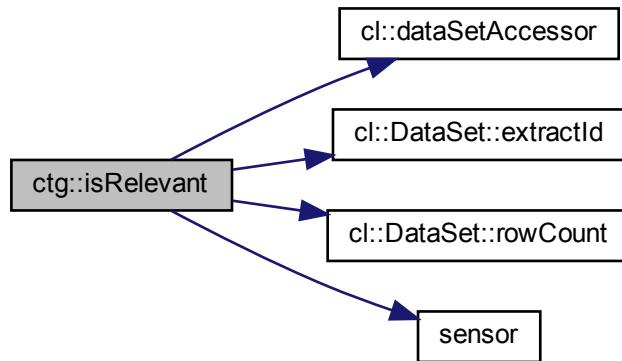


5.5.1.4 isRelevant()

```
template<typename ComparisonValueCalculator >
bool ctg::isRelevant (
    cl::Sensor sensor,
    cl::Channel channel,
    const cl::DataSet & dataSet,
    ComparisonValueCalculator comparisonValueCalculator )
```

Definition at line 11 of file is_relevant.hpp.

Here is the call graph for this function:



Here is the caller graph for this function:

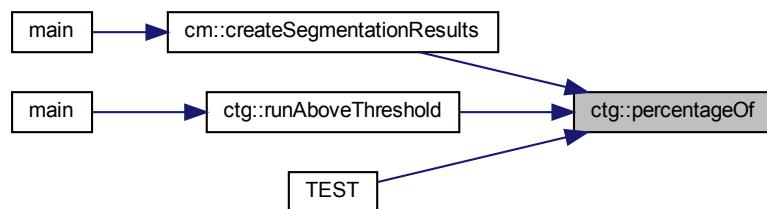


5.5.1.5 percentageOf()

```
constexpr long double ctg::percentageOf (
    std::size_t amount,
    std::size_t totalCount ) [constexpr], [noexcept]
```

Definition at line 6 of file percentage_of.hpp.

Here is the caller graph for this function:

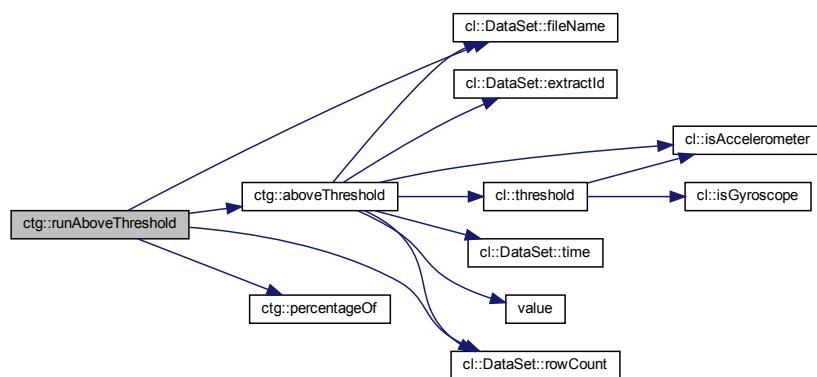


5.5.1.6 runAboveThreshold()

```
void ctg::runAboveThreshold (
    std::ostream & aboveThresholdLogFileStream,
    const cl::DataSet & dataSet )
```

Definition at line 14 of file run_above_threshold.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:



5.6 fmc Namespace Reference

Functions

- void [adjustHardwareTimestamp](#) (std::string *cellContent, const std::string &nextRowHardwareTimestamp, std::uint64_t *overflowCount)
- bool [convertToUnixLineEndings](#) (const std::string &csvPath)
- bool [createBackupFile](#) (const std::string &csvFilePath, const std::string &backupFilePath)
- void [deleteNonBoschSensors](#) (std::vector< std::vector< std::string >> *data)
- [cl::Expected< void >](#) [deleteOutOfBoundsValues](#) (std::vector< std::vector< std::string >> *data)
- void [removeZerosFromField](#) (std::string *field)
- bool [restoreFromBackup](#) (const std::string &csvFilePath, const std::string &backupFilePath)
- bool [writeFile](#) (pl::string_view csvPath, pl::string_view csvFileExtension, const std::vector< std::string > &columnNames, const std::vector< std::vector< std::string >> &data)

5.6.1 Function Documentation

5.6.1.1 **adjustHardwareTimestamp()**

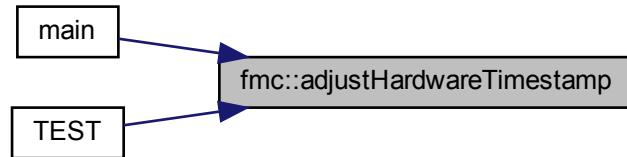
```
void fmc::adjustHardwareTimestamp (
    std::string * cellContent,
    const std::string & nextRowHardwareTimestamp,
    std::uint64_t * overflowCount )
```

Definition at line 16 of file `adjust_hardware_timestamp.cpp`.

Here is the call graph for this function:



Here is the caller graph for this function:

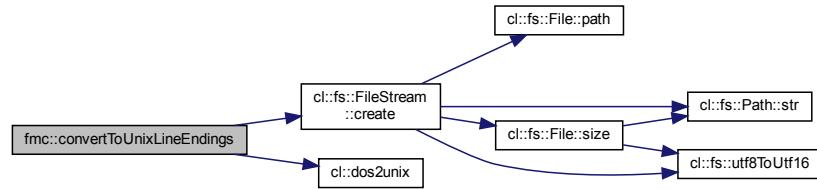


5.6.1.2 **convertToUnixLineEndings()**

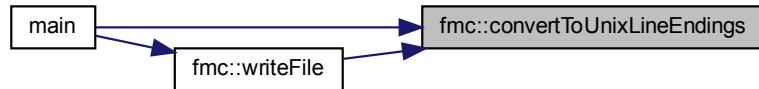
```
bool fmc::convertToUnixLineEndings (
    const std::string & csvPath )
```

Definition at line 18 of file `convert_to_unix_line_endings.cpp`.

Here is the call graph for this function:



Here is the caller graph for this function:



5.6.1.3 `createBackupFile()`

```
bool fmc::createBackupFile (
    const std::string & csvFilePath,
    const std::string & backupFilePath )
```

Definition at line 6 of file `create_backup_file.cpp`.

Here is the caller graph for this function:



5.6.1.4 deleteNonBoschSensors()

```
void fmc::deleteNonBoschSensors (
    std::vector< std::vector< std::string >> * data )
```

Definition at line 30 of file `delete_non_bosch_sensors.cpp`.

Here is the caller graph for this function:



5.6.1.5 deleteOutOfBoundsValues()

```
cl::Expected< void > fmc::deleteOutOfBoundsValues (
    std::vector< std::vector< std::string >> * data )
```

Definition at line 29 of file `delete_out_of_bounds_values.cpp`.

Here is the caller graph for this function:

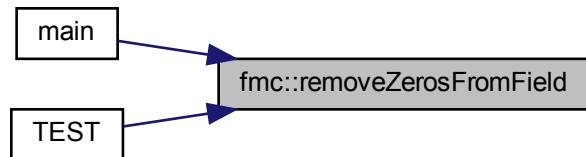


5.6.1.6 removeZerosFromField()

```
void fmc::removeZerosFromField (
    std::string * field )
```

Definition at line 6 of file `remove_zeros_from_field.cpp`.

Here is the caller graph for this function:



5.6.1.7 restoreFromBackup()

```
bool fmc::restoreFromBackup (
    const std::string & csvFilePath,
    const std::string & backupFilePath )
```

Definition at line 11 of file restore_from_backup.cpp.

Here is the caller graph for this function:

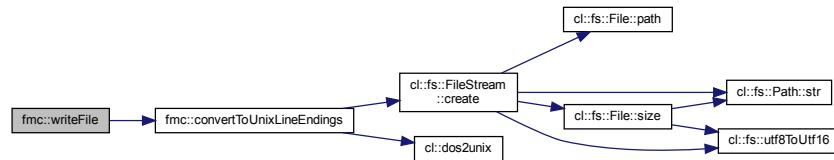


5.6.1.8 writeFile()

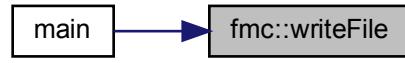
```
bool fmc::writeFile (
    pl::string_view csvPath,
    pl::string_view csvFileExtension,
    const std::vector< std::string > & columnNames,
    const std::vector< std::vector< std::string >> & data )
```

Definition at line 12 of file write_file.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:



Chapter 6

Class Documentation

6.1 cm::Configuration::Builder Class Reference

[Builder](#) type for [Configuration](#).

```
#include <configuration.hpp>
```

Public Member Functions

- [Builder \(\) noexcept](#)
Creates an empty [Builder](#).
- [Builder & skipWindow \(bool value\)](#)
Sets the [skipWindow](#) property.
- [Builder & deleteTooClose \(bool value\)](#)
Sets the [deleteTooClose](#) property.
- [Builder & deleteTooLowVariance \(bool value\)](#)
Sets the [deleteTooLowVariance](#) property.
- [Builder & imu \(Imu value\)](#)
Sets the [imu](#) property.
- [Builder & segmentationKind \(std::string value\)](#)
Sets the [segmentationKind](#) property.
- [Builder & windowSize \(std::size_t value\)](#)
Sets the [windowSize](#) property.
- [Builder & filterKind \(std::string value\)](#)
Sets the [filterKind](#) property.
- [Configuration build \(\) const](#)
Builds a [Configuration](#).

6.1.1 Detailed Description

[Builder](#) type for [Configuration](#).

Definition at line 41 of file configuration.hpp.

6.1.2 Constructor & Destructor Documentation

6.1.2.1 Builder()

```
cm::Configuration::Builder::Builder ( ) [noexcept]
```

Creates an empty [Builder](#).

Definition at line 39 of file configuration.cpp.

6.1.3 Member Function Documentation

6.1.3.1 build()

```
Configuration cm::Configuration::Builder::build ( ) const
```

Builds a [Configuration](#).

Returns

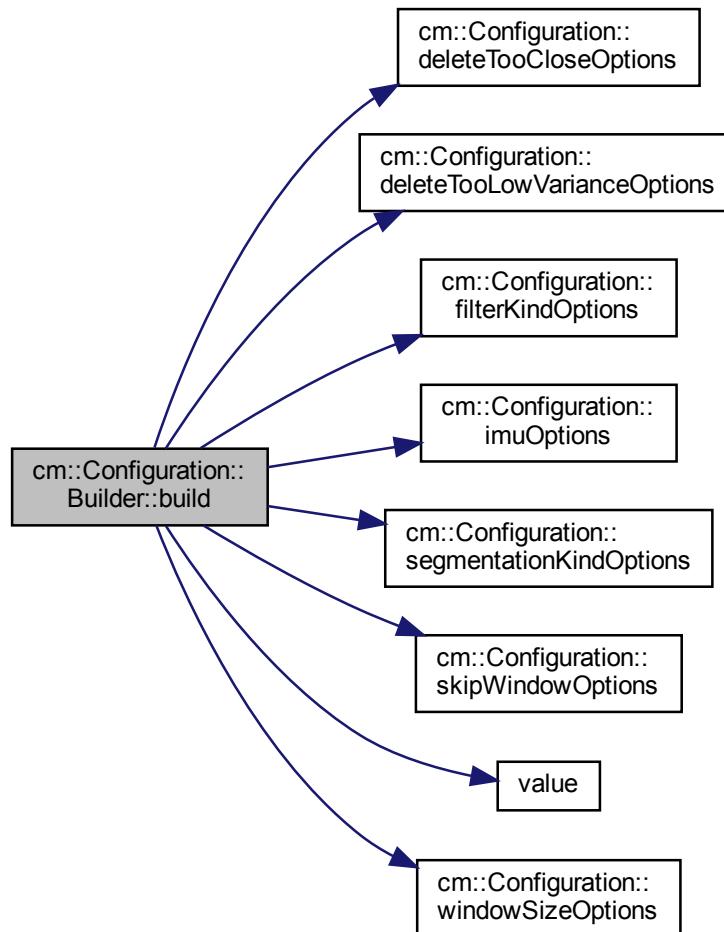
The [Configuration](#) built.

Exceptions

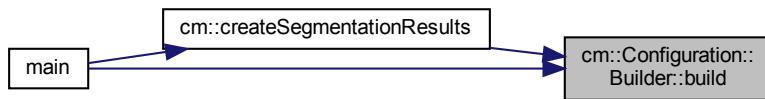
cl::Exception	if one of the properties has not been set or is invalid.
-------------------------------	--

Definition at line 93 of file configuration.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:



6.1.3.2 `deleteTooClose()`

```
Configuration::Builder & cm::Configuration::Builder::deleteTooClose ( bool value )
```

Sets the deleteTooClose property.

Parameters

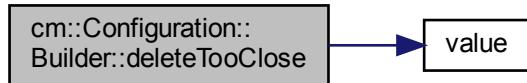
<code>value</code>	The value to use.
--------------------	-------------------

Returns

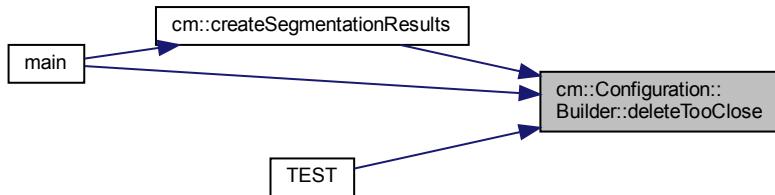
`*this`

Definition at line 56 of file configuration.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:



6.1.3.3 `deleteTooLowVariance()`

```
Configuration::Builder & cm::Configuration::Builder::deleteTooLowVariance (
    bool value )
```

Sets the deleteTooLowVariance property.

Parameters

<code>value</code>	The value to use.
--------------------	-------------------

Returns

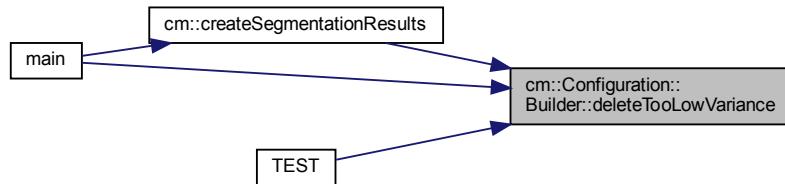
`*this`

Definition at line 62 of file configuration.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:



6.1.3.4 filterKind()

```
Configuration::Builder & cm::Configuration::Builder::filterKind (
    std::string value )
```

Sets the filterKind property.

Parameters

<code>value</code>	The value to use.
--------------------	-------------------

Returns

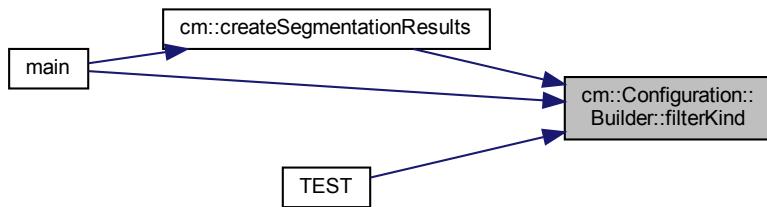
`*this`

Definition at line 87 of file configuration.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:



6.1.3.5 imu()

```
Configuration::Builder & cm::Configuration::Builder::imu ( Imu value )
```

Sets the imu property.

Parameters

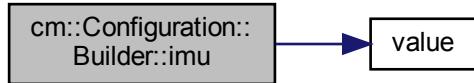
<code>value</code>	The value to use.
--------------------	-------------------

Returns

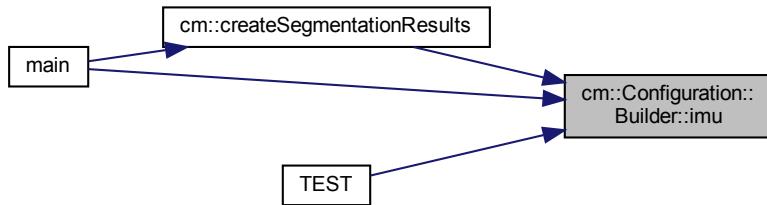
`*this`

Definition at line 68 of file configuration.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:



6.1.3.6 segmentationKind()

```
Configuration::Builder & cm::Configuration::Builder::segmentationKind ( std::string value )
```

Sets the segmentationKind property.

Parameters

<code>value</code>	The value to use.
--------------------	-------------------

Returns

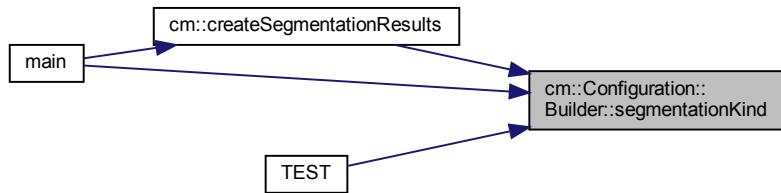
`*this`

Definition at line 74 of file configuration.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:



6.1.3.7 skipWindow()

```
Configuration::Builder & cm::Configuration::Builder::skipWindow (
    bool value )
```

Sets the skipWindow property.

Parameters

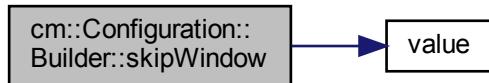
value	The value to use.
-------	-------------------

Returns

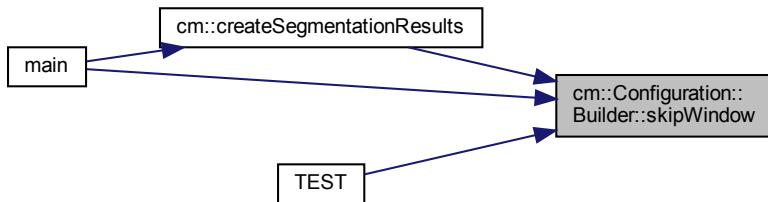
*this

Definition at line 50 of file configuration.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:



6.1.3.8 windowSize()

```
Configuration::Builder & cm::Configuration::Builder::windowSize ( std::size_t value )
```

Sets the windowSize property.

Parameters

value	The value to use.
-------	-------------------

Returns

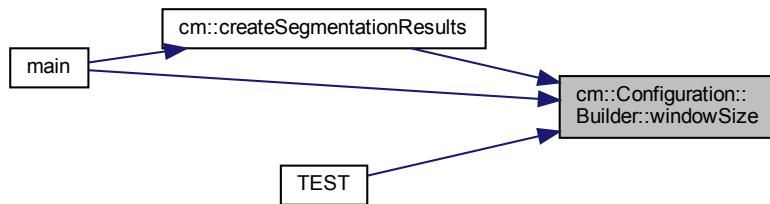
*this

Definition at line 81 of file configuration.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:



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

- confusion_matrix/include/[configuration.hpp](#)
- confusion_matrix/src/[configuration.cpp](#)

6.2 cl::col_traits< Col > Struct Template Reference

```
#include <column.hpp>
```

6.2.1 Detailed Description

```
template<Column Col>
struct cl::col_traits< Col >
```

Definition at line 24 of file column.hpp.

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

- csv_lib/include/cl/column.hpp

6.3 cm::Configuration Class Reference

Represents a possible configuration for the Python segmentor.

```
#include <configuration.hpp>
```

Classes

- class [Builder](#)
Builder type for [Configuration](#).

Public Member Functions

- [Configuration \(\)](#)
Default constructor.
- bool [skipWindow \(\) const noexcept](#)
Read accessor for the skipWindow property.
- bool [deleteTooClose \(\) const noexcept](#)
Read accessor for the deleteTooClose property.
- bool [deleteTooLowVariance \(\) const noexcept](#)
Read accessor for the deleteTooLowVariance property.
- [Imu imu \(\) const noexcept](#)
Read accessor for the imu property.
- const std::string & [segmentationKind \(\) const noexcept](#)
Read accessor for the segmentationKind property.
- std::size_t [windowSize \(\) const noexcept](#)
Read accessor for the windowSize property.
- const std::string & [filterKind \(\) const noexcept](#)
Read accessor for the filterKind property.
- bool [isInitialized \(\) const noexcept](#)
Checks if this object is initialized and thus valid.
- [cl::fs::Path createFilePath \(\) const](#)
Create a file path for this kind of Configuration.
- bool [serializeSegmentationPoints \(const std::unordered_map< cl::fs::Path, std::vector< std::uint64_t >> &segmentationPointsMap\) const](#)
Serializes a map of segmentation points to the file path for this Configuration.
- std::unordered_map< [cl::fs::Path](#), std::vector< std::uint64_t > > [importSegmentationPoints \(\) const](#)
Imports segmentation points from the file path for this Configuration.

Static Public Member Functions

- static const std::deque< bool > & [skipWindowOptions \(\) noexcept](#)
Returns the possible skipWindow options.
- static const std::deque< bool > & [deleteTooCloseOptions \(\) noexcept](#)
Returns the possible deleteTooClose options.
- static const std::deque< bool > & [deleteTooLowVarianceOptions \(\) noexcept](#)
Returns the possible deleteTooLowVariance options.
- static const std::vector< [Imu](#) > & [imuOptions \(\) noexcept](#)
Returns the possible imu options.
- static const std::vector< std::string > & [segmentationKindOptions \(\) noexcept](#)
Returns the possible segmentationKind options.
- static const std::vector< std::size_t > & [windowSizeOptions \(\) noexcept](#)
Returns the possible windowSize options.
- static const std::vector< std::string > & [filterKindOptions \(\) noexcept](#)
Returns the possible filterKind options.

Friends

- class `Builder`
- struct `std::hash< Configuration >`
- bool `operator==` (const `Configuration &lhs`, const `Configuration &rhs`) noexcept
Compares two Configurations for equality.
- bool `operator<` (const `Configuration &lhs`, const `Configuration &rhs`) noexcept
Less than compares two Configurations.
- `std::ostream & operator<<` (`std::ostream &os`, const `Configuration &config`)
Prints config to os.

6.3.1 Detailed Description

Represents a possible configuration for the Python segmentor.

Definition at line 33 of file configuration.hpp.

6.3.2 Constructor & Destructor Documentation

6.3.2.1 Configuration()

```
cm::Configuration::Configuration ( )
```

Default constructor.

Warning

This constructor is only there to work around Microsoft buggedness, don't use.

Note

Creates an uninitialized object!

Definition at line 254 of file configuration.cpp.

6.3.3 Member Function Documentation

6.3.3.1 createFilePath()

```
cl::fs::Path cm::Configuration::createFilePath ( ) const
```

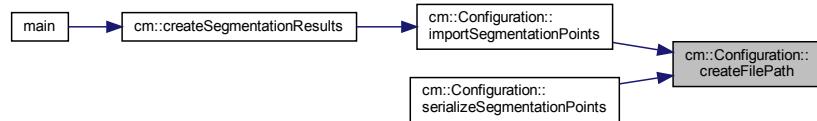
Create a file path for this kind of Configuration.

Returns

The file path for this kind of Configuration.

Definition at line 291 of file configuration.cpp.

Here is the caller graph for this function:



6.3.3.2 deleteTooClose()

```
bool cm::Configuration::deleteTooClose ( ) const [noexcept]
```

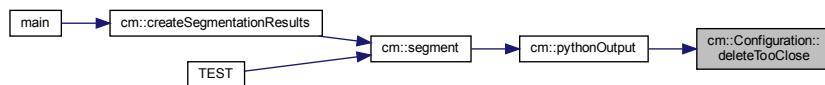
Read accessor for the `deleteTooClose` property.

Returns

The `deleteTooClose` option.

Definition at line 268 of file configuration.cpp.

Here is the caller graph for this function:



6.3.3.3 deleteTooCloseOptions()

```
const std::deque< bool > & cm::Configuration::deleteTooCloseOptions ( ) [static], [noexcept]
```

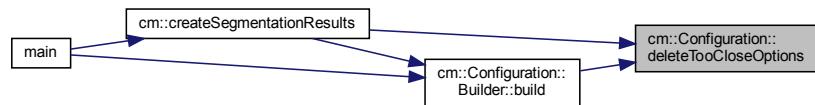
Returns the possible deleteTooClose options.

Returns

The deleteTooClose options.

Definition at line 154 of file configuration.cpp.

Here is the caller graph for this function:



6.3.3.4 deleteTooLowVariance()

```
bool cm::Configuration::deleteTooLowVariance ( ) const [noexcept]
```

Read accessor for the deleteTooLowVariance property.

Returns

The deleteTooLowVariance option.

Definition at line 270 of file configuration.cpp.

Here is the caller graph for this function:



6.3.3.5 deleteTooLowVarianceOptions()

```
const std::deque< bool > & cm::Configuration::deleteTooLowVarianceOptions ( ) [static], [noexcept]
```

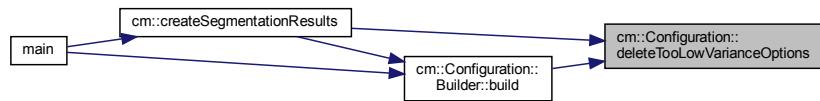
Returns the possible deleteTooLowVariance options.

Returns

The deleteTooLowVariance options.

Definition at line 160 of file configuration.cpp.

Here is the caller graph for this function:



6.3.3.6 filterKind()

```
const std::string & cm::Configuration::filterKind ( ) const [noexcept]
```

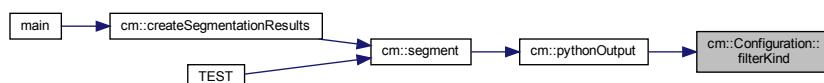
Read accessor for the filterKind property.

Returns

The filterKind option.

Definition at line 284 of file configuration.cpp.

Here is the caller graph for this function:



6.3.3.7 filterKindOptions()

```
const std::vector< std::string > & cm::Configuration::filterKindOptions ( ) [static], [noexcept]
```

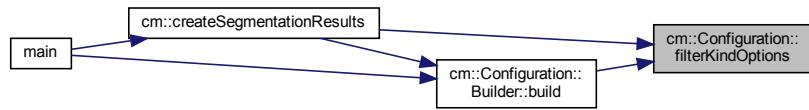
Returns the possible filterKind options.

Returns

The filterKind options.

Definition at line 187 of file configuration.cpp.

Here is the caller graph for this function:



6.3.3.8 importSegmentationPoints()

```
std::unordered_map< cl::fs::Path, std::vector< std::uint64_t > > cm::Configuration::importSegmentationPoints ( ) const
```

Imports segmentation points from the file path for this [Configuration](#).

Returns

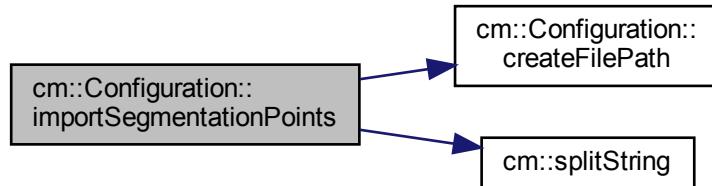
The imported segmentation points.

Exceptions

cl::Exception	if the file path for this Configuration does not exist or an error occurs while reading / parsing.
-------------------------------	--

Definition at line 330 of file configuration.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:



6.3.3.9 imu()

`Imu cm::Configuration::imu () const [noexcept]`

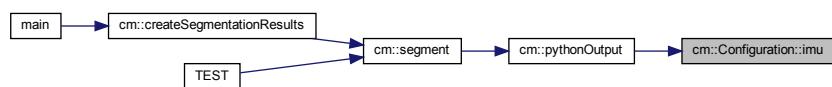
Read accessor for the imu property.

Returns

The imu option.

Definition at line 275 of file configuration.cpp.

Here is the caller graph for this function:



6.3.3.10 imuOptions()

```
const std::vector< Imu > & cm::Configuration::imuOptions ( ) [static], [noexcept]
```

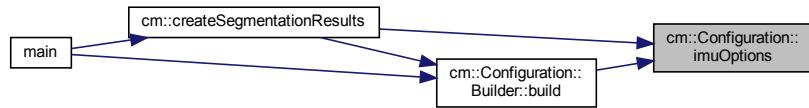
Returns the possible imu options.

Returns

The imu options.

Definition at line 166 of file configuration.cpp.

Here is the caller graph for this function:



6.3.3.11 isInitialized()

```
bool cm::Configuration::isInitialized ( ) const [noexcept]
```

Checks if this object is initialized and thus valid.

Returns

true if this object is initialized; false otherwise.

Warning

If you use the [Builder](#) to construct (as you should) this member function will always return true. false will only be returned if you use the (invalid) default constructor that servers as a workaround for MSVC bugs.

Definition at line 289 of file configuration.cpp.

6.3.3.12 segmentationKind()

```
const std::string & cm::Configuration::segmentationKind() const [noexcept]
```

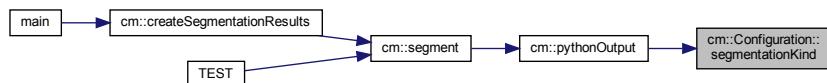
Read accessor for the segmentationKind property.

Returns

The segmentationKind option.

Definition at line 277 of file configuration.cpp.

Here is the caller graph for this function:



6.3.3.13 segmentationKindOptions()

```
const std::vector< std::string > & cm::Configuration::segmentationKindOptions() [static], [noexcept]
```

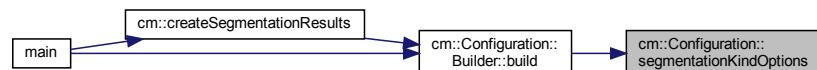
Returns the possible segmentationKind options.

Returns

The segmentationKind options.

Definition at line 173 of file configuration.cpp.

Here is the caller graph for this function:



6.3.3.14 serializeSegmentationPoints()

```
bool cm::Configuration::serializeSegmentationPoints(
    const std::unordered_map< cl::fs::Path, std::vector< std::uint64_t >> & segmentationPointsMap ) const
```

Serializes a map of segmentation points to the file path for this [Configuration](#).

Parameters

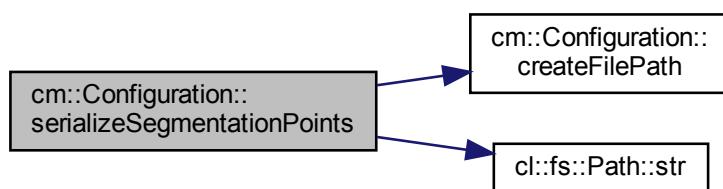
<i>segmentationPointsMap</i>	The map to serialize.
------------------------------	-----------------------

Returns

true on success; false otherwise.

Definition at line 309 of file configuration.cpp.

Here is the call graph for this function:

**6.3.3.15 skipWindow()**

```
bool cm::Configuration::skipWindow() const [noexcept]
```

Read accessor for the skipWindow property.

Returns

The skipWindow option.

Definition at line 266 of file configuration.cpp.

Here is the caller graph for this function:



6.3.3.16 skipWindowOptions()

```
const std::deque< bool > & cm::Configuration::skipWindowOptions ( ) [static], [noexcept]
```

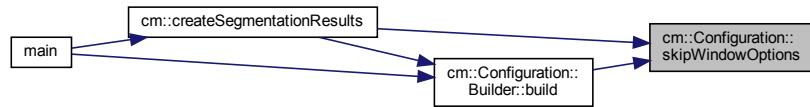
Returns the possible skipWindow options.

Returns

The skipWindow options.

Definition at line 148 of file configuration.cpp.

Here is the caller graph for this function:



6.3.3.17 windowHeight()

```
std::size_t cm::Configuration::windowSize ( ) const [noexcept]
```

Read accessor for the windowHeight property.

Returns

The windowHeight option.

Definition at line 282 of file configuration.cpp.

Here is the caller graph for this function:



6.3.3.18 `windowSizeOptions()`

```
const std::vector< std::size_t > & cm::Configuration::windowSizeOptions ( ) [static], [noexcept]
```

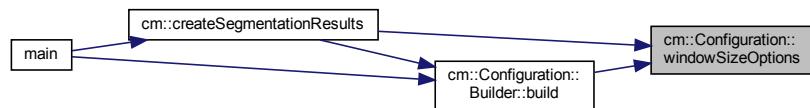
Returns the possible `windowSize` options.

Returns

The `windowSize` options.

Definition at line 179 of file `configuration.cpp`.

Here is the caller graph for this function:



6.3.4 Friends And Related Function Documentation

6.3.4.1 `Builder`

```
friend class Builder [friend]
```

Definition at line 35 of file `configuration.hpp`.

6.3.4.2 `operator<`

```
bool operator< (
    const Configuration & lhs,
    const Configuration & rhs ) [friend]
```

`Less than` compares two `Configurations`.

Parameters

<code>lhs</code>	The first operand.
<code>rhs</code>	The second operand.

Returns

true if *lhs* is considered less than *rhs*; otherwise false.

Definition at line 213 of file configuration.cpp.

6.3.4.3 operator<<

```
std::ostream& operator<< (
    std::ostream & os,
    const Configuration & config ) [friend]
```

Prints *config* to *os*.

Parameters

<i>os</i>	The ostream to print to.
<i>config</i>	The Configuration to print.

Returns

os

Definition at line 233 of file configuration.cpp.

6.3.4.4 operator==

```
bool operator== (
    const Configuration & lhs,
    const Configuration & rhs ) [friend]
```

Compares two Configurations for equality.

Parameters

<i>lhs</i>	The first operand.
<i>rhs</i>	The second operand.

Returns

true if *lhs* and *rhs* are considered to be equal.

Definition at line 193 of file configuration.cpp.

6.3.4.5 std::hash< Configuration >

```
friend struct std::hash< Configuration > [friend]
```

Definition at line 36 of file configuration.hpp.

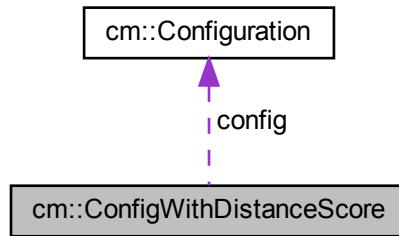
The documentation for this class was generated from the following files:

- confusion_matrix/include/configuration.hpp
- confusion_matrix/src/configuration.cpp

6.4 cm::ConfigWithDistanceScore Struct Reference

```
#include <order_configurations_by_quality.hpp>
```

Collaboration diagram for cm::ConfigWithDistanceScore:



Public Member Functions

- [ConfigWithDistanceScore \(Configuration p_config, std::uint64_t p_distScore\)](#)

Public Attributes

- [Configuration config](#)
- [std::uint64_t distScore](#)

6.4.1 Detailed Description

Definition at line 15 of file order_configurations_by_quality.hpp.

6.4.2 Constructor & Destructor Documentation

6.4.2.1 ConfigWithDistanceScore()

```
cm::ConfigWithDistanceScore::ConfigWithDistanceScore (
    Configuration p_config,
    std::uint64_t p_distScore )
```

Definition at line 13 of file order_configurations_by_quality.cpp.

6.4.3 Member Data Documentation

6.4.3.1 config

```
Configuration cm::ConfigWithDistanceScore::config
```

Definition at line 18 of file order_configurations_by_quality.hpp.

6.4.3.2 distScore

```
std::uint64_t cm::ConfigWithDistanceScore::distScore
```

Definition at line 19 of file order_configurations_by_quality.hpp.

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

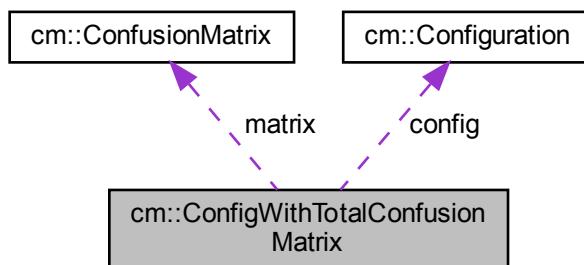
- confusion_matrix/include/order_configurations_by_quality.hpp
- confusion_matrix/src/order_configurations_by_quality.cpp

6.5 cm::ConfigWithTotalConfusionMatrix Struct Reference

A Configuration with a ConfusionMatrix.

```
#include <confusion_matrix_best_configs.hpp>
```

Collaboration diagram for cm::ConfigWithTotalConfusionMatrix:



Public Member Functions

- `ConfigWithTotalConfusionMatrix ()=default`
Default constructor.
- `ConfigWithTotalConfusionMatrix (Configuration p_config, ConfusionMatrix p_matrix)`
Constructor.

Public Attributes

- `Configuration config`
- `ConfusionMatrix matrix`

Friends

- `std::ostream & operator<< (std::ostream &os, const ConfigWithTotalConfusionMatrix &obj)`
Prints a `ConfigWithTotalConfusionMatrix` to os.

6.5.1 Detailed Description

A `Configuration` with a `ConfusionMatrix`.

Definition at line 16 of file `confusion_matrix_best_configs.hpp`.

6.5.2 Constructor & Destructor Documentation

6.5.2.1 ConfigWithTotalConfusionMatrix() [1/2]

```
cm::ConfigWithTotalConfusionMatrix::ConfigWithTotalConfusionMatrix ( ) [default]
```

Default constructor.

6.5.2.2 ConfigWithTotalConfusionMatrix() [2/2]

```
cm::ConfigWithTotalConfusionMatrix::ConfigWithTotalConfusionMatrix (
    Configuration p_config,
    ConfusionMatrix p_matrix )
```

Constructor.

Parameters

<code>p_config</code>	The <code>Configuration</code> to use.
<code>p_matrix</code>	The <code>ConfusionMatrix</code> to use.

Definition at line 93 of file confusion_matrix_best_configs.cpp.

6.5.3 Friends And Related Function Documentation

6.5.3.1 operator<<

```
std::ostream& operator<< (
    std::ostream & os,
    const ConfigWithTotalConfusionMatrix & obj ) [friend]
```

Prints a [ConfigWithTotalConfusionMatrix](#) to os.

Parameters

<i>os</i>	The ostream to print to.
<i>obj</i>	The ConfigWithTotalConfusionMatrix to print.

Returns

os

Definition at line 69 of file confusion_matrix_best_configs.cpp.

6.5.4 Member Data Documentation

6.5.4.1 config

[Configuration](#) cm::ConfigWithTotalConfusionMatrix::config

The [Configuration](#)

Definition at line 41 of file confusion_matrix_best_configs.hpp.

6.5.4.2 matrix

[ConfusionMatrix](#) cm::ConfigWithTotalConfusionMatrix::matrix

The associated [ConfusionMatrix](#)

Definition at line 42 of file confusion_matrix_best_configs.hpp.

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

- confusion_matrix/include/[confusion_matrix_best_configs.hpp](#)
- confusion_matrix/src/[confusion_matrix_best_configs.cpp](#)

6.6 cm::ConfusionMatrix Class Reference

Type to represent a confusion matrix.

```
#include <confusion_matrix.hpp>
```

Public Types

- using `this_type = ConfusionMatrix`

Public Member Functions

- `ConfusionMatrix ()`
Default constructs a `ConfusionMatrix` initializing all data members with 0.
- `std::uint64_t truePositives () const noexcept`
Read accessor for the true positive count.
- `std::uint64_t trueNegatives () const noexcept`
Read accessor for the true negative count.
- `std::uint64_t falsePositives () const noexcept`
Read accessor for the false positive count.
- `std::uint64_t falseNegatives () const noexcept`
Read accessor for the false negative count.
- `std::uint64_t totalCount () const noexcept`
Read accessor for the total count.
- `this_type & incrementTruePositives () noexcept`
Increments the true positive count and the total count.
- `this_type & incrementTrueNegatives () noexcept`
Increments the true negative count and the total count.
- `this_type & incrementFalsePositives () noexcept`
Increments the false positive count and the total count.
- `this_type & incrementFalseNegatives () noexcept`
Increments the false negative count and the total count.
- `this_type & operator+= (const ConfusionMatrix &other) noexcept`
*Accumulates `other` into `*this`.*

6.6.1 Detailed Description

Type to represent a confusion matrix.

Definition at line 9 of file `confusion_matrix.hpp`.

6.6.2 Member Typedef Documentation

6.6.2.1 this_type

```
using cm::ConfusionMatrix::this_type = ConfusionMatrix
```

Definition at line 11 of file confusion_matrix.hpp.

6.6.3 Constructor & Destructor Documentation

6.6.3.1 ConfusionMatrix()

```
cm::ConfusionMatrix::ConfusionMatrix( )
```

Default constructs a [ConfusionMatrix](#) initializing all data members with 0.

Definition at line 4 of file confusion_matrix.cpp.

6.6.4 Member Function Documentation

6.6.4.1 falseNegatives()

```
std::uint64_t cm::ConfusionMatrix::falseNegatives( ) const [noexcept]
```

Read accessor for the false negative count.

Returns

The false negative count.

Definition at line 28 of file confusion_matrix.cpp.

6.6.4.2 falsePositives()

```
std::uint64_t cm::ConfusionMatrix::falsePositives( ) const [noexcept]
```

Read accessor for the false positive count.

Returns

The false positive count.

Definition at line 23 of file confusion_matrix.cpp.

6.6.4.3 incrementFalseNegatives()

```
ConfusionMatrix & cm::ConfusionMatrix::incrementFalseNegatives () [noexcept]
```

Increments the false negative count and the total count.

Returns

*this

Definition at line 59 of file confusion_matrix.cpp.

Here is the caller graph for this function:



6.6.4.4 incrementFalsePositives()

```
ConfusionMatrix & cm::ConfusionMatrix::incrementFalsePositives () [noexcept]
```

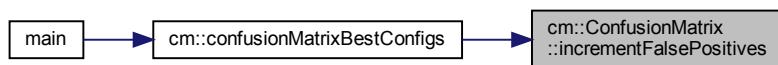
Increments the false positive count and the total count.

Returns

*this

Definition at line 52 of file confusion_matrix.cpp.

Here is the caller graph for this function:



6.6.4.5 incrementTrueNegatives()

```
ConfusionMatrix & cm::ConfusionMatrix::incrementTrueNegatives ( ) [noexcept]
```

Increments the true negative count and the total count.

Returns

*this

Definition at line 45 of file confusion_matrix.cpp.

Here is the caller graph for this function:



6.6.4.6 incrementTruePositives()

```
ConfusionMatrix & cm::ConfusionMatrix::incrementTruePositives ( ) [noexcept]
```

Increments the true positive count and the total count.

Returns

*this

Definition at line 38 of file confusion_matrix.cpp.

Here is the caller graph for this function:



6.6.4.7 operator+=()

```
ConfusionMatrix & cm::ConfusionMatrix::operator+= ( const ConfusionMatrix & other ) [noexcept]
```

Accumulates other into *this.

Parameters

<code>other</code>	The other ConfusionMatrix to add to this ConfusionMatrix .
--------------------	--

Returns

`*this`

Definition at line 66 of file confusion_matrix.cpp.

6.6.4.8 totalCount()

```
std::uint64_t cm::ConfusionMatrix::totalCount ( ) const [noexcept]
```

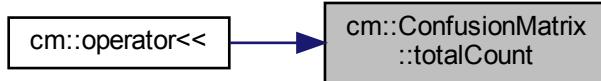
Read accessor for the total count.

Returns

The total count.

Definition at line 33 of file confusion_matrix.cpp.

Here is the caller graph for this function:

**6.6.4.9 trueNegatives()**

```
std::uint64_t cm::ConfusionMatrix::trueNegatives ( ) const [noexcept]
```

Read accessor for the true negative count.

Returns

The true negative count.

Definition at line 18 of file confusion_matrix.cpp.

6.6.4.10 truePositives()

```
std::uint64_t cm::ConfusionMatrix::truePositives () const [noexcept]
```

Read accessor for the true positive count.

Returns

The true positive count.

Definition at line 13 of file confusion_matrix.cpp.

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

- confusion_matrix/include/[confusion_matrix.hpp](#)
- confusion_matrix/src/[confusion_matrix.cpp](#)

6.7 cm::CsvFileInfo Class Reference

Type to hold the hardware timestamps of a CSV file.

```
#include <csv_file_info.hpp>
```

Public Member Functions

- [CsvFileInfo](#) (const [cl::fs::Path](#) &csvFilePath)
Reads the hardware timestamps from csvFilePath.
- const std::vector< std::uint64_t > & [hardwareTimestamps](#) () const noexcept
Read accessor for the hardware timestamps.

6.7.1 Detailed Description

Type to hold the hardware timestamps of a CSV file.

Definition at line 13 of file csv_file_info.hpp.

6.7.2 Constructor & Destructor Documentation

6.7.2.1 CsvFileInfo()

```
cm::CsvFileInfo::CsvFileInfo (
    const cl::fs::Path & csvFilePath ) [explicit]
```

Reads the hardware timestamps from csvFilePath.

Parameters

<code>csvFilePath</code>	The CSV to read the hardware timestamps from.
--------------------------	---

Exceptions

<code>cl::Exception</code>	on error.
----------------------------	-----------

Definition at line 10 of file csv_file_info.cpp.

6.7.3 Member Function Documentation

6.7.3.1 hardwareTimestamps()

```
const std::vector< std::uint64_t > & cm::CsvFileInfo::hardwareTimestamps ( ) const [noexcept]
```

Read accessor for the hardware timestamps.

Returns

The hardware timestamps.

Definition at line 56 of file csv_file_info.cpp.

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

- confusion_matrix/include/[csv_file_info.hpp](#)
- confusion_matrix/src/[csv_file_info.cpp](#)

6.8 cs::CsvLineBuilder Class Reference

Builder for a CSV line.

```
#include <csv_line.hpp>
```

Public Types

- using `this_type = CsvLineBuilder`

Public Member Functions

- [CsvLineBuilder \(\)](#)
Creates an empty, invalid CsvLineBuilder.
- [this_type & skipWindow \(bool value\)](#)
Write accessor for the skip window property.
- [this_type & deleteTooClose \(bool value\)](#)
Write accessor for the delete too close property.
- [this_type & deleteLowVariance \(bool value\)](#)
Write accessor for the delete low variance property.
- [this_type & kind \(SegmentationKind value\)](#)
Write accessor for the kind property.
- [this_type & windowSize \(std::uint64_t value\)](#)
Write accessor for the window size property.
- [this_type & filter \(FilterKind value\)](#)
Write accessor for the filter property.
- [this_type & dataSet \(std::string value\)](#)
Write accessor for the data set property.
- [this_type & sensor \(std::uint64_t value\)](#)
Write accessor for the sensor property.
- [this_type & repetitions \(std::uint64_t value\)](#)
Write accessor for the repetitions property.
- [this_type & segmentationPoints \(std::uint64_t value\)](#)
Write accessor for the segmentation points property.
- [this_type & isOld \(bool value\)](#)
Write accessor for the is old property.
- [std::vector< std::string > build \(\) const](#)
Builds the CSV line as a vector containing the cells of the CSV line.

6.8.1 Detailed Description

Builder for a CSV line.

Builder type for a CSV line. All write accessors have to be called before the build member function is called!

Definition at line 21 of file csv_line.hpp.

6.8.2 Member Typedef Documentation

6.8.2.1 this_type

```
using cs::CsvLineBuilder::this_type = CsvLineBuilder
```

Definition at line 23 of file csv_line.hpp.

6.8.3 Constructor & Destructor Documentation

6.8.3.1 CsvLineBuilder()

```
cs::CsvLineBuilder::CsvLineBuilder ( )
```

Creates an empty, invalid [CsvLineBuilder](#).

Definition at line 44 of file csv_line.cpp.

6.8.4 Member Function Documentation

6.8.4.1 build()

```
std::vector< std::string > cs::CsvLineBuilder::build ( ) const
```

Builds the CSV line as a vector containing the cells of the CSV line.

Returns

The resulting vector of strings.

Warning

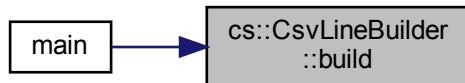
May only be called after all the write accessors have been called.

Definition at line 124 of file csv_line.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:



6.8.4.2 dataSet()

```
CsvLineBuilder & cs::CsvLineBuilder::dataSet (
    std::string value )
```

Write accessor for the data set property.

Parameters

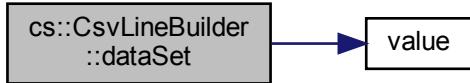
value	The value to use.
-------	-------------------

Returns

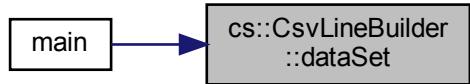
*this

Definition at line 94 of file csv_line.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:



6.8.4.3 deleteLowVariance()

```
CsvLineBuilder & cs::CsvLineBuilder::deleteLowVariance (
    bool value )
```

Write accessor for the delete low variance property.

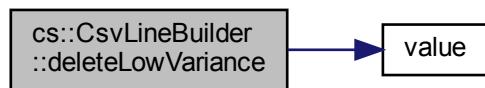
Parameters

<code>value</code>	The value to use.
--------------------	-------------------

Returns`*this`

Definition at line 70 of file csv_line.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:



6.8.4.4 `deleteTooClose()`

```
CsvLineBuilder & cs::CsvLineBuilder::deleteTooClose (\n    bool value )
```

Write accessor for the delete too close property.

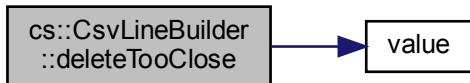
Parameters

<code>value</code>	The value to use.
--------------------	-------------------

Returns`*this`

Definition at line 64 of file csv_line.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:



6.8.4.5 filter()

```
CsvLineBuilder & cs::CsvLineBuilder::filter (
    FilterKind value )
```

Write accessor for the filter property.

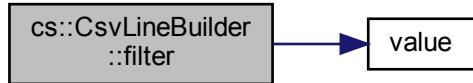
Parameters

<code>value</code>	The value to use.
--------------------	-------------------

Returns`*this`

Definition at line 88 of file csv_line.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:



6.8.4.6 `isOld()`

```
CsvLineBuilder & cs::CsvLineBuilder::isOld ( bool value )
```

Write accessor for the `is old` property.

Parameters

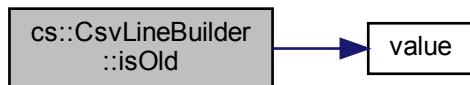
<code>value</code>	The value to use.
--------------------	-------------------

Returns

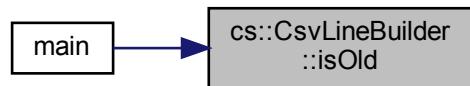
`*this`

Definition at line 118 of file csv_line.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:



6.8.4.7 kind()

```
CsvLineBuilder & cs::CsvLineBuilder::kind ( SegmentationKind value )
```

Write accessor for the kind property.

Parameters

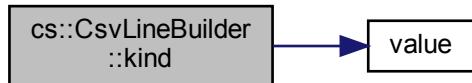
<code>value</code>	The value to use.
--------------------	-------------------

Returns

`*this`

Definition at line 76 of file csv_line.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:



6.8.4.8 repetitions()

```
CsvLineBuilder & cs::CsvLineBuilder::repetitions( std::uint64_t value )
```

Write accessor for the repetitions property.

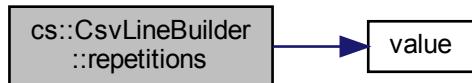
Parameters

<code>value</code>	The value to use.
--------------------	-------------------

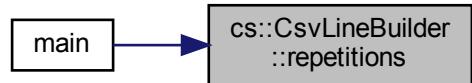
Returns`*this`

Definition at line 106 of file csv_line.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:



6.8.4.9 segmentationPoints()

```
CsvLineBuilder & cs::CsvLineBuilder::segmentationPoints (
    std::uint64_t value )
```

Write accessor for the segmentation points property.

Parameters

<code>value</code>	The value to use.
--------------------	-------------------

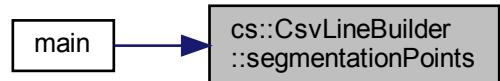
Returns`*this`

Definition at line 112 of file csv_line.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:



6.8.4.10 sensor()

```
CsvLineBuilder & cs::CsvLineBuilder::sensor ( std::uint64_t value )
```

Write accessor for the sensor property.

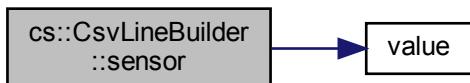
Parameters

<code>value</code>	The value to use.
--------------------	-------------------

Returns`*this`

Definition at line 100 of file csv_line.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:



6.8.4.11 skipWindow()

```
CsvLineBuilder & cs::CsvLineBuilder::skipWindow (
    bool value )
```

Write accessor for the skip window property.

Parameters

<code>value</code>	The value to use.
--------------------	-------------------

Returns`*this`

Definition at line 58 of file csv_line.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:



6.8.4.12 `windowSize()`

```
CsvLineBuilder & cs::CsvLineBuilder::windowSize( std::uint64_t value )
```

Write accessor for the window size property.

Parameters

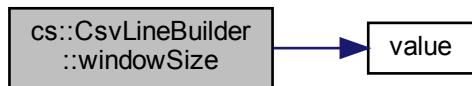
<code>value</code>	The value to use.
--------------------	-------------------

Returns

*this

Definition at line 82 of file csv_line.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:



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

- compare_segmentation/include/[csv_line.hpp](#)
- compare_segmentation/src/[csv_line.cpp](#)

6.9 cl::data_set_accessor< Chan > Struct Template Reference

```
#include <channel.hpp>
```

6.9.1 Detailed Description

```
template<Channel Chan>
struct cl::data_set_accessor< Chan >
```

Definition at line 39 of file channel.hpp.

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

- [csv_lib/include/cl/channel.hpp](#)

6.10 cs::data_set_info< Tag > Struct Template Reference

Meta function for data set tags.

```
#include <data_set_info.hpp>
```

6.10.1 Detailed Description

```
template<typename Tag>
struct cs::data_set_info< Tag >
```

Meta function for data set tags.

Template Parameters

<i>Tag</i>	The data set tag to use.
------------	--------------------------

Meta function for data set tags. Contains a text for the data set tag and its repetition count.

Definition at line 21 of file data_set_info.hpp.

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

- compare_segmentation/include/[data_set_info.hpp](#)

6.11 cl::DataPoint Class Reference

```
#include <data_point.hpp>
```

Public Member Functions

- [DataPoint](#) (std::string *fileName*, long double *time*, Sensor *sensor*, Channel *channel*, long double *value*) noexcept
- const std::string & *fileName* () const noexcept
- long double *time* () const noexcept
- Sensor *sensor* () const noexcept
- Channel *channel* () const noexcept
- long double *value* () const noexcept

Friends

- std::ostream & [operator<<](#) (std::ostream &*os*, const [DataPoint](#) &*dataPoint*)

6.11.1 Detailed Description

Definition at line 10 of file data_point.hpp.

6.11.2 Constructor & Destructor Documentation

6.11.2.1 DataPoint()

```
DataPoint::DataPoint (
    std::string fileName,
    long double time,
    Sensor sensor,
    Channel channel,
    long double value ) [noexcept]
```

Definition at line 21 of file data_point.cpp.

Here is the call graph for this function:



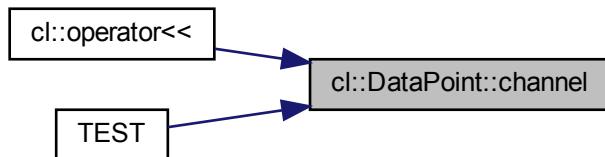
6.11.3 Member Function Documentation

6.11.3.1 channel()

```
Channel DataPoint::channel () const [noexcept]
```

Definition at line 41 of file data_point.cpp.

Here is the caller graph for this function:

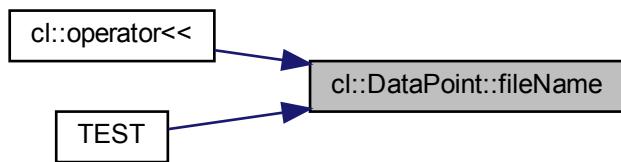


6.11.3.2 fileName()

```
const std::string & DataPoint::fileName ( ) const [noexcept]
```

Definition at line 35 of file data_point.cpp.

Here is the caller graph for this function:

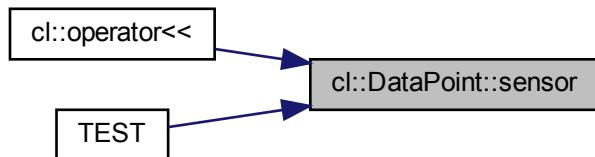


6.11.3.3 sensor()

```
Sensor DataPoint::sensor ( ) const [noexcept]
```

Definition at line 39 of file data_point.cpp.

Here is the caller graph for this function:

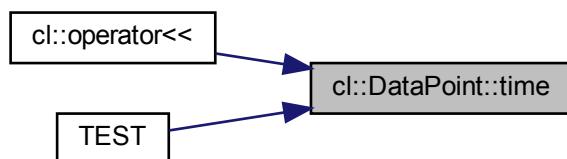


6.11.3.4 time()

```
long double DataPoint::time ( ) const [noexcept]
```

Definition at line 37 of file data_point.cpp.

Here is the caller graph for this function:

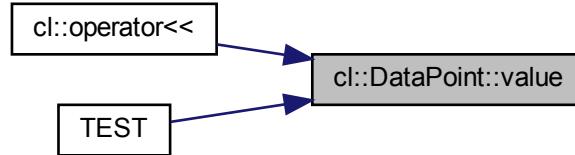


6.11.3.5 value()

```
long double DataPoint::value ( ) const [noexcept]
```

Definition at line 43 of file data_point.cpp.

Here is the caller graph for this function:



6.11.4 Friends And Related Function Documentation

6.11.4.1 operator<<

```
std::ostream& operator<< (
    std::ostream & os,
    const DataPoint & dataPoint ) [friend]
```

Definition at line 10 of file `data_point.cpp`.

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

- [csv_lib/include/cl/data_point.hpp](#)
- [csv_lib/src/cl/data_point.cpp](#)

6.12 cl::DataSet Class Reference

```
#include <data_set.hpp>
```

Public Types

- using `size_type` = `std::size_t`
- using `ChannelAccessor` = `long double(DataSet::*)(size_type) const`

Public Member Functions

- `size_type rowCount () const noexcept`
- `const std::string & fileName () const noexcept`
- `column_type< Column::Time > time (size_type index) const`
- `column_type< Column::HardwareTimestamp > hardwareTimestamp (size_type index) const`
- `column_type< Column::ExtractId > extractId (size_type index) const`
- `column_type< Column::Trigger > trigger (size_type index) const`
- `column_type< Column::AccelerometerX > accelerometerX (size_type index) const`
- `column_type< Column::AccelerometerY > accelerometerY (size_type index) const`
- `column_type< Column::AccelerometerZ > accelerometerZ (size_type index) const`
- `column_type< Column::GyroscopeX > gyroscopeX (size_type index) const`
- `column_type< Column::GyroscopeY > gyroscopeY (size_type index) const`
- `column_type< Column::GyroscopeZ > gyroscopeZ (size_type index) const`
- `long double accelerometerAverage (Sensor sensor) const`
- `long double gyroscopeAverage (Sensor sensor) const`
- `long double accelerometerMaximum (Sensor sensor) const`
- `long double gyroscopeMaximum (Sensor sensor) const`

Static Public Member Functions

- static `Expected< DataSet > create (std::string fileName, const std::vector< std::vector< std::string >> &matrix)`

6.12.1 Detailed Description

Definition at line 14 of file data_set.hpp.

6.12.2 Member Typedef Documentation

6.12.2.1 ChannelAccessor

```
using cl::DataSet::ChannelAccessor = long double (DataSet::*)(size_type) const
```

Definition at line 17 of file data_set.hpp.

6.12.2.2 size_type

```
using cl::DataSet::size_type = std::size_t
```

Definition at line 16 of file data_set.hpp.

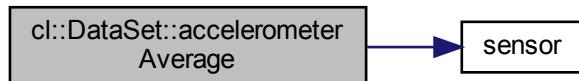
6.12.3 Member Function Documentation

6.12.3.1 accelerometerAverage()

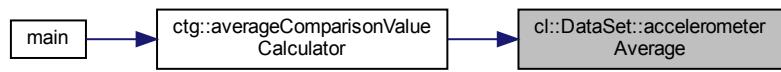
```
long double cl::DataSet::accelerometerAverage (
    Sensor sensor ) const
```

Definition at line 255 of file data_set.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:

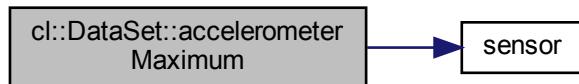


6.12.3.2 accelerometerMaximum()

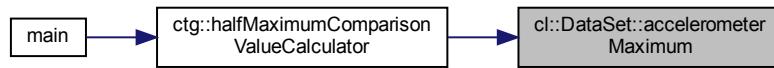
```
long double cl::DataSet::accelerometerMaximum (
    Sensor sensor ) const
```

Definition at line 265 of file data_set.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:

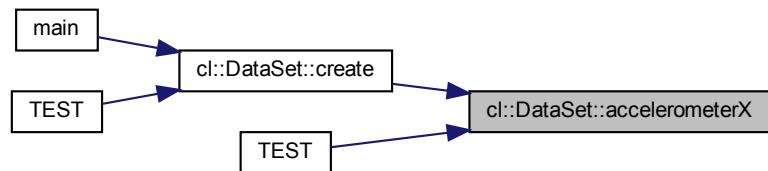


6.12.3.3 accelerometerX()

```
column_type< Column::AccelerometerX > cl::DataSet::accelerometerX (
    size_type index ) const
```

Definition at line 200 of file data_set.cpp.

Here is the caller graph for this function:

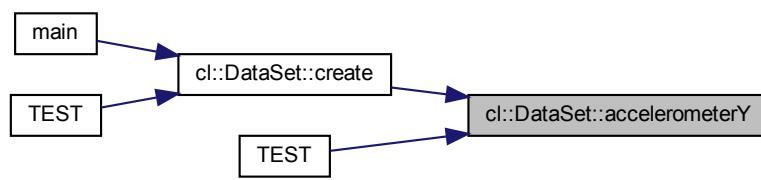


6.12.3.4 accelerometerY()

```
column_type< Column::AccelerometerY > cl::DataSet::accelerometerY ( size_type index ) const
```

Definition at line 208 of file data_set.cpp.

Here is the caller graph for this function:

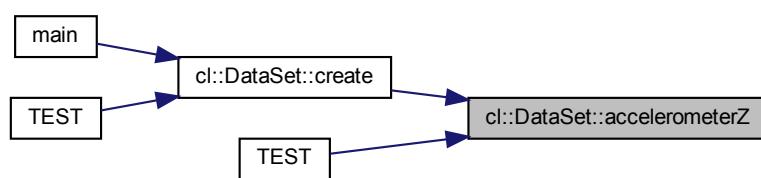


6.12.3.5 accelerometerZ()

```
column_type< Column::AccelerometerZ > cl::DataSet::accelerometerZ ( size_type index ) const
```

Definition at line 216 of file data_set.cpp.

Here is the caller graph for this function:

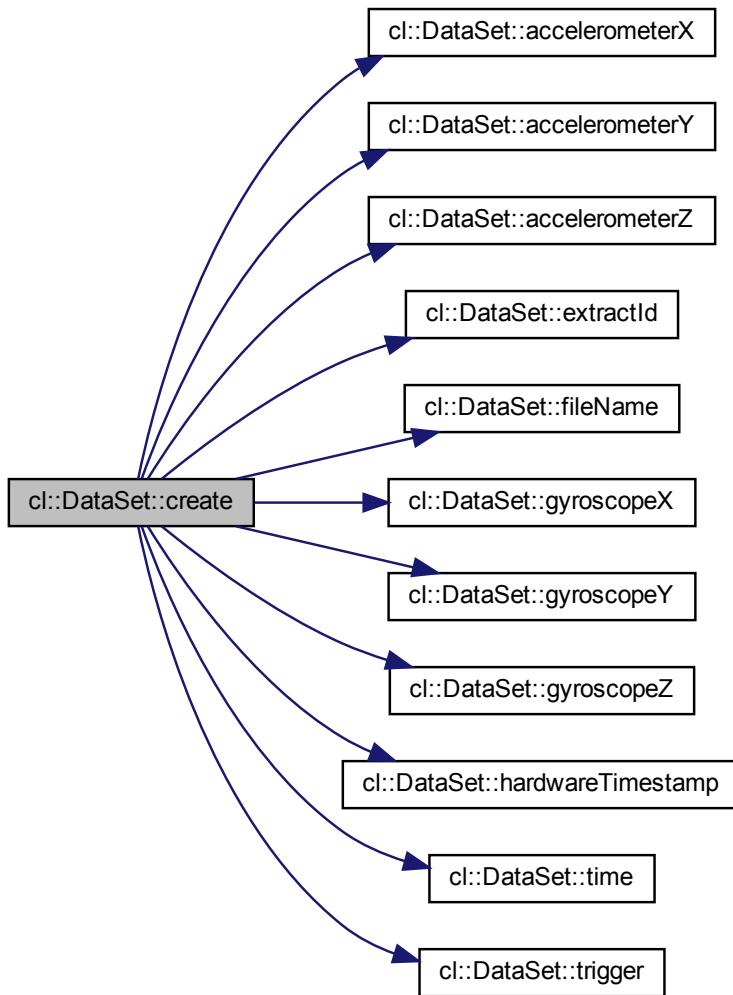


6.12.3.6 create()

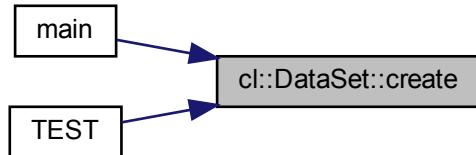
```
Expected< DataSet > cl::DataSet::create (
    std::string fileName,
    const std::vector< std::vector< std::string >> & matrix ) [static]
```

Definition at line 42 of file data_set.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:

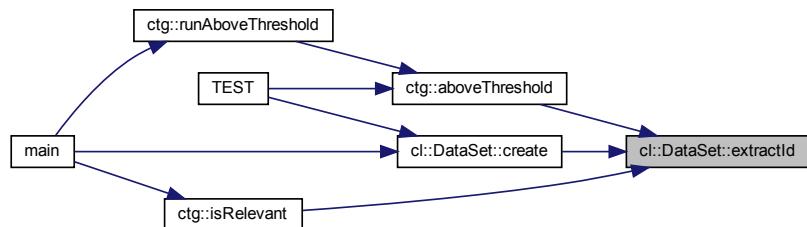


6.12.3.7 extractId()

```
column_type< Column::ExtractId > cl::DataSet::extractId ( size_type index ) const
```

Definition at line 186 of file data_set.cpp.

Here is the caller graph for this function:

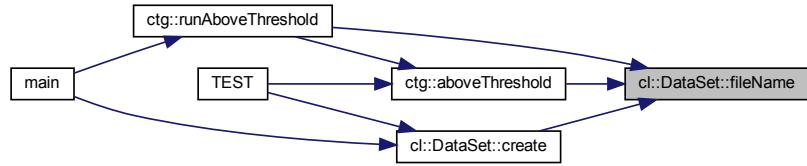


6.12.3.8 fileName()

```
const std::string & cl::DataSet::fileName ( ) const [noexcept]
```

Definition at line 169 of file data_set.cpp.

Here is the caller graph for this function:



6.12.3.9 gyroscopeAverage()

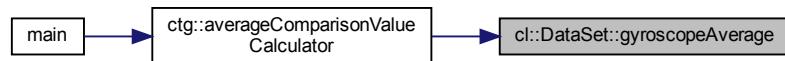
```
long double cl::DataSet::gyroscopeAverage (
    Sensor sensor ) const
```

Definition at line 260 of file data_set.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:



6.12.3.10 gyroscopeMaximum()

```
long double cl::DataSet::gyroscopeMaximum (
    Sensor sensor ) const
```

Definition at line 270 of file data_set.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:

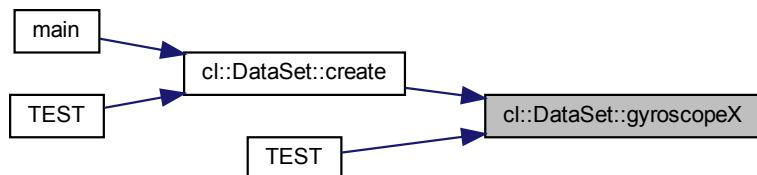


6.12.3.11 gyroscopeX()

```
column_type< Column::GyroscopeX > cl::DataSet::gyroscopeX (
    size_type index ) const
```

Definition at line 224 of file data_set.cpp.

Here is the caller graph for this function:

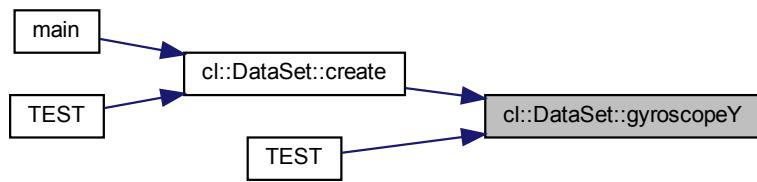


6.12.3.12 gyroscopeY()

```
column_type< Column::GyroscopeY > cl::DataSet::gyroscopeY ( size_type index ) const
```

Definition at line 231 of file data_set.cpp.

Here is the caller graph for this function:

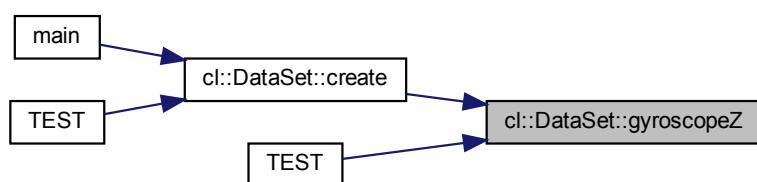


6.12.3.13 gyroscopeZ()

```
column_type< Column::GyroscopeZ > cl::DataSet::gyroscopeZ ( size_type index ) const
```

Definition at line 238 of file data_set.cpp.

Here is the caller graph for this function:

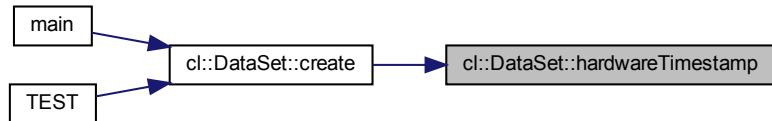


6.12.3.14 hardwareTimestamp()

```
column_type< Column::HardwareTimestamp > cl::DataSet::hardwareTimestamp ( size_type index ) const
```

Definition at line 178 of file data_set.cpp.

Here is the caller graph for this function:

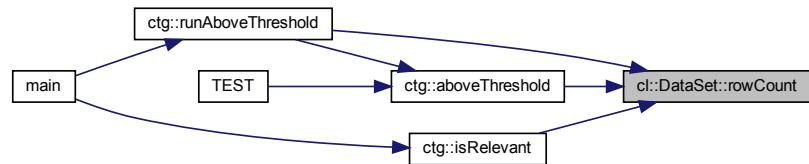


6.12.3.15 rowCount()

```
DataSet::size_type cl::DataSet::rowCount ( ) const [noexcept]
```

Definition at line 152 of file data_set.cpp.

Here is the caller graph for this function:

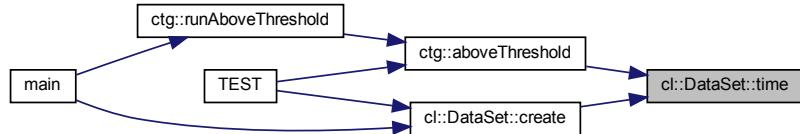


6.12.3.16 time()

```
column_type< Column::Time > cl::DataSet::time ( size_type index ) const
```

Definition at line 171 of file data_set.cpp.

Here is the caller graph for this function:

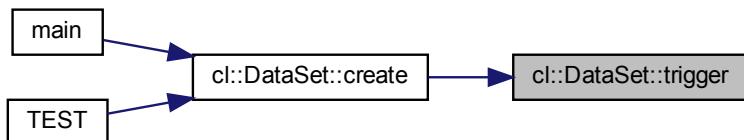


6.12.3.17 trigger()

```
column_type< Column::Trigger > cl::DataSet::trigger (
    size_type index ) const
```

Definition at line 193 of file `data_set.cpp`.

Here is the caller graph for this function:



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

- `csv_lib/include/cl/data_set.hpp`
- `csv_lib/src/cl/data_set.cpp`

6.13 cl::Error Class Reference

```
#include <error.hpp>
```

Public Types

- enum `Kind { CL_ERROR_KIND }`

Public Member Functions

- `Error (Kind kind, std::string file, std::string function, std::size_t line, std::string message)`
- `Kind kind () const noexcept`
- `const std::string & file () const noexcept`
- `const std::string & function () const noexcept`
- `std::size_t line () const noexcept`
- `const std::string & message () const noexcept`
- `void raise () const`
- `std::string to_string () const`

Friends

- `std::ostream & operator<< (std::ostream &os, const Error &error)`

6.13.1 Detailed Description

Definition at line 23 of file error.hpp.

6.13.2 Member Enumeration Documentation

6.13.2.1 Kind

`enum cl::Error::Kind`

Enumerator

<code>CL_ERROR_KIND</code>	<input type="button" value=" "/>
----------------------------	----------------------------------

Definition at line 26 of file error.hpp.

6.13.3 Constructor & Destructor Documentation

6.13.3.1 Error()

```
cl::Error::Error (
    Kind kind,
    std::string file,
    std::string function,
    std::size_t line,
    std::string message )
```

Definition at line 41 of file error.cpp.

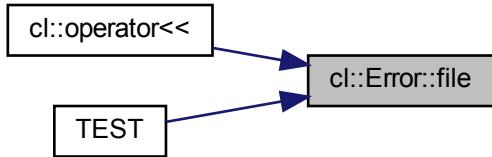
6.13.4 Member Function Documentation

6.13.4.1 file()

```
const std::string & cl::Error::file() const [noexcept]
```

Definition at line 57 of file error.cpp.

Here is the caller graph for this function:

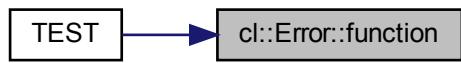


6.13.4.2 function()

```
const std::string & cl::Error::function() const [noexcept]
```

Definition at line 59 of file error.cpp.

Here is the caller graph for this function:

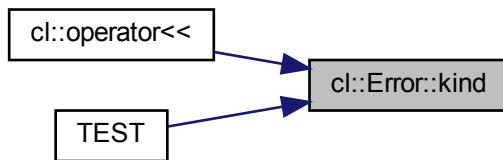


6.13.4.3 kind()

```
Error::Kind cl::Error::kind () const [noexcept]
```

Definition at line 55 of file error.cpp.

Here is the caller graph for this function:



6.13.4.4 line()

```
std::size_t cl::Error::line () const [noexcept]
```

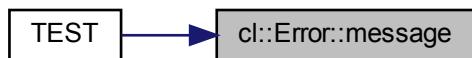
Definition at line 61 of file error.cpp.

6.13.4.5 message()

```
const std::string & cl::Error::message () const [noexcept]
```

Definition at line 63 of file error.cpp.

Here is the caller graph for this function:



6.13.4.6 `raise()`

```
void cl::Error::raise ( ) const
```

Definition at line 65 of file error.cpp.

6.13.4.7 `to_string()`

```
std::string cl::Error::to_string ( ) const
```

Definition at line 74 of file error.cpp.

6.13.5 Friends And Related Function Documentation

6.13.5.1 `operator<<`

```
std::ostream& operator<< (
    std::ostream & os,
    const Error & error ) [friend]
```

Definition at line 30 of file error.cpp.

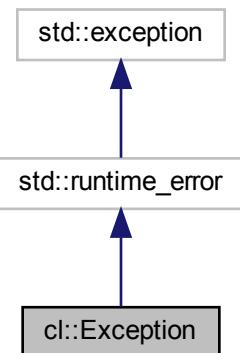
The documentation for this class was generated from the following files:

- csv_lib/include/cl/error.hpp
- csv_lib/src/cl/error.cpp

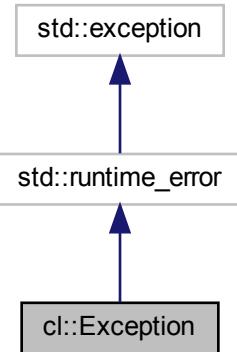
6.14 cl::Exception Class Reference

```
#include <exception.hpp>
```

Inheritance diagram for cl::Exception:



Collaboration diagram for cl::Exception:



Public Types

- using `base_type` = `std::runtime_error`

Public Member Functions

- `Exception (std::string file, std::string function, std::size_t line, const std::string &what_arg)`
- `Exception (std::string file, std::string function, std::size_t line, const char *what_arg)`
- `const std::string & file () const noexcept`
- `const std::string & function () const noexcept`
- `std::size_t line () const noexcept`

6.14.1 Detailed Description

Definition at line 14 of file exception.hpp.

6.14.2 Member Typedef Documentation

6.14.2.1 `base_type`

```
using cl::Exception::base_type = std::runtime_error
```

Definition at line 16 of file exception.hpp.

6.14.3 Constructor & Destructor Documentation

6.14.3.1 Exception() [1/2]

```
cl::Exception::Exception (
    std::string file,
    std::string function,
    std::size_t line,
    const std::string & what_arg )
```

Definition at line 6 of file exception.cpp.

6.14.3.2 Exception() [2/2]

```
cl::Exception::Exception (
    std::string file,
    std::string function,
    std::size_t line,
    const char * what_arg )
```

Definition at line 18 of file exception.cpp.

6.14.4 Member Function Documentation

6.14.4.1 file()

```
const std::string & cl::Exception::file ( ) const [noexcept]
```

Definition at line 30 of file exception.cpp.

Here is the caller graph for this function:

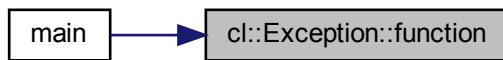


6.14.4.2 function()

```
const std::string & cl::Exception::function() const [noexcept]
```

Definition at line 32 of file exception.cpp.

Here is the caller graph for this function:



6.14.4.3 line()

```
std::size_t cl::Exception::line() const [noexcept]
```

Definition at line 34 of file exception.cpp.

Here is the caller graph for this function:



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

- csv_lib/include/cl/exception.hpp
- csv_lib/src/cl/exception.cpp

6.15 cl::fs::File Class Reference

Represents a file.

```
#include <file.hpp>
```

Public Member Functions

- **File (Path path)**
Creates a [File](#) from the given `path`.
- **bool exists () const noexcept**
Determines if this file exists.
- **bool create () const noexcept**
Creates this file.
- **bool copyTo (const Path ©ToPath) const noexcept**
Copies this file in the filesystem.
- **bool moveTo (const Path &newPath)**
Moves this file in the filesystem.
- **bool remove () noexcept**
Deletes this file.
- **std::int64_t size () const noexcept**
Determines the size of this file in bytes.
- **const Path & path () const noexcept**
Read accessor for the path of this file.

6.15.1 Detailed Description

Represents a file.

Definition at line 11 of file file.hpp.

6.15.2 Constructor & Destructor Documentation

6.15.2.1 File()

```
cl::fs::File::File (
    Path path ) [explicit]
```

Creates a [File](#) from the given `path`.

Parameters

<code>path</code>	The path to use.
-------------------	------------------

Definition at line 21 of file file.cpp.

Here is the call graph for this function:



6.15.3 Member Function Documentation

6.15.3.1 copyTo()

```
bool cl::fs::File::copyTo (
    const Path & copyToPath ) const [noexcept]
```

Copies this file in the filesystem.

Parameters

<i>copyToPath</i>	The path to copy to.
-------------------	----------------------

Returns

true if the file was successfully copied to *copyToPath*; otherwise false.

Warning

There should be no file that already exists at *copyToPath*.

Definition at line 56 of file file.cpp.

Here is the call graph for this function:



6.15.3.2 `create()`

```
bool cl::fs::File::create() const [noexcept]
```

Creates this file.

Returns

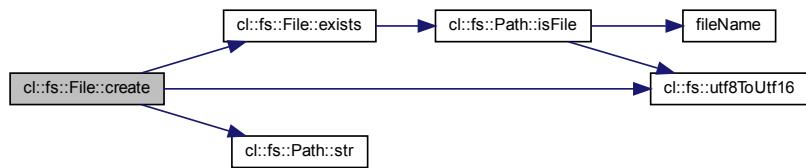
true if the file was successfully created; otherwise false.

Note

Will fail if the file already exists.

Definition at line 25 of file file.cpp.

Here is the call graph for this function:



6.15.3.3 `exists()`

```
bool cl::fs::File::exists() const [noexcept]
```

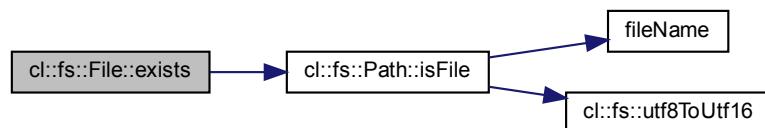
Determines if this file exists.

Returns

true if the file exists; otherwise false.

Definition at line 23 of file file.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:



6.15.3.4 moveTo()

```
bool cl::fs::File::moveTo (
    const Path & newPath )
```

Moves this file in the filesystem.

Parameters

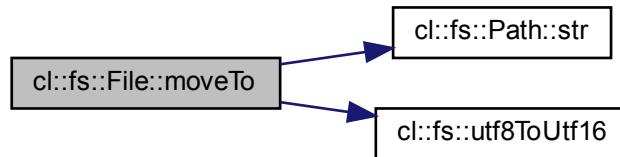
<i>newPath</i>	The path to move this file to.
----------------	--------------------------------

Returns

true if the file was successfully moved to newPath; otherwise false.

Definition at line 100 of file file.cpp.

Here is the call graph for this function:



6.15.3.5 path()

```
const Path & cl::fs::File::path() const [noexcept]
```

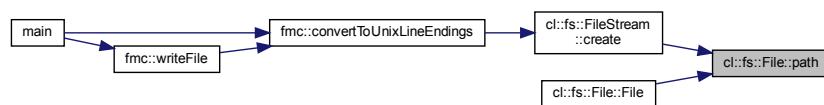
Read accessor for the path of this file.

Returns

The path of this file.

Definition at line 169 of file file.cpp.

Here is the caller graph for this function:



6.15.3.6 remove()

```
bool cl::fs::File::remove() [noexcept]
```

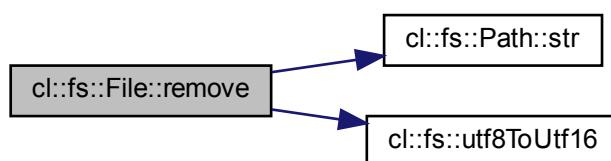
Deletes this file.

Returns

true if deleting succeeded; otherwise false.

Definition at line 117 of file file.cpp.

Here is the call graph for this function:



6.15.3.7 size()

```
std::int64_t cl::fs::File::size() const [noexcept]
```

Determines the size of this file in bytes.

Returns

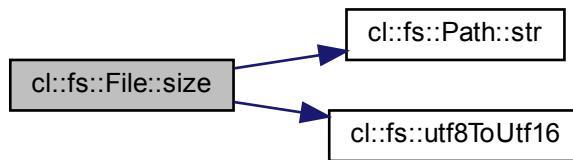
The size of this file in bytes or -1 on error.

Warning

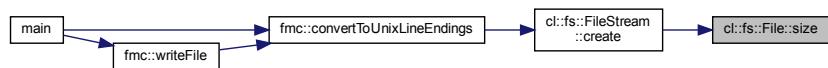
Returns -1 on error.

Definition at line 128 of file file.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:



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

- csv_lib/include/cl/fs/file.hpp
- csv_lib/src/cl/fs/file.cpp

6.16 cl::fs::FileStream Class Reference

A binary file stream.

```
#include <file_stream.hpp>
```

Public Types

- enum `OpenMode` : `std::uint8_t` { `Read` = 0b0000'0001, `Write` = 0b0000'0010, `ReadWrite` = `Read` | `Write` }
The file open mode.
- using `this_type` = `FileStream`

Public Member Functions

- `PL_NONCOPYABLE (FileStream)`
- `FileStream (this_type &&other) noexcept`
Move constructs from other.
- `this_type & operator= (this_type &&other) noexcept`
Move assigns other to this file stream.
- `~FileStream ()`
Closes this file stream.
- bool `write (const void *data, std::size_t byteCount)`
Writes data to the file.
- `std::vector< pl::byte > readAll () const`
Reads the entire file into RAM.

Static Public Member Functions

- static `Expected< FileStream > create (const File &file, OpenMode openMode)`
Creates a file stream.

6.16.1 Detailed Description

A binary file stream.

Definition at line 19 of file `file_stream.hpp`.

6.16.2 Member Typedef Documentation

6.16.2.1 `this_type`

```
using cl::fs::FileStream::this_type = FileStream
```

Definition at line 30 of file `file_stream.hpp`.

6.16.3 Member Enumeration Documentation

6.16.3.1 `OpenMode`

```
enum cl::fs::FileStream::OpenMode : std::uint8_t
```

The file open mode.

Enumerator

Read	Read only access
Write	Write only access
ReadWrite	Read and write access

Definition at line 24 of file file_stream.hpp.

6.16.4 Constructor & Destructor Documentation

6.16.4.1 FileStream()

```
cl::fs::FileStream::FileStream (
    this_type && other ) [noexcept]
```

Move constructs from *other*.

Parameters

<i>other</i>	The file stream to move construct from.
--------------	---

Definition at line 70 of file file_stream.cpp.

6.16.4.2 ~FileStream()

```
cl::fs::FileStream::~FileStream ( )
```

Closes this file stream.

Definition at line 84 of file file_stream.cpp.

6.16.5 Member Function Documentation

6.16.5.1 create()

```
Expected< FileStream > cl::fs::FileStream::create (
    const File & file,
    OpenMode openMode ) [static]
```

Creates a file stream.

Parameters

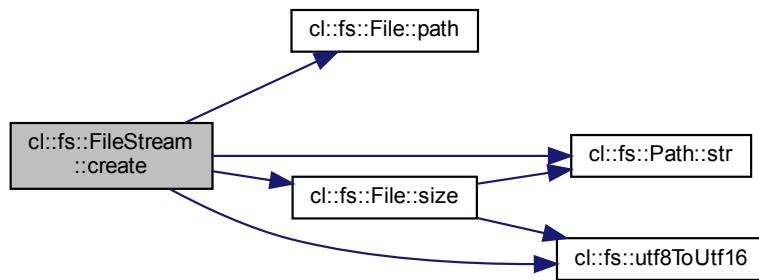
<i>file</i>	The file to open.
<i>openMode</i>	The open mode to use.

Returns

The file stream or an error.

Definition at line 36 of file `file_stream.cpp`.

Here is the call graph for this function:



Here is the caller graph for this function:

**6.16.5.2 operator=()**

```
FileStream & cl::fs::FileStream::operator= (
    this_type && other ) [noexcept]
```

Move assigns `other` to this file stream.

Parameters

<i>other</i>	The file stream to move assign to this file stream.
--------------	---

Returns`*this`

Definition at line 77 of file `file_stream.cpp`.

6.16.5.3 PL_NOCOPYABLE()

```
cl::fs::FileStream::PL_NOCOPYABLE (
    FileStream )
```

6.16.5.4 readAll()

```
std::vector< pl::byte > cl::fs::FileStream::readAll ( ) const
```

Reads the entire file into RAM.

Returns

The bytes read.

Definition at line 103 of file `file_stream.cpp`.

6.16.5.5 write()

```
bool cl::fs::FileStream::write (
    const void * data,
    std::size_t byteCount )
```

Writes data to the file.

Parameters

<code>data</code>	Pointer to the beginning of the memory region to write.
<code>byteCount</code>	The amount of bytes to write, starting from <code>data</code> .

Returns

true on success; otherwise false.

Definition at line 96 of file `file_stream.cpp`.

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

- [csv_lib/include/cl/fs/file_stream.hpp](#)
- [csv_lib/src/cl/fs/file_stream.cpp](#)

6.17 std::hash<::cl::fs::Path> Struct Reference

```
#include <path.hpp>
```

Public Member Functions

- size_t [operator\(\)](#) (const ::cl::fs::Path &path) const

6.17.1 Detailed Description

Definition at line 90 of file path.hpp.

6.17.2 Member Function Documentation

6.17.2.1 operator()()

```
size_t std::hash<::cl::fs::Path>::operator() (
    const ::cl::fs::Path & path ) const [inline]
```

Definition at line 91 of file path.hpp.

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

- csv_lib/include/cl/fs/[path.hpp](#)

6.18 std::hash<::cm::Configuration> Struct Reference

```
#include <configuration.hpp>
```

Public Member Functions

- size_t [operator\(\)](#) (const ::cm::Configuration &configuration) const

6.18.1 Detailed Description

Definition at line 299 of file configuration.hpp.

6.18.2 Member Function Documentation

6.18.2.1 operator()

```
size_t std::hash<::cm::Configuration>::operator() (
    const ::cm::Configuration & configuration) const [inline]
```

Definition at line 300 of file configuration.hpp.

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

- confusion_matrix/include/configuration.hpp

6.19 cs::LogInfo Class Reference

Information about a log file.

```
#include <log_info.hpp>
```

Public Member Functions

- [LogInfo \(\)](#)
Creates an uninitialized LogInfo.
- [const cl::fs::Path & logFilePath \(\) const noexcept](#)
Read accessor for the log file path.
- [bool skipWindow \(\) const noexcept](#)
Read accessor for the skip window option.
- [bool deleteTooClose \(\) const noexcept](#)
Read accessor for the delete too close option.
- [bool deleteLowVariance \(\) const noexcept](#)
Read accessor for the delete low variance option.
- [SegmentationKind segmentationKind \(\) const noexcept](#)
Read accessor for the segmentation kind.
- [std::uint64_t windowSize \(\) const noexcept](#)
Read accessor for the window size.
- [FilterKind filterKind \(\) const noexcept](#)
Read accessor for the filter kind.
- [std::uint64_t sensor \(\) const noexcept](#)
Read accessor for the sensor.
- [bool isInitialized \(\) const noexcept](#)
Checks whether this LogInfo is initialized.

Static Public Member Functions

- [static cl::Expected< LogInfo > create \(cl::fs::Path logFilePath\) noexcept](#)
Creates a LogInfo from the given log file path.

Static Public Attributes

- [static const std::uint64_t invalidSensor = UINT64_C\(0xFFFFFFFFFFFFFF\)](#)
Represents an invalid sensor.

Friends

- bool `operator==` (const `LogInfo` &lhs, const `LogInfo` &rhs) noexcept
Compares two LogInfos for equality.
- bool `operator!=` (const `LogInfo` &lhs, const `LogInfo` &rhs) noexcept
Compares two LogInfos for inequality.
- std::ostream & `operator<<` (std::ostream &os, const `LogInfo` &logInfo)
Prints a LogInfo to an ostream.

6.19.1 Detailed Description

Information about a log file.

Information about a log file that is extracted from the log file name.

Definition at line 20 of file `log_info.hpp`.

6.19.2 Constructor & Destructor Documentation

6.19.2.1 `LogInfo()`

```
cs::LogInfo::LogInfo ( )
```

Creates an uninitialized `LogInfo`.

Warning

Should only be used in order to be assigned with an initialized `LogInfo`; otherwise use the `create` static member function.

Definition at line 304 of file `log_info.cpp`.

6.19.3 Member Function Documentation

6.19.3.1 `create()`

```
cl::Expected< LogInfo > cs::LogInfo::create (
    cl::fs::Path filePath ) [static], [noexcept]
```

Creates a `LogInfo` from the given log file path.

Parameters

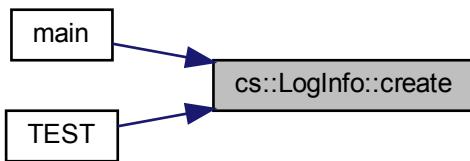
<i>logFilePath</i>	The log file path to create a LogInfo from.
--------------------	---

Returns

The [LogInfo](#) created or an error.

Definition at line 90 of file `log_info.cpp`.

Here is the caller graph for this function:



6.19.3.2 deleteLowVariance()

```
bool cs::LogInfo::deleteLowVariance( ) const [noexcept]
```

Read accessor for the delete low variance option.

Returns

true if delete low variance is active; false otherwise.

Definition at line 326 of file `log_info.cpp`.

6.19.3.3 deleteTooClose()

```
bool cs::LogInfo::deleteTooClose( ) const [noexcept]
```

Read accessor for the delete too close option.

Returns

true if delete too close is active; false otherwise.

Definition at line 324 of file `log_info.cpp`.

6.19.3.4 filterKind()

```
FilterKind cs::LogInfo::filterKind () const [noexcept]
```

Read accessor for the filter kind.

Returns

The filter kind.

Definition at line 335 of file log_info.cpp.

6.19.3.5 isInitialized()

```
bool cs::LogInfo::isInitialized () const [noexcept]
```

Checks whether this [LogInfo](#) is initialized.

Returns

true if this [LogInfo](#) is initialized; false otherwise.

Note

Will return true if this [LogInfo](#) was created with the create static member function.

Definition at line 339 of file log_info.cpp.

6.19.3.6 logFilePath()

```
const cl::fs::Path & cs::LogInfo::logFilePath () const [noexcept]
```

Read accessor for the log file path.

Returns

The log file path.

Definition at line 317 of file log_info.cpp.

Here is the caller graph for this function:



6.19.3.7 segmentationKind()

```
SegmentationKind cs::LogInfo::segmentationKind () const [noexcept]
```

Read accessor for the segmentation kind.

Returns

The segmentation kind.

Definition at line 328 of file log_info.cpp.

6.19.3.8 sensor()

```
std::uint64_t cs::LogInfo::sensor () const [noexcept]
```

Read accessor for the sensor.

Returns

The sensor.

Note

Will be the invalid sensor unless the log file is old.

Definition at line 337 of file log_info.cpp.

6.19.3.9 skipWindow()

```
bool cs::LogInfo::skipWindow () const [noexcept]
```

Read accessor for the skip window option.

Returns

true if skip window is active; false otherwise.

Definition at line 322 of file log_info.cpp.

6.19.3.10 `windowSize()`

```
std::uint64_t cs::LogInfo::windowSize ( ) const [noexcept]
```

Read accessor for the window size.

Returns

The window size.

Definition at line 333 of file log_info.cpp.

6.19.4 Friends And Related Function Documentation

6.19.4.1 `operator"!=`

```
bool operator!= (
    const LogInfo & lhs,
    const LogInfo & rhs ) [friend]
```

Compares two LogInfos for inequality.

Parameters

<i>lhs</i>	The left hand side operand.
<i>rhs</i>	The right hand side operand.

Returns

true if *lhs* and *rhs* are considered not equal; otherwise false.

Definition at line 287 of file log_info.cpp.

6.19.4.2 `operator<<`

```
std::ostream& operator<< (
    std::ostream & os,
    const LogInfo & logInfo ) [friend]
```

Prints a [LogInfo](#) to an ostream.

Parameters

<i>os</i>	The ostream to print to.
<i>logInfo</i>	The LogInfo to print.

Returns

```
os
```

Definition at line 292 of file log_info.cpp.

6.19.4.3 operator==

```
bool operator== (
    const LogInfo & lhs,
    const LogInfo & rhs ) [friend]
```

Compares two LogInfos for equality.

Parameters

<i>lhs</i>	The left hand side operand.
<i>rhs</i>	The right hand side operand.

Returns

true if *lhs* and *rhs* are considered equal; otherwise false.

Definition at line 264 of file log_info.cpp.

6.19.5 Member Data Documentation**6.19.5.1 invalidSensor**

```
const std::uint64_t cs::LogInfo::invalidSensor = UINT64_C(0xFFFFFFFFFFFFFF) [static]
```

Represents an invalid sensor.

Definition at line 25 of file log_info.hpp.

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

- compare_segmentation/include/[log_info.hpp](#)
- compare_segmentation/src/[log_info.cpp](#)

6.20 cs::LogLine Class Reference

A line out of a log file.

```
#include <log_line.hpp>
```

Public Member Functions

- std::uint64_t `segmentationPointCount () const noexcept`
Read accessor for the segmentation point count.
- const `cl::fs::Path & filePath () const noexcept`
Read accessor for the file path.
- `cl::Expected< std::string > fileName () const`
Creates the short file name for the file in the log line.
- std::uint64_t `sensor () const noexcept`
Read accessor for the sensor.

Static Public Member Functions

- static `cl::Expected< LogLine > parse (const std::string &line)`
Parses a `LogLine` out of a line of text read from a log file.

Static Public Attributes

- static const std::uint64_t `invalidSensor = UINT64_C(0xFFFFFFFFFFFFFF)`
Indicates an invalid sensor.

6.20.1 Detailed Description

A line out of a log file.

Definition at line 14 of file `log_line.hpp`.

6.20.2 Member Function Documentation

6.20.2.1 `fileName()`

`cl::Expected< std::string > cs::LogLine::fileName () const`

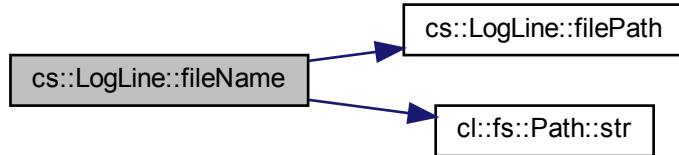
Creates the short file name for the file in the log line.

Returns

The resulting short file name or an error.

Definition at line 126 of file log_line.cpp.

Here is the call graph for this function:



6.20.2.2 filePath()

```
const cl::fs::Path & cs::LogLine::filePath ( ) const [noexcept]
```

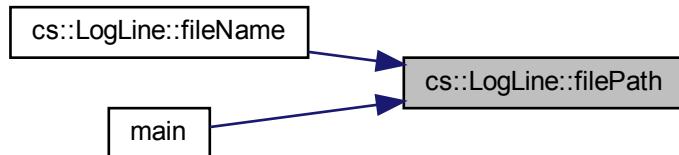
Read accessor for the file path.

Returns

The file path of the file in the log line.

Definition at line 124 of file log_line.cpp.

Here is the caller graph for this function:



6.20.2.3 parse()

```
cl::Expected< LogLine > cs::LogLine::parse (const std::string & line) [static]
```

Parses a [LogLine](#) out of a line of text read from a log file.

Parameters

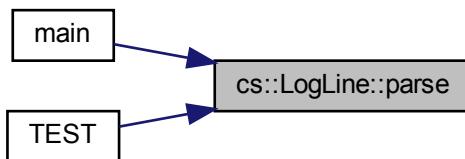
<i>line</i>	The line read.
-------------	----------------

Returns

The resulting [LogLine](#) or an error.

Definition at line 31 of file log_line.cpp.

Here is the caller graph for this function:

**6.20.2.4 segmentationPointCount()**

```
std::uint64_t cs::LogLine::segmentationPointCount ( ) const [noexcept]
```

Read accessor for the segmentation point count.

Returns

The segmentation point count.

Definition at line 119 of file log_line.cpp.

6.20.2.5 sensor()

```
std::uint64_t cs::LogLine::sensor ( ) const [noexcept]
```

Read acccessor for the sensor.

Returns

The sensor.

Note

Will only return a valid sensor if the [LogLine](#) is for a preprocessed file.

Definition at line 164 of file log_line.cpp.

6.20.3 Member Data Documentation

6.20.3.1 invalidSensor

```
const std::uint64_t cs::LogLine::invalidSensor = UINT64_C(0xFFFFFFFFFFFFFF) [static]
```

Indicates an invalid sensor.

Definition at line 19 of file log_line.hpp.

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

- compare_segmentation/include/[log_line.hpp](#)
- compare_segmentation/src/[log_line.cpp](#)

6.21 cm::ManualSegmentationPoint Class Reference

Type used to represent a manual segmentation point.

```
#include <manual_segmentation_point.hpp>
```

Public Member Functions

- [ManualSegmentationPoint](#) (std::uint32_t **hour**, std::uint32_t **minute**, std::uint32_t **second**, std::uint32_t **frame**)
Creates a ManualSegmentationPoint.
- std::uint32_t **hour** () const noexcept
Read accessor for the hour property.
- std::uint32_t **minute** () const noexcept
Read accessor for the minute property.
- std::uint32_t **second** () const noexcept
Read accessor for the second property.
- std::uint32_t **frame** () const noexcept
Read accessor for the frame property.
- std::uint64_t **asMilliseconds** () const noexcept
Converts this manual segmentation point into a millisecond representation.

Static Public Member Functions

- static std::unordered_map< [DataSetIdentifier](#), std::vector< [ManualSegmentationPoint](#) > > [readCsvFile](#) ()
Reads the CSV file of the manual segmentation points.
- static std::unordered_map< [DataSetIdentifier](#), std::vector< std::uint64_t > > [convertToHardwareTimestamps](#) (const std::unordered_map< [DataSetIdentifier](#), std::vector< [ManualSegmentationPoint](#) >> &[manualSegmentationPoints](#), const std::unordered_map< [cl::fs::Path](#), std::vector< std::uint64_t >> &[pythonResult](#))
Converts manualSegmentationPoints imported from the CSV file to hardware timestamps.

Friends

- bool `operator==` (const `ManualSegmentationPoint` &lhs, const `ManualSegmentationPoint` &rhs) noexcept
Compares two manual segmentation points for equality.
- bool `operator!=` (const `ManualSegmentationPoint` &lhs, const `ManualSegmentationPoint` &rhs) noexcept
Compares two manual segmentation points for inequality.
- std::ostream & `operator<<` (std::ostream &os, const `ManualSegmentationPoint` &manualSegmentationPoint)
Prints manualSegmentationPoint to os.

6.21.1 Detailed Description

Type used to represent a manual segmentation point.

Definition at line 17 of file `manual_segmentation_point.hpp`.

6.21.2 Constructor & Destructor Documentation

6.21.2.1 `ManualSegmentationPoint()`

```
cm::ManualSegmentationPoint::ManualSegmentationPoint (
    std::uint32_t hour,
    std::uint32_t minute,
    std::uint32_t second,
    std::uint32_t frame )
```

Creates a `ManualSegmentationPoint`.

Parameters

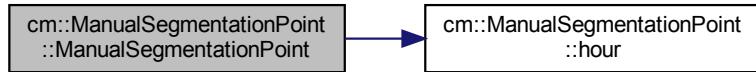
<code>hour</code>	The hour to use. Must be within [0,59].
<code>minute</code>	The minute to use. Must be within [0,59].
<code>second</code>	The second to use. Must be within [0,59].
<code>frame</code>	The frame to use. Must be within [0,29].

Exceptions

<code>cl::Exception</code>	if one of the arguments is out of bounds.
----------------------------	---

Definition at line 415 of file `manual_segmentation_point.cpp`.

Here is the call graph for this function:



6.21.3 Member Function Documentation

6.21.3.1 asMilliseconds()

```
std::uint64_t cm::ManualSegmentationPoint::asMilliseconds( ) const [noexcept]
```

Converts this manual segmentation point into a millisecond representation.

Returns

This manual segmentation point converted to milliseconds.

Definition at line 473 of file manual_segmentation_point.cpp.

6.21.3.2 convertToHardwareTimestamps()

```
std::unordered_map< DataSetIdentifier, std::vector< std::uint64_t > > cm::ManualSegmentationPoint::convertToHardwareTimestamps(
    const std::unordered_map< DataSetIdentifier, std::vector< ManualSegmentationPoint >> & manualSegmentationPoints,
    const std::unordered_map< cl::fs::Path, std::vector< std::uint64_t >> & pythonResult ) [static]
```

Converts `manualSegmentationPoints` imported from the CSV file to hardware timestamps.

Parameters

<code>manualSegmentationPoints</code>	The manual segmentation points that were read from the CSV file.
<code>pythonResult</code>	The result from Python of a (good) Configuration to use for the first segmentation point in order to convert the manual segmentation points to ones that are based on hardware timestamps.

Returns

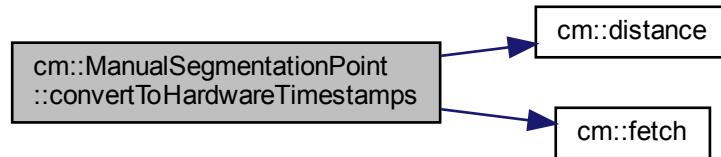
The resulting hardware timestamp based manual segmentation points.

Exceptions

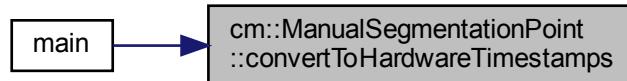
cl::Exception on error.

Definition at line 359 of file manual_segmentation_point.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:



6.21.3.3 frame()

```
std::uint32_t cm::ManualSegmentationPoint::frame( ) const [noexcept]
```

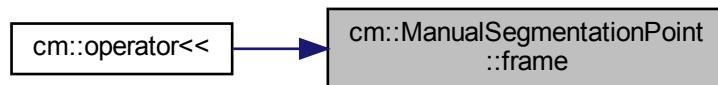
Read accessor for the frame property.

Returns

The frame within the second of this manual segmentation point.

Definition at line 468 of file manual_segmentation_point.cpp.

Here is the caller graph for this function:



6.21.3.4 hour()

```
std::uint32_t cm::ManualSegmentationPoint::hour( ) const [noexcept]
```

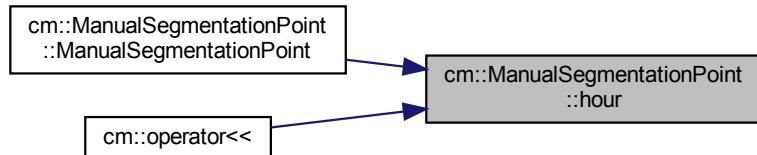
Read accessor for the hour property.

Returns

The hour.

Definition at line 456 of file manual_segmentation_point.cpp.

Here is the caller graph for this function:



6.21.3.5 minute()

```
std::uint32_t cm::ManualSegmentationPoint::minute ( ) const [noexcept]
```

Read accessor for the minute property.

Returns

The minute.

Definition at line 458 of file manual_segmentation_point.cpp.

Here is the caller graph for this function:



6.21.3.6 readCsvFile()

```
std::unordered_map< DataSetIdentifier, std::vector< ManualSegmentationPoint > > cm::ManualSegmentationPoint::readCsvFile ( ) [static]
```

Reads the CSV file of the manual segmentation points.

Returns

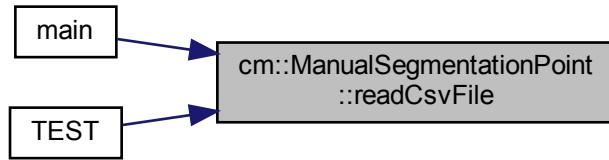
A map that maps the `DataSetIdentifier` enumerators to vectors of the corresponding manual segmentation points extracted from the CSV file.

Exceptions

<code>cl::Exception</code>	if parsing fails, CSV processing fails or the CSV file is missing.
----------------------------	--

Definition at line 209 of file manual_segmentation_point.cpp.

Here is the caller graph for this function:



6.21.3.7 second()

```
std::uint32_t cm::ManualSegmentationPoint::second() const [noexcept]
```

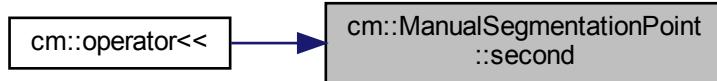
Read accessor for the second property.

Returns

The second.

Definition at line 463 of file manual_segmentation_point.cpp.

Here is the caller graph for this function:



6.21.4 Friends And Related Function Documentation

6.21.4.1 operator"!=

```
bool operator!=(
    const ManualSegmentationPoint & lhs,
    const ManualSegmentationPoint & rhs) [friend]
```

Compares two manual segmentation points for inequality.

Parameters

<i>lhs</i>	The first operand.
<i>rhs</i>	The second operand.

Returns

true if *lhs* is considered not equal to *rhs*; false otherwise.

Definition at line 187 of file manual_segmentation_point.cpp.

6.21.4.2 operator<<

```
std::ostream& operator<< (
    std::ostream & os,
    const ManualSegmentationPoint & manualSegmentationPoint ) [friend]
```

Prints *manualSegmentationPoint* to *os*.

Parameters

<i>os</i>	The ostream to print to
<i>manualSegmentationPoint</i>	The <i>ManualSegmentationPoint</i> to print.

Returns

os

Definition at line 194 of file manual_segmentation_point.cpp.

6.21.4.3 operator==

```
bool operator== (
    const ManualSegmentationPoint & lhs,
    const ManualSegmentationPoint & rhs ) [friend]
```

Compares two manual segmentation points for equality.

Parameters

<i>lhs</i>	The first operand.
<i>rhs</i>	The second operand.

Returns

true if `lhs` is considered equal to `rhs`; false otherwise.

Definition at line 179 of file manual_segmentation_point.cpp.

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

- confusion_matrix/include/manual_segmentation_point.hpp
- confusion_matrix/src/manual_segmentation_point.cpp

6.22 cl::fs::Path Class Reference

A filesystem path.

```
#include <path.hpp>
```

Public Member Functions

- [Path \(\)](#)
Default constructs an (empty) path.
- [PL_IMPLICIT Path \(std::string path\)](#)
Creates a path.
- [PL_IMPLICIT Path \(const char *path\)](#)
Creates a path.
- [bool exists \(\) const noexcept](#)
Checks if the path exists.
- [bool isFile \(\) const noexcept](#)
Checks if the path is a file.
- [bool isDirectory \(\) const noexcept](#)
Checks if the path is a directory.
- [const std::string & str \(\) const noexcept](#)
Read accessor for the underlying string.

Friends

- [std::ostream & operator<< \(std::ostream &os, const Path &path\)](#)
Prints a `Path` to an ostream.
- [bool operator< \(const Path &lhs, const Path &rhs\) noexcept](#)
Checks if `lhs` is less than `rhs`.
- [bool operator== \(const Path &lhs, const Path &rhs\) noexcept](#)
Equality compares `lhs` and `rhs`.

6.22.1 Detailed Description

A filesystem path.

Definition at line 14 of file path.hpp.

6.22.2 Constructor & Destructor Documentation

6.22.2.1 Path() [1/3]

```
cl::fs::Path::Path ( )
```

Default constructs an (empty) path.

Definition at line 37 of file path.cpp.

6.22.2.2 Path() [2/3]

```
cl::fs::Path::Path ( std::string path )
```

Creates a path.

Parameters

<i>path</i>	The string to construct from.
-------------	-------------------------------

Definition at line 39 of file path.cpp.

6.22.2.3 Path() [3/3]

```
cl::fs::Path::Path ( const char * path )
```

Creates a path.

Parameters

<i>path</i>	The string to construct from.
-------------	-------------------------------

Definition at line 46 of file path.cpp.

6.22.3 Member Function Documentation

6.22.3.1 exists()

```
bool cl::fs::Path::exists () const [noexcept]
```

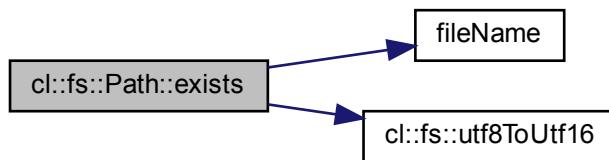
Checks if the path exists.

Returns

true if the path exists; otherwise false.

Definition at line 48 of file path.cpp.

Here is the call graph for this function:



6.22.3.2 isDirectory()

```
bool cl::fs::Path::isDirectory () const [noexcept]
```

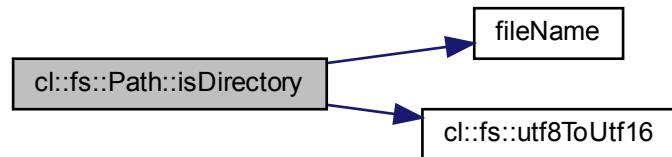
Checks if the path is a directory.

Returns

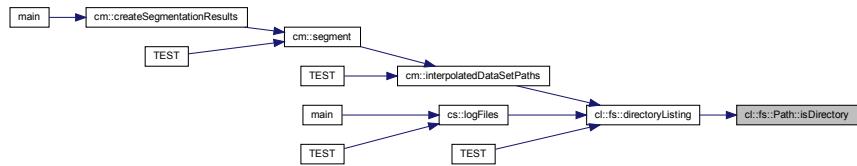
true if the path is a directory; otherwise false.

Definition at line 104 of file path.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:



6.22.3.3 `isFile()`

```
bool cl::fs::Path::isFile ( ) const [noexcept]
```

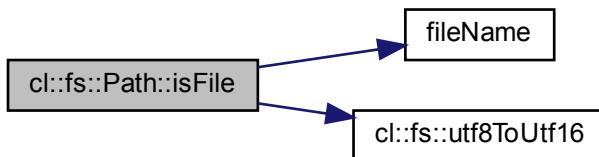
Checks if the path is a file.

Returns

true if the path is a file; otherwise false.

Definition at line 77 of file path.cpp.

Here is the call graph for this function:



Here is the caller graph for this function:



6.22.3.4 str()

```
const std::string & cl::fs::Path::str() const [noexcept]
```

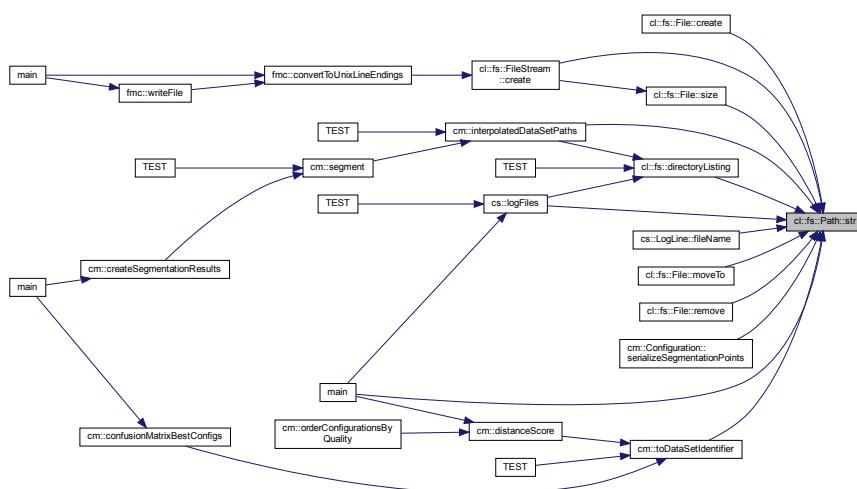
Read accessor for the underlying string.

Returns

The underlying string.

Definition at line 127 of file path.cpp.

Here is the caller graph for this function:



6.22.4 Friends And Related Function Documentation

6.22.4.1 operator<

```
bool operator< (
    const Path & lhs,
    const Path & rhs ) [friend]
```

Checks if `lhs` is less than `rhs`.

Parameters

<code>lhs</code>	The left hand side operand.
<code>rhs</code>	The right hand side operand.

Returns

true if lhs < rhs; otherwise false.

Definition at line 27 of file path.cpp.

6.22.4.2 operator<<

```
std::ostream& operator<< (
    std::ostream & os,
    const Path & path ) [friend]
```

Prints a [Path](#) to an ostream.

Parameters

<i>os</i>	the ostream to print to.
<i>path</i>	The path to print.

Returns

os

Definition at line 22 of file path.cpp.

6.22.4.3 operator==

```
bool operator== (
    const Path & lhs,
    const Path & rhs ) [friend]
```

Equality compares lhs and rhs.

Parameters

<i>lhs</i>	The left hand side operand.
<i>rhs</i>	The right hand side operand.

Returns

true if lhs and rhs are equal.

Definition at line 32 of file path.cpp.

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

- [csv_lib/include/cl/fs/path.hpp](#)
- [csv_lib/src/cl/fs/path.cpp](#)

6.23 cl::Process Class Reference

```
#include <process.hpp>
```

Public Types

- using `this_type = Process`

Public Member Functions

- `PL_NONCOPYABLE (Process)`
- `Process (this_type &&other) noexcept`
- `this_type & operator= (this_type &&other) noexcept`
- `~Process ()`
- `std::FILE * file () noexcept`
- `const std::FILE * file () const noexcept`

Static Public Member Functions

- static `Expected< Process > create (pl::string_view command, pl::string_view mode)`

6.23.1 Detailed Description

Definition at line 11 of file process.hpp.

6.23.2 Member Typedef Documentation

6.23.2.1 this_type

```
using cl::Process::this_type = Process
```

Definition at line 15 of file process.hpp.

6.23.3 Constructor & Destructor Documentation

6.23.3.1 Process()

```
cl::Process::Process (
    this_type && other ) [noexcept]
```

Definition at line 56 of file process.cpp.

6.23.3.2 ~Process()

```
cl::Process::~Process ( )
```

Definition at line 69 of file process.cpp.

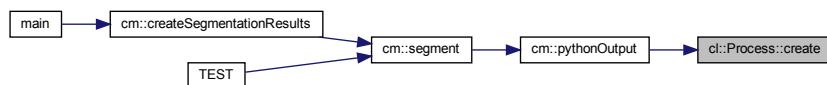
6.23.4 Member Function Documentation

6.23.4.1 create()

```
Expected< Process > cl::Process::create (
    pl::string_view command,
    pl::string_view mode ) [static]
```

Definition at line 36 of file process.cpp.

Here is the caller graph for this function:



6.23.4.2 file() [1/2]

```
const std::FILE* cl::Process::file ( ) const [noexcept]
```

6.23.4.3 file() [2/2]

```
const std::FILE * cl::Process::file ( ) [noexcept]
```

Definition at line 79 of file process.cpp.

6.23.4.4 operator=()

```
Process & cl::Process::operator= (
    this_type && other ) [noexcept]
```

Definition at line 61 of file process.cpp.

6.23.4.5 PL_NONCOPYABLE()

```
cl::Process::PL_NONCOPYABLE (
    Process )
```

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

- csv_lib/include/cl/process.hpp
- csv_lib/src/cl/process.cpp

Chapter 7

File Documentation

7.1 compare_segmentation/CMakeLists.txt File Reference

Functions

- `set (LIB_NAME compare_segmentation_lib) set(LIB_HEADERS include/csv_line.hpp include/data_set_info.hpp include/filter_kind.hpp include/log_files.hpp include/log_info.hpp include/log_line.hpp include/paths.hpp include/segmentation_kind.hpp) set(LIB_SOURCES src/csv_line.cpp src/data_set_info.cpp src/filter_kind.cpp src/log_files.cpp src/log_info.cpp src/log_line.cpp src/segmentation_kind.cpp) add_library($`

7.1.1 Function Documentation

7.1.1.1 set()

```
set (
    LIB_NAME compare_segmentation_lib )
```

Definition at line 2 of file CMakeLists.txt.

7.2 compare_segmentation/test/CMakeLists.txt File Reference

Functions

- `include (GoogleTest) set(TEST_NAME compare_segmentation_test) set(TEST_SOURCES csv_line_test.cpp data_set_info_test.cpp log_files_test.cpp log_info_test.cpp log_line_test.cpp main.cpp) add_executable($`

7.2.1 Function Documentation

7.2.1.1 include()

```
include (
    GoogleTest    )
```

Definition at line 1 of file CMakeLists.txt.

7.3 counting/CMakeLists.txt File Reference

Functions

- `set (LIB_NAME counting_lib) set(LIB_HEADERS include/above_threshold.hpp include/average_← comparison_value_calculator.hpp include/half_maximum_comparison_value_calculator.hpp include/is_← relevant.hpp include/percentage_of.hpp include/run_above_threshold.hpp) set(LIB_SOURCES src/above← _threshold.cpp src/average_comparison_value_calculator.cpp src/half_maximum_comparison_value← calculator.cpp src/run_above_threshold.cpp) add_library($`

7.3.1 Function Documentation

7.3.1.1 set()

```
set (
    LIB_NAME counting_lib )
```

Definition at line 2 of file CMakeLists.txt.

7.4 counting/test/CMakeLists.txt File Reference

Functions

- `include (GoogleTest) set(TEST_NAME counting_test) set(TEST_SOURCES above_threshold_test.cpp main.cpp percentage_of_test.cpp) add_executable($`

7.4.1 Function Documentation

7.4.1.1 include()

```
include (
    GoogleTest    )
```

Definition at line 1 of file CMakeLists.txt.

7.5 csv_lib/CMakeLists.txt File Reference

Functions

- `set (LIB_NAME csv_lib) set(LIB_HEADERS include/cl/fs/directory_listing.hpp include/cl/fs/file.hpp include/cl/fs/file_stream.hpp include/cl/fs/path.hpp include/cl/fs/sePARATOR.hpp include/cl/fs/windows.hpp include/cl/channel.hpp include/cl/column.hpp include/cl/data_point.hpp include/cl/data_set.hpp include/cl/dos2unix.hpp include/cl/error.hpp include/cl/exception.hpp include/cl/process.hpp include/cl/read_csv_file.hpp include/cl/s2n.hpp include/cl/sensor.hpp include/cl/to_string.hpp include/cl/use_unbuffered_io.hpp) set(LIB_SOURCES src/cl/fs/directory_listing.cpp src/cl/fs/file.cpp src/cl/fs/file_stream.cpp src/cl/fs/path.cpp src/cl/fs/windows.cpp src/cl/channel.cpp src/cl/data_point.cpp src/cl/data_set.cpp src/cl/dos2unix.cpp src/cl/error.cpp src/cl/exception.cpp src/cl/process.cpp src/cl/read_csv_file.cpp src/cl/sensor.cpp src/cl/use_unbuffered_io.cpp) add_library($`

7.5.1 Function Documentation

7.5.1.1 set()

```
set (  
    LIB_NAME csv_lib )
```

Definition at line 2 of file CMakeLists.txt.

7.6 csv_lib/test/CMakeLists.txt File Reference

Functions

- `include (GoogleTest) set(TEST_NAME csv_lib_test) set(TEST_SOURCES channel_test.cpp column_test.cpp data_point_test.cpp directory_listing_test.cpp error_test.cpp exception_test.cpp main.cpp sensor_test.cpp to_string_test.cpp read_csv_file_test.cpp data_set_test.cpp s2n_test.cpp) add_executable($`

7.6.1 Function Documentation

7.6.1.1 include()

```
include (  
    GoogleTest )
```

Definition at line 1 of file CMakeLists.txt.

7.7 fix_csv/CMakeLists.txt File Reference

Functions

- `set (LIB_NAME fix_mogasens_csv_lib) set(LIB_HEADERS include/adjust_hardware_timestamp.hpp include/convert_to_unix_line_endings.hpp include/create_backup_file.hpp include/delete_non_bosch_sensors.hpp include/delete_out_of_bounds_values.hpp include/remove_zeros_from_field.hpp include/restore_from_backup.hpp include/write_file.hpp) set(LIB_SOURCES src/adjust_hardware_timestamp.cpp src/convert_to_unix_line_endings.cpp src/create_backup_file.cpp src/delete_non_bosch_sensors.cpp src/delete_out_of_bounds_values.cpp src/remove_zeros_from_field.cpp src/restore_from_backup.cpp src/write_file.cpp) add_library($`

7.7.1 Function Documentation

7.7.1.1 `set()`

```
set (
    LIB_NAME fix_mogasens_csv_lib )
```

Definition at line 2 of file CMakeLists.txt.

7.8 fix_csv/test/CMakeLists.txt File Reference

Functions

- `include (GoogleTest) set(TEST_NAME fmc_test) set(TEST_SOURCES main.cpp remove_zeros_from_field_test.cpp adjust_hardware_timestamp_test.cpp) add_executable($`

7.8.1 Function Documentation

7.8.1.1 `include()`

```
include (
    GoogleTest )
```

Definition at line 1 of file CMakeLists.txt.

7.9 confusion_matrix/CMakeLists.txt File Reference

Functions

- `set (LIB_NAME confusion_matrix_lib) set(LIB_HEADERS include/closest_one.hpp include/configuration.hpp include/confusion_matrix.hpp include/confusion_matrix_best_configs.hpp include/create_segmentation_results.hpp include/csv_file_info.hpp include/data_set_identifier.hpp include/distance.hpp include/distance_score.hpp include/fetch.hpp include imu.hpp include/interpolated_data_set_paths.hpp include/manual_segmentation_point.hpp include/order_configurations_by_quality.hpp include/python_output.hpp include/segment.hpp include/split_string.hpp) set(LIB_SOURCES src/closest_one.cpp src/configuration.cpp src/confusion_matrix.cpp src/confusion_matrix_best_configs.cpp src/create_segmentation_results.cpp src/csv_file_info.cpp src/data_set_identifier.cpp src/distance.cpp src/distance_score.cpp src/imu.cpp src/interpolated_data_set_paths.cpp src/manual_segmentation_point.cpp src/order_configurations_by_quality.cpp src/python_output.cpp src/segment.cpp src/split_string.cpp) add_library($`

7.9.1 Function Documentation

7.9.1.1 set()

```
set (  
    LIB_NAME confusion_matrix_lib )
```

Definition at line 2 of file CMakeLists.txt.

7.10 confusion_matrix/test/CMakeLists.txt File Reference

Functions

- `include (GoogleTest) set(TEST_NAME confusion_matrix_test) set(TEST_SOURCES data_set_identifier_test.cpp interpolated_data_set_paths_test.cpp main.cpp manual_segmentation_point_test.cpp segment_test.cpp split_string_test.cpp) add_executable($`

7.10.1 Function Documentation

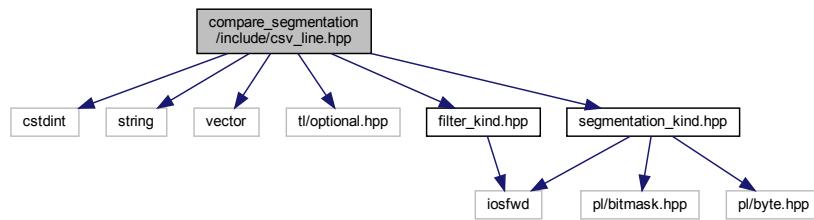
7.10.1.1 include()

```
include (  
    GoogleTest )
```

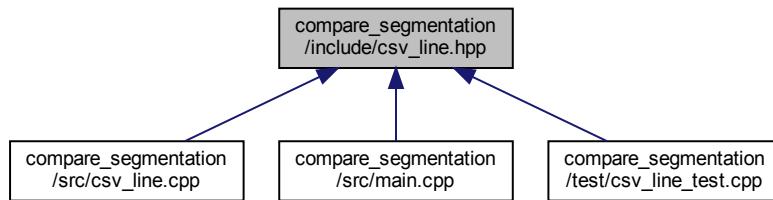
Definition at line 1 of file CMakeLists.txt.

7.11 compare_segmentation/include/csv_line.hpp File Reference

```
#include <cstdint>
#include <string>
#include <vector>
#include <tl/optional.hpp>
#include "filter_kind.hpp"
#include "segmentation_kind.hpp"
Include dependency graph for csv_line.hpp:
```



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



Classes

- class [cs::CsvLineBuilder](#)

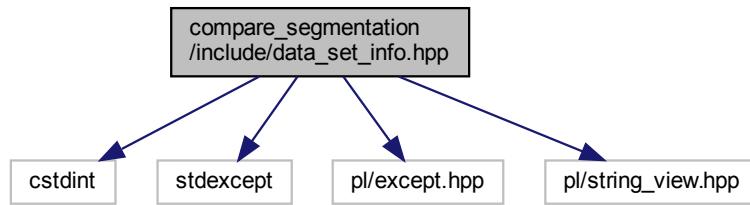
Builder for a CSV line.

Namespaces

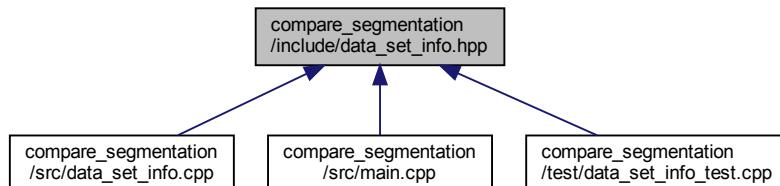
- [CS](#)

7.12 compare_segmentation/include/data_set_info.hpp File Reference

```
#include <cstdint>
#include <stdexcept>
#include <pl/except.hpp>
#include <pl/string_view.hpp>
Include dependency graph for data_set_info.hpp:
```



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



Classes

- struct `cs::data_set_info< Tag >`

Meta function for data set tags.

Namespaces

- `cs`

Macros

- `#define CS_SPECIALIZE_DATA_SET_INFO(tag, string, repetitionCount)`

Functions

- `cs::PL_DEFINE_EXCEPTION_TYPE` (NoSuchDataSetException, std::logic_error)
- `cs::CS_SPECIALIZE_DATA_SET_INFO` (Felix1, "11.17.39", 24)
- `cs::CS_SPECIALIZE_DATA_SET_INFO` (Felix2, "12.50.00", 20)
- `cs::CS_SPECIALIZE_DATA_SET_INFO` (Felix3, "13.00.09", 15)
- `cs::CS_SPECIALIZE_DATA_SET_INFO` (Marcelle1, "14.59.59", 10)
- `cs::CS_SPECIALIZE_DATA_SET_INFO` (Marcelle2, "15.13.22", 16)
- `cs::CS_SPECIALIZE_DATA_SET_INFO` (Marcelle3, "15.31.36", 18)
- `cs::CS_SPECIALIZE_DATA_SET_INFO` (Mike1, "14.07.33", 26)
- `cs::CS_SPECIALIZE_DATA_SET_INFO` (Mike2, "14.14.32", 22)
- `cs::CS_SPECIALIZE_DATA_SET_INFO` (Mike3, "14.20.28", 18)
- `cs::CS_SPECIALIZE_DATA_SET_INFO` (Andre1, "Andre_liegestuetzen1", 27)
- `cs::CS_SPECIALIZE_DATA_SET_INFO` (Andre2, "Andre_liegestuetzen2", 20)
- `cs::CS_SPECIALIZE_DATA_SET_INFO` (Andre3, "Andre_liegestuetzen3", 17)
- `cs::CS_SPECIALIZE_DATA_SET_INFO` (AndreSquats1, "Andre_Squats", 30)
- `cs::CS_SPECIALIZE_DATA_SET_INFO` (AndreSquats2, "Andre_Squats2", 49)
- `cs::CS_SPECIALIZE_DATA_SET_INFO` (Jan1, "Jan_liegestuetzen1", 25)
- `cs::CS_SPECIALIZE_DATA_SET_INFO` (Jan2, "Jan_liegestuetzen2", 19)
- `cs::CS_SPECIALIZE_DATA_SET_INFO` (Jan3, "Jan_liegestuetzen3", 13)
- `cs::CS_SPECIALIZE_DATA_SET_INFO` (Lucas1, "Lukas_liegestuetzen1", 24)
- `cs::CS_SPECIALIZE_DATA_SET_INFO` (Lucas2, "Lukas_liegestuetzen2", 19)
- `cs::CS_SPECIALIZE_DATA_SET_INFO` (Lucas3, "Lukas_liegestuetzen3", 11)
- `std::uint64_t cs::repetitionCount` (pl::string_view dataSet)

Fetches the repetition count for a given data set identified by its string.

7.12.1 Macro Definition Documentation

7.12.1.1 CS_SPECIALIZE_DATA_SET_INFO

```
#define CS_SPECIALIZE_DATA_SET_INFO( \
    tag, \
    string, \
    repetitionCount )
```

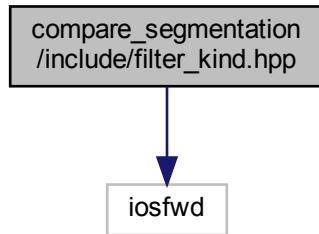
Value:

```
struct tag { \
}; \
constexpr bool contains##tag(pl::string_view other) \
{ \
    return other.contains(string); \
} \
template<> \
struct data_set_info<tag> { \
    static constexpr pl::string_view text      = string; \
    static constexpr std::uint64_t   repetitions = UINT64_C(repetitionCount); \
}
```

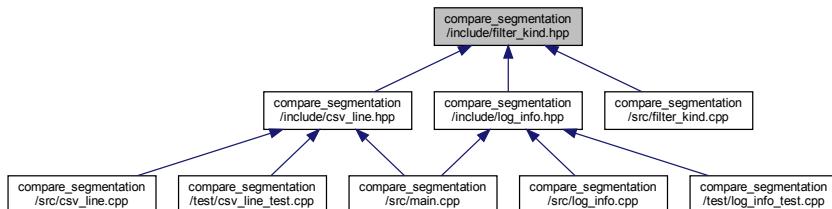
Definition at line 23 of file data_set_info.hpp.

7.13 compare_segmentation/include/filter_kind.hpp File Reference

```
#include <iostream>
Include dependency graph for filter_kind.hpp:
```



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



Namespaces

- `cs`

Enumerations

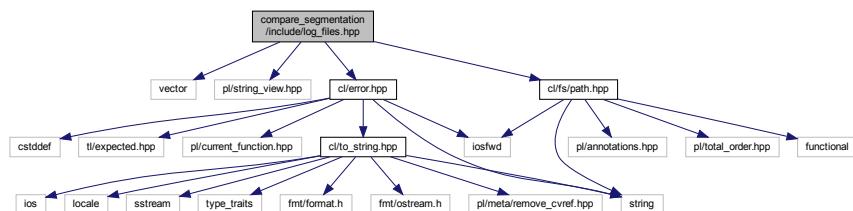
- enum `cs::FilterKind` { `cs::FilterKind::Butterworth`, `cs::FilterKind::MovingAverage` }
- Type for the different kinds of filters.*

Functions

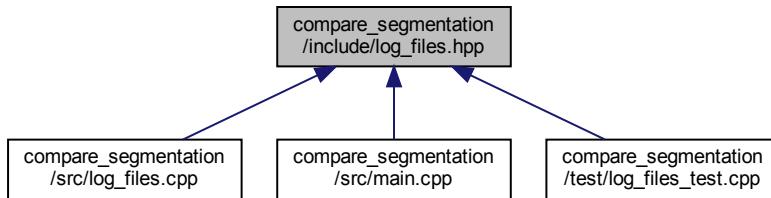
- `std::ostream & cs::operator<< (std::ostream &os, FilterKind filterKind)`
- Prints a FilterKind to an ostream.*

7.14 compare_segmentation/include/log_files.hpp File Reference

```
#include <vector>
#include <pl/string_view.hpp>
#include <cl/error.hpp>
#include <cl/fs/path.hpp>
Include dependency graph for log_files.hpp:
```



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



Namespaces

- `cs`

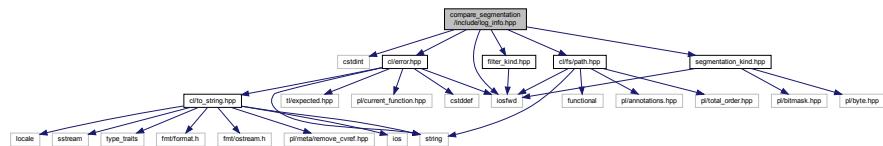
Functions

- `cl::Expected< std::vector< cl::fs::Path > > cs::logFiles (pl::string_view directoryPath)`
Fetches the paths to the log files in the given directory.

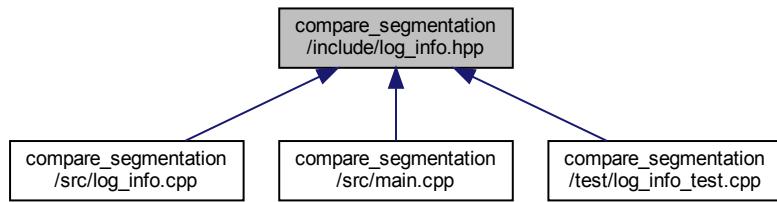
7.15 compare_segmentation/include/log_info.hpp File Reference

```
#include <cstdint>
#include <iostream>
#include <cl/error.hpp>
#include <cl/fs/path.hpp>
#include "filter_kind.hpp"
```

```
#include "segmentation_kind.hpp"
Include dependency graph for log_info.hpp:
```



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



Classes

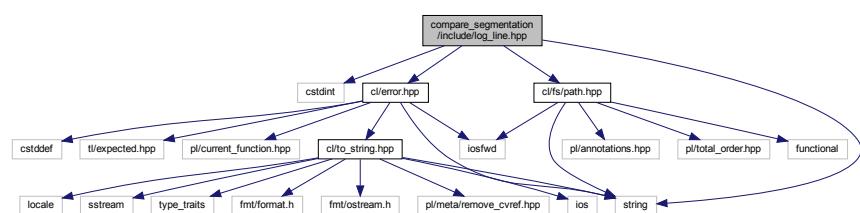
- class [cs::LogInfo](#)
Information about a log file.

Namespaces

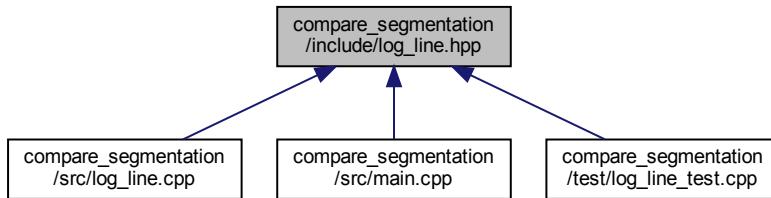
- [cs](#)

7.16 compare_segmentation/include/log_line.hpp File Reference

```
#include <cstdint>
#include <string>
#include "cl/error.hpp"
#include "cl/fs/path.hpp"
Include dependency graph for log_line.hpp:
```



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



Classes

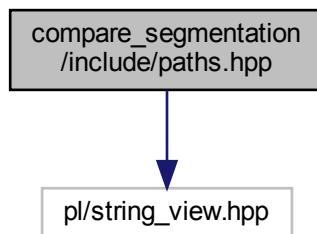
- class [cs::LogLine](#)
A line out of a log file.

Namespaces

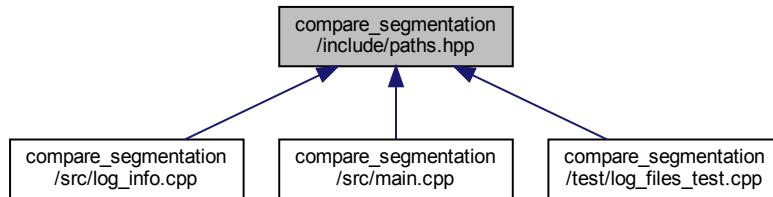
- [cs](#)

7.17 compare_segmentation/include/paths.hpp File Reference

```
#include <pl/string_view.hpp>
Include dependency graph for paths.hpp:
```



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



Namespaces

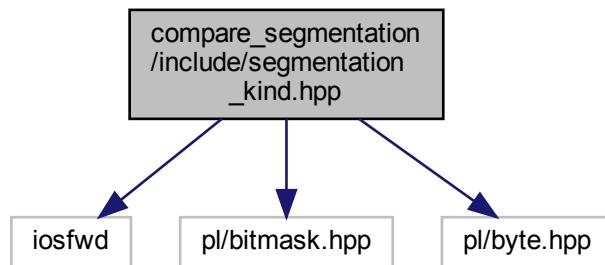
- `cs`

Variables

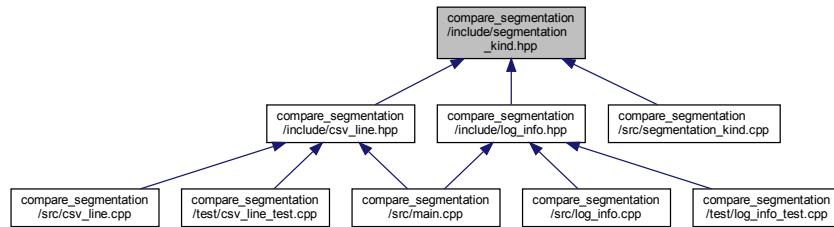
- `constexpr pl::string_view cs::logPath {"segmentation_comparison/logs"}`
Relative path to the directory containing the preprocessed log files.
- `constexpr pl::string_view cs::oldLogPath {"segmentation_comparison/logs/old"}`
Relative path to the directory containing the old log files.

7.18 compare_segmentation/include/segmentation_kind.hpp File Reference

```
#include <iostream>
#include <pl/bitmask.hpp>
#include <pl/byte.hpp>
Include dependency graph for segmentation_kind.hpp:
```



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



Namespaces

- [cs](#)

Enumerations

- enum [cs::SegmentationKind](#) : pl::byte { [cs::SegmentationKind::Minima](#) = 0b0000'0001, [cs::SegmentationKind::Maxima](#) = 0b0000'0010, [cs::SegmentationKind::Both](#) = Minima | Maxima }

The segmentation kind.

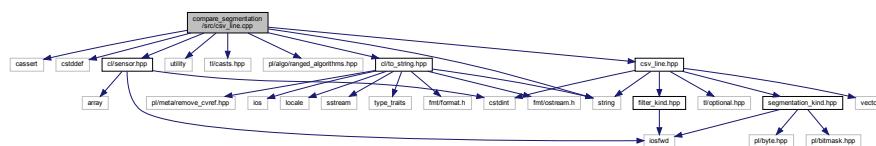
Functions

- std::ostream & [cs::operator<<](#) (std::ostream &os, SegmentationKind segmentationKind)

Prints a SegmentationKind to an ostream.

7.19 compare_segmentation/src/csv_line.cpp File Reference

```
#include <cassert>
#include <cstddef>
#include <string>
#include <utility>
#include <tl/casts.hpp>
#include <pl/algo/ranged_algorithms.hpp>
#include "cl/sensor.hpp"
#include "cl/to_string.hpp"
#include "csv_line.hpp"
Include dependency graph for csv_line.cpp:
```

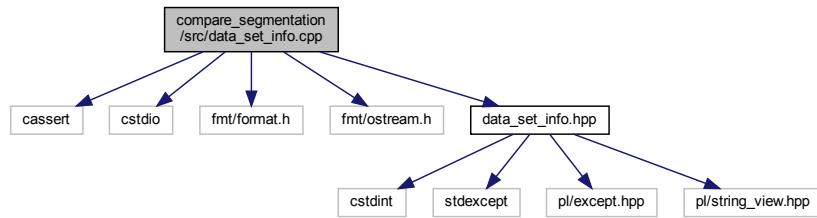


Namespaces

- [cs](#)

7.20 compare_segmentation/src/data_set_info.cpp File Reference

```
#include <cassert>
#include <cstdio>
#include <fmt/format.h>
#include <fmt/ostream.h>
#include "data_set_info.hpp"
Include dependency graph for data_set_info.cpp:
```



Namespaces

- [cs](#)

Functions

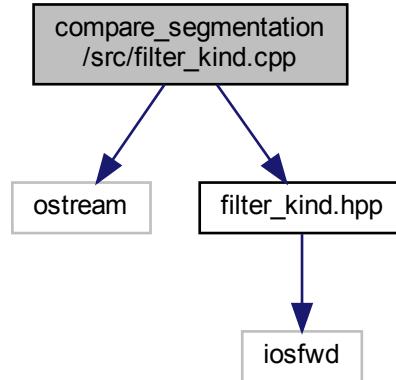
- `std::uint64_t cs::repetitionCount (pl::string_view dataSet)`

Fetches the repetition count for a given data set identified by its string.

7.21 compare_segmentation/src/filter_kind.cpp File Reference

```
#include <iostream>
#include "filter_kind.hpp"
```

Include dependency graph for filter_kind.cpp:



Namespaces

- [cs](#)

Functions

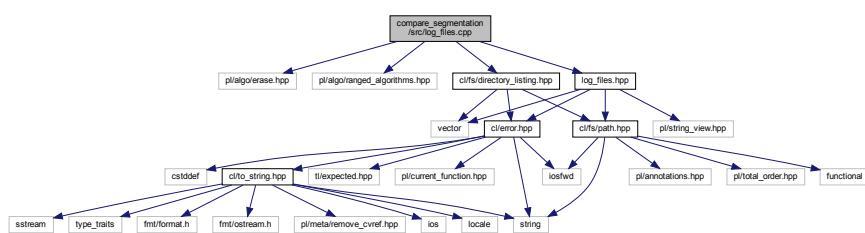
- `std::ostream & cs::operator<< (std::ostream &os, FilterKind filterKind)`

Prints a FilterKind to an ostream.

7.22 compare_segmentation/src/log_files.cpp File Reference

```
#include <pl/algo/erase.hpp>
#include <pl/algo/ranged_algorithms.hpp>
#include <cl/fs/directory_listing.hpp>
#include "log_files.hpp"
```

Include dependency graph for log_files.cpp:



Namespaces

- `cs`

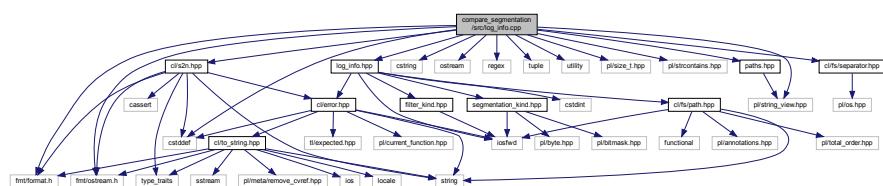
Functions

- `cl::Expected< std::vector< cl::fs::Path > > cs::logFiles (pl::string_view directoryPath)`
Fetches the paths to the log files in the given directory.

7.23 compare_segmentation/src/log_info.cpp File Reference

```
#include <cstdint>
#include <cstring>
#include <iostream>
#include <regex>
#include <tuple>
#include <utility>
#include <fmt/format.h>
#include <fmt/ostream.h>
#include <pl/size_t.hpp>
#include <pl/strcontains.hpp>
#include <pl/string_view.hpp>
#include "cl/fs/separators.hpp"
#include "cl/s2n.hpp"
#include "log_info.hpp"
#include "paths.hpp"
```

Include dependency graph for `log_info.hpp`:



Namespaces

- `cs`

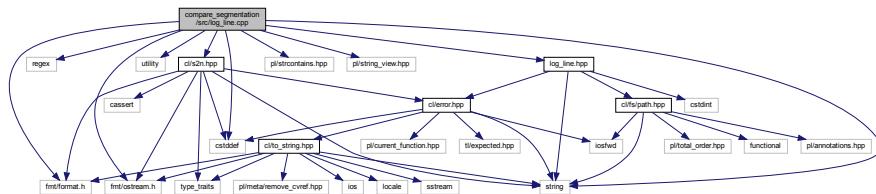
Functions

- `bool cs::operator== (const LogInfo &lhs, const LogInfo &rhs) noexcept`
- `bool cs::operator!= (const LogInfo &lhs, const LogInfo &rhs) noexcept`
- `std::ostream & cs::operator<< (std::ostream &os, const LogInfo &logInfo)`

7.24 compare_segmentation/src/log_line.cpp File Reference

```
#include <cstddef>
#include <regex>
#include <string>
#include <utility>
#include <fmt/format.h>
#include <fmt/ostream.h>
#include <pl/strcontains.hpp>
#include <pl/string_view.hpp>
#include "cl/s2n.hpp"
#include "log_line.hpp"
Include dependency graph for log_line.cpp:
```

Include dependency graph for log_line.cpp:



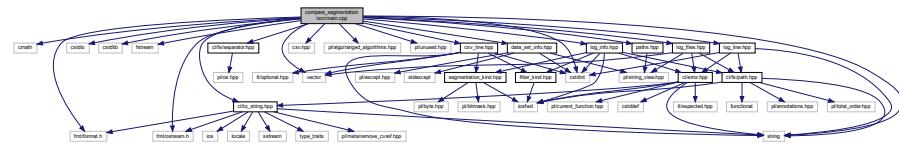
Namespaces

- CS

7.25 compare_segmentation/src/main.cpp File Reference

```
#include <cmath>
#include <cstdint>
#include <cstdio>
#include <cstdlib>
#include <fstream>
#include <string>
#include <vector>
#include <fmt/format.h>
#include <fmt/ostream.h>
#include <csv.hpp>
#include <pl/algo/ranged_algorithms.hpp>
#include <pl/unused.hpp>
#include "cl/fs/sePARATOR.hpp"
#include "cl/to_string.hpp"
#include "csv_line.hpp"
#include "data_set_info.hpp"
#include "log_files.hpp"
#include "log_info.hpp"
#include "log_line.hpp"
```

```
#include "paths.hpp"
Include dependency graph for main.cpp:
```



Functions

- int main (int argc, char *argv[])

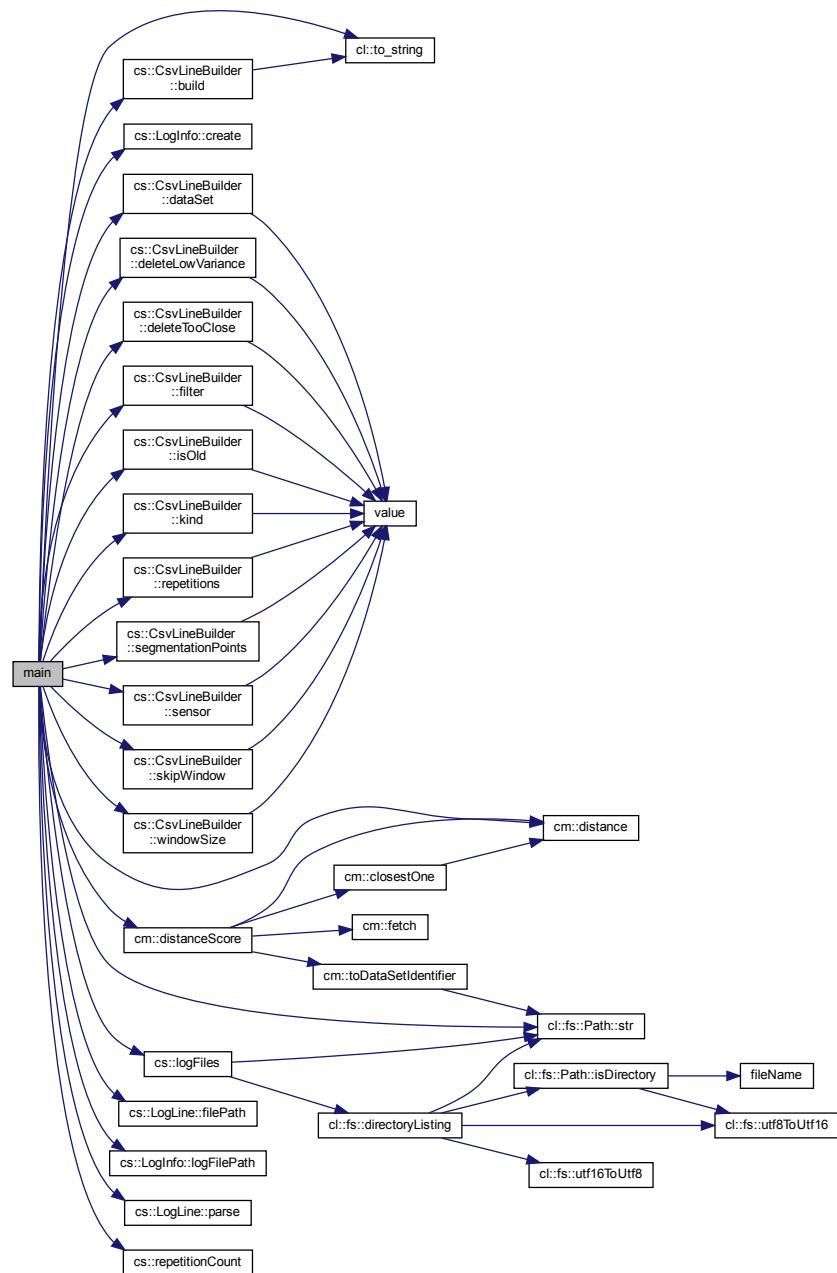
7.25.1 Function Documentation

7.25.1.1 main()

```
int main ( int argc,  
           char * argv[ ] )
```

Definition at line 28 of file main.cpp.

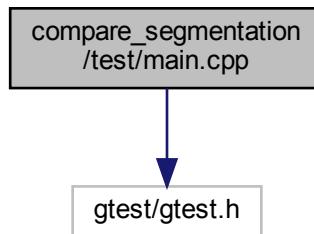
Here is the call graph for this function:



7.26 compare_segmentation/test/main.cpp File Reference

```
#include "gtest/gtest.h"
```

Include dependency graph for main.cpp:



Functions

- int `main` (int argc, char *argv[])

7.26.1 Function Documentation

7.26.1.1 `main()`

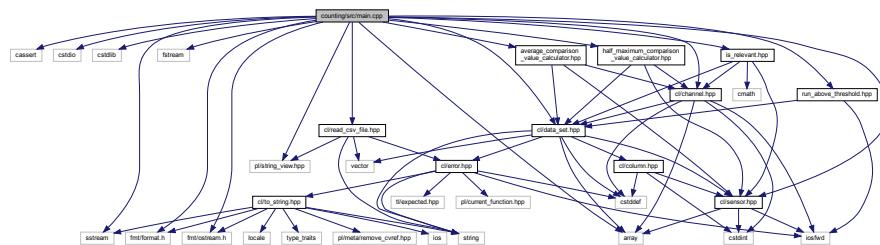
```
int main (
    int argc,
    char * argv[] )
```

Definition at line 3 of file main.cpp.

7.27 counting/src/main.cpp File Reference

```
#include <cassert>
#include <cstdio>
#include <cstdlib>
#include <array>
#include <fstream>
#include <sstream>
#include <fmt/format.h>
#include <fmt/ostream.h>
#include <pl/string_view.hpp>
#include "cl/channel.hpp"
#include "cl/data_set.hpp"
#include "cl/read_csv_file.hpp"
#include "cl/sensor.hpp"
#include "average_comparison_value_calculator.hpp"
#include "half_maximum_comparison_value_calculator.hpp"
```

```
#include "is_relevant.hpp"
#include "run_above_threshold.hpp"
Include dependency graph for main.cpp:
```



Functions

- int `main` (int argc, char *argv[])

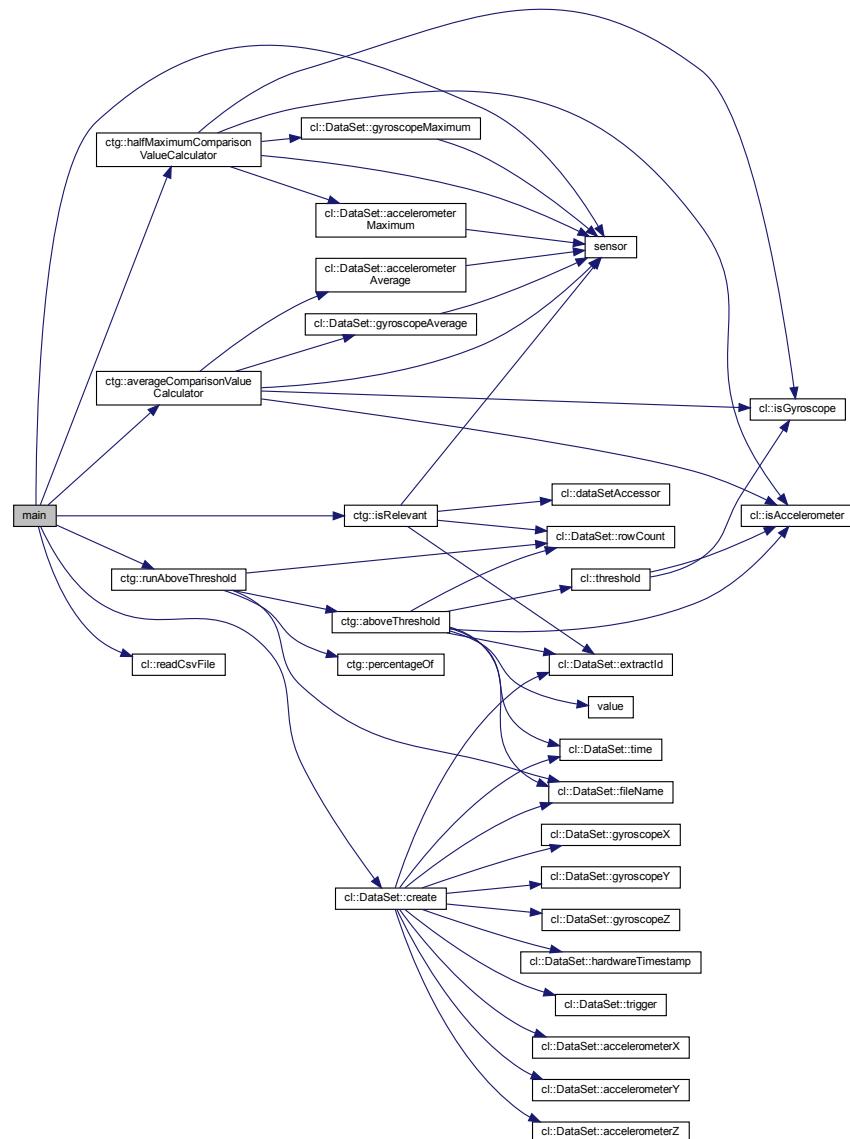
7.27.1 Function Documentation

7.27.1.1 `main()`

```
int main (
    int argc,
    char * argv[ ] )
```

Definition at line 24 of file `main.cpp`.

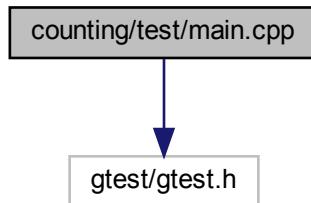
Here is the call graph for this function:



7.28 counting/test/main.cpp File Reference

```
#include "gtest/gtest.h"
```

Include dependency graph for main.cpp:



Functions

- int `main` (int argc, char *argv[])

7.28.1 Function Documentation

7.28.1.1 `main()`

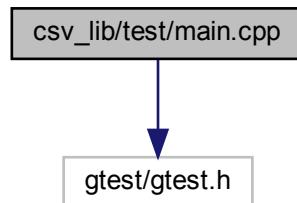
```
int main (
    int argc,
    char * argv[] )
```

Definition at line 3 of file main.cpp.

7.29 csv_lib/test/main.cpp File Reference

```
#include "gtest/gtest.h"
```

Include dependency graph for main.cpp:



Functions

- int main (int argc, char *argv[])

7.29.1 Function Documentation

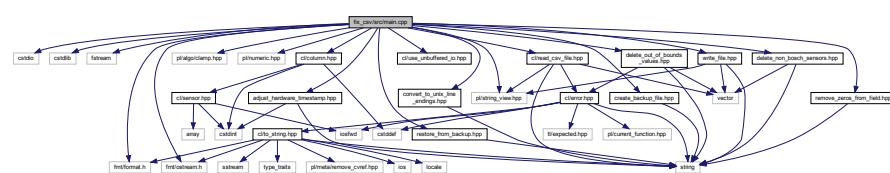
7.29.1.1 main()

```
int main ( int argc,  
           char * argv[ ] )
```

Definition at line 3 of file main.cpp.

7.30 fix_csv/src/main.cpp File Reference

```
#include <cstdio>
#include <cstdlib>
#include <fstream>
#include <fmt/format.h>
#include <fmt/ostream.h>
#include <pl/algo/clamp.hpp>
#include <pl/numeric.hpp>
#include <pl/string_view.hpp>
#include "cl/column.hpp"
#include "cl/read_csv_file.hpp"
#include "cl/use_unbuffered_io.hpp"
#include "adjust_hardware_timestamp.hpp"
#include "convert_to_unix_line_endings.hpp"
#include "create_backup_file.hpp"
#include "delete_non_bosch_sensors.hpp"
#include "delete_out_of_bounds_values.hpp"
#include "remove_zeros_from_field.hpp"
#include "restore_from_backup.hpp"
#include "write_file.hpp"
Include dependency graph for main.cpp:
```



Functions

- int main (int argc, char *argv[])

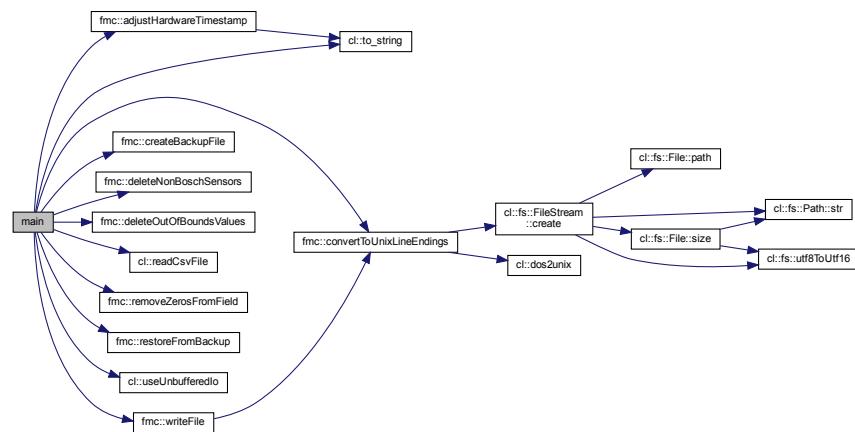
7.30.1 Function Documentation

7.30.1.1 main()

```
int main (
    int argc,
    char * argv[] )
```

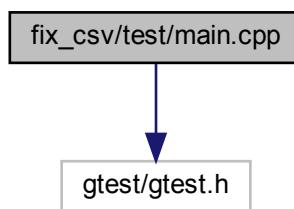
Definition at line 26 of file main.cpp.

Here is the call graph for this function:



7.31 fix_csv/test/main.cpp File Reference

```
#include "gtest/gtest.h"
Include dependency graph for main.cpp:
```



Functions

- int main (int argc, char *argv[])

7.31.1 Function Documentation

7.31.1.1 main()

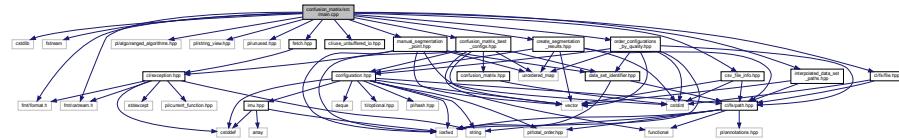
```
int main ( int argc,  
           char * argv[ ] )
```

Definition at line 3 of file main.cpp.

7.32 confusion matrix/src/main.cpp File Reference

```
#include <cstdlib>
#include <fstream>
#include <fmt/format.h>
#include <fmt/ostream.h>
#include <pl/algo/ranged_algorithms.hpp>
#include <pl/string_view.hpp>
#include <pl/unused.hpp>
#include <cl/fs/file.hpp>
#include <cl/use_unbuffered_io.hpp>
#include "confusion_matrix_best_configs.hpp"
#include "create_segmentation_results.hpp"
#include "csv_file_info.hpp"
#include "fetch.hpp"
#include "interpolated_data_set_paths.hpp"
#include "manual_segmentation_point.hpp"
#include "order_configurations_by_quality.hpp"
Include dependency graph for main.cpp:
```

Include dependency graph for main.cpp:



Macros

- #define SORT_PRINT(kind)

Functions

- int main (int argc, char *argv[])

7.32.1 Macro Definition Documentation

7.32.1.1 SORT_PRINT

```
#define SORT_PRINT(  
    kind )
```

Value:

```
pl::algo::stable_sort(bestConfigs, cm::kind##Sorter);  
print("{}\n", #kind);  
for (const cm::ConfigWithTotalConfusionMatrix& cur : bestConfigs) {  
    print("{}\n", cur);  
}  
print("\nBest configuration (" #kind "): {}\n", bestConfigs.front())
```

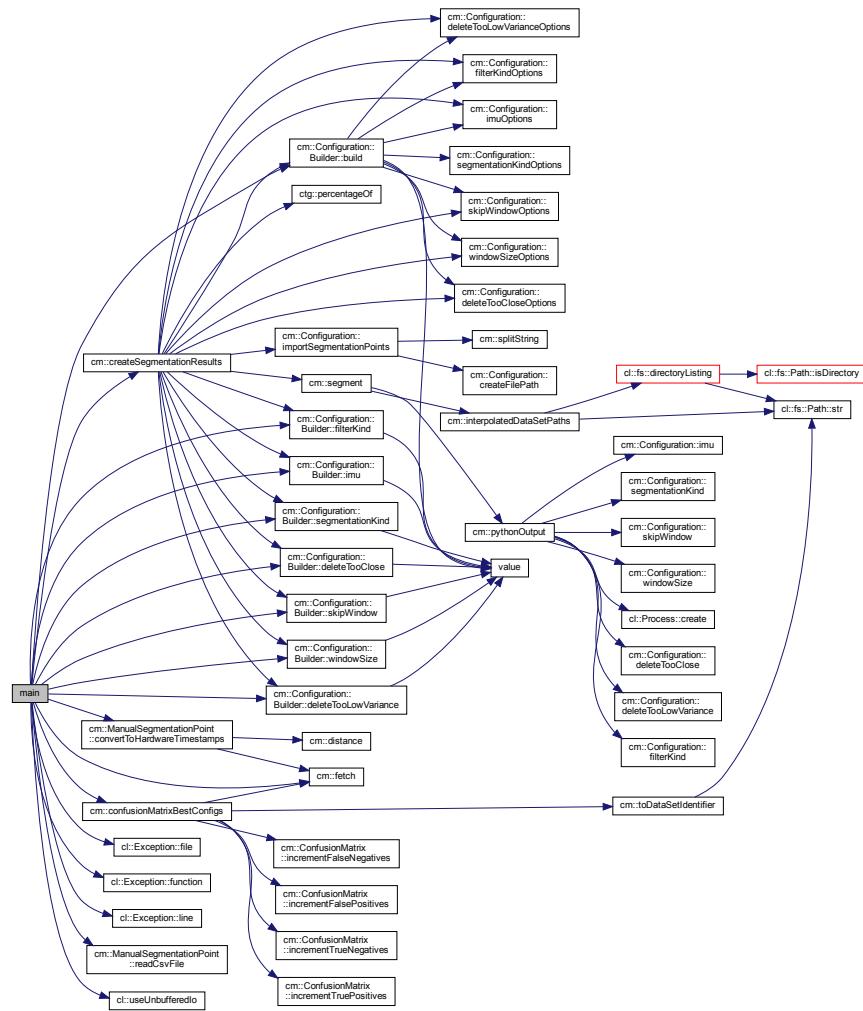
7.32.2 Function Documentation

7.32.2.1 main()

```
int main (  
    int argc,  
    char * argv[] )
```

Definition at line 36 of file main.cpp.

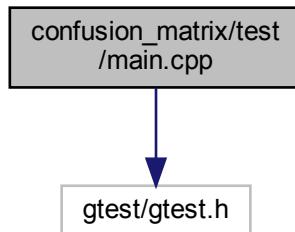
Here is the call graph for this function:



7.33 confusion_matrix/test/main.cpp File Reference

```
#include "gtest/gtest.h"
```

Include dependency graph for main.cpp:



Functions

- int [main](#) (int argc, char *argv[])

7.33.1 Function Documentation

7.33.1.1 [main\(\)](#)

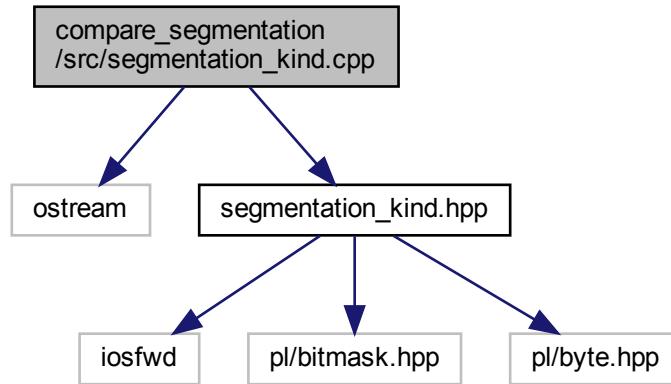
```
int main (
    int argc,
    char * argv[] )
```

Definition at line 3 of file main.cpp.

7.34 compare_segmentation/src/segmentation_kind.cpp File Reference

```
#include <iostream>
#include "segmentation_kind.hpp"
```

Include dependency graph for segmentation_kind.cpp:



Namespaces

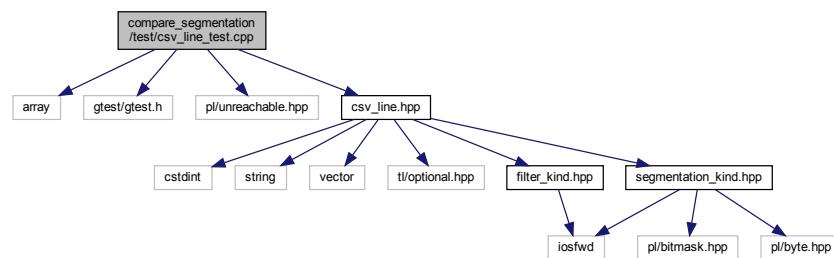
- `cs`

Functions

- `std::ostream & cs::operator<< (std::ostream &os, SegmentationKind segmentationKind)`
Prints a SegmentationKind to an ostream.

7.35 compare_segmentation/test/csv_line_test.cpp File Reference

```
#include <array>
#include "gtest/gtest.h"
#include <pl/unreachable.hpp>
#include "csv_line.hpp"
Include dependency graph for csv_line_test.cpp:
```



Functions

- [TEST](#) (CsvLine, shouldWork)

7.35.1 Function Documentation

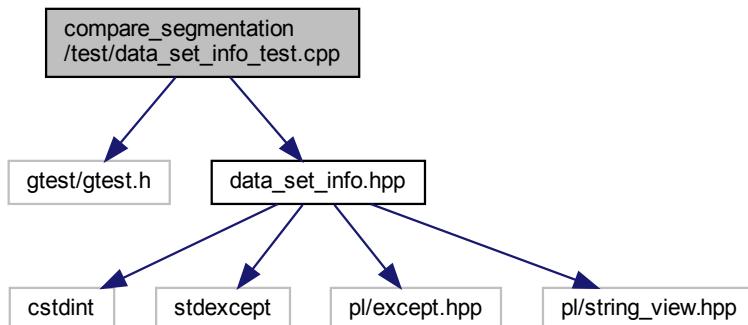
7.35.1.1 TEST()

```
TEST (
    CsvLine ,
    shouldWork )
```

Definition at line 30 of file csv_line_test.cpp.

7.36 compare_segmentation/test/data_set_info_test.cpp File Reference

```
#include "gtest/gtest.h"
#include "data_set_info.hpp"
Include dependency graph for data_set_info_test.cpp:
```



Functions

- [TEST](#) (dataSetInfo, repetitionCount)

7.36.1 Function Documentation

7.36.1.1 TEST()

```
TEST (
    dataSetInfo ,
    repetitionCount )
```

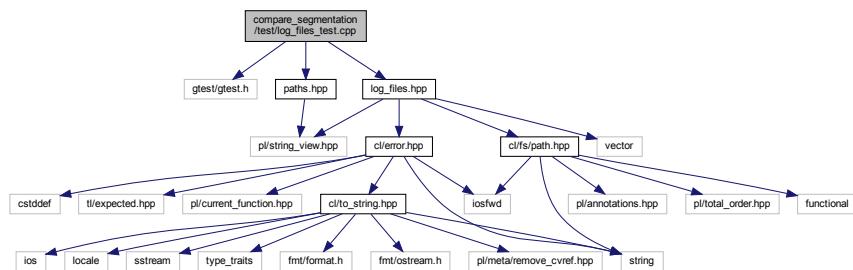
Definition at line 5 of file `data_set_info_test.cpp`.

Here is the call graph for this function:



7.37 compare_segmentation/test/log_files_test.cpp File Reference

```
#include "gtest/gtest.h"
#include <log_files.hpp>
#include <paths.hpp>
Include dependency graph for log_files_test.cpp:
```



Functions

- [TEST](#) (`logFiles`, `shouldFindLogFiles`)
- [TEST](#) (`logFiles`, `shouldFindOldLogFiles`)
- [TEST](#) (`logFiles`, `shouldNotFindGarbage`)

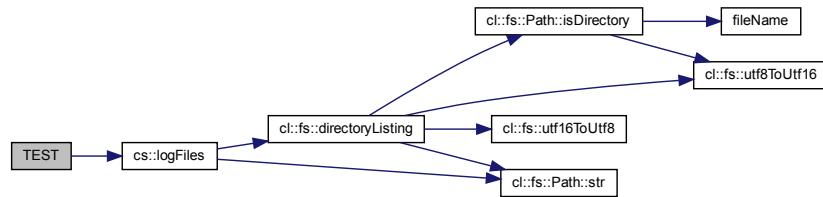
7.37.1 Function Documentation

7.37.1.1 TEST() [1/3]

```
TEST (
    logFiles ,
    shouldFindLogFiles )
```

Definition at line 6 of file log_files_test.cpp.

Here is the call graph for this function:

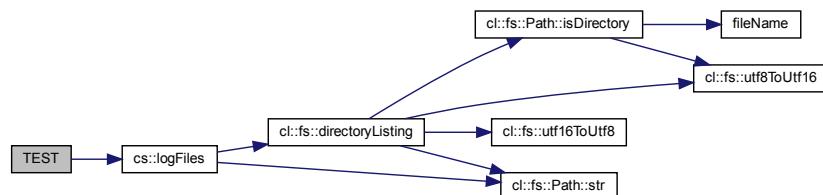


7.37.1.2 TEST() [2/3]

```
TEST (
    logFiles ,
    shouldFindOldLogFiles )
```

Definition at line 23 of file log_files_test.cpp.

Here is the call graph for this function:

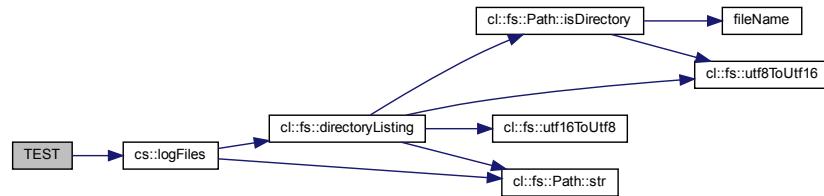


7.37.1.3 TEST() [3/3]

```
TEST ( logFiles ,  
       shouldNotFindGarbage )
```

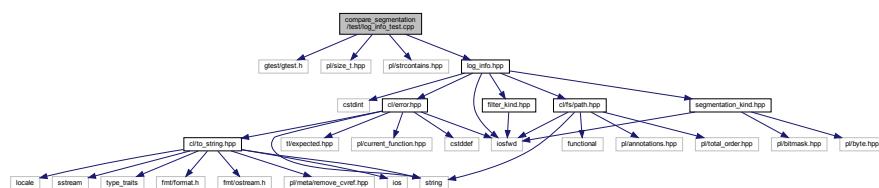
Definition at line 40 of file log_files_test.cpp.

Here is the call graph for this function:



7.38 compare_segmentation/test/log_info_test.cpp File Reference

```
#include "gtest/gtest.h"
#include <pl/size_t.hpp>
#include <pl/strcontains.hpp>
#include "log_info.hpp"
Include dependency graph for log_info_test.cpp:
```



Functions

- **TEST** (LogInfo, shouldWork)
 - **TEST** (LogInfo, shouldWork2)
 - **TEST** (LogInfo, shouldWork3)
 - **TEST** (LogInfo, shouldWork4)
 - **TEST** (LogInfo, shouldWork5)
 - **TEST** (LogInfo, shouldWork6)
 - **TEST** (LogInfo, shouldWork7)
 - **TEST** (LogInfo, shouldWork8)
 - **TEST** (LogInfo, shouldWork9)
 - **TEST** (LogInfo, shouldWorkWithOldPath)
 - **TEST** (LogInfo, shouldWorkWithOldPath2)
 - **TEST** (LogInfo, shouldResultInErrorIfLogFilePathsTooShort)

- [TEST](#) (LogInfo, shouldFailIfSkipWindowIsInvalid)
- [TEST](#) (LogInfo, shouldFailIfDeleteTooCloseIsInvalid)
- [TEST](#) (LogInfo, shouldFailIfDeleteTooLowVarianceIsInvalid)
- [TEST](#) (LogInfo, shouldFailIfSegmentationKindIsInvalid)
- [TEST](#) (LogInfo, shouldFailIfWindowSizeIsInvalid)
- [TEST](#) (LogInfo, shouldFailIfFilterIsInvalid)
- [TEST](#) (LogInfo, shouldCreateUninitializedObjectWhenDefaultConstructorIsCalled)

7.38.1 Function Documentation

7.38.1.1 TEST() [1/19]

```
TEST (
    LogInfo ,
    shouldCreateUninitializedObjectWhenDefaultConstructorIsCalled )
```

Definition at line 388 of file log_info_test.cpp.

7.38.1.2 TEST() [2/19]

```
TEST (
    LogInfo ,
    shouldFailIfDeleteTooCloseIsInvalid )
```

Definition at line 341 of file log_info_test.cpp.

Here is the call graph for this function:



7.38.1.3 TEST() [3/19]

```
TEST (
    LogInfo ,
    shouldFailIfDeleteTooLowVarianceIsInvalid )
```

Definition at line 350 of file log_info_test.cpp.

Here is the call graph for this function:

**7.38.1.4 TEST() [4/19]**

```
TEST (
    LogInfo ,
    shouldFailIfFilterIsInvalid )
```

Definition at line 379 of file log_info_test.cpp.

Here is the call graph for this function:



7.38.1.5 TEST() [5/19]

```
TEST (
    LogInfo ,
    shouldFailIfSegmentationKindIsInvalid )
```

Definition at line 359 of file log_info_test.cpp.

Here is the call graph for this function:



7.38.1.6 TEST() [6/19]

```
TEST (
    LogInfo ,
    shouldFailIfSkipWindowIsInvalid )
```

Definition at line 332 of file log_info_test.cpp.

Here is the call graph for this function:



7.38.1.7 TEST() [7/19]

```
TEST (
    LogInfo ,
    shouldFailIfWindowSizeIsInvalid )
```

Definition at line 368 of file log_info_test.cpp.

Here is the call graph for this function:

**7.38.1.8 TEST() [8/19]**

```
TEST (
    LogInfo ,
    shouldResultInErrorIfLogFilePathIsTooShort )
```

Definition at line 325 of file log_info_test.cpp.

Here is the call graph for this function:



7.38.1.9 TEST() [9/19]

```
TEST (
    LogInfo ,
    shouldWork )
```

Definition at line 8 of file log_info_test.cpp.

Here is the call graph for this function:

**7.38.1.10 TEST() [10/19]**

```
TEST (
    LogInfo ,
    shouldWork2 )
```

Definition at line 37 of file log_info_test.cpp.

Here is the call graph for this function:



7.38.1.11 TEST() [11/19]

```
TEST (
    LogInfo ,
    shouldWork3 )
```

Definition at line 66 of file log_info_test.cpp.

Here is the call graph for this function:

**7.38.1.12 TEST() [12/19]**

```
TEST (
    LogInfo ,
    shouldWork4 )
```

Definition at line 95 of file log_info_test.cpp.

Here is the call graph for this function:



7.38.1.13 TEST() [13/19]

```
TEST (
    LogInfo ,
    shouldWork5 )
```

Definition at line 124 of file log_info_test.cpp.

Here is the call graph for this function:



7.38.1.14 TEST() [14/19]

```
TEST (
    LogInfo ,
    shouldWork6 )
```

Definition at line 153 of file log_info_test.cpp.

Here is the call graph for this function:



7.38.1.15 TEST() [15/19]

```
TEST (
    LogInfo ,
    shouldWork7 )
```

Definition at line 182 of file log_info_test.cpp.

Here is the call graph for this function:

**7.38.1.16 TEST() [16/19]**

```
TEST (
    LogInfo ,
    shouldWork8 )
```

Definition at line 211 of file log_info_test.cpp.

Here is the call graph for this function:



7.38.1.17 TEST() [17/19]

```
TEST (
    LogInfo ,
    shouldWork9 )
```

Definition at line 240 of file log_info_test.cpp.

Here is the call graph for this function:

**7.38.1.18 TEST() [18/19]**

```
TEST (
    LogInfo ,
    shouldWorkWithPath )
```

Definition at line 269 of file log_info_test.cpp.

Here is the call graph for this function:



7.38.1.19 TEST() [19/19]

```
TEST (
    LogInfo ,
    shouldWorkWithOldPath2 )
```

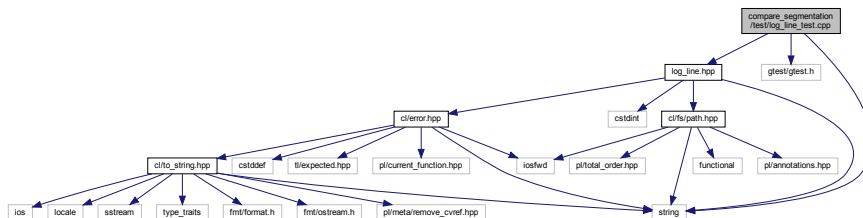
Definition at line 297 of file log_info_test.cpp.

Here is the call graph for this function:



7.39 compare_segmentation/test/log_line_test.cpp File Reference

```
#include <string>
#include "gtest/gtest.h"
#include "log_line.hpp"
Include dependency graph for log_line_test.cpp:
```



Functions

- [TEST \(LogLine, shouldWorkWithPreprocessedLine\)](#)
- [TEST \(LogLine, shouldWorkWithOldLine\)](#)
- [TEST \(LogLine, shouldNotMatchGarbage\)](#)
- [TEST \(LogLine, shouldNotParseGarbageSensor\)](#)

7.39.1 Function Documentation

7.39.1.1 TEST() [1/4]

```
TEST (
    LogLine ,
    shouldNotMatchGarbage   )
```

Definition at line 41 of file log_line_test.cpp.

Here is the call graph for this function:



7.39.1.2 TEST() [2/4]

```
TEST (
    LogLine ,
    shouldNotParseGarbageSensor   )
```

Definition at line 48 of file log_line_test.cpp.

Here is the call graph for this function:



7.39.1.3 TEST() [3/4]

```
TEST (
    LogLine ,
    shouldWorkWithOldLine )
```

Definition at line 25 of file log_line_test.cpp.

Here is the call graph for this function:

**7.39.1.4 TEST() [4/4]**

```
TEST (
    LogLine ,
    shouldWorkWithPreprocessedLine )
```

Definition at line 9 of file log_line_test.cpp.

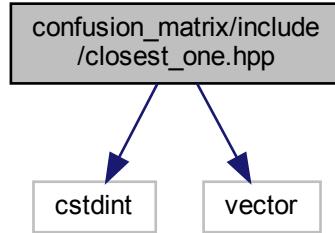
Here is the call graph for this function:



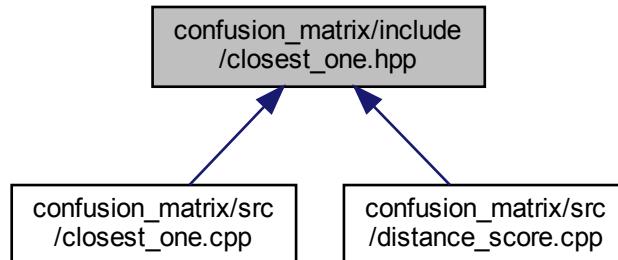
7.40 confusion_matrix/include/closest_one.hpp File Reference

```
#include <cstdint>
#include <vector>
```

Include dependency graph for closest_one.hpp:



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



Namespaces

- [cm](#)

Functions

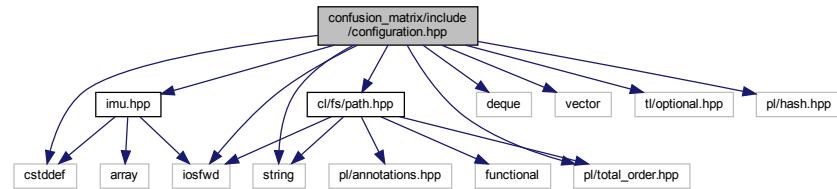
- std::uint64_t [cm::closestOne](#) (std::uint64_t algorithmicallyDeterminedSegmentationPoint, const std::vector<std::uint64_t > &manualSegmentationPoints)

Finds the segmentation point in manualSegmentationPoints that is the closest to algorithmicallyDeterminedSegmentationPoint.

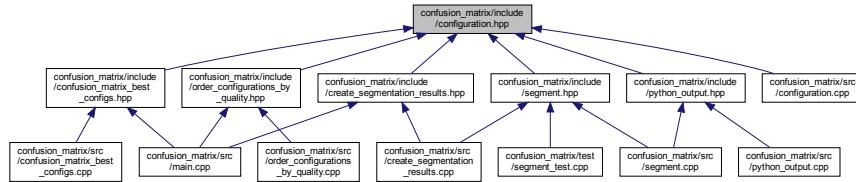
7.41 confusion_matrix/include/configuration.hpp File Reference

```
#include <cstdint>
#include <deque>
```

```
#include <iostream>
#include <string>
#include <vector>
#include <t1/optional.hpp>
#include <pl/hash.hpp>
#include <pl/total_order.hpp>
#include <cl/fs/path.hpp>
#include "imu.hpp"
Include dependency graph for configuration.hpp:
```



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



Classes

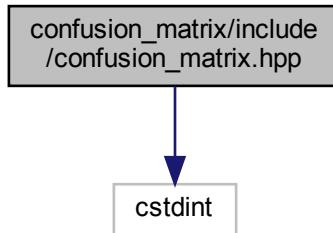
- class `cm::Configuration`
Represents a possible configuration for the Python segmentor.
- class `cm::Configuration::Builder`
Builder type for Configuration.
- struct `std::hash<::cm::Configuration >`

Namespaces

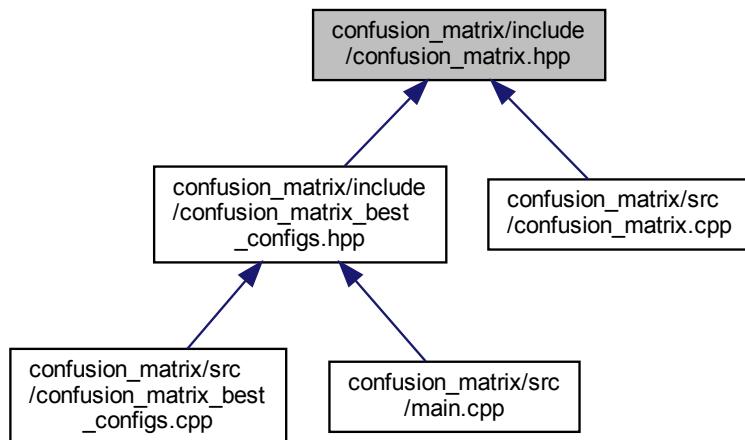
- `cm`

7.42 confusion_matrix/include/confusion_matrix.hpp File Reference

```
#include <cstdint>
Include dependency graph for confusion_matrix.hpp:
```



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



Classes

- class [cm::ConfusionMatrix](#)

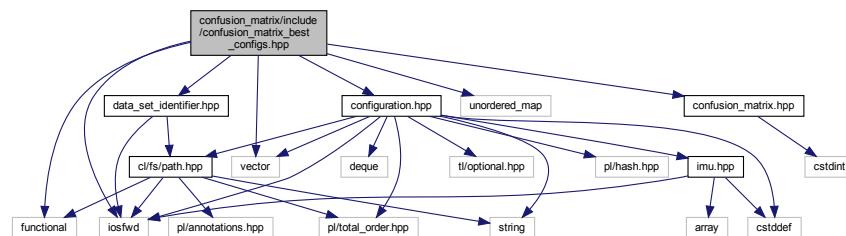
Type to represent a confusion matrix.

Namespaces

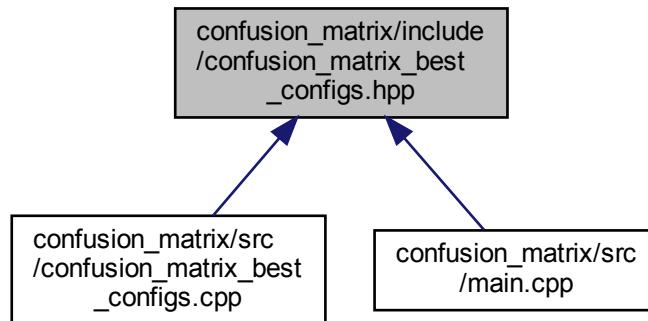
- [cm](#)

7.43 confusion_matrix/include/confusion_matrix_best_configs.hpp File Reference

```
#include <functional>
#include <iostream>
#include <unordered_map>
#include <vector>
#include "configuration.hpp"
#include "confusion_matrix.hpp"
#include "data_set_identifier.hpp"
Include dependency graph for confusion_matrix_best_configs.hpp:
```



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



Classes

- struct [cm::ConfigWithTotalConfusionMatrix](#)
A *Configuration* with a *ConfusionMatrix*.

Namespaces

- [cm](#)

Macros

- `#define CM_SORTER(criterion, op)`

Macro to define a sorter based on a single criterion for ConfigWithTotalConfusionMatrix objects.

Functions

- `cm::CM_SORTER (truePositives, >)`
Sorts ConfigWithTotalConfusionMatrix objects by true positives (highest first)
- `cm::CM_SORTER (trueNegatives, >)`
Sorts ConfigWithTotalConfusionMatrix objects by true negatives (highest first)
- `cm::CM_SORTER (falsePositives,<)`
Sorts ConfigWithTotalConfusionMatrix objects by false positives (lowest first)
- `cm::CM_SORTER (falseNegatives,<)`
Sorts ConfigWithTotalConfusionMatrix objects by false negatives (lowest first)
- `std::vector< ConfigWithTotalConfusionMatrix > cm::confusionMatrixBestConfigs (const std::unordered_map< DataSetIdentifier, std::vector< std::uint64_t > > &manualSegmentationPoints, const std::unordered_map< Configuration, std::unordered_map< cl::fs::Path, std::vector< std::uint64_t > >> &algorithmicallyDeterminedSegmentationPoints, const std::function< bool(const ConfigWithTotalConfusionMatrix &, const ConfigWithTotalConfusionMatrix &)> &sorter)`
Determines the 'best' configurations.

Variables

- `struct {`
 `} cm::disregardTrueNegativesSorter`

Sorter to sort ConfigWithTotalConfusionMatrix objects by the count of true positives minus the count of false positives minus the count of false negatives.

- `struct {`
 `} cm::addTrueSubtractFalseSorter`

Sorter to sort ConfigWithTotalConfusionMatrix objects by the sum of true positives and true negatives minus the false positives minus the false negatives.

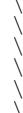
7.43.1 Macro Definition Documentation

7.43.1.1 CM_SORTER

```
#define CM_SORTER( criterion, op )
```

Value:

```
inline constexpr struct {
    [[nodiscard]] bool operator()(
        const ConfigWithTotalConfusionMatrix& lhs,
        const ConfigWithTotalConfusionMatrix& rhs) const noexcept
    {
        if (
```



```

!(lhs.matrix.criterion() op rhs.matrix.criterion())
&& !(rhs.matrix.criterion() op lhs.matrix.criterion())) {
    return lhs.config < rhs.config;
}

return lhs.matrix.criterion() op rhs.matrix.criterion();
}
} criterion##Sorter

```

Macro to define a sorter based on a single criterion for ConfigWithTotalConfusionMatrix objects.

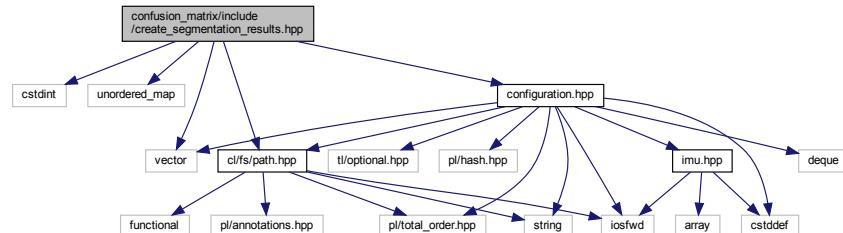
Definition at line 50 of file confusion_matrix_best_configs.hpp.

7.44 confusion_matrix/include/create_segmentation_results.hpp File Reference

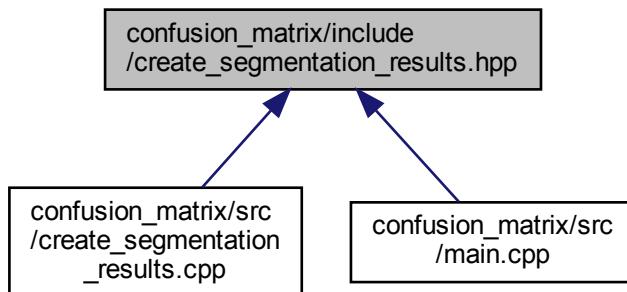
```

#include <cstdint>
#include <unordered_map>
#include <vector>
#include <cl/fs/path.hpp>
#include "configuration.hpp"
Include dependency graph for create_segmentation_results.hpp:

```



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



Namespaces

- [cm](#)

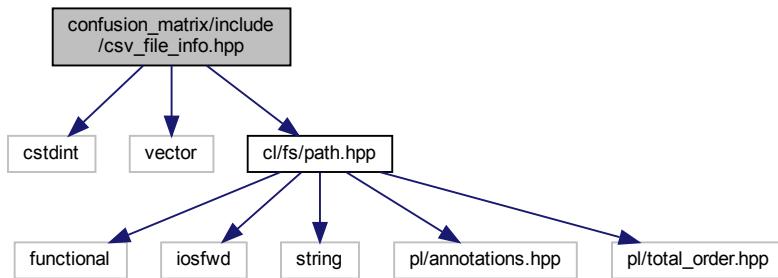
Functions

- `std::unordered_map< cm::Configuration, std::unordered_map< cl::fs::Path, std::vector< std::uint64_t > > >`
`> cm::createSegmentationResults ()`

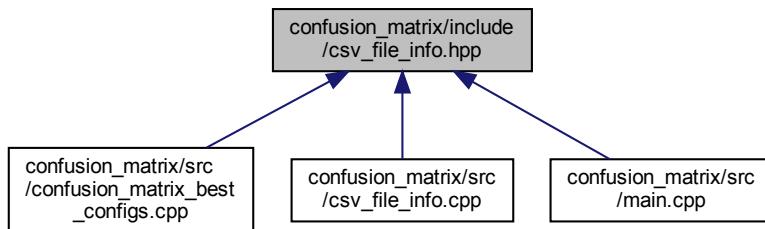
Invokes Python to generate the segmentation points algorithmically.

7.45 confusion_matrix/include/csv_file_info.hpp File Reference

```
#include <cstdint>
#include <vector>
#include <cl/fs/path.hpp>
Include dependency graph for csv_file_info.hpp:
```



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



Classes

- class [cm::CsvFileInfo](#)

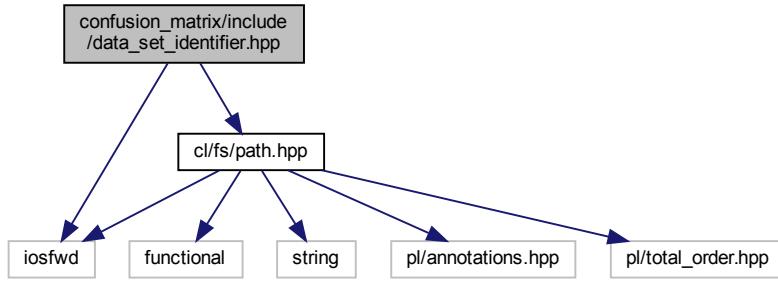
Type to hold the hardware timestamps of a CSV file.

Namespaces

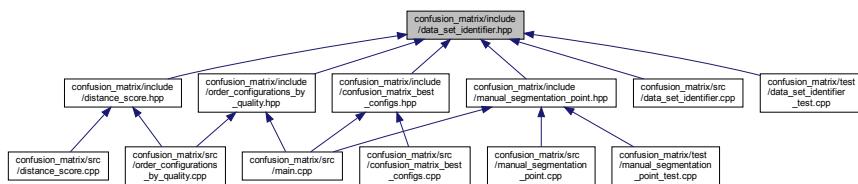
- [cm](#)

7.46 confusion_matrix/include/data_set_identifier.hpp File Reference

```
#include <iostream>
#include <cl/fs/path.hpp>
Include dependency graph for data_set_identifier.hpp:
```



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



Namespaces

- [cm](#)

Macros

- `#define CM_DATA_SET_IDENTIFIER`
- `#define CM_DATA_SET_IDENTIFIER_X(enm) enm,`

Enumerations

- enum [cm::DataSetIdentifier](#) { [cm::DataSetIdentifier::CM_DATA_SET_IDENTIFIER_X](#), [cm::DataSetIdentifier::CM_DATA_SET_IDENTIFIER_Y](#), ... }

Functions

- std::ostream & `cm::operator<<` (std::ostream &os, DataSetIdentifier dsi)

Prints a DataSetIdentifier to an ostream.

- DataSetIdentifier `cm::toDataSetIdentifier` (const `cl::fs::Path` &path)

Converts a path to a CSV file to the corresponding DataSetIdentifier.

7.46.1 Macro Definition Documentation

7.46.1.1 CM_DATA_SET_IDENTIFIER

```
#define CM_DATA_SET_IDENTIFIER
```

Value:

```
CM_DATA_SET_IDENTIFIER_X(Felix_11_17_39) \
CM_DATA_SET_IDENTIFIER_X(Felix_12_50_00) \
CM_DATA_SET_IDENTIFIER_X(Felix_13_00_09) \
CM_DATA_SET_IDENTIFIER_X(Mike_14_07_33) \
CM_DATA_SET_IDENTIFIER_X(Mike_14_14_32) \
CM_DATA_SET_IDENTIFIER_X(Mike_14_20_28) \
CM_DATA_SET_IDENTIFIER_X(Marsi_14_59_59) \
CM_DATA_SET_IDENTIFIER_X(Marsi_15_13_22) \
CM_DATA_SET_IDENTIFIER_X(Marsi_15_31_36) \
CM_DATA_SET_IDENTIFIER_X(Jan_1) \
CM_DATA_SET_IDENTIFIER_X(Jan_2) \
CM_DATA_SET_IDENTIFIER_X(Jan_3) \
CM_DATA_SET_IDENTIFIER_X(Andre_1) \
CM_DATA_SET_IDENTIFIER_X(Andre_2) \
CM_DATA_SET_IDENTIFIER_X(Andre_3) \
CM_DATA_SET_IDENTIFIER_X(Andre_Squats_1) \
CM_DATA_SET_IDENTIFIER_X(Andre_Squats_2) \
CM_DATA_SET_IDENTIFIER_X(Lucas_1) \
CM_DATA_SET_IDENTIFIER_X(Lucas_2) \
CM_DATA_SET_IDENTIFIER_X(Lucas_3)
```

Definition at line 8 of file `data_set_identifier.hpp`.

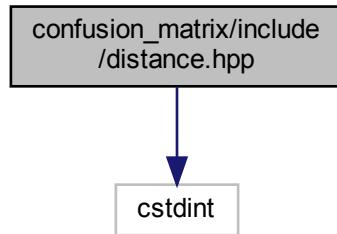
7.46.1.2 CM_DATA_SET_IDENTIFIER_X

```
#define CM_DATA_SET_IDENTIFIER_X(
    enm ) enm,
```

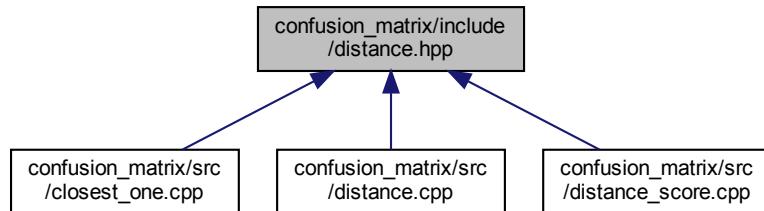
Definition at line 31 of file `data_set_identifier.hpp`.

7.47 confusion_matrix/include/distance.hpp File Reference

```
#include <cstdint>
Include dependency graph for distance.hpp:
```



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



Namespaces

- [cm](#)

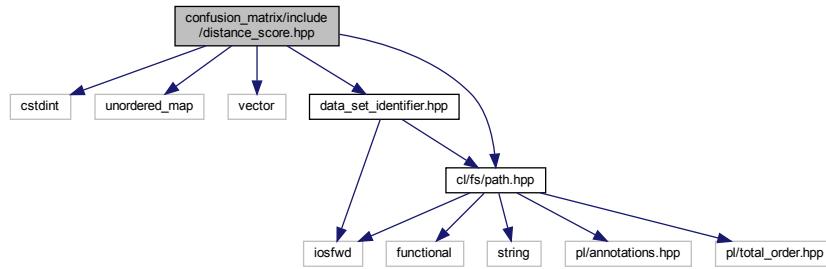
Functions

- std::uint64_t [cm::distance](#) (std::uint64_t a, std::uint64_t b)

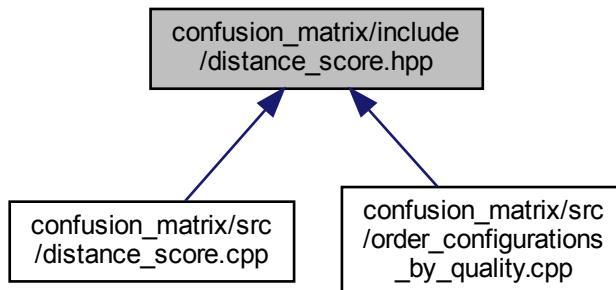
Calculates the distance between a and b.

7.48 confusion_matrix/include/distance_score.hpp File Reference

```
#include <cstdint>
#include <unordered_map>
#include <vector>
#include <cl/fs/path.hpp>
#include "data_set_identifier.hpp"
Include dependency graph for distance_score.hpp:
```



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



Namespaces

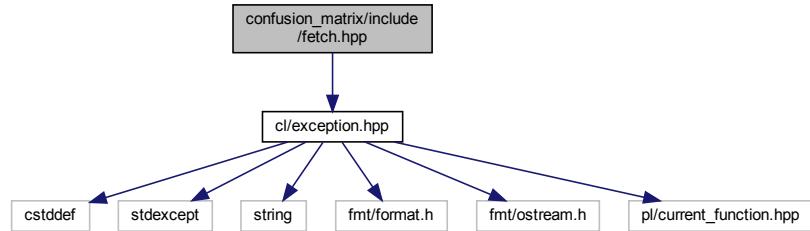
- `cm`

Functions

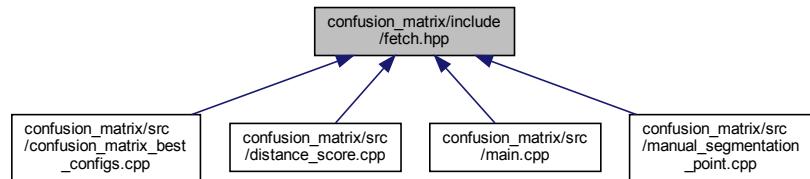
- `std::uint64_t cm::distanceScore (const std::unordered_map< cl::fs::Path, std::vector< std::uint64_t >> &segmentationPointsForConfig, const std::unordered_map< DataSetIdentifier, std::vector< std::uint64_t >> &manualSegmentationPoints)`

7.49 confusion_matrix/include/fetch.hpp File Reference

```
#include <cl/exception.hpp>
Include dependency graph for fetch.hpp:
```



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



Namespaces

- `cm`

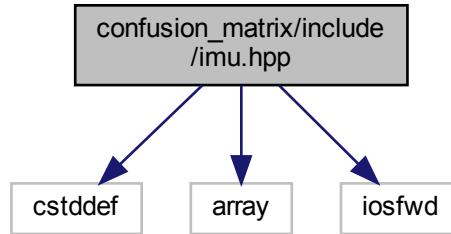
Functions

- template<typename Map , typename Key >
`auto cm::fetch (const Map &map, const Key &key)`
Fetches a value from a map for a given key.

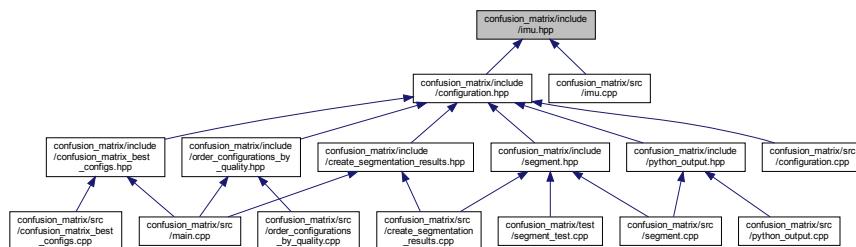
7.50 confusion_matrix/include imu.hpp File Reference

```
#include <cstddef>
#include <array>
```

```
#include <iostream>
Include dependency graph for imu.hpp:
```



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



Namespaces

- `cm`

Macros

- `#define CM_IMU`
- `#define CM_IMU_X(enm) enm,`
- `#define CM_IMU_X(enm) +1`
- `#define CM_IMU_X(enm) ::cm::imu::enm,`

Enumerations

- enum `cm::imu { cm::imu::CM_IMU_X, cm::imu::CM_IMU }`
Scoped enum type for the IMUs.

Functions

- `std::ostream & cm::operator<< (std::ostream &os, Imu imu)`
Prints imu to os.

Variables

- `constexpr std::size_t cm::imuCount`
The amount of IMUs.
- `constexpr std::array<Imu, imuCount> cm::imus`
An array of the IMU enumerators.

7.50.1 Macro Definition Documentation

7.50.1.1 CM_IMU

```
#define CM_IMU
```

Value:

```
CM_IMU_X(Accelerometer) \
CM_IMU_X(Gyroscope)
```

Definition at line 10 of file imu.hpp.

7.50.1.2 CM_IMU_X [1/3]

```
#define CM_IMU_X(
    enm ) enm,
```

Definition at line 18 of file imu.hpp.

7.50.1.3 CM_IMU_X [2/3]

```
#define CM_IMU_X(
    enm ) +1
```

Definition at line 18 of file imu.hpp.

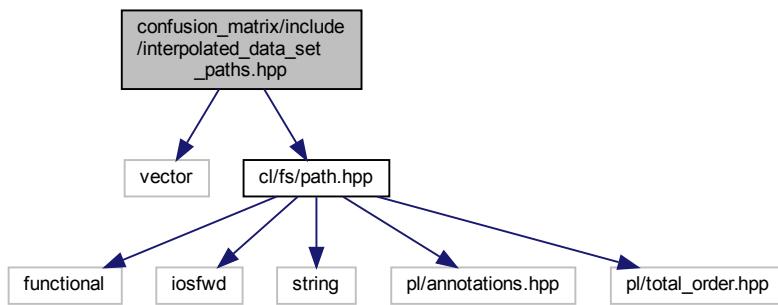
7.50.1.4 CM_IMU_X [3/3]

```
#define CM_IMU_X(
    enm ) ::cm::Imu::enm,
```

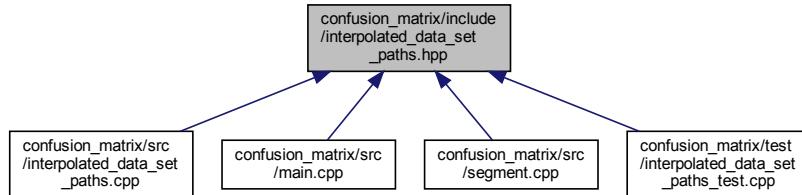
Definition at line 18 of file imu.hpp.

7.51 confusion_matrix/include/interpolated_data_set_paths.hpp File Reference

```
#include <vector>
#include <cl/fs/path.hpp>
Include dependency graph for interpolated_data_set_paths.hpp:
```



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



Namespaces

- `cm`

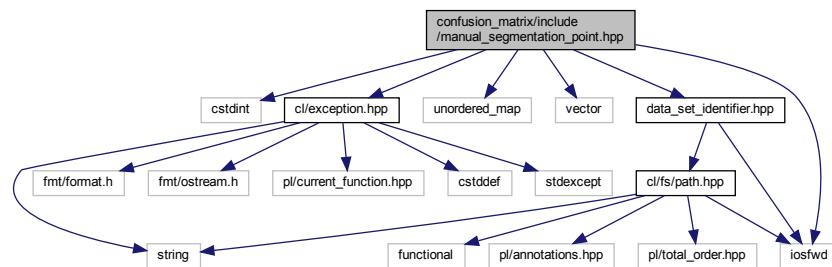
Functions

- `std::vector< cl::fs::Path > cm::interpolatedDataSetPaths ()`

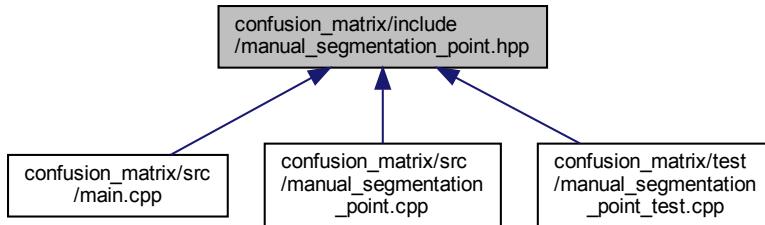
Returns the paths to the interpolated data sets.

7.52 confusion_matrix/include/manual_segmentation_point.hpp File Reference

```
#include <cstdint>
#include <iostream>
#include <unordered_map>
#include <vector>
#include <cl/exception.hpp>
#include "data_set_identifier.hpp"
Include dependency graph for manual_segmentation_point.hpp:
```



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



Classes

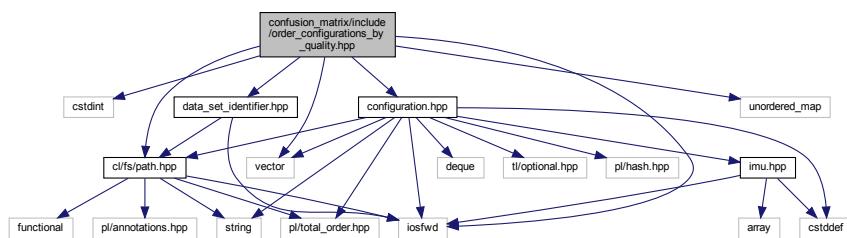
- class [cm::ManualSegmentationPoint](#)
Type used to represent a manual segmentation point.

Namespaces

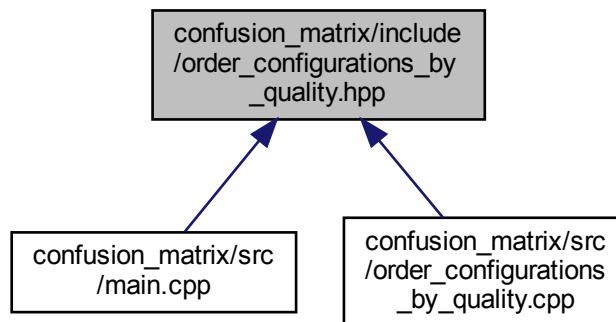
- [cm](#)

7.53 confusion_matrix/include/order_configurations_by_quality.hpp File Reference

```
#include <cstdint>
#include <iostream>
#include <unordered_map>
#include <vector>
#include <cl/fs/path.hpp>
#include "configuration.hpp"
#include "data_set_identifier.hpp"
Include dependency graph for order_configurations_by_quality.hpp:
```



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



Classes

- struct [cm::ConfigWithDistanceScore](#)

Namespaces

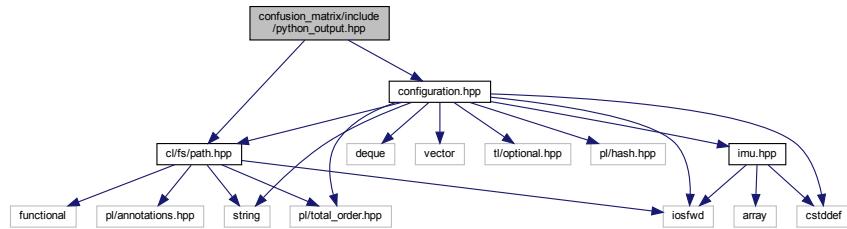
- [cm](#)

Functions

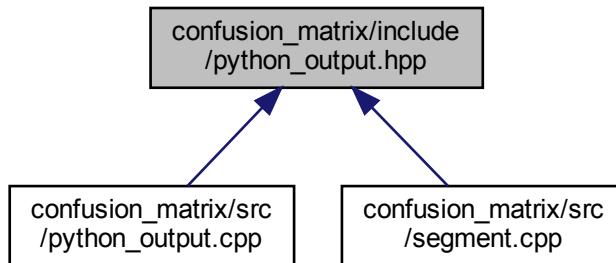
- bool `cm::operator<` (const ConfigWithDistanceScore &lhs, const ConfigWithDistanceScore &rhs) noexcept
- std::ostream & `cm::operator<<` (std::ostream &os, const ConfigWithDistanceScore &configWithDistScore)
- std::vector< ConfigWithDistanceScore > `cm::orderConfigurationsByQuality` (const std::unordered_map< DataSetIdentifier, std::vector< std::uint64_t > >> &manualSegmentationPoints, const std::unordered_map< Configuration, std::unordered_map< cl::fs::Path, std::vector< std::uint64_t > >>> &algorithmicallyDeterminedSegmentationPoints)

7.54 confusion_matrix/include/python_output.hpp File Reference

```
#include <cl/fs/path.hpp>
#include "configuration.hpp"
Include dependency graph for python_output.hpp:
```



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



Namespaces

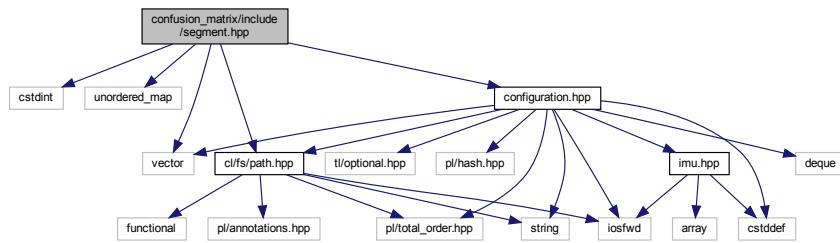
- `cm`

Functions

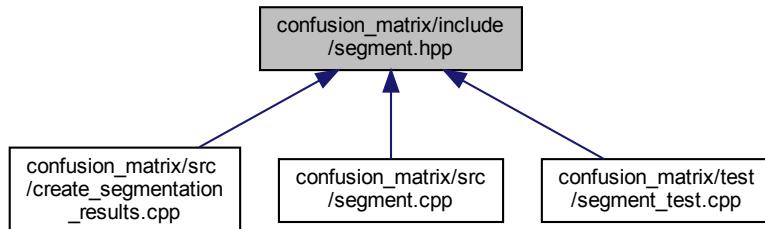
- std::string `cm::pythonOutput` (const `cl::fs::Path` &csvFilePath, const Configuration &segmentorConfiguration)
Runs the Python segmentor on path.

7.55 confusion_matrix/include/segment.hpp File Reference

```
#include <cstdint>
#include <unordered_map>
#include <vector>
#include <cl/fs/path.hpp>
#include "configuration.hpp"
Include dependency graph for segment.hpp:
```



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



Namespaces

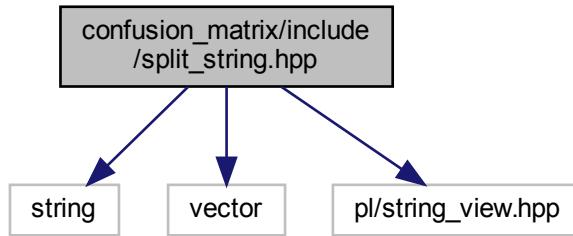
- `cm`

Functions

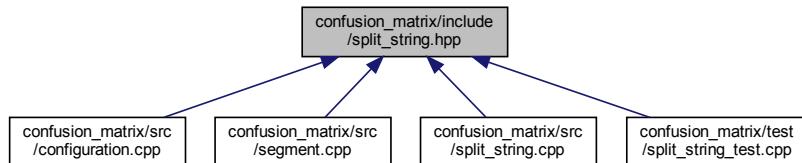
- `std::unordered_map< cl::fs::Path, std::vector< std::uint64_t > > cm::segment (const Configuration &segmentorConfiguration)`

7.56 confusion_matrix/include/split_string.hpp File Reference

```
#include <string>
#include <vector>
#include <pl/string_view.hpp>
Include dependency graph for split_string.hpp:
```



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



Namespaces

- [cm](#)

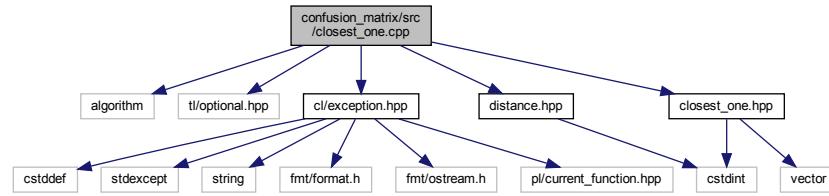
Functions

- `std::vector< std::string > cm::splitString (std::string string, pl::string_view splitBy)`
Splits string by splitBy.

7.57 confusion_matrix/src/closest_one.cpp File Reference

```
#include <algorithm>
#include <t1/optional.hpp>
#include <c1/exception.hpp>
#include "closest_one.hpp"
```

```
#include "distance.hpp"
Include dependency graph for closest_one.cpp:
```



Namespaces

- `cm`

Functions

- `std::uint64_t cm::closestOne (std::uint64_t algorithmicallyDeterminedSegmentationPoint, const std::vector<std::uint64_t > &manualSegmentationPoints)`
Finds the segmentation point in manualSegmentationPoints that is the closest to algorithmicallyDeterminedSegmentationPoint.

7.58 confusion_matrix/src/configuration.cpp File Reference

```
#include <algorithm>
#include <fstream>
#include <iostream>
#include <tuple>
#include <utility>
#include <fmt/format.h>
#include <fmt/ostream.h>
#include <pl/begin_end_macro.hpp>
#include <cl/exception.hpp>
#include <cl/s2n.hpp>
#include "configuration.hpp"
#include "split_string.hpp"
Include dependency graph for configuration.cpp:
```



Namespaces

- `cm`

Macros

- `#define CM_ENSURE_HAS_VALUE(dataMember)`
- `#define CM_ENSURE_CONTAINS(container, dataMember)`

Functions

- `bool cm::operator==(const Configuration &lhs, const Configuration &rhs) noexcept`
- `bool cm::operator<(const Configuration &lhs, const Configuration &rhs) noexcept`
- `std::ostream & cm::operator<<(std::ostream &os, const Configuration &config)`

7.58.1 Macro Definition Documentation

7.58.1.1 CM_ENSURE_CONTAINS

```
#define CM_ENSURE_CONTAINS (
    container,
    dataMember )
```

Value:

```
PL_BEGIN_MACRO
if (!contains(container, dataMember)) {
    CL_THROW_FMT(
        "\\"{}\\" is not a valid option for \"{}\"", *dataMember, #dataMember); \
}
PL_END_MACRO
```

7.58.1.2 CM_ENSURE_HAS_VALUE

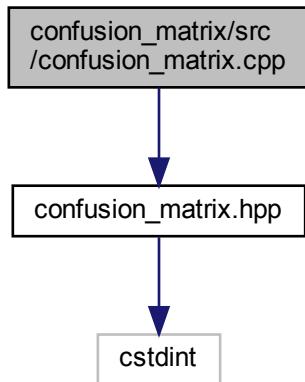
```
#define CM_ENSURE_HAS_VALUE (
    dataMember )
```

Value:

```
PL_BEGIN_MACRO
if (!dataMember.has_value()) {
    CL_THROW_FMT("\"{}\" was nullopt!", #dataMember); \
}
PL_END_MACRO
```

7.59 confusion_matrix/src/confusion_matrix.cpp File Reference

```
#include "confusion_matrix.hpp"  
Include dependency graph for confusion_matrix.cpp:
```



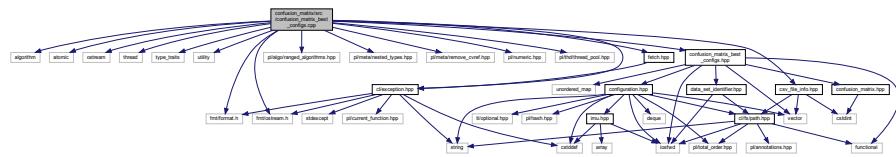
Namespaces

- [cm](#)

7.60 confusion_matrix/src/confusion_matrix_best_configs.cpp File Reference

```
#include <algorithm>  
#include <atomic>  
#include <iostream>  
#include <thread>  
#include <type_traits>  
#include <utility>  
#include <fmt/format.h>  
#include <fmt/ostream.h>  
#include <pl/algo/ranged_algorithms.hpp>  
#include <pl/meta/nested_types.hpp>  
#include <pl/meta/remove_cvref.hpp>  
#include <pl/numeric.hpp>  
#include <pl/thd/thread_pool.hpp>  
#include <cl/exception.hpp>  
#include "confusion_matrix_best_configs.hpp"  
#include "csv_file_info.hpp"
```

```
#include "fetch.hpp"
Include dependency graph for confusion_matrix_best_configs.cpp:
```



Namespaces

- cm

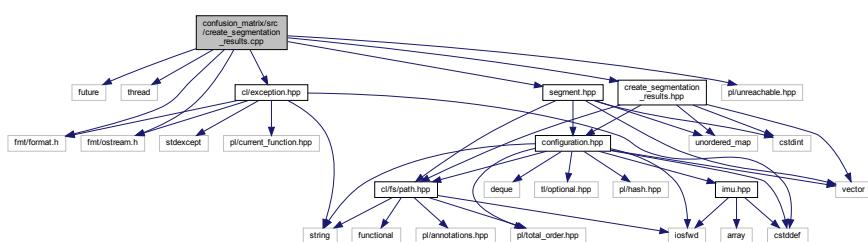
Functions

- std::ostream & **cm::operator<<** (std::ostream &os, const ConfigWithTotalConfusionMatrix &obj)
 - std::vector< ConfigWithTotalConfusionMatrix > **cm::confusionMatrixBestConfigs** (const std::unordered_map< DataSetIdentifier, std::vector< std::uint64_t > > &manualSegmentationPoints, const std::unordered_map< Configuration, std::unordered_map< cl::fs::Path, std::vector< std::uint64_t > > > &algorithmicallyDeterminedSegmentationPoints, const std::function< bool(const ConfigWithTotalConfusionMatrix &, const ConfigWithTotalConfusionMatrix &) > &sorter)

Determines the 'best' configurations.

7.61 confusion_matrix/src/create_segmentation_results.cpp File Reference

```
#include <future>
#include <thread>
#include <fmt/format.h>
#include <fmt/ostream.h>
#include <pl/unreachable.hpp>
#include <cl/exception.hpp>
#include "create_segmentation_results.hpp"
#include "segment.hpp"
Include dependency graph for create_segmentation_results.cpp
```



Namespaces

- cm

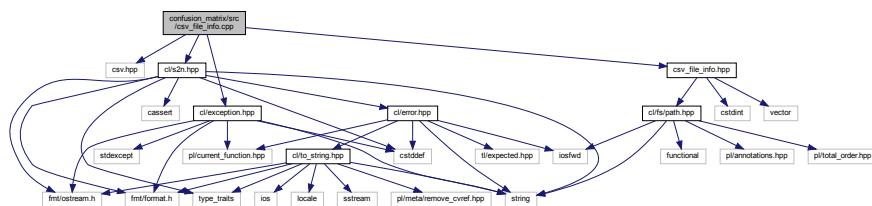
Functions

- std::unordered_map< cm::Configuration, std::unordered_map< cl::fs::Path, std::vector< std::uint64_t > > > cm::createSegmentationResults ()

Invokes Python to generate the segmentation points algorithmically.

7.62 confusion_matrix/src/csv_file_info.cpp File Reference

```
#include <csv.hpp>
#include <cl/exception.hpp>
#include <cl/s2n.hpp>
#include "csv_file_info.hpp"
Include dependency graph for csv_file_info.cpp:
```

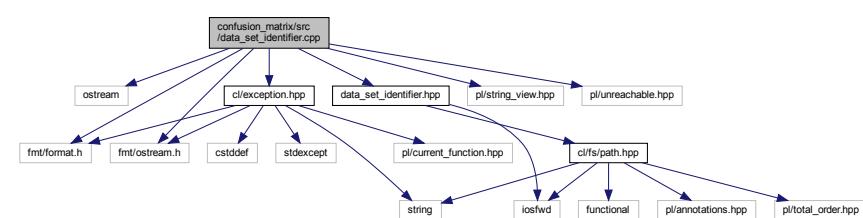


Namespaces

- cm

7.63 confusion_matrix/src/data_set_identifier.cpp File Reference

```
#include <iostream>
#include <fmt/format.h>
#include <fmt/ostream.h>
#include <pl/string_view.hpp>
#include <pl/unreachable.hpp>
#include <cl/exception.hpp>
#include "data_set_identifier.hpp"
Include dependency graph for data_set_identifier.cpp:
```



Namespaces

- [cm](#)

Macros

- `#define CM_DATA_SET_IDENTIFIER_X(enm) case DataSetIdentifier::enm: return #enm; /* stringify */`
- `#define DSI DataSetIdentifier`

Functions

- `std::ostream & cm::operator<< (std::ostream &os, DataSetIdentifier dsi)`
Prints a DataSetIdentifier to an ostream.
- `DataSetIdentifier cm::toDataSetIdentifier (const cl::fs::Path &path)`
Converts a path to a CSV file to the corresponding DataSetIdentifier.

7.63.1 Macro Definition Documentation

7.63.1.1 CM_DATA_SET_IDENTIFIER_X

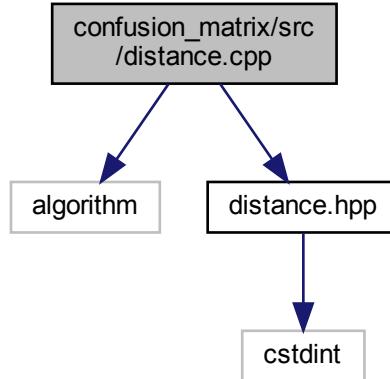
```
#define CM_DATA_SET_IDENTIFIER_X(  
    enm ) case DataSetIdentifier::enm:    return #enm; /* stringify */
```

7.63.1.2 DSI

```
#define DSI DataSetIdentifier
```

7.64 confusion_matrix/src/distance.cpp File Reference

```
#include <algorithm>
#include "distance.hpp"
Include dependency graph for distance.cpp:
```



Namespaces

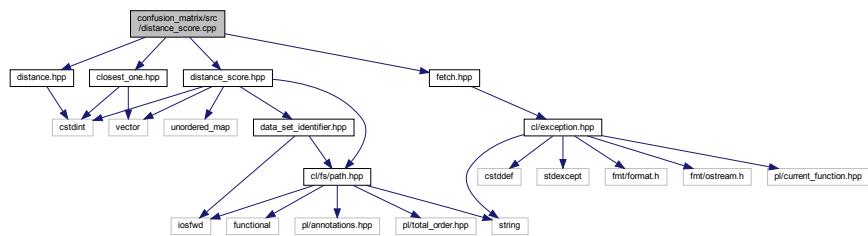
- [cm](#)

Functions

- std::uint64_t [cm::distance](#) (std::uint64_t a, std::uint64_t b)
Calculates the distance between a and b.

7.65 confusion_matrix/src/distance_score.cpp File Reference

```
#include "distance_score.hpp"
#include "closest_one.hpp"
#include "distance.hpp"
#include "fetch.hpp"
Include dependency graph for distance_score.cpp:
```



Namespaces

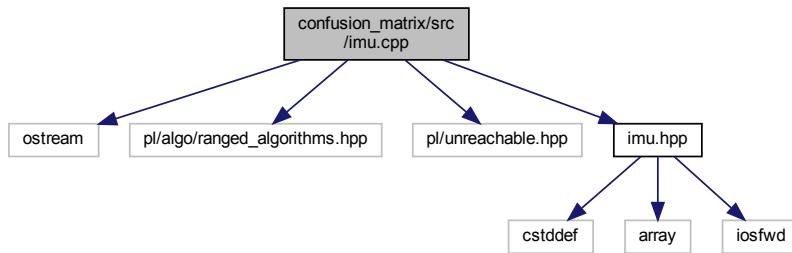
- cm

Functions

- std::uint64_t cm::distanceScore (const std::unordered_map< cl::fs::Path, std::vector< std::uint64_t >> &segmentationPointsForConfig, const std::unordered_map< DataSetIdentifier, std::vector< std::uint64_t >> &manualSegmentationPoints)

7.66 confusion_matrix/src/imu.cpp File Reference

```
#include <iostream>
#include <pl/algo/ranged_algorithms.hpp>
#include <pl/unreachable.hpp>
#include "imu.hpp"
Include dependency graph for imu.cpp:
```



Namespaces

- cm

Macros

- #define CM_IMU_X(enm) case Imu::enm: return os << toLower(#enm);

Functions

- std::ostream & cm::operator<< (std::ostream &os, Imu imu)

Prints imu to os.

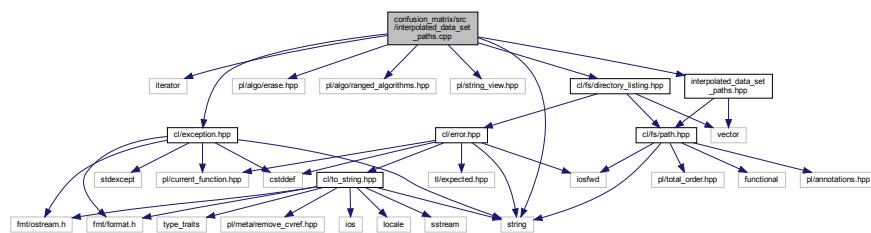
7.66.1 Macro Definition Documentation

7.66.1.1 CM_IMU_X

```
#define CM_IMU_X(
    enm ) case Imu::enm: return os << toLower(#enm);
```

7.67 confusion_matrix/src/interpolated_data_set_paths.cpp File Reference

```
#include <iterator>
#include <string>
#include <pl/algo/erase.hpp>
#include <pl/algo/ranged_algorithms.hpp>
#include <pl/string_view.hpp>
#include <cl/exception.hpp>
#include <cl/fs/directory_listing.hpp>
#include "interpolated_data_set_paths.hpp"
Include dependency graph for interpolated_data_set_paths.cpp:
```



Namespaces

- `cm`

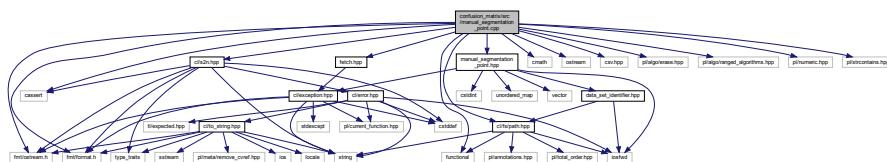
Functions

- `std::vector< cl::fs::Path > cm::interpolatedDataSetPaths ()`
Returns the paths to the interpolated data sets.

7.68 confusion_matrix/src/manual_segmentation_point.cpp File Reference

```
#include <cassert>
#include <cmath>
#include <functional>
#include <iostream>
#include <fmt/format.h>
#include <fmt/ostream.h>
#include <csv.hpp>
```

```
#include <pl/algo/erase.hpp>
#include <pl/algo/ranged_algorithms.hpp>
#include <pl/numeric.hpp>
#include <pl/strcontains.hpp>
#include <c1/fs/path.hpp>
#include <c1/s2n.hpp>
#include "fetch.hpp"
#include "manual_segmentation_point.hpp"
Include dependency graph for manual_segmentation_point.cpp:
```



Namespaces

- cm

Macros

- #define DSI DataSetIdentifier

Functions

- bool `cm::operator==` (const ManualSegmentationPoint &lhs, const ManualSegmentationPoint &rhs) noexcept
 - bool `cm::operator!=` (const ManualSegmentationPoint &lhs, const ManualSegmentationPoint &rhs) noexcept
 - std::ostream & `cm::operator<<` (std::ostream &os, const ManualSegmentationPoint &manualSegmentationPoint)

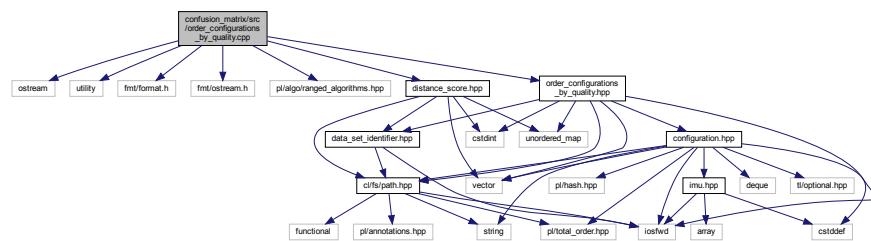
7.68.1 Macro Definition Documentation

7.68.1.1 DSI

```
#define DST DataSetIdentifier
```

7.69 confusion_matrix/src/order_configurations_by_quality.cpp File Reference

```
#include <iostream>
#include <utility>
#include <fmt/format.h>
#include <fmt/ostream.h>
#include <pl/algo/ranged_algorithms.hpp>
#include "distance_score.hpp"
#include "order_configurations_by_quality.hpp"
Include dependency graph for order_configurations_by_quality.cpp:
```



Namespaces

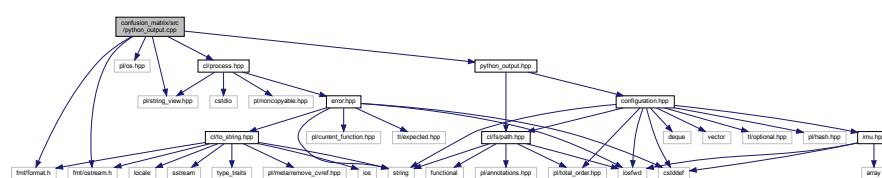
- [cm](#)

Functions

- bool [cm::operator<](#) (const ConfigWithDistanceScore &lhs, const ConfigWithDistanceScore &rhs) noexcept
- std::ostream & [cm::operator<<](#) (std::ostream &os, const ConfigWithDistanceScore &configWithDistScore)
- std::vector< ConfigWithDistanceScore > [cm::orderConfigurationsByQuality](#) (const std::unordered_map< DataSetIdentifier, std::vector< std::uint64_t >> &manualSegmentationPoints, const std::unordered_map< Configuration, std::unordered_map< [cl:fs::Path](#), std::vector< std::uint64_t >>> &algorithmicallyDeterminedSegmentationPoints)

7.70 confusion_matrix/src/python_output.cpp File Reference

```
#include <fmt/format.h>
#include <fmt/ostream.h>
#include <pl/os.hpp>
#include <pl/string_view.hpp>
#include <cl/process.hpp>
#include "python_output.hpp"
Include dependency graph for python_output.cpp:
```



Namespaces

- cm

Macros

- `#define CM_SEGMENTOR "./preprocessed_segment.sh"`
Object like macro for the segmentor script.
 - `#define CM_DEV_NULL "/dev/null"`
Object like macro for /dev/null.

Functions

- std::string **cm::pythonOutput** (const cl::fs::Path &csvFilePath, const Configuration &segmentorConfiguration)
Runs the Python segmentor on path.

7.70.1 Macro Definition Documentation

7.70.1.1 CM DEV NULL

```
#define CM_DEV NULL "/dev/null"
```

Object like macro for /dev/null.

Definition at line 24 of file `python_output.cpp`.

7.70.1.2 CM SEGMENTOR

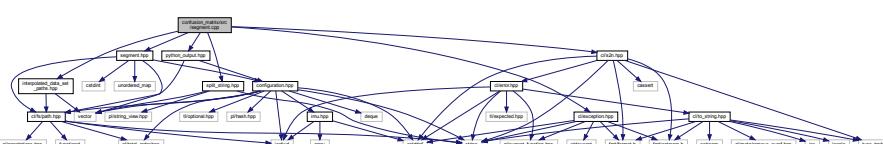
```
#define CM_SEGMENTOR "./preprocessed_segment.sh"
```

Object like macro for the segmentor script.

Definition at line 23 of file `python_output.cpp`.

7.71 confusion matrix/src/segment.cpp File Reference

```
#include <cl/exception.hpp>
#include <cl/s2n.hpp>
#include "interpolated_data_set_paths.hpp"
#include "python_output.hpp"
#include "segment.hpp"
#include "split_string.hpp"
Include dependency graph for segment.cpp:
```



Namespaces

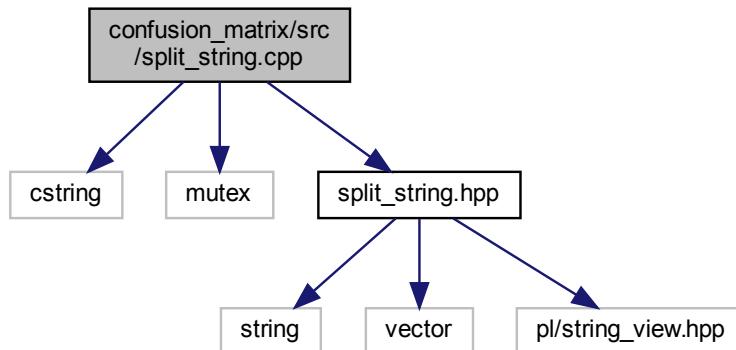
- [cm](#)

Functions

- `std::unordered_map< cl::fs::Path, std::vector< std::uint64_t > > cm::segment (const Configuration &segmentorConfiguration)`

7.72 confusion_matrix/src/split_string.cpp File Reference

```
#include <cstring>
#include <mutex>
#include "split_string.hpp"
Include dependency graph for split_string.cpp:
```



Namespaces

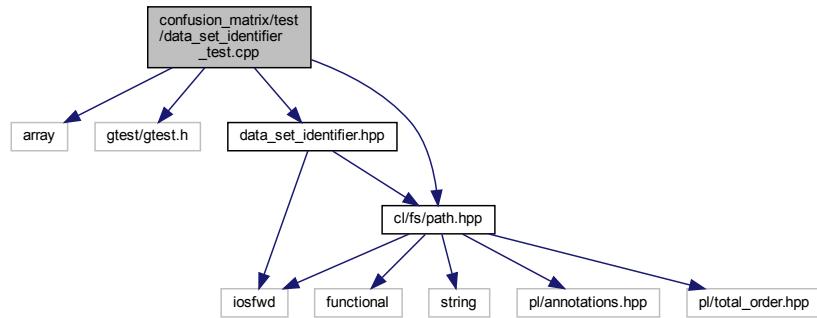
- [cm](#)

Functions

- `std::vector< std::string > cm::splitString (std::string string, pl::string_view splitBy)`
Splits string by splitBy.

7.73 confusion_matrix/test/data_set_identifier_test.cpp File Reference

```
#include <array>
#include "gtest/gtest.h"
#include <c1/fs/path.hpp>
#include "data_set_identifier.hpp"
Include dependency graph for data_set_identifier_test.cpp:
```



Macros

- `#define DSI ::cm::DataSetIdentifier`

Functions

- `TEST (DataSetIdentifier, shouldConvertPaths)`

7.73.1 Macro Definition Documentation

7.73.1.1 DSI

```
#define DSI ::cm::DataSetIdentifier
```

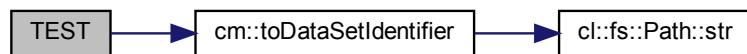
7.73.2 Function Documentation

7.73.2.1 TEST()

```
TEST (
    DataSetIdentifier ,
    shouldConvertPaths )
```

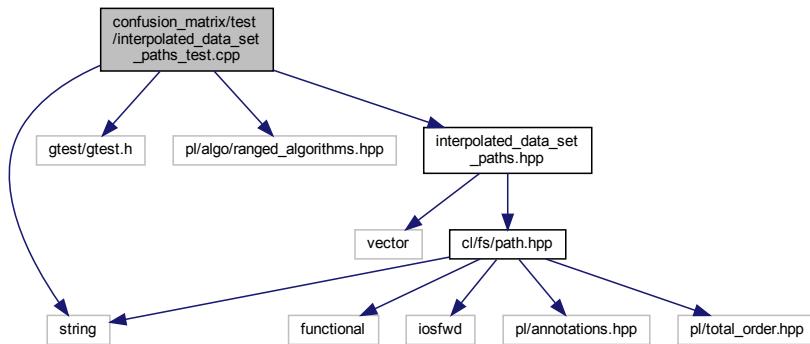
Definition at line 9 of file `data_set_identifier_test.cpp`.

Here is the call graph for this function:



7.74 confusion_matrix/test/interpolated_data_set_paths_test.cpp File Reference

```
#include <string>
#include "gtest/gtest.h"
#include <pl/algo/ranged_algorithms.hpp>
#include "interpolated_data_set_paths.hpp"
Include dependency graph for interpolated_data_set_paths_test.cpp:
```



Functions

- [TEST](#) (`interpolatedDataSetPaths`, `shouldFetchPaths`)

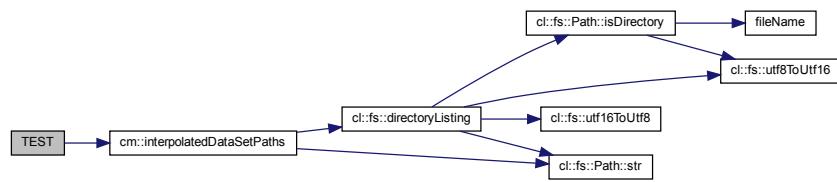
7.74.1 Function Documentation

7.74.1.1 TEST()

```
TEST (
    interpolatedDataSetPaths ,
    shouldFetchPaths )
```

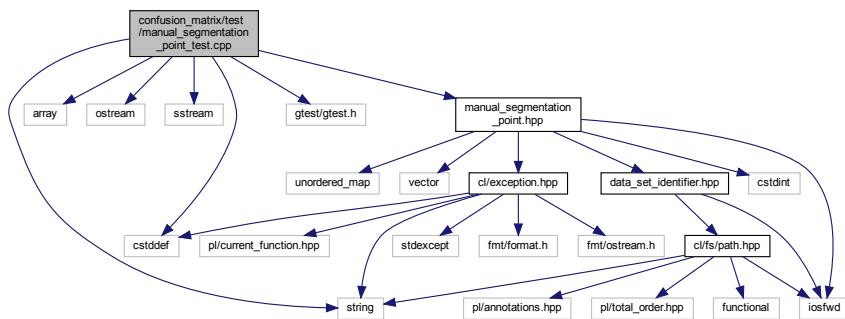
Definition at line 9 of file interpolated_data_set_paths_test.cpp.

Here is the call graph for this function:



7.75 confusion_matrix/test/manual_segmentation_point_test.cpp File Reference

```
#include <cstddef>
#include <array>
#include <iostream>
#include <sstream>
#include <sstream>
#include <string>
#include "gtest/gtest.h"
#include "manual_segmentation_point.hpp"
Include dependency graph for manual_segmentation_point_test.cpp:
```



Macros

- #define DSI ::cm::DataSetIdentifier

Functions

- `TEST (ManualSegmentationPoint, shouldConstruct)`
- `TEST (ManualSegmentationPoint, shouldThrowWhenConstructingWithInvalidMinute)`
- `TEST (ManualSegmentationPoint, shouldThrowWhenConstructingWithInvalidSecond)`
- `TEST (ManualSegmentationPoint, shouldThrowWhenConstructingWithInvalidFrame)`
- `TEST (ManualSegmentationPoint, shouldConvertToMilliseconds)`
- `TEST (ManualSegmentationPoint, shouldConvertHourToMilliseconds)`
- `TEST (ManualSegmentationPoint, shouldConvertMinuteToMilliseconds)`
- `TEST (ManualSegmentationPoint, shouldConvertSecondToMilliseconds)`
- `TEST (ManualSegmentationPoint, shouldConvertFramesToMilliseconds)`
- `TEST (ManualSegmentationPoint, shouldBeAbleToImportCsvFile)`
- `TEST (ManualSegmentationPoint, shouldPrint)`

7.75.1 Macro Definition Documentation

7.75.1.1 DSI

```
#define DSI ::cm::DataSetIdentifier
```

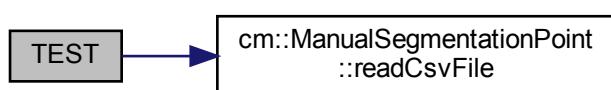
7.75.2 Function Documentation

7.75.2.1 TEST() [1/11]

```
TEST (
    ManualSegmentationPoint ,
    shouldBeAbleToImportCsvFile )
```

Definition at line 98 of file manual_segmentation_point_test.cpp.

Here is the call graph for this function:



7.75.2.2 TEST() [2/11]

```
TEST (
    ManualSegmentationPoint ,
    shouldConstruct )
```

Definition at line 12 of file manual_segmentation_point_test.cpp.

7.75.2.3 TEST() [3/11]

```
TEST (
    ManualSegmentationPoint ,
    shouldConvertFramesToMilliseconds )
```

Definition at line 82 of file manual_segmentation_point_test.cpp.

7.75.2.4 TEST() [4/11]

```
TEST (
    ManualSegmentationPoint ,
    shouldConvertHourToMilliseconds )
```

Definition at line 64 of file manual_segmentation_point_test.cpp.

7.75.2.5 TEST() [5/11]

```
TEST (
    ManualSegmentationPoint ,
    shouldConvertMinuteToMilliseconds )
```

Definition at line 70 of file manual_segmentation_point_test.cpp.

7.75.2.6 TEST() [6/11]

```
TEST (
    ManualSegmentationPoint ,
    shouldConvertSecondToMilliseconds )
```

Definition at line 76 of file manual_segmentation_point_test.cpp.

7.75.2.7 TEST() [7/11]

```
TEST (
    ManualSegmentationPoint ,
    shouldConvertToMilliseconds )
```

Definition at line 58 of file manual_segmentation_point_test.cpp.

7.75.2.8 TEST() [8/11]

```
TEST (
    ManualSegmentationPoint ,
    shouldPrint )
```

Definition at line 370 of file manual_segmentation_point_test.cpp.

7.75.2.9 TEST() [9/11]

```
TEST (
    ManualSegmentationPoint ,
    shouldThrowWhenConstructingWithInvalidFrame )
```

Definition at line 46 of file manual_segmentation_point_test.cpp.

7.75.2.10 TEST() [10/11]

```
TEST (
    ManualSegmentationPoint ,
    shouldThrowWhenConstructingWithInvalidMinute )
```

Definition at line 22 of file manual_segmentation_point_test.cpp.

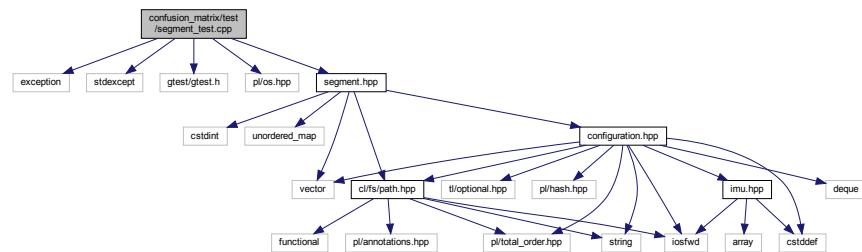
7.75.2.11 TEST() [11/11]

```
TEST (
    ManualSegmentationPoint ,
    shouldThrowWhenConstructingWithInvalidSecond )
```

Definition at line 34 of file manual_segmentation_point_test.cpp.

7.76 confusion_matrix/test/segment_test.cpp File Reference

```
#include <exception>
#include <stdexcept>
#include "gtest/gtest.h"
#include <pl/os.hpp>
#include "segment.hpp"
Include dependency graph for segment_test.cpp:
```



Macros

- `#define EXPECT_SEGMENTATION_POINTS(path, ...) EXPECT_EQ((std::vector<std::uint64_t>{__VA_ARGS__}), fetch(path))`

Functions

- `TEST(segment, shouldGetExpectedSegmentationPointsFromPython)`

7.76.1 Macro Definition Documentation

7.76.1.1 EXPECT_SEGMENTATION_POINTS

```
#define EXPECT_SEGMENTATION_POINTS(
    path,
    ...
) EXPECT_EQ((std::vector<std::uint64_t>{__VA_ARGS__}), fetch(path))
```

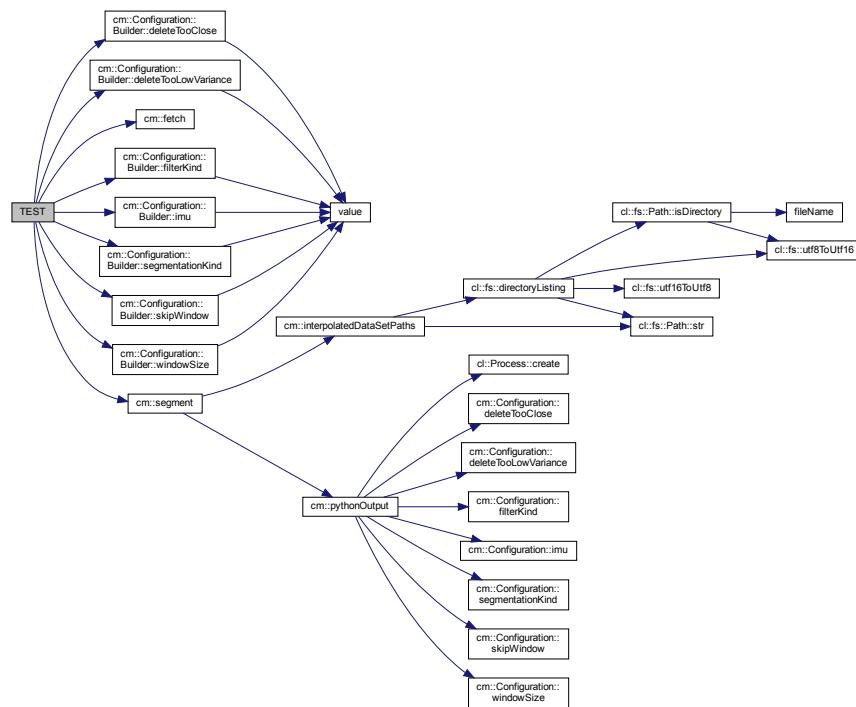
7.76.2 Function Documentation

7.76.2.1 TEST()

```
TEST (
    segment ,
    shouldGetExpectedSegmentationPointsFromPython )
```

Definition at line 11 of file segment_test.cpp.

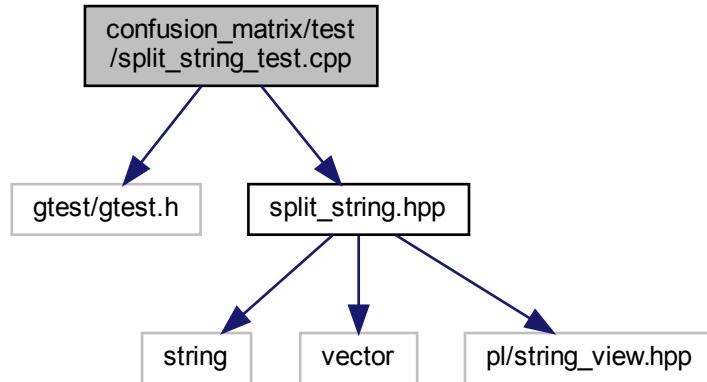
Here is the call graph for this function:



7.77 confusion_matrix/test/split_string_test.cpp File Reference

```
#include "gtest/gtest.h"
#include "split_string.hpp"
```

Include dependency graph for split_string_test.cpp:



Functions

- [TEST](#) (`splitString`, `shouldSplitString`)

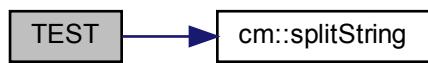
7.77.1 Function Documentation

7.77.1.1 TEST()

```
TEST (
    splitString ,
    shouldSplitString )
```

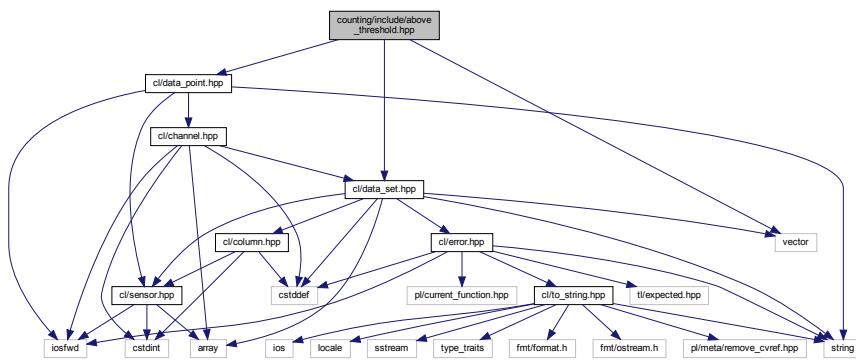
Definition at line 5 of file `split_string_test.cpp`.

Here is the call graph for this function:

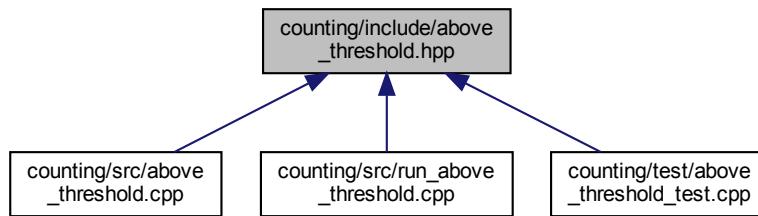


7.78 counting/include/above_threshold.hpp File Reference

```
#include <vector>
#include "cl/data_point.hpp"
#include "cl/data_set.hpp"
Include dependency graph for above_threshold.hpp:
```



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



Namespaces

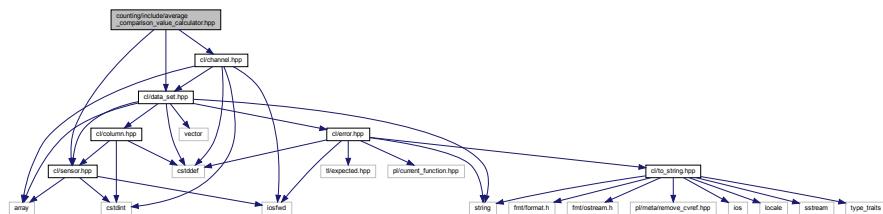
- `ctg`

Functions

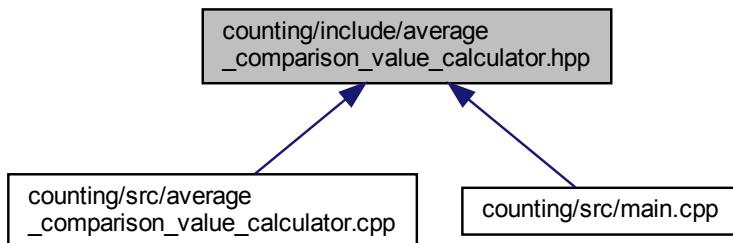
- `std::vector< cl::DataPoint > ctg::aboveThreshold (const cl::DataSet &dataSet, long double accelerometerThreshold, long double gyroscopeThreshold)`

7.79 counting/include/average_comparison_value_calculator.hpp File Reference

```
#include "cl/channel.hpp"
#include "cl/data_set.hpp"
#include "cl/sensor.hpp"
Include dependency graph for average_comparison_value_calculator.hpp:
```



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



Namespaces

- `ctg`

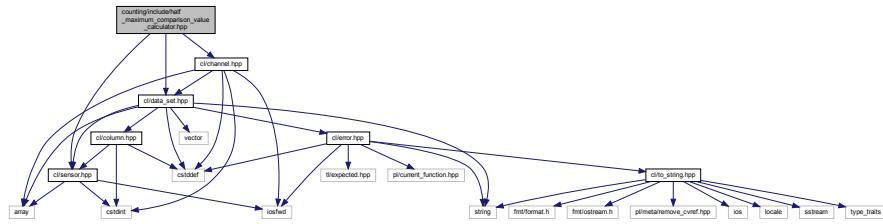
Functions

- `long double ctg::averageComparisonValueCalculator (cl::Sensor sensor, cl::Channel channel, const cl::DataSet &dataSet)`

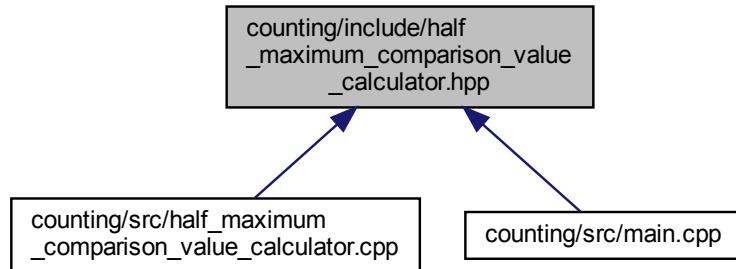
7.80 counting/include/half_maximum_comparison_value_calculator.hpp File Reference

```
#include "cl/channel.hpp"
#include "cl/data_set.hpp"
```

```
#include "cl/sensor.hpp"
Include dependency graph for half_maximum_comparison_value_calculator.hpp:
```



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



Namespaces

- ctg

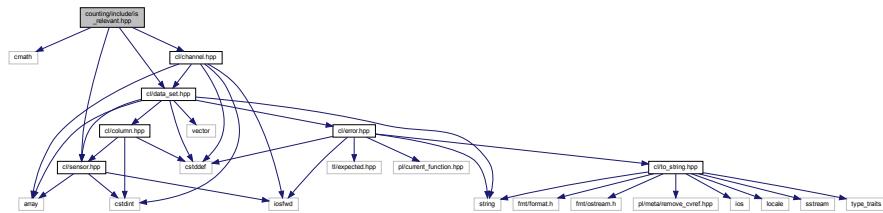
Functions

- long double `ctg::halfMaximumComparisonValueCalculator` (`cl::Sensor sensor, cl::Channel channel, const cl::DataSet &dataSet`)

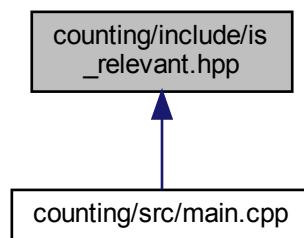
7.81 counting/include/is_relevant.hpp File Reference

```
#include <cmath>
#include "cl/channel.hpp"
#include "cl/data_set.hpp"
```

```
#include "cl/sensor.hpp"
Include dependency graph for is_relevant.hpp:
```



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



Namespaces

- ctg

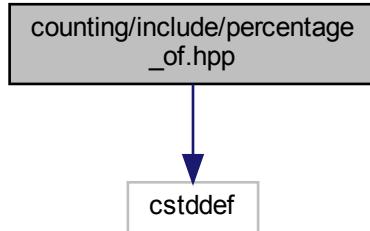
Functions

- template<typename ComparisonValueCalculator>
bool **ctg::isRelevant**(**cl::Sensor sensor**, **cl::Channel channel**, const **cl::DataSet** &**dataSet**, **ComparisonValueCalculator** **comparisonValueCalculator**)

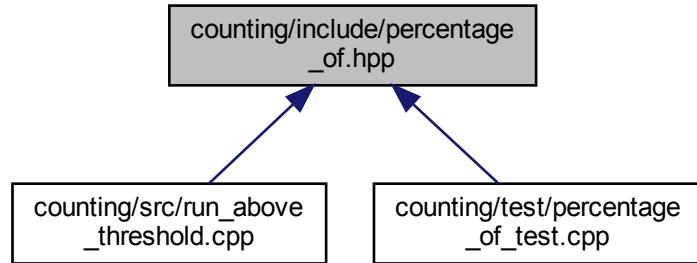
7.82 counting/include/percentage_of.hpp File Reference

```
#include <cstddef>
```

Include dependency graph for percentage_of.hpp:



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



Namespaces

- [ctg](#)

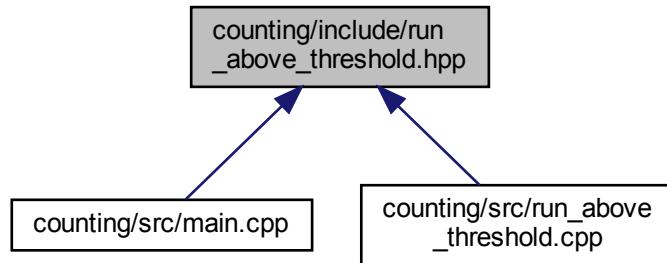
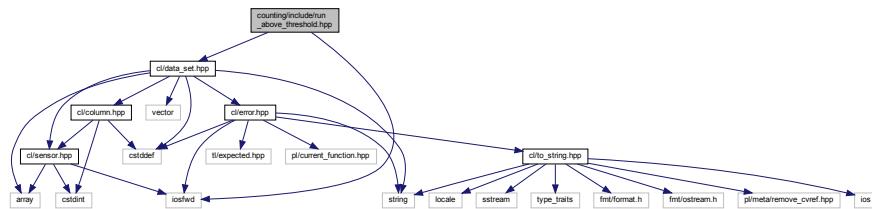
Functions

- `constexpr long double ctg::percentageOf (std::size_t amount, std::size_t totalCount) noexcept`

7.83 counting/include/run_above_threshold.hpp File Reference

```
#include <iostream>
#include "cl/data_set.hpp"
```

Include dependency graph for run_above_threshold.hpp:



Namespaces

- `ctg`

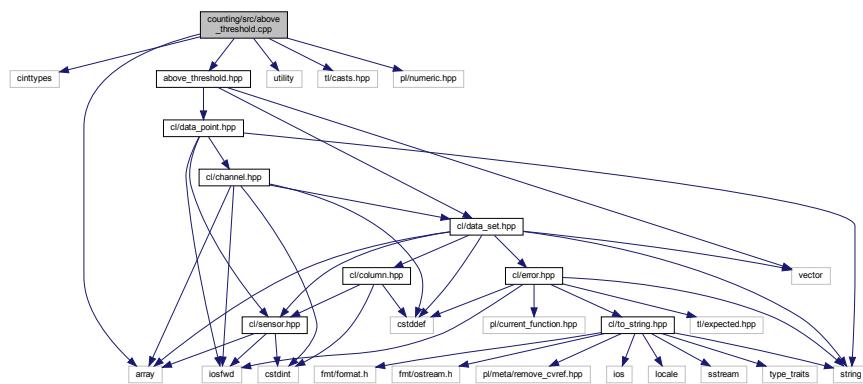
Functions

- void `ctg::runAboveThreshold` (`std::ostream &aboveThresholdLogFileStream, const cl::DataSet &dataSet)`

7.84 counting/src/above_threshold.cpp File Reference

```
#include <cinttypes>
#include <array>
#include <utility>
#include <tl/casts.hpp>
#include <pl/numeric.hpp>
```

```
#include "above_threshold.hpp"
Include dependency graph for above_threshold.cpp:
```



Namespaces

- `ctg`

Macros

- `#define CL_CHANNEL_X(enm, v, accessor) {accessor, cl::Channel::enm},`

Functions

- `std::vector< cl::DataPoint > ctg::aboveThreshold (const cl::DataSet &dataSet, long double accelerometerThreshold, long double gyroscopeThreshold)`

7.84.1 Macro Definition Documentation

7.84.1.1 CL_CHANNEL_X

```
#define CL_CHANNEL_X(
    enm,
    v,
    accessor ) {accessor, cl::Channel::enm},
```

7.84.2 Variable Documentation

7.84.2.1 channel

```
cl::Channel channel
```

Definition at line 18 of file above_threshold.cpp.

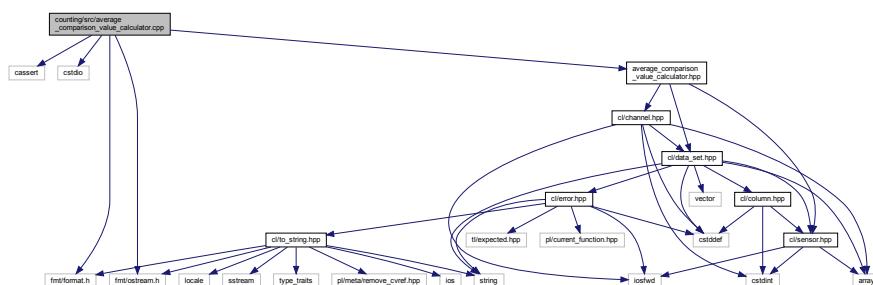
7.84.2.2 channelAccessor

```
cl::DataSet::ChannelAccessor channelAccessor
```

Definition at line 17 of file above_threshold.cpp.

7.85 counting/src/average_comparison_value_calculator.cpp File Reference

```
#include <cassert>
#include <cstdio>
#include <fmt/format.h>
#include <fmt/ostream.h>
#include "average_comparison_value_calculator.hpp"
Include dependency graph for average_comparison_value_calculator.cpp:
```



Namespaces

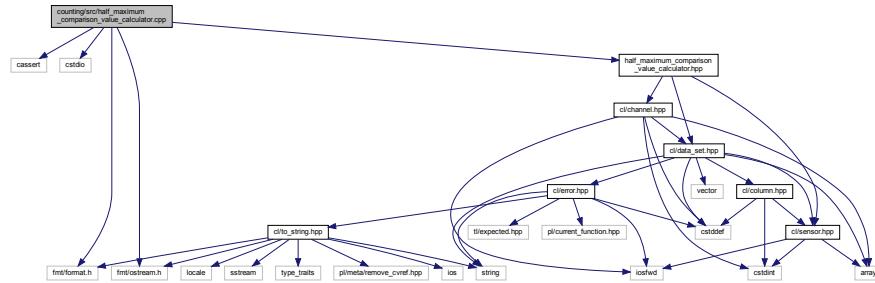
- `ctg`

Functions

- long double `ctg::averageComparisonValueCalculator (cl::Sensor sensor, cl::Channel channel, const cl::DataSet &dataSet)`

7.86 counting/src/half_maximum_comparison_value_calculator.cpp File Reference

```
#include <cassert>
#include <cstdio>
#include <fmt/format.h>
#include <fmt/ostream.h>
#include "half_maximum_comparison_value_calculator.hpp"
Include dependency graph for half_maximum_comparison_value_calculator.cpp:
```



Namespaces

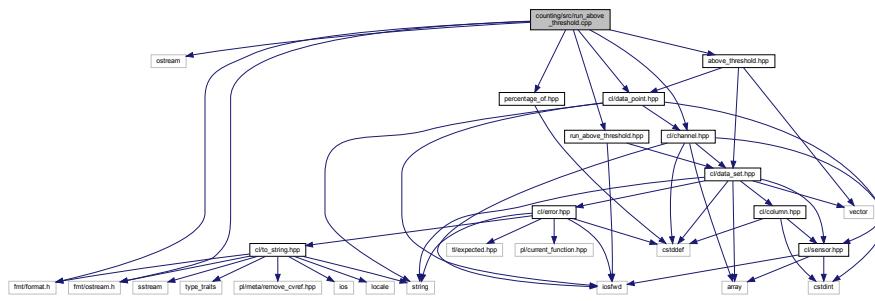
- ctg

Functions

- long double ctg::halfMaximumComparisonValueCalculator (cl::Sensor sensor, cl::Channel channel, const cl::DataSet &dataSet)

7.87 counting/src/run_above_threshold.cpp File Reference

```
#include <iostream>
#include <fmt/format.h>
#include <fmt/ostream.h>
#include "cl/channel.hpp"
#include "cl/data_point.hpp"
#include "above_threshold.hpp"
#include "percentage_of.hpp"
#include "run_above_threshold.hpp"
Include dependency graph for run_above_threshold.cpp:
```



Namespaces

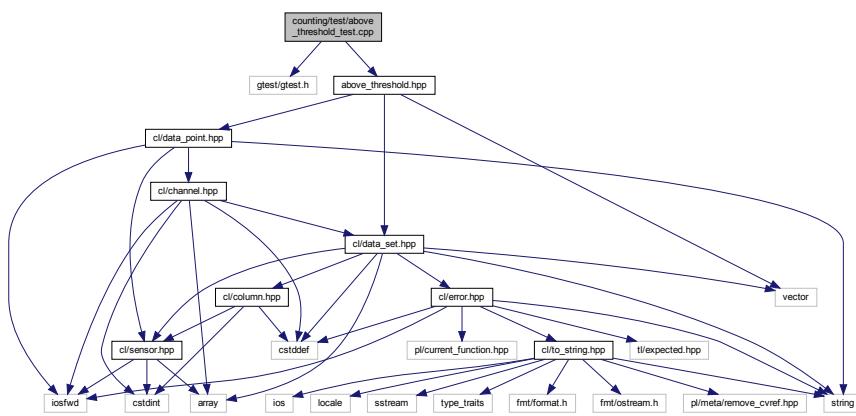
- `ctg`

Functions

- void `ctg::runAboveThreshold` (`std::ostream &aboveThresholdLogFileStream, const cl::DataSet &dataSet)`

7.88 counting/test/above_threshold_test.cpp File Reference

```
#include "gtest/gtest.h"
#include "above_threshold.hpp"
Include dependency graph for above_threshold_test.cpp:
```



Macros

- `#define EXPECT_LONG_DOUBLE_EQ(a, b) EXPECT_DOUBLE_EQ(static_cast<double>(a), static_cast<double>(b))`

Functions

- `TEST` (`aboveThreshold, shouldFindDataPointsIfThereAreAny`)

7.88.1 Macro Definition Documentation

7.88.1.1 EXPECT_LONG_DOUBLE_EQ

```
#define EXPECT_LONG_DOUBLE_EQ( a, b ) EXPECT_DOUBLE_EQ( static_cast<double>(a), static_cast<double>(b) )
```

Definition at line 6 of file above_threshold_test.cpp.

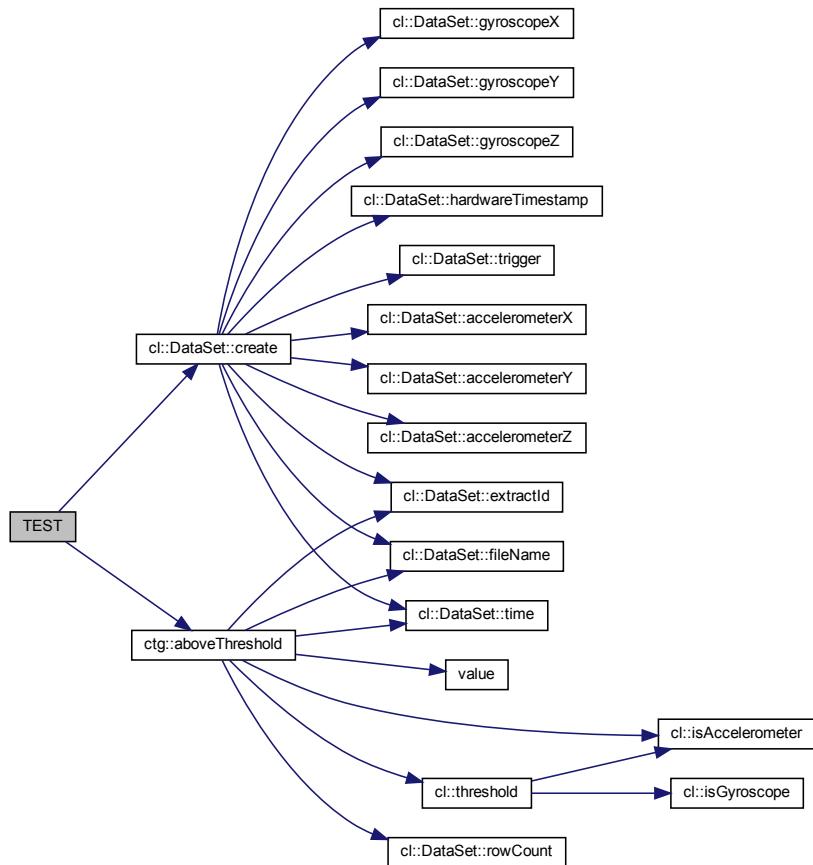
7.88.2 Function Documentation

7.88.2.1 TEST()

```
TEST( aboveThreshold , shouldFindDataPointsIfThereAreAny )
```

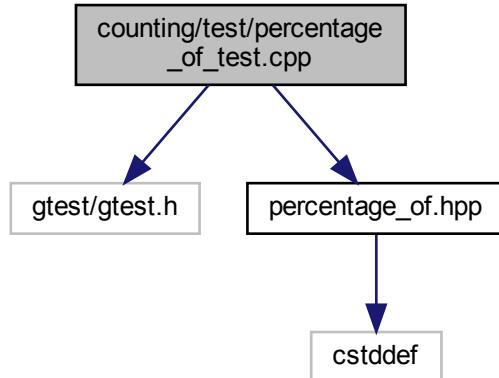
Definition at line 10 of file above_threshold_test.cpp.

Here is the call graph for this function:



7.89 counting/test/percentage_of_test.cpp File Reference

```
#include "gtest/gtest.h"
#include "percentage_of.hpp"
Include dependency graph for percentage_of_test.cpp:
```



Macros

- `#define EXPECT_LONG_DOUBLE_EQ(a, b) EXPECT_DOUBLE_EQ(static_cast<double>(a), static_cast<double>(b))`

Functions

- `TEST(percentageOf, shouldWork)`

7.89.1 Macro Definition Documentation

7.89.1.1 EXPECT_LONG_DOUBLE_EQ

```
#define EXPECT_LONG_DOUBLE_EQ(
    a,
    b ) EXPECT_DOUBLE_EQ(static_cast<double>(a), static_cast<double>(b))
```

Definition at line 6 of file percentage_of_test.cpp.

7.89.2 Function Documentation

7.89.2.1 TEST()

```
TEST (
    percentageOf ,
    shouldWork )
```

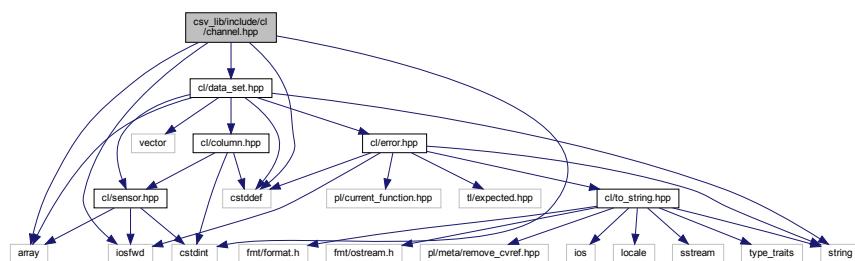
Definition at line 10 of file percentage_of_test.cpp.

Here is the call graph for this function:

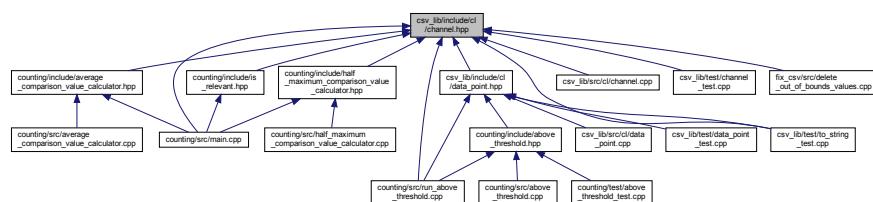


7.90 csv_lib/include/cl/channel.hpp File Reference

```
#include <cstdint>
#include <array>
#include <iostream>
#include "cl/data_set.hpp"
Include dependency graph for channel.hpp:
```



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



Classes

- struct `cl::data_set_accessor< Chan >`

Namespaces

- `cl`

Macros

- `#define CL_CHANNEL`
- `#define CL_CHANNEL_X(enumerator, value, dataSetAccessor) enumerator = value,`
- `#define CL_CHANNEL_X(enumerator, value, dataSetAccessor) +1`
- `#define CL_CHANNEL_X(enm, v, a) ::cl::Channel::enm,`
- `#define CL_CHANNEL_X(enumerator, value, dataSetAccessor)`

Enumerations

- enum `cl::Channel : std::uint64_t { cl::Channel::CL_CHANNEL_X, cl::Channel::CL_CHANNEL }`

Functions

- `DataSet::ChannelAccessor cl::dataSetAccessor (Channel channel)`
- `std::ostream & cl::operator<< (std::ostream &os, Channel channel)`
- `bool cl::isAccelerometer (Channel channel)`
- `bool cl::isGyroscope (Channel channel)`
- `long double cl::threshold (Channel channel)`

Variables

- `constexpr std::size_t cl::channelCount`
- `constexpr std::array< Channel, channelCount > cl::channels`
- `template<Channel Chan>`
`constexpr CL_CHANNEL DataSet::ChannelAccessor cl::data_set_accessor_v = data_set_accessor<Chan>::f`
- `constexpr long double cl::accelerometerThreshold {1.99L}`
- `constexpr long double cl::gyroscopeThreshold {1999.99L}`

7.90.1 Macro Definition Documentation

7.90.1.1 CL_CHANNEL

```
#define CL_CHANNEL
```

Value:

```
CL_CHANNEL_X(AccelerometerX, 1, &::cl::DataSet::accelerometerX) \
CL_CHANNEL_X(AccelerometerY, 2, &::cl::DataSet::accelerometerY) \
CL_CHANNEL_X(AccelerometerZ, 3, &::cl::DataSet::accelerometerZ) \
CL_CHANNEL_X(GyroscopeX, 4, &::cl::DataSet::gyroscopeX) \
CL_CHANNEL_X(GyroscopeY, 5, &::cl::DataSet::gyroscopeY) \
CL_CHANNEL_X(GyroscopeZ, 6, &::cl::DataSet::gyroscopeZ)
```

Definition at line 11 of file channel.hpp.

7.90.1.2 CL_CHANNEL_X [1/4]

```
#define CL_CHANNEL_X(
    enm,
    v,
    a ) ::cl::Channel::enm,
```

Definition at line 41 of file channel.hpp.

7.90.1.3 CL_CHANNEL_X [2/4]

```
#define CL_CHANNEL_X(
    enumerator,
    value,
    dataSetAccessor ) enumerator = value,
```

Definition at line 41 of file channel.hpp.

7.90.1.4 CL_CHANNEL_X [3/4]

```
#define CL_CHANNEL_X(
    enumerator,
    value,
    dataSetAccessor ) +1
```

Definition at line 41 of file channel.hpp.

7.90.1.5 CL_CHANNEL_X [4/4]

```
#define CL_CHANNEL_X(enumerator, value, dataSetAccessor )
```

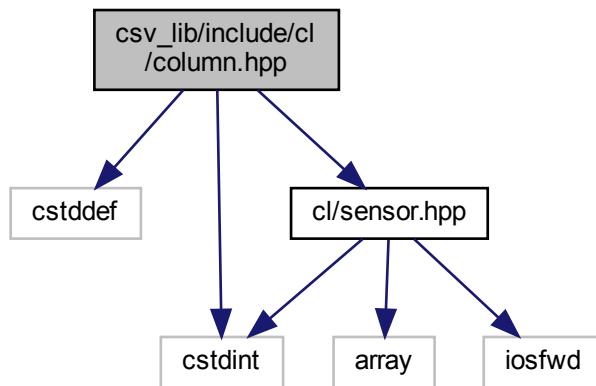
Value:

```
template<>
struct data_set_accessor<Channel::enumerator> {
    static constexpr ::cl::DataSet::ChannelAccessor f = dataSetAccessor; \
};
```

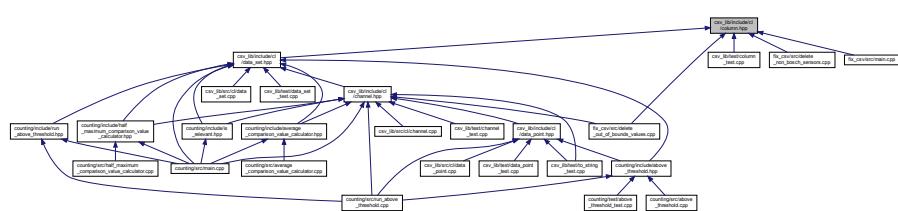
Definition at line 41 of file channel.hpp.

7.91 csv_lib/include/cl/column.hpp File Reference

```
#include <cstddef>
#include <cstdint>
#include "cl/sensor.hpp"
Include dependency graph for column.hpp:
```



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



Classes

- struct `cl::col_traits< Col >`

Namespaces

- `cl`

Macros

- `#define CL_SPECIALIZE_COL_TRAITS(column, columnType)`

Typedefs

- template<Column Col>
using `cl::column_type` = typename `col_traits< Col >::type`

Enumerations

- enum `cl::Column` : `std::size_t` {
`cl::Column::Time, cl::Column::HardwareTimestamp, cl::Column::ExtractId, cl::Column::Trigger,`
`cl::Column::AccelerometerX, cl::Column::AccelerometerY, cl::Column::AccelerometerZ, cl::Column::GyroscopeX,`
`cl::Column::GyroscopeY, cl::Column::GyroscopeZ, cl::Column::SamplingRate }`

Functions

- `cl::CL_SPECIALIZE_COL_TRAITS (Column::Time, long double)`
- `cl::CL_SPECIALIZE_COL_TRAITS (Column::HardwareTimestamp, std::uint64_t)`
- `cl::CL_SPECIALIZE_COL_TRAITS (Column::ExtractId, Sensor)`
- `cl::CL_SPECIALIZE_COL_TRAITS (Column::Trigger, std::uint64_t)`
- `cl::CL_SPECIALIZE_COL_TRAITS (Column::AccelerometerX, long double)`
- `cl::CL_SPECIALIZE_COL_TRAITS (Column::AccelerometerY, long double)`
- `cl::CL_SPECIALIZE_COL_TRAITS (Column::AccelerometerZ, long double)`
- `cl::CL_SPECIALIZE_COL_TRAITS (Column::GyroscopeX, long double)`
- `cl::CL_SPECIALIZE_COL_TRAITS (Column::GyroscopeY, long double)`
- `cl::CL_SPECIALIZE_COL_TRAITS (Column::GyroscopeZ, long double)`
- `cl::CL_SPECIALIZE_COL_TRAITS (Column::SamplingRate, std::uint64_t)`

Variables

- template<Column Col>
constexpr `std::size_t cl::column_index` = `col_traits<Col>::index`

7.91.1 Macro Definition Documentation

7.91.1.1 CL_SPECIALIZE_COL_TRAITS

```
#define CL_SPECIALIZE_COL_TRAITS(
    column,
    columnType )
```

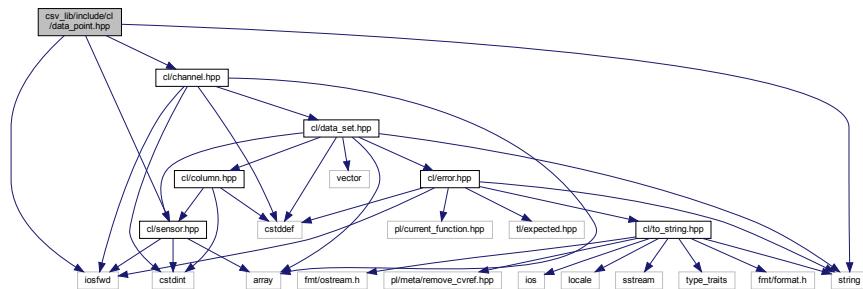
Value:

```
template<>
struct col_traits<column> {
    static constexpr std::size_t index = static_cast<std::size_t>(column);
    using type = columnType;
}
```

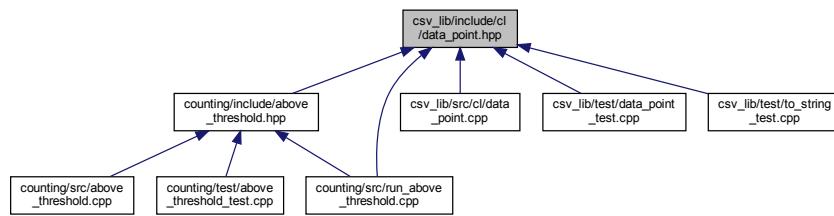
Definition at line 26 of file column.hpp.

7.92 csv_lib/include/cl/data_point.hpp File Reference

```
#include <iostream>
#include <string>
#include "cl/channel.hpp"
#include "cl/sensor.hpp"
Include dependency graph for data_point.hpp:
```



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



Classes

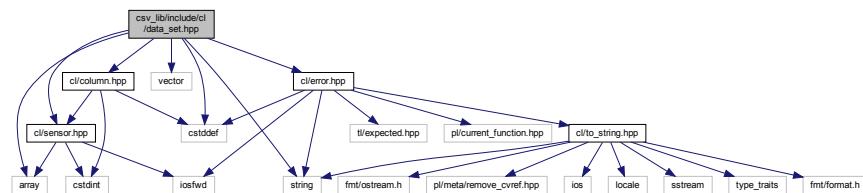
- class `cl::DataPoint`

Namespaces

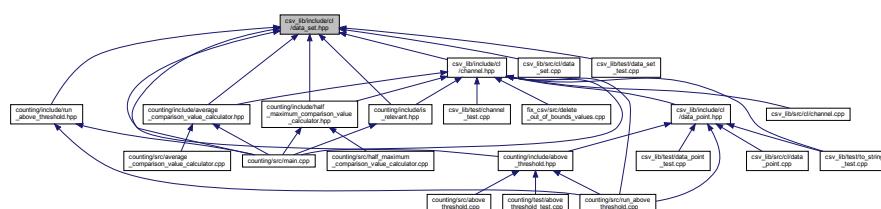
- [cl](#)

7.93 csv_lib/include/cl/data_set.hpp File Reference

```
#include <cstddef>
#include <array>
#include <string>
#include <vector>
#include "cl/column.hpp"
#include "cl/error.hpp"
#include "cl/sensor.hpp"
Include dependency graph for data_set.hpp:
```



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



Classes

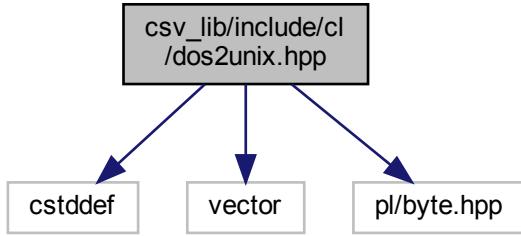
- class [cl::DataSet](#)

Namespaces

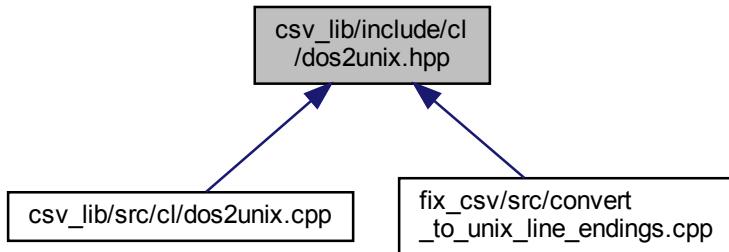
- [cl](#)

7.94 csv_lib/include/cl/dos2unix.hpp File Reference

```
#include <cstddef>
#include <vector>
#include <pl/byte.hpp>
Include dependency graph for dos2unix.hpp:
```



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



Namespaces

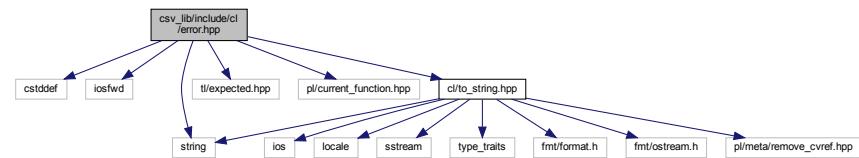
- `cl`

Functions

- `std::vector< pl::byte > cl::dos2unix (const void *p, std::size_t size)`
Converts DOS / Microsoft Windows line endings to UNIX line endings.

7.95 csv_lib/include/cl/error.hpp File Reference

```
#include <cstddef>
#include <iostream>
#include <string>
#include <tl/expected.hpp>
#include <pl/current_function.hpp>
#include "cl/to_string.hpp"
Include dependency graph for error.hpp:
```



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



Classes

- class [cl::Error](#)

Namespaces

- [cl](#)

Macros

- `#define CL_ERROR_KIND`
- `#define CL_ERROR_KIND_X(kind) kind,`
- `#define CL_UNEXPECTED(kind, message)`

Typedefs

- template<typename Ty >
using [cl::Expected](#) = tl::expected< Ty, Error >

7.95.1 Macro Definition Documentation

7.95.1.1 CL_ERROR_KIND

```
#define CL_ERROR_KIND
```

Value:

```
CL_ERROR_KIND_X(Filesystem) \
CL_ERROR_KIND_X(InvalidArgumentException) \
CL_ERROR_KIND_X(OutOfRange) \
CL_ERROR_KIND_X(Parsing) \
CL_ERROR_KIND_X(Logic) \
CL_ERROR_KIND_X(OperatingSystem)
```

Definition at line 14 of file error.hpp.

7.95.1.2 CL_ERROR_KIND_X

```
#define CL_ERROR_KIND_X(
    kind ) kind,
```

Definition at line 27 of file error.hpp.

7.95.1.3 CL_UNEXPECTED

```
#define CL_UNEXPECTED (
    kind,
    message )
```

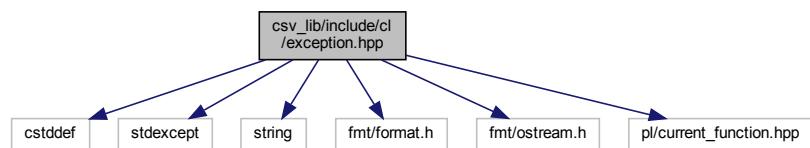
Value:

```
::tl::make_unexpected(
    ::cl::Error{kind, __FILE__, PL_CURRENT_FUNCTION, __LINE__, message})
```

Definition at line 67 of file error.hpp.

7.96 csv_lib/include/cl/exception.hpp File Reference

```
#include <cstddef>
#include <stdexcept>
#include <string>
#include <fmt/format.h>
#include <fmt/ostream.h>
#include <pl/current_function.hpp>
Include dependency graph for exception.hpp:
```



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



Classes

- class [cl::Exception](#)

Namespaces

- [cl](#)

Macros

- `#define CL_THROW(what_arg) throw ::cl::Exception { __FILE__, PL_CURRENT_FUNCTION, __LINE__← , what_arg }`
- `#define CL_THROW_FMT(fmt_str, ...) CL_THROW(::fmt::format(fmt_str, __VA_ARGS__))`

7.96.1 Macro Definition Documentation

7.96.1.1 CL_THROW

```
#define CL_THROW(
    what_arg ) throw ::cl::Exception { __FILE__, PL_CURRENT_FUNCTION, __LINE__←
, what_arg }
```

Definition at line 42 of file exception.hpp.

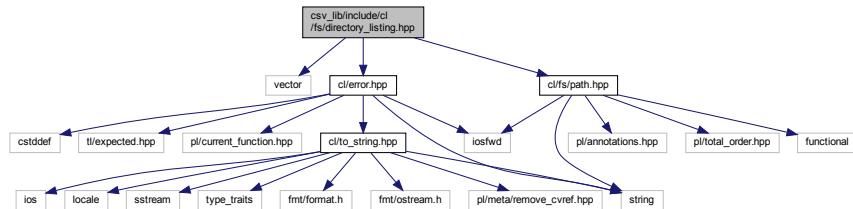
7.96.1.2 CL_THROW_FMT

```
#define CL_THROW_FMT (
    fmt_str,
    ... ) CL_THROW(::fmt::format(fmt_str, __VA_ARGS__))
```

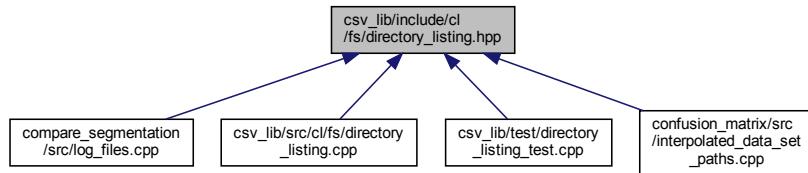
Definition at line 45 of file exception.hpp.

7.97 csv_lib/include/cl/fs/directory_listing.hpp File Reference

```
#include <vector>
#include <cl/error.hpp>
#include <cl/fs/path.hpp>
Include dependency graph for directory_listing.hpp:
```



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



Namespaces

- `cl`
- `cl::fs`

Enumerations

- enum `cl::fs::DirectoryListingOption` { `cl::fs::DirectoryListingOption::None`, `cl::fs::DirectoryListingOption::ExcludeDotAndDotDot` }

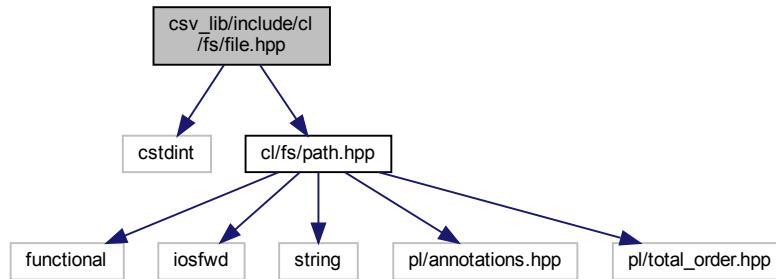
Options for directoryListing.

Functions

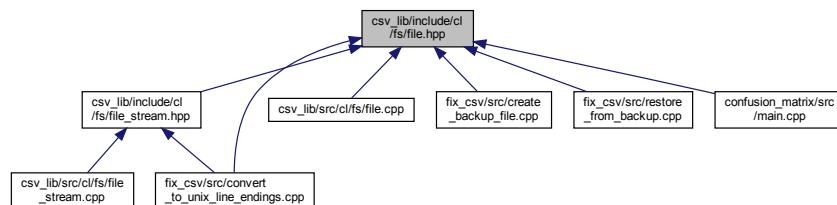
- `Expected< std::vector< Path > > cl::fs::directoryListing (const Path &directoryPath, DirectoryListingOption directoryListingOption=DirectoryListingOption::ExcludeDotAndDotDot)`
Creates a listing of the contents of a directory.

7.98 csv_lib/include/cl/fs/file.hpp File Reference

```
#include <cstdint>
#include "cl/fs/path.hpp"
Include dependency graph for file.hpp:
```



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



Classes

- class [cl::fs::File](#)
Represents a file.

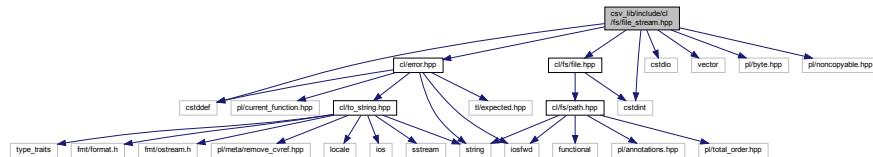
Namespaces

- [cl](#)
- [cl::fs](#)

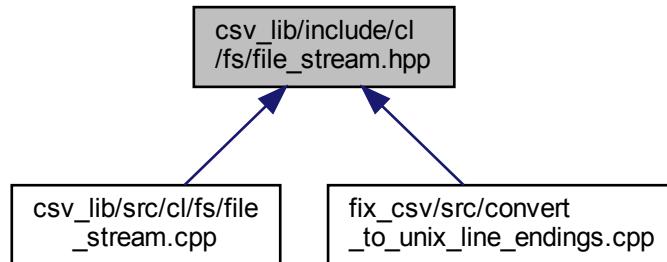
7.99 csv_lib/include/cl/fs/file_stream.hpp File Reference

```
#include <cstddef>
#include <cstdint>
#include <cstdio>
#include <vector>
```

```
#include <pl/byte.hpp>
#include <pl/noncopyable.hpp>
#include "cl/error.hpp"
#include "cl/fs/file.hpp"
Include dependency graph for file_stream.hpp:
```



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



Classes

- class [cl::fs::FileStream](#)
A binary file stream.

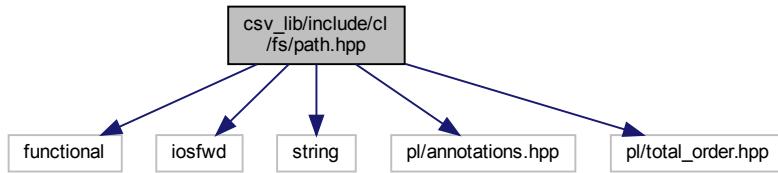
Namespaces

- [cl](#)
- [cl::fs](#)

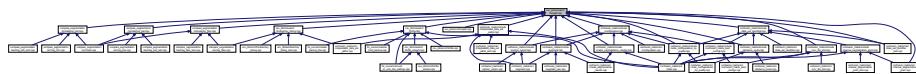
7.100 csv_lib/include/cl/fs/path.hpp File Reference

```
#include <functional>
#include <iostfwd>
#include <string>
#include <pl/annotations.hpp>
```

```
#include <pl/total_order.hpp>
Include dependency graph for path.hpp:
```



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



Classes

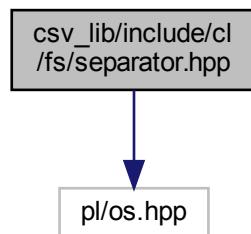
- class [cl::fs::Path](#)
A filesystem path.
- struct [std::hash<::cl::fs::Path >](#)

Namespaces

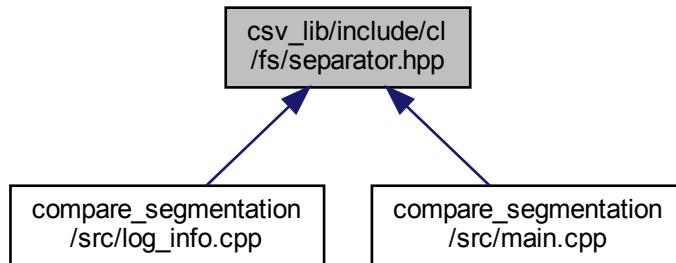
- [cl](#)
- [cl::fs](#)

7.101 csv_lib/include/cl/fs/separator.hpp File Reference

```
#include <pl/os.hpp>
Include dependency graph for separator.hpp:
```



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



Macros

- `#define CL_FS_SEPARATOR "\\\"`
The filesystem separator of the operating system.

7.101.1 Macro Definition Documentation

7.101.1.1 CL_FS_SEPARATOR

```
#define CL_FS_SEPARATOR "\\\"
```

The filesystem separator of the operating system.

Definition at line 11 of file separator.hpp.

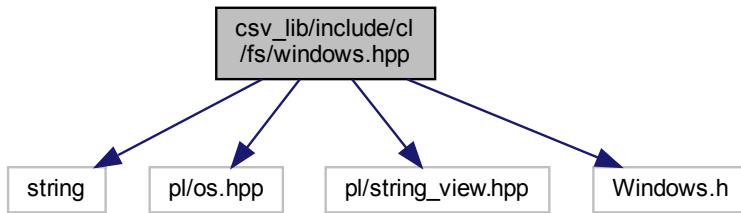
7.102 csv_lib/include/cl/fs/windows.hpp File Reference

Contains Microsoft Windows specific functions.

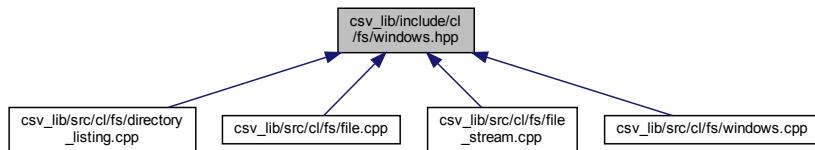
```
#include <string>
#include <pl/os.hpp>
#include <pl/string_view.hpp>
```

```
#include <Windows.h>
```

Include dependency graph for windows.hpp:



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



Namespaces

- `cl`
- `cl::fs`

Functions

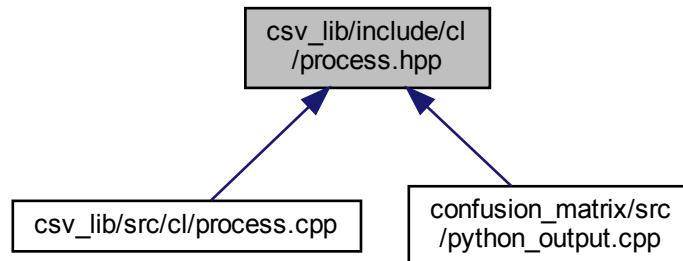
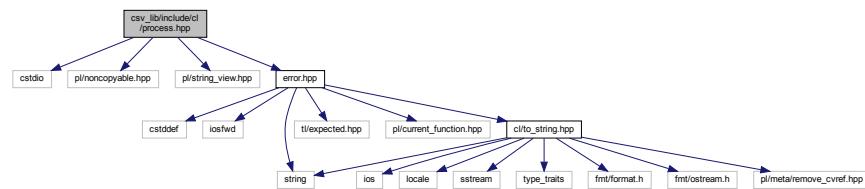
- `std::wstring cl::fs::utf8ToUtf16 (pl::string_view utf8)`
Converts a UTF-8 encoded string to a UTF-16 encoded wstring.
- `std::string cl::fs::utf16ToUtf8 (pl::wstring_view utf16)`
Converts a UTF-16 encoded wide character string to UTF-8 string.
- `std::wstring cl::fs::formatError (DWORD errorCode)`
Formats a WINAPI error code to a UTF-16 encoded wide character string.

7.102.1 Detailed Description

Contains Microsoft Windows specific functions.

7.103 csv_lib/include/cl/process.hpp File Reference

```
#include <cstdio>
#include <pl/noncopyable.hpp>
#include <pl/string_view.hpp>
#include "error.hpp"
Include dependency graph for process.hpp:
```



Classes

- class [cl::Process](#)

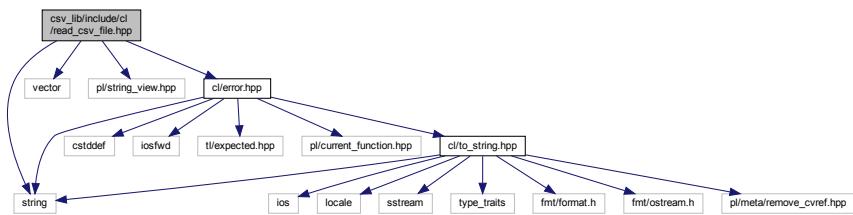
Namespaces

- [cl](#)

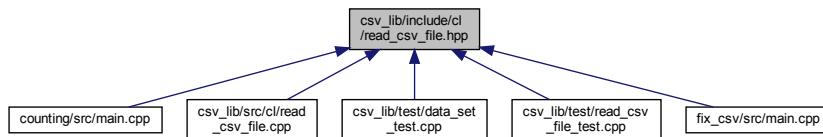
7.104 csv_lib/include/cl/read_csv_file.hpp File Reference

```
#include <string>
#include <vector>
#include <pl/string_view.hpp>
```

```
#include "cl/error.hpp"
Include dependency graph for read_csv_file.hpp:
```



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



Namespaces

- `cl`

Enumerations

- enum `cl::CsvFileKind` { `cl::CsvFileKind::Raw`, `cl::CsvFileKind::Fixed` }

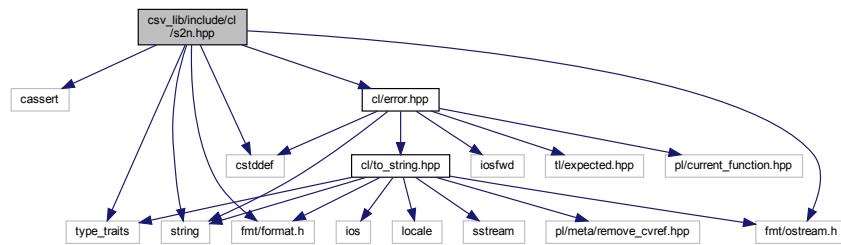
Functions

- `Expected< std::vector< std::vector< std::string > > > cl::readCsvFile(pl::string_view csvFilePath, std::vector< std::string > *columnNames=nullptr, CsvFileKind csvFileKind=CsvFileKind::Fixed) noexcept`

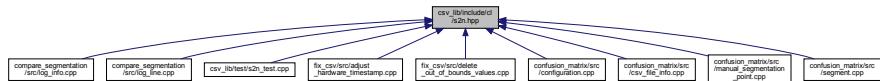
7.105 csv_lib/include/cl/s2n.hpp File Reference

```
#include <cassert>
#include <cstdint>
#include <string>
#include <type_traits>
#include <fmt/format.h>
#include <fmt/ostream.h>
```

```
#include "cl/error.hpp"
Include dependency graph for s2n.hpp:
```



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



Namespaces

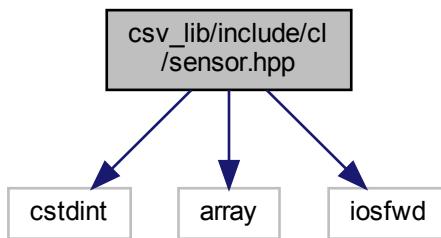
- `cl`

Functions

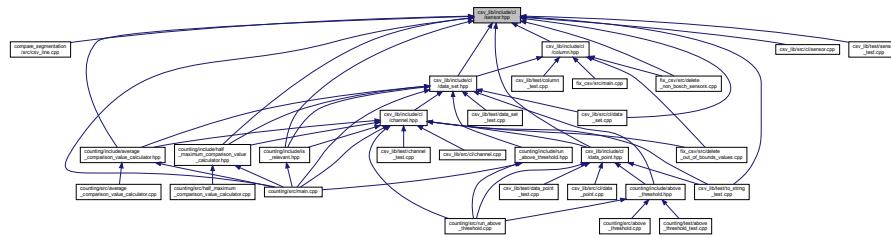
- template<typename Integer>
`Expected< Integer > cl::s2n (const std::string &str, std::size_t *pos=nullptr, [[maybe_unused]] int base=10)`

7.106 csv_lib/include/cl/sensor.hpp File Reference

```
#include <cstdint>
#include <array>
#include <iostfwd>
Include dependency graph for sensor.hpp:
```



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



Namespaces

- `cl`

Macros

- `#define CL_SENSOR`
- `#define CL_SENSOR_X(enum, value) enumerator = value,`
- `#define CL_SENSOR_X(enm, v) ::cl::Sensor::enm,`

Enumerations

- enum `cl::Sensor` : std::uint64_t { `cl::Sensor::CL_SENSOR_X, cl::Sensor::CL_SENSOR` }

Functions

- `std::ostream & cl::operator<< (std::ostream &os, Sensor sensor)`

Variables

- `constexpr std::array< Sensor, 4 > cl::sensors`

7.106.1 Macro Definition Documentation

7.106.1.1 CL_SENSOR

```
#define CL_SENSOR
```

Value:

```
CL_SENSOR_X(LeftArm, 769) \
CL_SENSOR_X(Belly, 770) \
CL_SENSOR_X(RightArm, 771) \
CL_SENSOR_X(Chest, 772)
```

Definition at line 9 of file `sensor.hpp`.

7.106.1.2 CL_SENSOR_X [1/2]

```
#define CL_SENSOR_X(
    enm,
    v ) ::cl::Sensor::enm,
```

Definition at line 16 of file sensor.hpp.

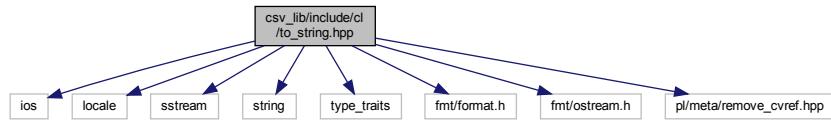
7.106.1.3 CL_SENSOR_X [2/2]

```
#define CL_SENSOR_X(
    enumerator,
    value ) enumerator = value,
```

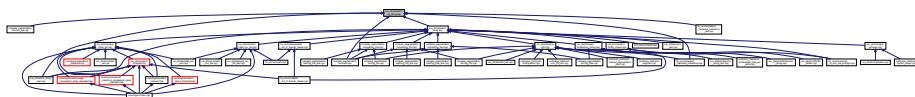
Definition at line 16 of file sensor.hpp.

7.107 csv_lib/include/cl/to_string.hpp File Reference

```
#include <iostream>
#include <locale>
#include <iostream>
#include <string>
#include <type_traits>
#include <fmt/format.h>
#include <fmt/ostream.h>
#include <pl/meta/remove_cvref.hpp>
Include dependency graph for to_string.hpp:
```



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



Namespaces

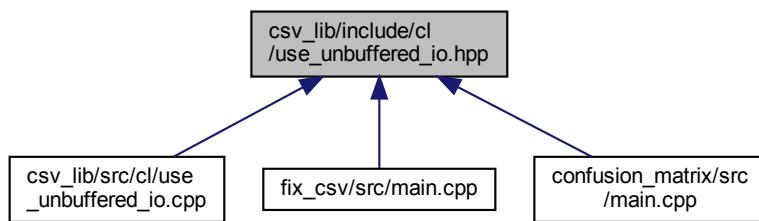
- `cl`

Functions

- template<typename Ty >
std::string [cl::to_string](#) (const Ty &ty)

7.108 csv_lib/include/cl/use_unbuffered_io.hpp File Reference

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



Namespaces

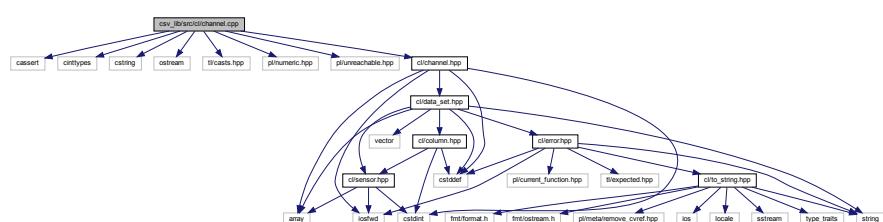
- [cl](#)

Functions

- void [cl::useUnbufferedIo\(\)](#)

7.109 csv_lib/src/cl/channel.cpp File Reference

```
#include <cassert>
#include <cinttypes>
#include <cstring>
#include <iostream>
#include <t1/casts.hpp>
#include <p1/numeric.hpp>
#include <p1/unreachable.hpp>
#include "cl/channel.hpp"
Include dependency graph for channel.cpp:
```



Namespaces

- `cl`

Macros

- `#define CL_CHANNEL_X(enm, v, acc) case Channel::enm: return data_set_accessor_v<Channel::enm>;`
- `#define CL_CHANNEL_X(enumerator, value, dataSetAccessor) case Channel::enumerator: return os << #enumerator;`

Functions

- `DataSet::ChannelAccessor cl::dataSetAccessor (Channel channel)`
- `std::ostream & cl::operator<< (std::ostream &os, Channel channel)`
- `bool cl::isAccelerometer (Channel channel)`
- `bool cl::isGyroscope (Channel channel)`
- `long double cl::threshold (Channel channel)`

7.109.1 Macro Definition Documentation

7.109.1.1 CL_CHANNEL_X [1/2]

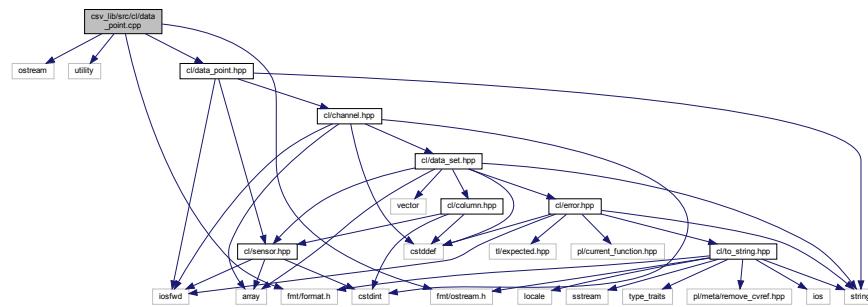
```
#define CL_CHANNEL_X(
    enm,
    v,
    acc ) case Channel::enm: return data_set_accessor_v<Channel::enm>;
```

7.109.1.2 CL_CHANNEL_X [2/2]

```
#define CL_CHANNEL_X(
    enumerator,
    value,
    dataSetAccessor ) case Channel::enumerator: return os << #enumerator;
```

7.110 csv_lib/src/cl/data_point.cpp File Reference

```
#include <iostream>
#include <utility>
#include <fmt/format.h>
#include <fmt/ostream.h>
#include "cl/data_point.hpp"
Include dependency graph for data_point.cpp:
```



Namespaces

- `cl`

Functions

- `std::ostream & cl::operator<< (std::ostream &os, const DataPoint &dataPoint)`
- `dataPoint fileName ()`
- `dataPoint dataPoint time ()`
- `dataPoint dataPoint dataPoint sensor ()`
- `dataPoint dataPoint dataPoint dataPoint channel ()`
- `dataPoint dataPoint dataPoint dataPoint value ()`

7.110.1 Function Documentation

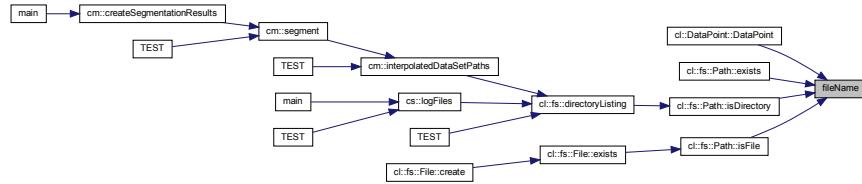
7.110.1.1 channel()

```
dataPoint dataPoint dataPoint dataPoint channel ( )
```

7.110.1.2 fileName()

```
dataPoint fileName ( )
```

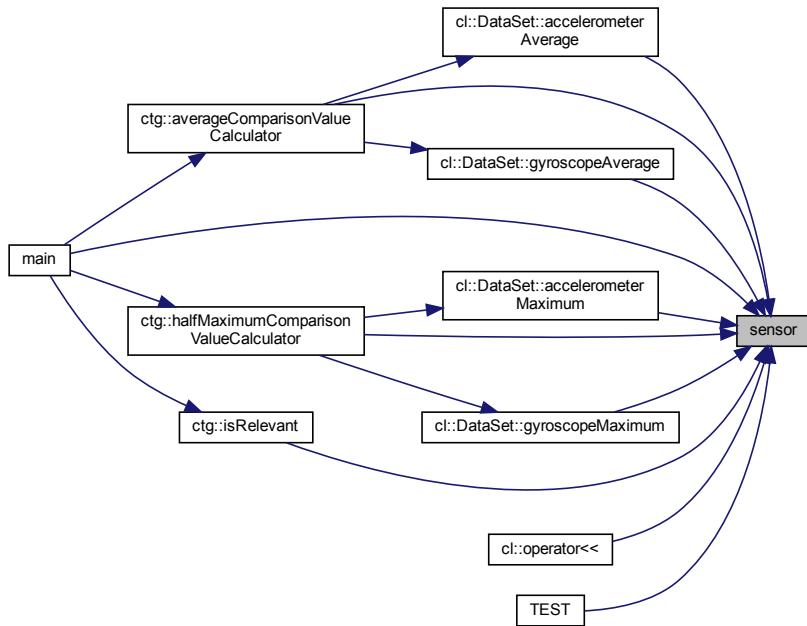
Here is the caller graph for this function:



7.110.1.3 sensor()

```
dataPoint dataPoint dataPoint sensor ( )
```

Here is the caller graph for this function:



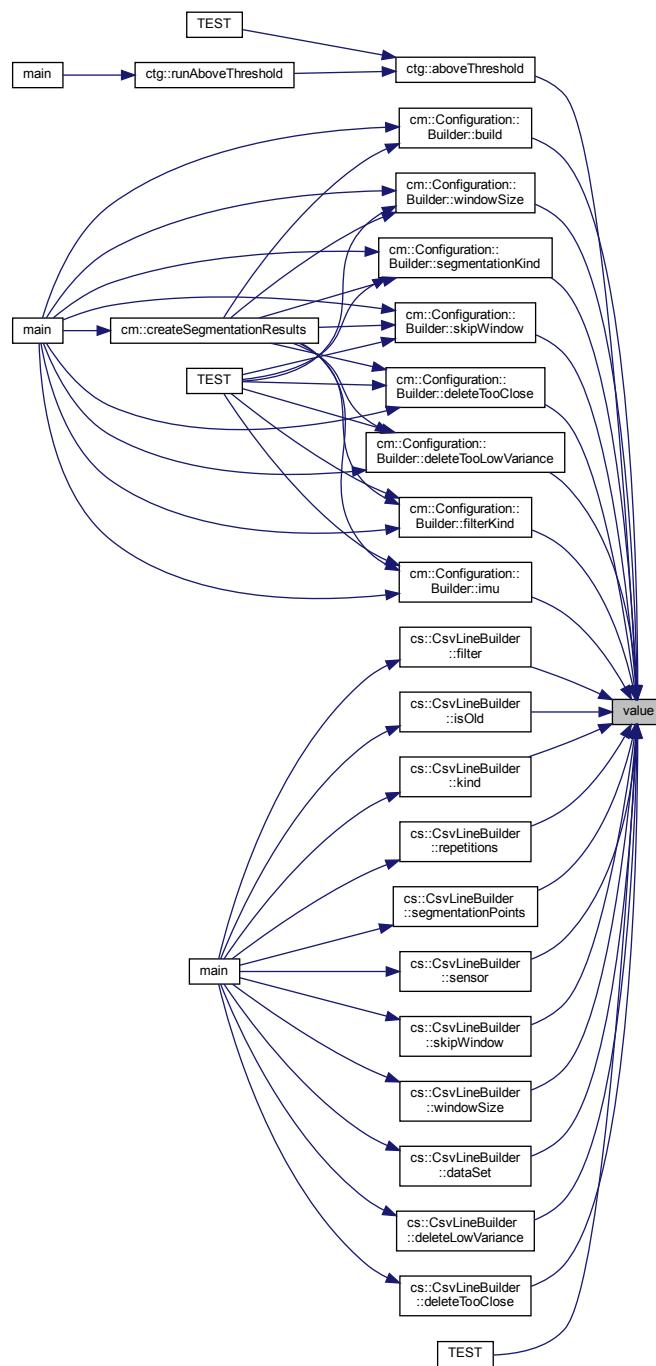
7.110.1.4 time()

```
dataPoint dataPoint time ( )
```

7.110.1.5 value()

```
dataPoint dataPoint dataPoint dataPoint value ( )
```

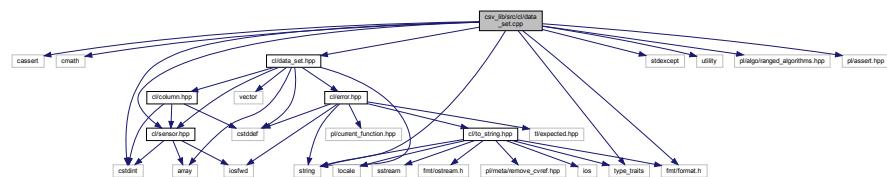
Here is the caller graph for this function:



7.111 csv_lib/src/cl/data_set.cpp File Reference

```
#include <cassert>
#include <cmath>
#include <cstdint>
#include <stdexcept>
#include <string>
#include <type_traits>
#include <utility>
#include <fmt/format.h>
#include <pl/algo/ranged_algorithms.hpp>
#include <pl/assert.hpp>
#include "cl/data_set.hpp"
#include "cl/sensor.hpp"

Include dependency graph for data_set.cpp:
```



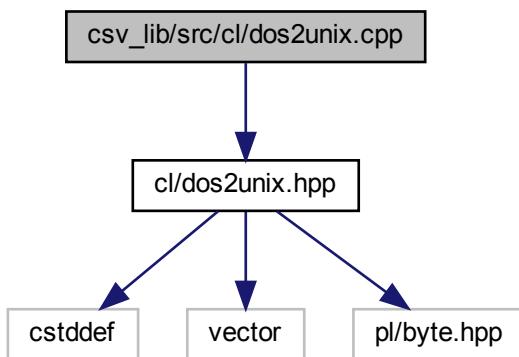
Namespaces

- `cl`

7.112 csv_lib/src/cl/dos2unix.cpp File Reference

```
#include "cl/dos2unix.hpp"

Include dependency graph for dos2unix.cpp:
```



Namespaces

- [cl](#)

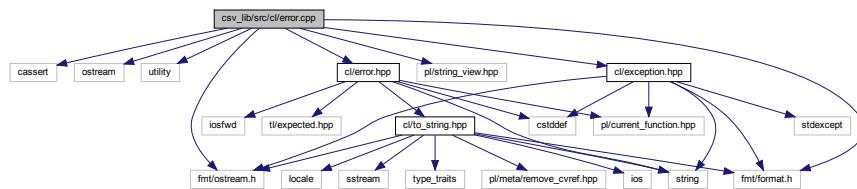
Functions

- `std::vector< pl::byte > cl::dos2unix (const void *p, std::size_t size)`

Converts DOS / Microsoft Windows line endings to UNIX line endings.

7.113 csv_lib/src/cl/error.cpp File Reference

```
#include <cassert>
#include <iostream>
#include <utility>
#include <fmt/format.h>
#include <fmt/ostream.h>
#include <pl/string_view.hpp>
#include "cl/error.hpp"
#include "cl/exception.hpp"
Include dependency graph for error.cpp:
```



Namespaces

- [cl](#)

Macros

- `#define CL_ERROR_KIND_X(kind) case Error::kind: return #kind;`

Functions

- `std::ostream & cl::operator<< (std::ostream &os, const Error &error)`

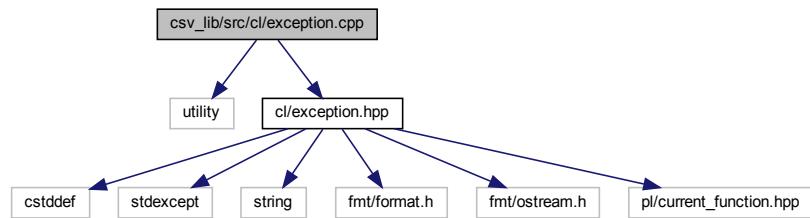
7.113.1 Macro Definition Documentation

7.113.1.1 CL_ERROR_KIND_X

```
#define CL_ERROR_KIND_X(
    kind ) case Error::kind:  return #kind;
```

7.114 csv_lib/src/cl/exception.cpp File Reference

```
#include <utility>
#include "cl/exception.hpp"
Include dependency graph for exception.cpp:
```

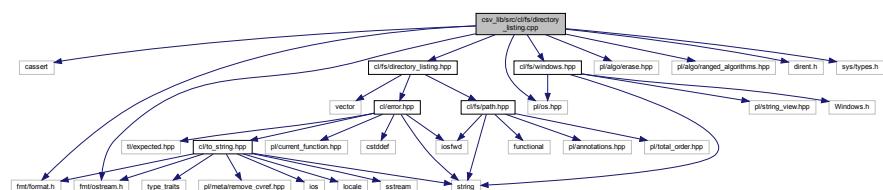


Namespaces

- `cl`

7.115 csv_lib/src/cl/fs/directory_listing.cpp File Reference

```
#include <cassert>
#include <fmt/format.h>
#include <fmt/ostream.h>
#include <p/algo/erase.hpp>
#include <p/algo/ranged_algorithms.hpp>
#include <p/os.hpp>
#include <cl/fs/windows.hpp>
#include <dirent.h>
#include <sys/types.h>
#include <cl/fs/directory_listing.hpp>
Include dependency graph for directory_listing.cpp:
```



Namespaces

- `cl`
- `cl::fs`

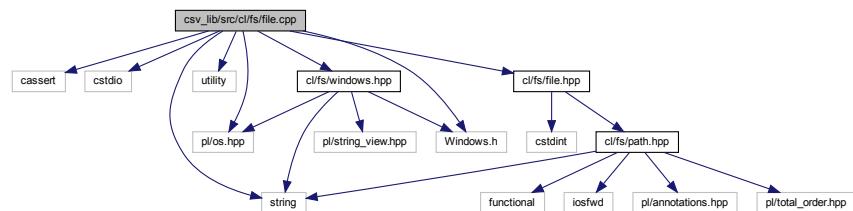
Functions

- Expected< std::vector< Path > > `cl::fs::directoryListing` (const Path &directoryPath, DirectoryListingOption directoryListingOption=DirectoryListingOption::ExcludeDotAndDotDot)

Creates a listing of the contents of a directory.

7.116 csv_lib/src/cl/fs/file.cpp File Reference

```
#include <cassert>
#include <cstdio>
#include <string>
#include <utility>
#include <pl/os.hpp>
#include "cl/fs/windows.hpp"
#include <Windows.h>
#include "cl/fs/file.hpp"
Include dependency graph for file.cpp:
```



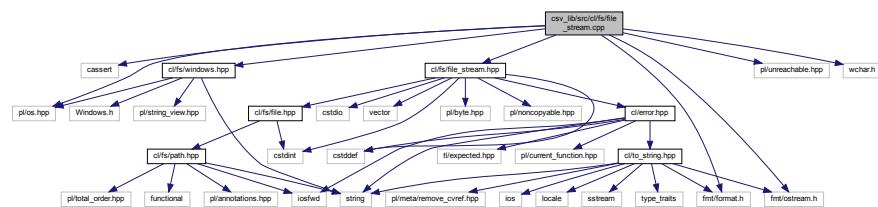
Namespaces

- `cl`
- `cl::fs`

7.117 csv_lib/src/cl/fs/file_stream.cpp File Reference

```
#include <cassert>
#include <pl/os.hpp>
#include <pl/unreachable.hpp>
#include "cl/fs/windows.hpp"
#include <wchar.h>
#include <fmt/format.hpp>
#include <fmt/ostream.hpp>
```

```
#include "cl/fs/file_stream.hpp"  
Include dependency graph for file_stream.cpp:
```



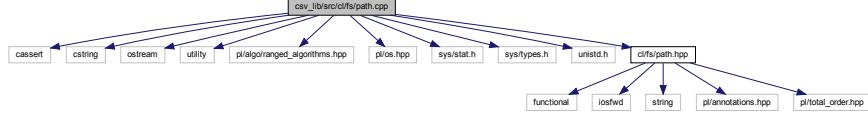
Namespaces

- cl
 - cl::fs

7.118 csv_lib/src/cl/fs/path.cpp File Reference

```
#include <cassert>
#include <cstring>
#include <iostream>
#include <utility>
#include <pl/algo/ranged_algorithms.hpp>
#include <pl/os.hpp>
#include <sys/stat.h>
#include <sys/types.h>
#include <unistd.h>
#include "cl/fs/path.hpp"
Include dependency graph for path.cpp:
```

Include dependency graph for path.cpp:



Namespaces

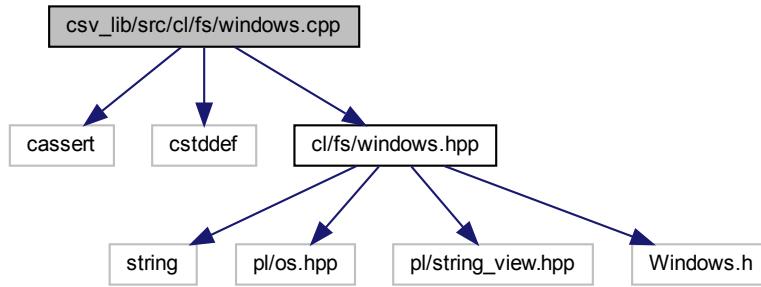
- cl
 - cl::fs

Functions

- std::ostream & `cl::fs::operator<<` (std::ostream &os, const Path &path)
 - bool `cl::fs::operator<` (const Path &lhs, const Path &rhs) noexcept
 - bool `cl::fs::operator==` (const Path &lhs, const Path &rhs) noexcept

7.119 csv_lib/src/cl/fs/windows.cpp File Reference

```
#include <cassert>
#include <cstddef>
#include "cl/fs/windows.hpp"
Include dependency graph for windows.cpp:
```



Namespaces

- [cl](#)
- [cl::fs](#)

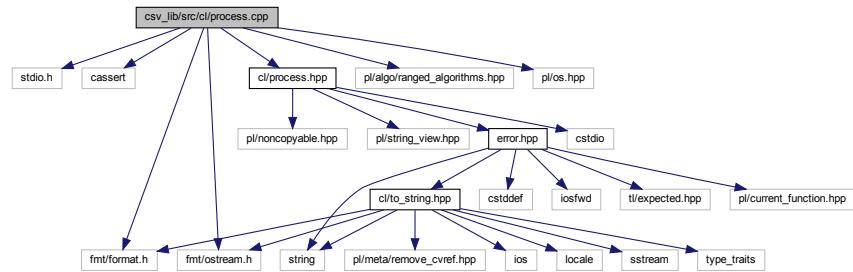
Functions

- std::wstring [cl::fs::utf8ToUtf16](#) (pl::string_view utf8)
Converts a UTF-8 encoded string to a UTF-16 encoded wstring.
- std::string [cl::fs::utf16ToUtf8](#) (pl::wstring_view utf16)
Converts a UTF-16 encoded wide character string to UTF-8 string.
- std::wstring [cl::fs::formatError](#) (DWORD errorCode)
Formats a WINAPI error code to a UTF-16 encoded wide character string.

7.120 csv_lib/src/cl/process.cpp File Reference

```
#include <stdio.h>
#include <cassert>
#include <fmt/format.h>
#include <fmt/ostream.h>
#include <pl/algo/ranged_algorithms.hpp>
#include <pl/os.hpp>
```

```
#include "cl/process.hpp"
Include dependency graph for process.cpp:
```

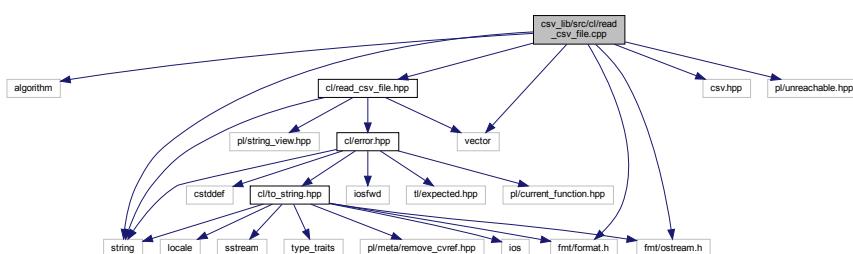


Namespaces

- `cl`

7.121 csv_lib/src/cl/read_csv_file.cpp File Reference

```
#include <algorithm>
#include <string>
#include <vector>
#include <fmt/format.h>
#include <fmt/ostream.h>
#include <csv.hpp>
#include <pl/unreachable.hpp>
#include "cl/read_csv_file.hpp"
Include dependency graph for read_csv_file.cpp:
```



Namespaces

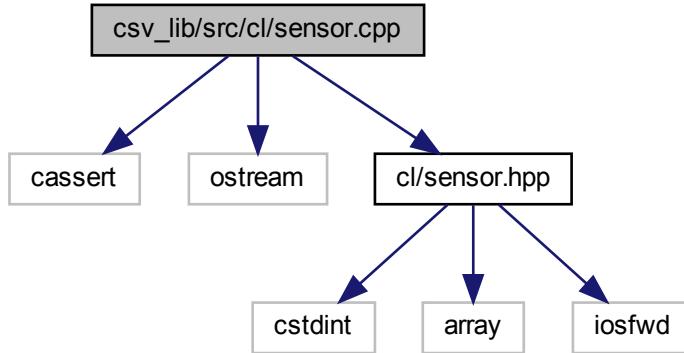
- `cl`

Functions

- `Expected< std::vector< std::vector< std::string > > > cl::readCsvFile(pl::string_view csvFilePath, std::vector< std::string > *columnNames=nullptr, CsvFileKind csvFileKind=CsvFileKind::Fixed) noexcept`

7.122 csv_lib/src/cl/sensor.cpp File Reference

```
#include <cassert>
#include <ostream>
#include "cl/sensor.hpp"
Include dependency graph for sensor.cpp:
```



Namespaces

- `cl`

Macros

- `#define CL_SENSOR_X(enumerator, value) case Sensor::enumerator: return os << #enumerator;`

Functions

- `std::ostream & cl::operator<< (std::ostream &os, Sensor sensor)`

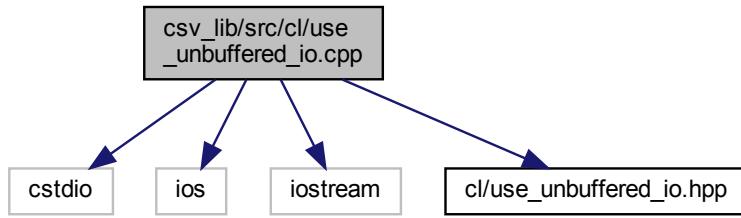
7.122.1 Macro Definition Documentation

7.122.1.1 CL_SENSOR_X

```
#define CL_SENSOR_X(
    enumerator,
    value ) case Sensor::enumerator: return os << #enumerator;
```

7.123 csv_lib/src/cl/use_unbuffered_io.cpp File Reference

```
#include <cstdio>
#include <iostream>
#include <iostream>
#include "cl/use_unbuffered_io.hpp"
Include dependency graph for use_unbuffered_io.cpp:
```



Namespaces

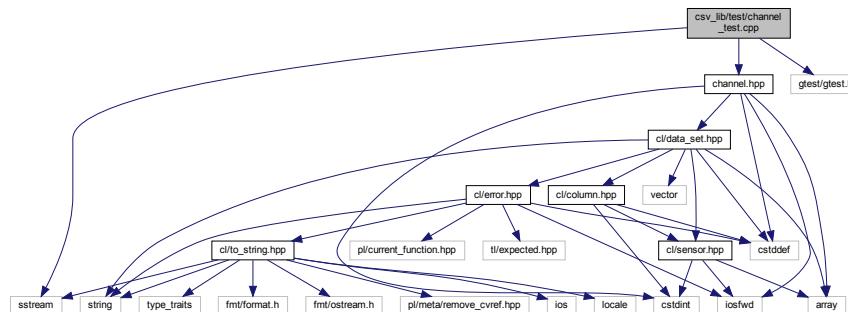
- `cl`

Functions

- `void cl::useUnbufferedIo ()`

7.124 csv_lib/test/channel_test.cpp File Reference

```
#include <sstream>
#include "gtest/gtest.h"
#include "channel.hpp"
Include dependency graph for channel_test.cpp:
```



Functions

- `TEST (channel, shouldHaveCorrectCount)`
- `TEST (channel, shouldHaveCorrectValues)`
- `TEST (channel, shouldPrintCorrectly)`
- `TEST (channel, shouldMapToCorrectDataSetAccessors)`

7.124.1 Function Documentation

7.124.1.1 TEST() [1/4]

```
TEST (
    channel ,
    shouldHaveCorrectCount )
```

Definition at line 7 of file channel_test.cpp.

7.124.1.2 TEST() [2/4]

```
TEST (
    channel ,
    shouldHaveCorrectValues )
```

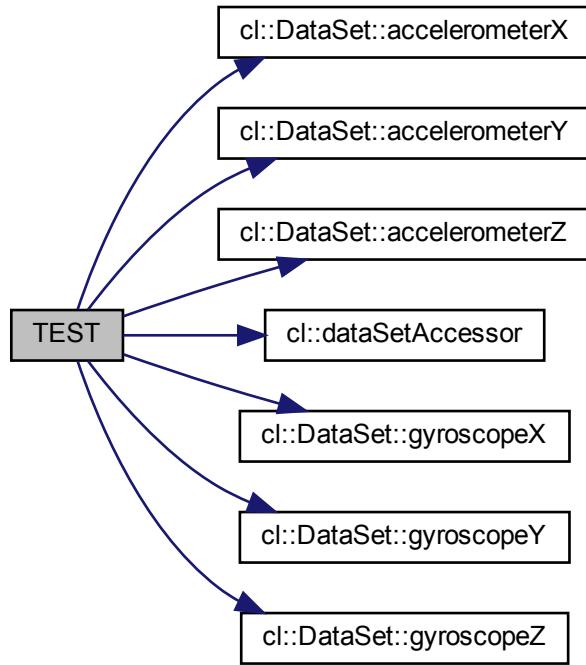
Definition at line 9 of file channel_test.cpp.

7.124.1.3 TEST() [3/4]

```
TEST (
    channel ,
    shouldMapToCorrectDataSetAccessors )
```

Definition at line 35 of file channel_test.cpp.

Here is the call graph for this function:



7.124.1.4 TEST() [4/4]

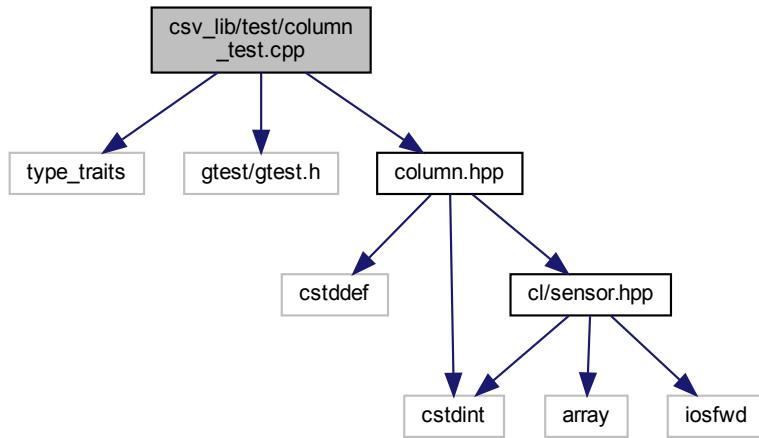
```
TEST (
    channel ,
    shouldPrintCorrectly )
```

Definition at line 19 of file channel_test.cpp.

7.125 csv_lib/test/column_test.cpp File Reference

```
#include <type_traits>
#include "gtest/gtest.h"
```

```
#include "column.hpp"
Include dependency graph for column_test.cpp:
```



Functions

- `TEST` (`column`, `shouldHaveCorrectIndex`)
- `TEST` (`column`, `shouldHaveCorrectColumnType`)

7.125.1 Function Documentation

7.125.1.1 TEST() [1/2]

```
TEST (
    column ,
    shouldHaveCorrectColumnType )
```

Definition at line 22 of file `column_test.cpp`.

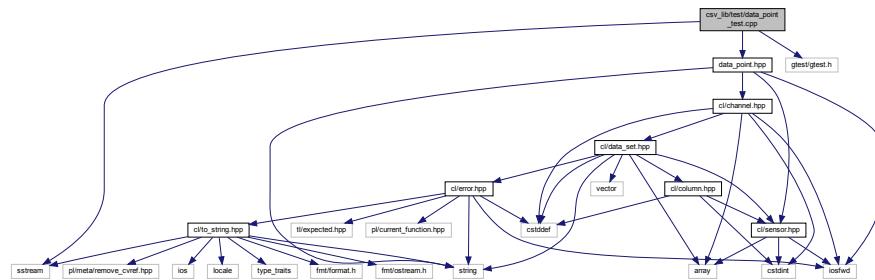
7.125.1.2 TEST() [2/2]

```
TEST (
    column ,
    shouldHaveCorrectIndex )
```

Definition at line 7 of file `column_test.cpp`.

7.126 csv_lib/test/data_point_test.cpp File Reference

```
#include <iostream>
#include "gtest/gtest.h"
#include "data_point.hpp"
Include dependency graph for data_point_test.cpp:
```



Functions

- [TEST](#) (DataPoint, shouldPrintCorrectly)
- [TEST](#) (DataPoint, shouldGetValuesCorrectly)

Variables

- const [cl::DataPoint](#) dp

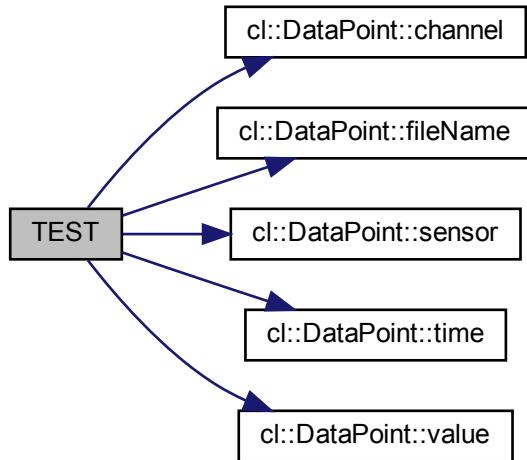
7.126.1 Function Documentation

7.126.1.1 TEST() [1/2]

```
TEST (
    DataPoint ,
    shouldGetValuesCorrectly )
```

Definition at line 23 of file `data_point_test.cpp`.

Here is the call graph for this function:



7.126.1.2 TEST() [2/2]

```
TEST (
    DataPoint ,
    shouldPrintCorrectly )
```

Definition at line 14 of file data_point_test.cpp.

7.126.2 Variable Documentation

7.126.2.1 dp

```
const cl::DataPoint dp
```

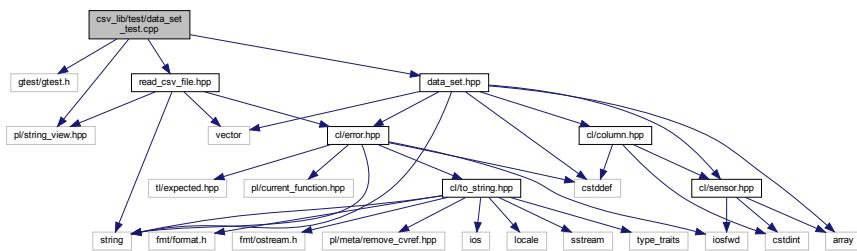
Initial value:

```
{
    "file.csv",
    0.01,
    cl::Sensor::Chest,
    cl::Channel::AccelerometerX,
    50.01}
```

Definition at line 7 of file data_point_test.cpp.

7.127 csv_lib/test/data_set_test.cpp File Reference

```
#include "gtest/gtest.h"
#include <pl/string_view.hpp>
#include "data_set.hpp"
#include "read_csv_file.hpp"
Include dependency graph for data_set_test.cpp:
```



Macros

- `#define EXPECT_LONG_DOUBLE_EQ(a, b) EXPECT_DOUBLE_EQ(static_cast<double>(a), static_cast<double>(b))`

Functions

- `TEST(DataSet, shouldBeAbleToCreateFromValidData)`
- `TEST(DataSet, shouldNotBeAbleToCreateFromEmptyMatrix)`
- `TEST(DataSet, shouldNotBeAbleToCreateFromJaggedMatrix)`
- `TEST(DataSet, shouldNotBeAbleToCreateFromInvalidData)`

7.127.1 Macro Definition Documentation

7.127.1.1 EXPECT_LONG_DOUBLE_EQ

```
#define EXPECT_LONG_DOUBLE_EQ(
    a,
    b ) EXPECT_DOUBLE_EQ(static_cast<double>(a), static_cast<double>(b))
```

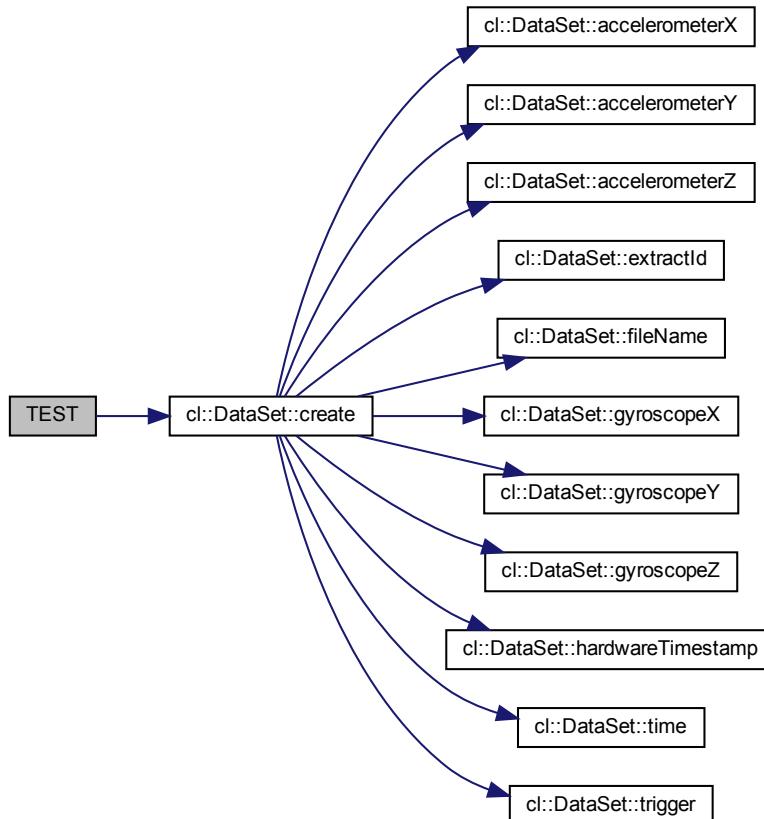
7.127.2 Function Documentation

7.127.2.1 TEST() [1/4]

```
TEST (
    DataSet ,
    shouldBeAbleToCreateFromValidData )
```

Definition at line 17 of file data_set_test.cpp.

Here is the call graph for this function:

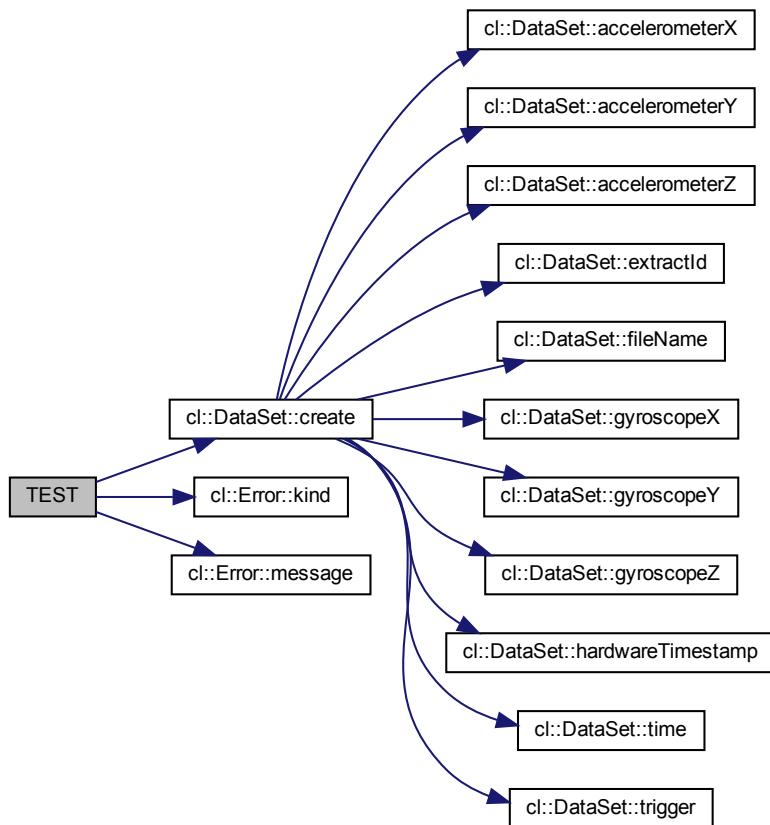


7.127.2.2 TEST() [2/4]

```
TEST (
    DataSet ,
    shouldNotBeAbleToCreateFromEmptyMatrix )
```

Definition at line 68 of file data_set_test.cpp.

Here is the call graph for this function:

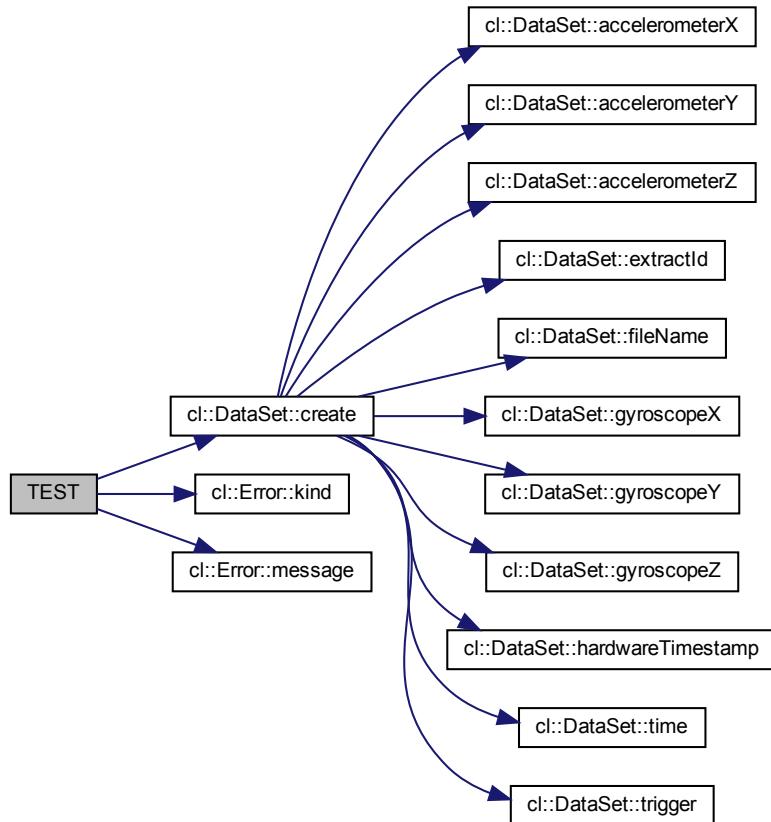


7.127.2.3 TEST() [3/4]

```
TEST (
    DataSet ,
    shouldNotBeAbleToCreateFromInvalidData )
```

Definition at line 108 of file `data_set_test.cpp`.

Here is the call graph for this function:

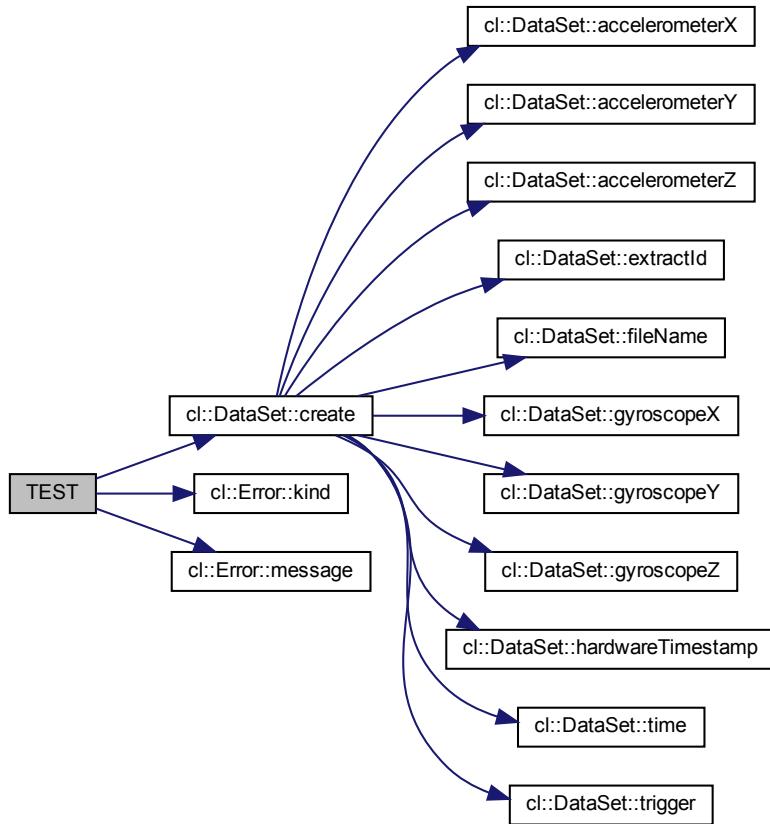


7.127.2.4 TEST() [4/4]

```
TEST (
    DataSet ,
    shouldNotBeAbleToCreateFromJaggedMatrix )
```

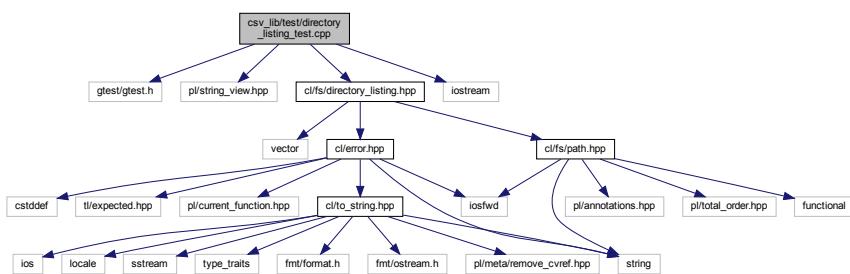
Definition at line 80 of file `data_set_test.cpp`.

Here is the call graph for this function:



7.128 csv_lib/test/directory_listing_test.cpp File Reference

```
#include "gtest/gtest.h"
#include <pl/string_view.hpp>
#include <cl/fs/directory_listing.hpp>
#include <iostream>
Include dependency graph for directory_listing_test.cpp:
```



Functions

- `TEST` (`directoryListing`, `shouldFindFiles`)
- `TEST` (`directoryListing`, `shouldFindFilesWithDotAndDotDot`)
- `TEST` (`directoryListing`, `shouldReturnErrorWhenPathDoesNotExist`)

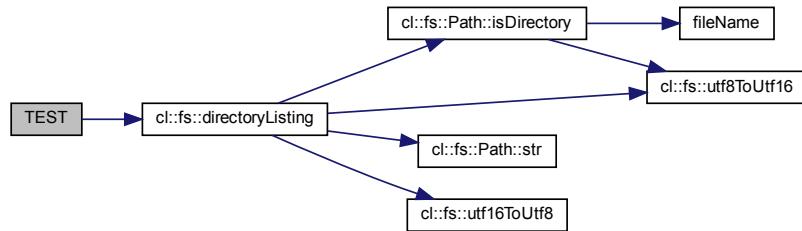
7.128.1 Function Documentation

7.128.1.1 TEST() [1/3]

```
TEST (
    directoryListing ,
    shouldFindFiles )
```

Definition at line 13 of file `directory_listing_test.cpp`.

Here is the call graph for this function:

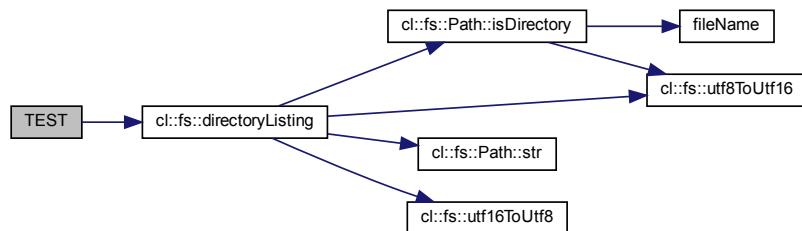


7.128.1.2 TEST() [2/3]

```
TEST (
    directoryListing ,
    shouldFindFilesWithDotAndDotDot )
```

Definition at line 28 of file `directory_listing_test.cpp`.

Here is the call graph for this function:

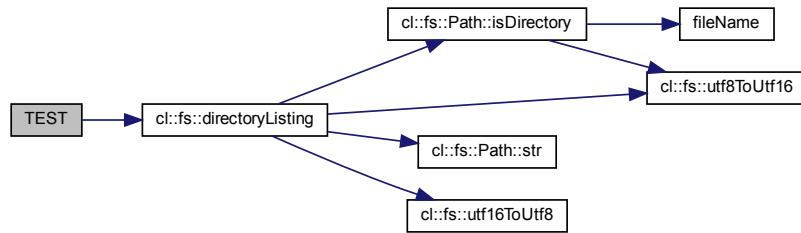


7.128.1.3 TEST() [3/3]

```
TEST (
    directoryListing ,
    shouldReturnErrorWhenPathDoesNotExist )
```

Definition at line 46 of file directory_listing_test.cpp.

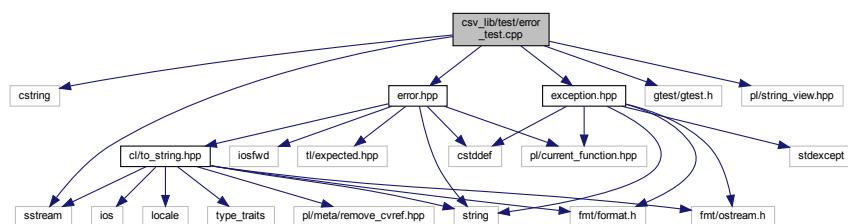
Here is the call graph for this function:



7.129 csv_lib/test/error_test.cpp File Reference

```
#include <cstring>
#include <sstream>
#include "gtest/gtest.h"
#include <pl/string_view.hpp>
#include "error.hpp"
#include "exception.hpp"
```

Include dependency graph for error_test.cpp:



Functions

- [TEST \(error, shouldPrint\)](#)
- [TEST \(error, shouldReturnValues\)](#)
- [TEST \(error, shouldThrowExceptionWhenRaisesCalled\)](#)
- [TEST \(error, shouldCreateExpectedWithUnexpected\)](#)

Variables

- const `cl::Error error`

7.129.1 Function Documentation

7.129.1.1 TEST() [1/4]

```
TEST (
    error ,
    shouldCreateExpectedWithUnexpected )
```

Definition at line 59 of file `error_test.cpp`.

7.129.1.2 TEST() [2/4]

```
TEST (
    error ,
    shouldPrint )
```

Definition at line 19 of file `error_test.cpp`.

7.129.1.3 TEST() [3/4]

```
TEST (
    error ,
    shouldReturnValues )
```

Definition at line 29 of file `error_test.cpp`.

7.129.1.4 TEST() [4/4]

```
TEST (
    error ,
    shouldThrowExceptionWhenRaiseIsCalled )
```

Definition at line 37 of file `error_test.cpp`.

7.129.2 Variable Documentation

7.129.2.1 error

```
const cl::Error error
```

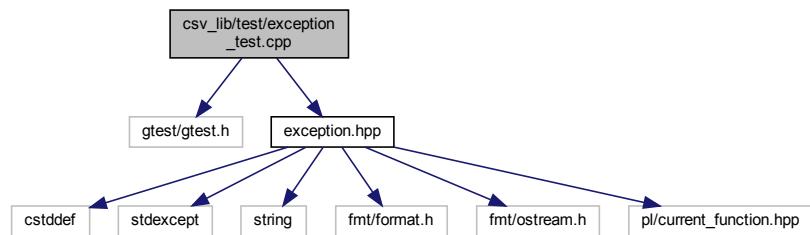
Initial value:

```
{
    cl::Error::Filesystem,
    "test_file.cpp",
    "bad_function",
    48,
    "Couldn't initialize the flux capacitor."}
```

Definition at line 12 of file error_test.cpp.

7.130 csv_lib/test/exception_test.cpp File Reference

```
#include "gtest/gtest.h"
#include "exception.hpp"
Include dependency graph for exception_test.cpp:
```



Functions

- [TEST](#) (exception, shouldWork)

7.130.1 Function Documentation

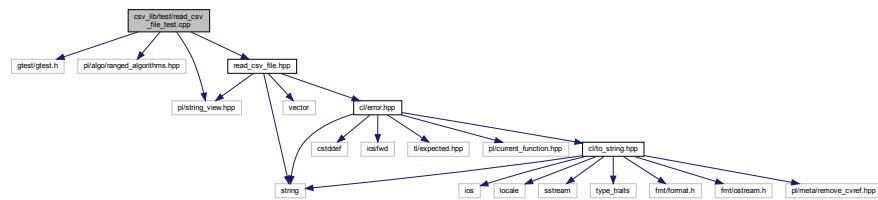
7.130.1.1 TEST()

```
TEST (
    exception ,
    shouldWork )
```

Definition at line 5 of file exception_test.cpp.

7.131 csv_lib/test/read_csv_file_test.cpp File Reference

```
#include "gtest/gtest.h"
#include <pl/algo/ranged_algorithms.hpp>
#include <pl/string_view.hpp>
#include "read_csv_file.hpp"
Include dependency graph for read_csv_file_test.cpp:
```



Functions

- [TEST](#) (`readCsvFile`, `shouldReadCsvFile`)
- [TEST](#) (`readCsvFile`, `shouldNotReadNonexistantCsvFile`)

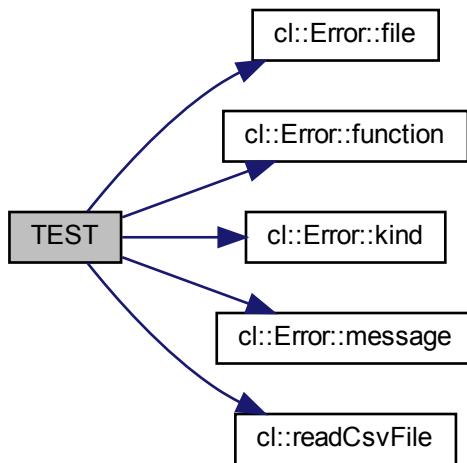
7.131.1 Function Documentation

7.131.1.1 TEST() [1/2]

```
TEST (
    readCsvFile ,
    shouldNotReadNonexistantCsvFile )
```

Definition at line 30 of file `read_csv_file_test.cpp`.

Here is the call graph for this function:

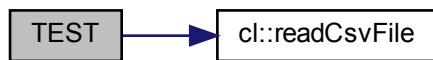


7.131.1.2 TEST() [2/2]

```
TEST (
    readCsvFile ,
    shouldReadCsvFile )
```

Definition at line 8 of file read_csv_file_test.cpp.

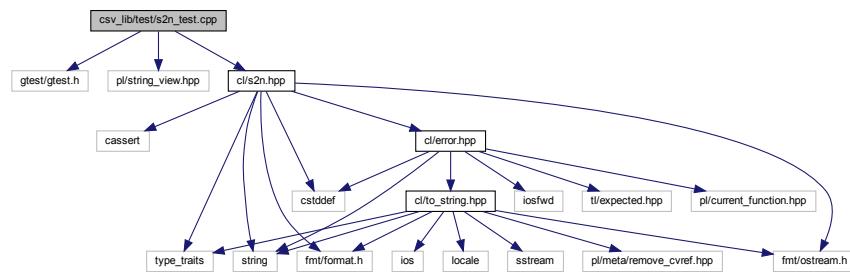
Here is the call graph for this function:



7.132 csv_lib/test/s2n_test.cpp File Reference

```
#include "gtest/gtest.h"
#include <pl/string_view.hpp>
```

```
#include "cl/s2n.hpp"
Include dependency graph for s2n_test.cpp:
```



Functions

- `TEST` (`s2n`, `shouldWork`)
- `TEST` (`s2n`, `shouldReturnInvalidArgumentErrorIfInputIsInvalid`)
- `TEST` (`s2n`, `shouldReturnOutOfRangeErrorIfInputIsOutOfRange`)

7.132.1 Function Documentation

7.132.1.1 TEST() [1/3]

```
TEST (
    s2n ,
    shouldReturnInvalidArgumentErrorIfInputIsInvalid )
```

Definition at line 21 of file `s2n_test.cpp`.

7.132.1.2 TEST() [2/3]

```
TEST (
    s2n ,
    shouldReturnOutOfRangeErrorIfInputIsOutOfRange )
```

Definition at line 29 of file `s2n_test.cpp`.

7.132.1.3 TEST() [3/3]

```
TEST (
    s2n ,
    shouldWork )
```

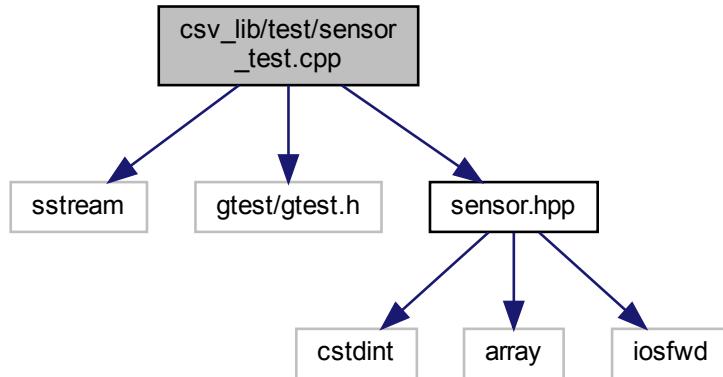
Definition at line 7 of file s2n_test.cpp.

Here is the call graph for this function:



7.133 csv_lib/test/sensor_test.cpp File Reference

```
#include <sstream>
#include "gtest/gtest.h"
#include "sensor.hpp"
Include dependency graph for sensor_test.cpp:
```



Functions

- [TEST \(sensor, shouldHaveCorrectValues\)](#)
- [TEST \(sensor, shouldPrintCorrely\)](#)

7.133.1 Function Documentation

7.133.1.1 TEST() [1/2]

```
TEST (
    sensor ,
    shouldHaveCorrectValues )
```

Definition at line 7 of file sensor_test.cpp.

7.133.1.2 TEST() [2/2]

```
TEST (
    sensor ,
    shouldPrintCorrectly )
```

Definition at line 15 of file sensor_test.cpp.

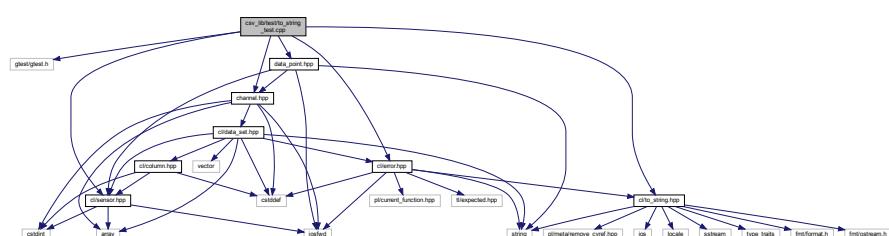
Here is the call graph for this function:



7.134 csv_lib/test/to_string_test.cpp File Reference

```
#include "gtest/gtest.h"
#include "channel.hpp"
#include "data_point.hpp"
#include "error.hpp"
#include "sensor.hpp"
#include "to_string.hpp"
```

Include dependency graph for to_string_test.cpp:



Functions

- [TEST](#) (to_string, test)

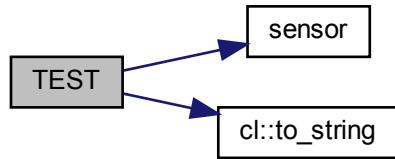
7.134.1 Function Documentation

7.134.1.1 TEST()

```
TEST (
    to_string ,
    test )
```

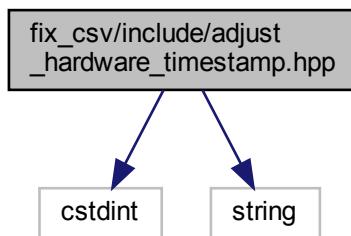
Definition at line 9 of file to_string_test.cpp.

Here is the call graph for this function:

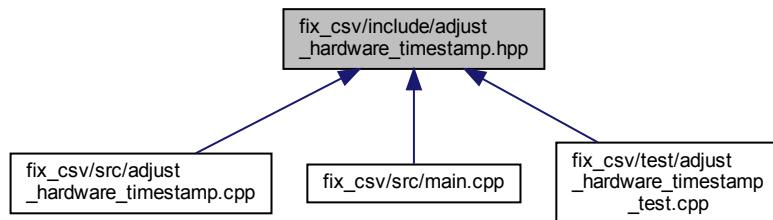


7.135 fix_csv/include/adjust_hardware_timestamp.hpp File Reference

```
#include <cstdint>
#include <string>
Include dependency graph for adjust_hardware_timestamp.hpp:
```



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



Namespaces

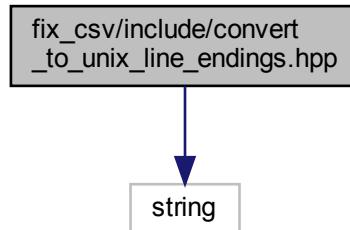
- [fmc](#)

Functions

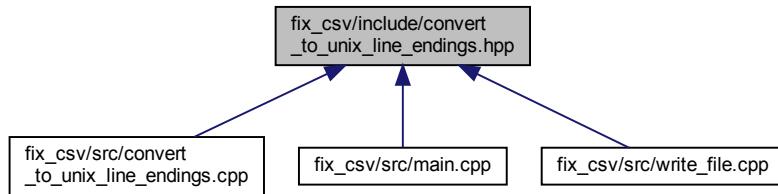
- void [`fmc::adjustHardwareTimestamp`](#) (`std::string *cellContent, const std::string &nextRowHardwareTimestamp, std::uint64_t *overflowCount`)

7.136 fix_csv/include/convert_to_unix_line_endings.hpp File Reference

```
#include <string>
Include dependency graph for convert_to_unix_line_endings.hpp:
```



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



Namespaces

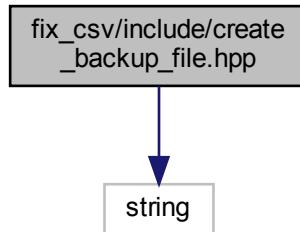
- `fmc`

Functions

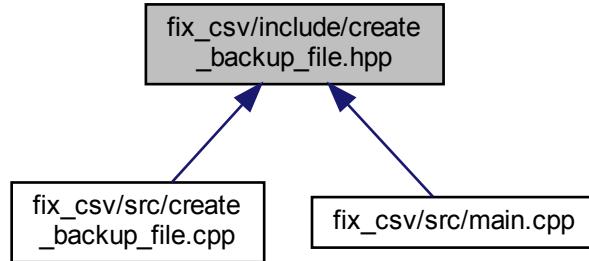
- `bool fmc::convertToUnixLineEndings (const std::string &csvPath)`

7.137 fix_csv/include/create_backup_file.hpp File Reference

```
#include <string>
Include dependency graph for create_backup_file.hpp:
```



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



Namespaces

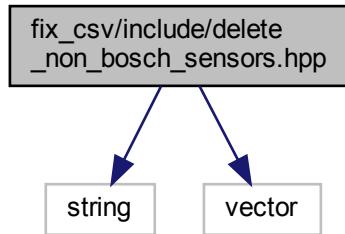
- [fmc](#)

Functions

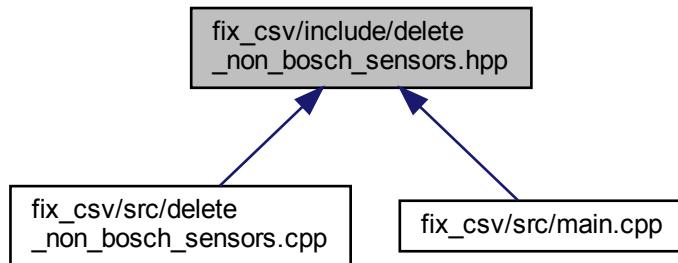
- `bool fmc::createBackupFile (const std::string &csvFilePath, const std::string &backupFilePath)`

7.138 fix_csv/include/delete_non_bosch_sensors.hpp File Reference

```
#include <string>
#include <vector>
Include dependency graph for delete_non_bosch_sensors.hpp:
```



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



Namespaces

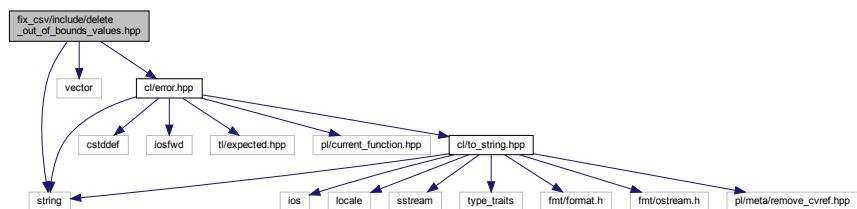
- [fmc](#)

Functions

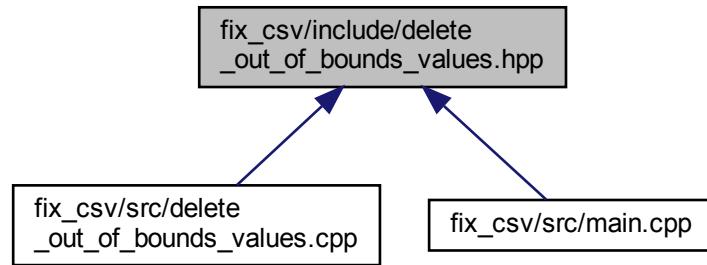
- void [fmc::deleteNonBoschSensors](#) (std::vector< std::vector< std::string >> *data)

7.139 fix_csv/include/delete_out_of_bounds_values.hpp File Reference

```
#include <string>
#include <vector>
#include "cl/error.hpp"
Include dependency graph for delete_out_of_bounds_values.hpp:
```



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



Namespaces

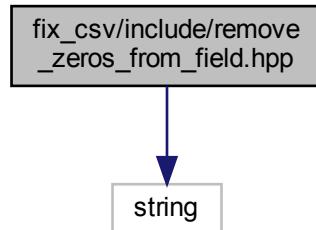
- [fmc](#)

Functions

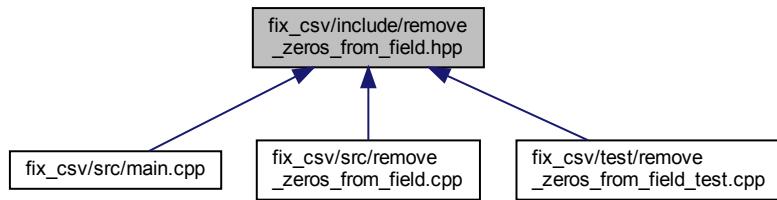
- `cl::Expected< void > fmc::deleteOutOfBoundsValues (std::vector< std::vector< std::string >> *data)`

7.140 fix_csv/include/remove_zeros_from_field.hpp File Reference

```
#include <string>
Include dependency graph for remove_zeros_from_field.hpp:
```



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



Namespaces

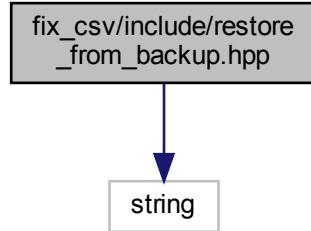
- `fmc`

Functions

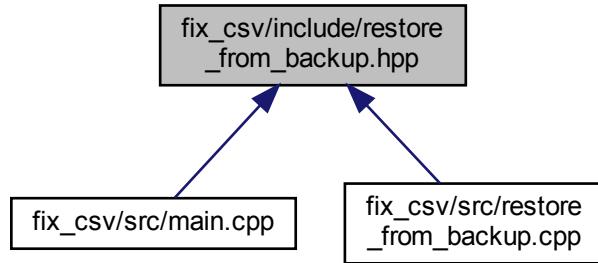
- void `fmc::removeZerosFromField` (`std::string *field`)

7.141 fix_csv/include/restore_from_backup.hpp File Reference

```
#include <string>
Include dependency graph for restore_from_backup.hpp:
```



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



Namespaces

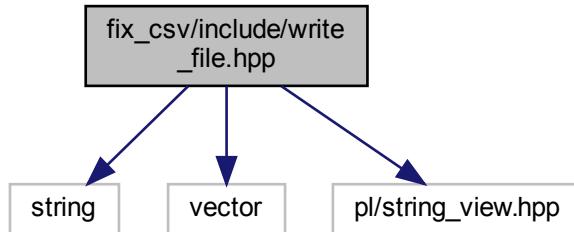
- [fmc](#)

Functions

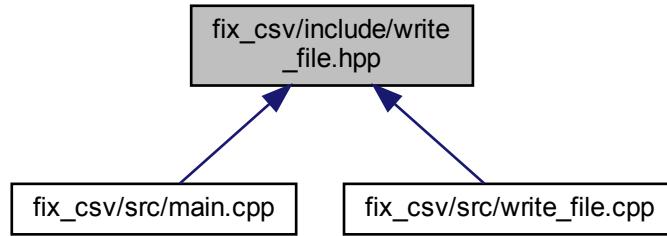
- bool [fmc::restoreFromBackup](#) (const std::string &csvFilePath, const std::string &backupFilePath)

7.142 fix_csv/include/write_file.hpp File Reference

```
#include <string>
#include <vector>
#include <pl/string_view.hpp>
Include dependency graph for write_file.hpp:
```



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



Namespaces

- `fmc`

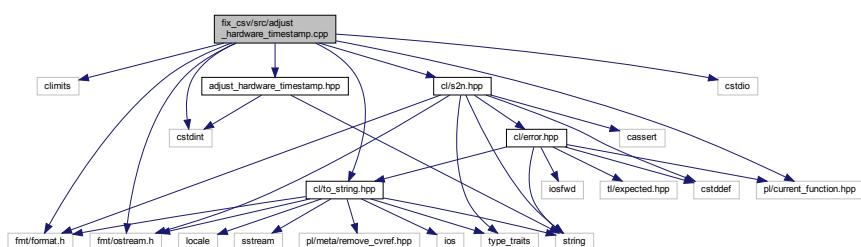
Functions

- `bool fmc::writeFile (pl::string_view csvPath, pl::string_view csvFileExtension, const std::vector< std::string > &columnNames, const std::vector< std::vector< std::string >> &data)`

7.143 fix_csv/src/adjust_hw timestamp.cpp File Reference

```

#include <climits>
#include <cstdint>
#include <cstdio>
#include <fmt/format.h>
#include <fmt/ostream.h>
#include <pl/current_function.hpp>
#include "cl/s2n.hpp"
#include "cl/to_string.hpp"
#include "adjust_hw timestamp.hpp"
Include dependency graph for adjust_hw timestamp.hpp:
  
```



Namespaces

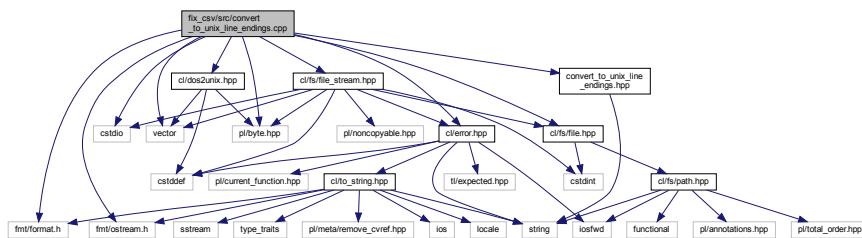
- [fmc](#)

Functions

- void [fmc::adjustHardwareTimestamp](#) (std::string *cellContent, const std::string &nextRowHardwareTimestamp, std::uint64_t *overflowCount)

7.144 fix_csv/src/convert_to_unix_line_endings.cpp File Reference

```
#include <cstdio>
#include <vector>
#include <fmt/format.h>
#include <fmt/ostream.h>
#include <pl/byte.hpp>
#include "cl/dos2unix.hpp"
#include "cl/error.hpp"
#include "cl/fs/file.hpp"
#include "cl/fs/file_stream.hpp"
#include "convert_to_unix_line_endings.hpp"
Include dependency graph for convert_to_unix_line_endings.cpp:
```



Namespaces

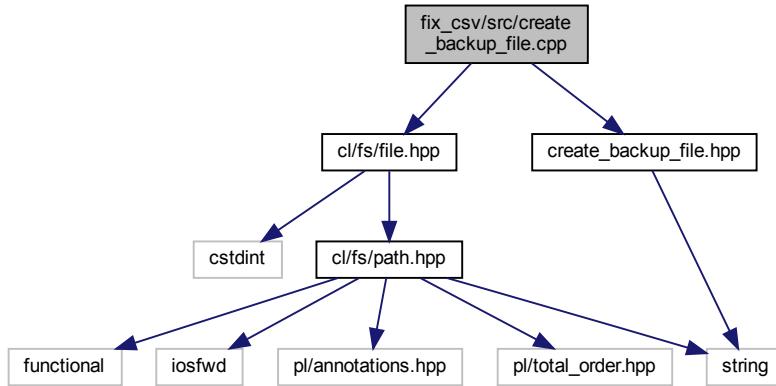
- [fmc](#)

Functions

- bool [fmc::convertToUnixLineEndings](#) (const std::string &csvPath)

7.145 fix_csv/src/create_backup_file.cpp File Reference

```
#include "cl/fs/file.hpp"
#include "create_backup_file.hpp"
Include dependency graph for create_backup_file.cpp:
```



Namespaces

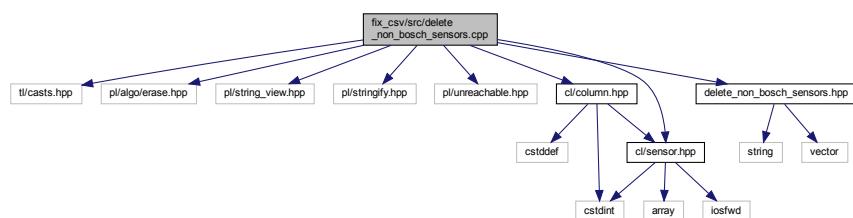
- `fmc`

Functions

- `bool fmc::createBackupFile (const std::string &csvFilePath, const std::string &backupFilePath)`

7.146 fix_csv/src/delete_non_bosch_sensors.cpp File Reference

```
#include <tl/casts.hpp>
#include <pl/algo/erase.hpp>
#include <pl/string_view.hpp>
#include <pl/stringify.hpp>
#include <pl/unreachable.hpp>
#include "cl/column.hpp"
#include "cl/sensor.hpp"
#include "delete_non_bosch_sensors.hpp"
Include dependency graph for delete_non_bosch_sensors.cpp:
```



Namespaces

- fmc

Macros

- ```
• #define CL_SENSOR_X(enm, value) case cl::Sensor::enm: return PL_STRINGIFY(value);
```

# Functions

- void **fmc::deleteNonBoschSensors** (std::vector< std::vector< std::string >>> \*data)

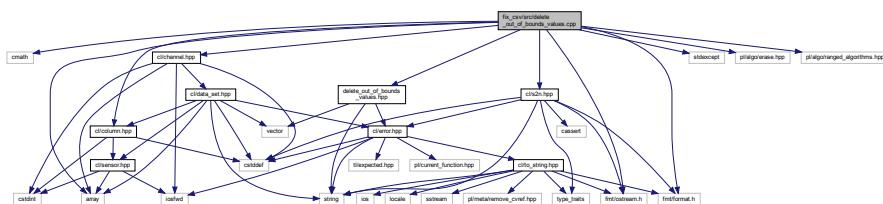
### 7.146.1 Macro Definition Documentation

### **7.146.1.1 CL SENSOR X**

```
#define CL_SENSOR_X(value) case cl::Sensor::enm: return PL_STRINGIFY(value);
```

## 7.147 fix\_csv/src/delete\_out\_of\_bounds\_values.cpp File Reference

```
#include <cmath>
#include <array>
#include <stdexcept>
#include <fmt/format.h>
#include <fmt/ostream.h>
#include <pl/algo/erase.hpp>
#include <pl/algo/ranged_algorithms.hpp>
#include "cl/channel.hpp"
#include "cl/column.hpp"
#include "cl/s2n.hpp"
#include "delete_out_of_bounds_values.hpp"
Include dependency graph for delete_out_of_bounds_values.cpp
```



## Namespaces

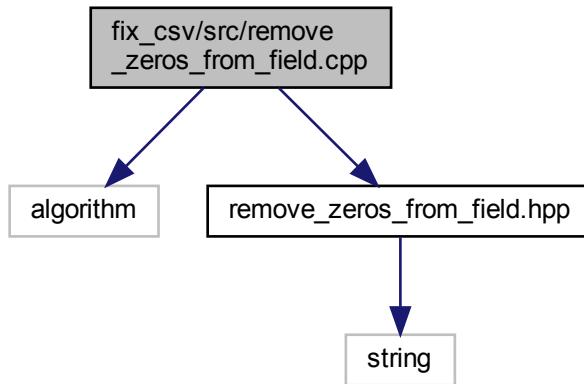
- fmc

## Functions

- `cl::Expected< void > fmc::deleteOutOfBoundsValues (std::vector< std::vector< std::string >> *data)`

## 7.148 fix\_csv/src/remove\_zeros\_from\_field.cpp File Reference

```
#include <algorithm>
#include "remove_zeros_from_field.hpp"
Include dependency graph for remove_zeros_from_field.cpp:
```



## Namespaces

- `fmc`

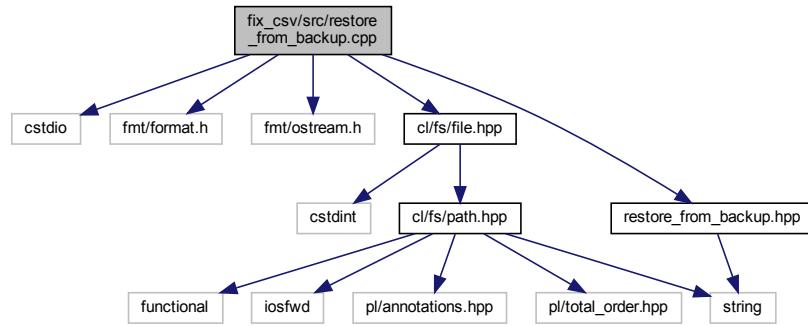
## Functions

- `void fmc::removeZerosFromField (std::string *field)`

## 7.149 fix\_csv/src/restore\_from\_backup.cpp File Reference

```
#include <cstdio>
#include <fmt/format.h>
#include <fmt/ostream.h>
#include "cl/fs/file.hpp"
```

```
#include "restore_from_backup.hpp"
Include dependency graph for restore_from_backup.cpp:
```



## Namespaces

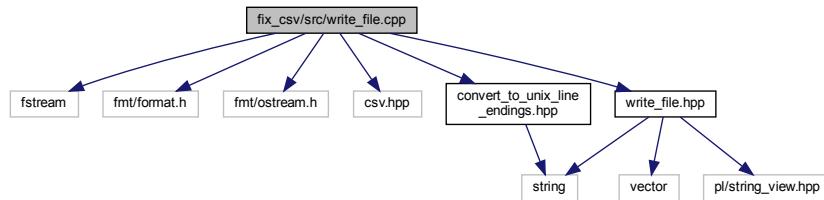
- `fmc`

## Functions

- `bool fmc::restoreFromBackup (const std::string &csvFilePath, const std::string &backupFilePath)`

## 7.150 fix\_csv/src/write\_file.cpp File Reference

```
#include <fstream>
#include <fmt/format.h>
#include <fmt/ostream.h>
#include <csv.hpp>
#include "convert_to_unix_line_endings.hpp"
#include "write_file.hpp"
Include dependency graph for write_file.cpp:
```



## Namespaces

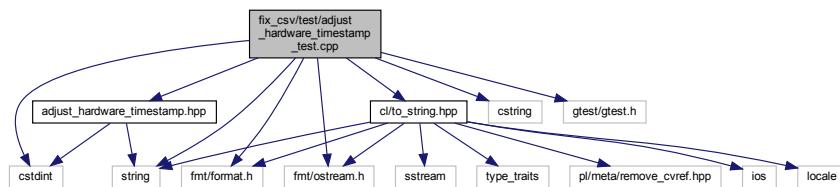
- `fmc`

## Functions

- bool `fmc::writeFile` (pl::string\_view csvPath, pl::string\_view csvFileExtension, const std::vector< std::string > &columnNames, const std::vector< std::vector< std::string >> &data)

## 7.151 fix\_csv/test/adjust\_hw\_timestamp\_test.cpp File Reference

```
#include <cstdint>
#include <cstring>
#include <string>
#include <fmt/format.h>
#include <fmt/ostream.h>
#include "gtest/gtest.h"
#include "cl/to_string.hpp"
#include "adjust_hw_timestamp.hpp"
Include dependency graph for adjust_hw_timestamp_test.cpp:
```



## Functions

- `TEST` (`adjustHardwareTimestamp`, `shouldDoNothingForNonOverflowedValue`)
- `TEST` (`adjustHardwareTimestamp`, `shouldIncrementOverflowCount`)
- `TEST` (`adjustHardwareTimestamp`, `shouldWorkForOneRoundOfOverflow`)
- `TEST` (`adjustHardwareTimestamp`, `shouldWorkForTwoRoundsOfOverflow`)
- `TEST` (`adjustHardwareTimestamp`, `shouldWork`)

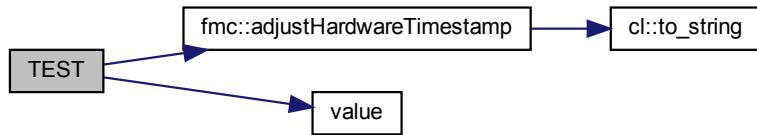
### 7.151.1 Function Documentation

#### 7.151.1.1 TEST() [1/5]

```
TEST (
 adjustHardwareTimestamp ,
 shouldDoNothingForNonOverflowedValue)
```

Definition at line 15 of file `adjust_hw_timestamp_test.cpp`.

Here is the call graph for this function:

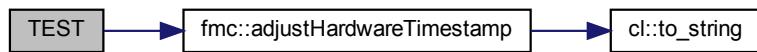


### 7.151.1.2 TEST() [2/5]

```
TEST (
 adjustHardwareTimestamp ,
 shouldIncrementOverflowCount)
```

Definition at line 26 of file `adjust_hardware_timestamp_test.cpp`.

Here is the call graph for this function:

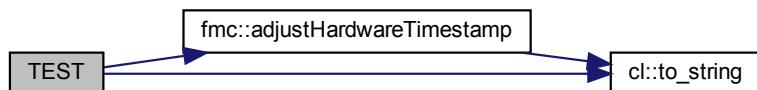


### 7.151.1.3 TEST() [3/5]

```
TEST (
 adjustHardwareTimestamp ,
 shouldWork)
```

Definition at line 132 of file `adjust_hardware_timestamp_test.cpp`.

Here is the call graph for this function:



**7.151.1.4 TEST() [4/5]**

```
TEST (
 adjustHardwareTimestamp ,
 shouldWorkForOneRoundOfOverflow)
```

Definition at line 48 of file adjust\_hardware\_timestamp\_test.cpp.

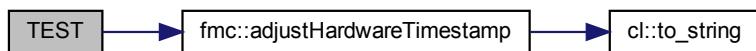
Here is the call graph for this function:

**7.151.1.5 TEST() [5/5]**

```
TEST (
 adjustHardwareTimestamp ,
 shouldWorkForTwoRoundsOfOverflow)
```

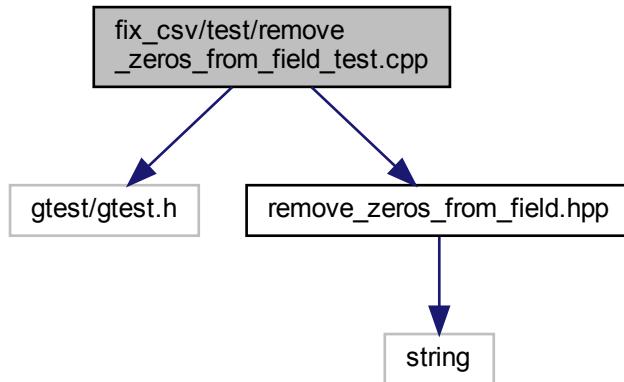
Definition at line 96 of file adjust\_hardware\_timestamp\_test.cpp.

Here is the call graph for this function:

**7.152 fix\_csv/test/remove\_zeros\_from\_field\_test.cpp File Reference**

```
#include "gtest/gtest.h"
#include "remove_zeros_from_field.hpp"
```

Include dependency graph for remove\_zeros\_from\_field\_test.cpp:



## Functions

- `TEST (removeZerosFromField, shouldRemoveDotAndZeros)`
- `TEST (removeZerosFromField, shouldNotRemovelfNonZerosFollow)`
- `TEST (removeZerosFromField, shouldNotRemovelfNoDot)`
- `TEST (removeZerosFromField, shouldDoNothingIfStringIsEmpty)`
- `TEST (removeZerosFromField, shouldDeleteStringIfStringIsSingleDot)`
- `TEST (removeZerosFromField, shouldDeleteStringIfStringIsDotAndZero)`

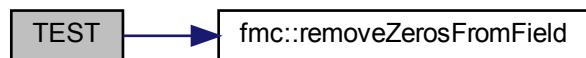
### 7.152.1 Function Documentation

#### 7.152.1.1 TEST() [1/6]

```
TEST (
 removeZerosFromField ,
 shouldDeleteStringIfStringIsDotAndZero)
```

Definition at line 53 of file `remove_zeros_from_field_test.cpp`.

Here is the call graph for this function:



### 7.152.1.2 TEST() [2/6]

```
TEST (
 removeZerosFromField ,
 shouldDeleteStringIfStringIsSingleDot)
```

Definition at line 44 of file remove\_zeros\_from\_field\_test.cpp.

Here is the call graph for this function:



### 7.152.1.3 TEST() [3/6]

```
TEST (
 removeZerosFromField ,
 shouldDoNothingIfStringIsEmpty)
```

Definition at line 35 of file remove\_zeros\_from\_field\_test.cpp.

Here is the call graph for this function:

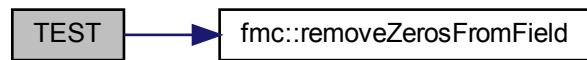


#### 7.152.1.4 TEST() [4/6]

```
TEST (
 removeZerosFromField ,
 shouldNotRemoveIfNoDot)
```

Definition at line 25 of file remove\_zeros\_from\_field\_test.cpp.

Here is the call graph for this function:



#### 7.152.1.5 TEST() [5/6]

```
TEST (
 removeZerosFromField ,
 shouldNotRemoveIfNonZerosFollow)
```

Definition at line 15 of file remove\_zeros\_from\_field\_test.cpp.

Here is the call graph for this function:



### 7.152.1.6 TEST() [6/6]

```
TEST (
 removeZerosFromField ,
 shouldRemoveDotAndZeros)
```

Definition at line 5 of file remove\_zeros\_from\_field\_test.cpp.

Here is the call graph for this function:





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