Package 'xlum'

July 5, 2022

Type Package

Title Read, Write, and Convert XLUM Data

Version 0.1.0.9000-91

Author Sebastian Kreutzer [aut, cre] (<https://orcid.org/0000-0002-0734-2199>),
Christoph Burow [ctb] (<https://orcid.org/0000-0002-5023-4046>)

Maintainer Sebastian Kreutzer <sebastian.kreutzer@uni-heidelberg.de>

Description Support for the XLUM file format for exchange and long-term preservation of luminescence data. Facilitated are the import and export of XLUM files and the conversion from other formats commonly used to store luminescence (dating) data.

License GPL-3

Depends R (>= 4.1),
utils

Imports methods,
Luminescence (>= 0.9.19),
xml2 (>= 1.3.3)

Suggests spelling (>= 2.2),
testthat (>= 3.1.3)

Encoding UTF-8

Language en-GB

LazyData true

RoxygenNote 7.2.0

Collate 'convert_Daybreak2xlum.R'
'convert_binx2xlum.R'
'convert_psl2xlum.R'
'convert_rlum2xlum.R'
'convert_xsyg2xlum.R'
'methods.R'
'read_xlum.R'
'utils.R'
'validate_xlum.R'
'write_xlum.R'
'xlum-package.R'

R topics documented:

`xlum-package` *Read, Write, and Convert xlum Data*

Description

Support for the XLUM-file format for exchange and long-term preservation of luminescence data. Facilitated are the import and export of XLUM-files and the conversion from other ASCII and binary formats commonly used to store luminescence (dating) data.

Details

Support contact

- https://github.com/R-Lum/xlum/discussions

Bug reporting

- https://github.com/R-Lum/xlum/issues

Project source code repository

- https://github.com/R-Lum/xlum

Package maintainer

Sebastian Kreutzer, Institute of Geography, Heidelberg University (Germany),
<sebastian.kreutzer@uni-heidelberg.de>

Funding

Between 2020–2022, the work of Sebastian Kreutzer as maintainer of the package has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 844457 (CREDit), and the work was carried out at the Geography & Earth Sciences, Aberystwyth University (United Kingdom)

`convert_binx2xlum` *Convert Risø BIN/BINX to XLUM*

Description

Wrapped function to quickly convert BIN/BINX files to `xlum` (files)

Usage

```
convert_binx2xlum(file, out_file = NULL, ...)

convert_bin2xlum(file, out_file = NULL)
```

Arguments

`file`	character (**required**): file
`out_file`	character (*optional*): output file, if set a file output is created
`...`	support for a limited number of additional arguments to be forwarded to Luminescence::read_BIN2R: `position`, `n.records`

Value

Depending on the setting. If `out_file == NULL` an xml2::xml_document object is returned, if file is set the function attempts to write an `*.xlum` file‘.

Function version

0.1.0

How to cite

Kreutzer, S., 2022. convert_binx2xlum(): Convert Risø BIN/BINX to XLUM. Function version 0.1.0. In: Kreutzer, S., 2022. xlum: Read, Write, and Convert XLUM Data. R package version 0.1.0.9000-91.

Author(s)

Sebastian Kreutzer, Institute of Geography, Heidelberg University, Heidelberg (Germany)

See Also

convert_rlum2xlum, Luminescence::read_BIN2R

Examples

```
## Not run:
file <- system.file("extdata/BINfile_V8.binx", package = "Luminescence")
convert_binx2xlum(file)

## End(Not run)
```

`convert_Daybreak2xlum` *Convert Daybreak TXT and DAT files to XLUM*

Description

Wrapped function to quickly convert Daybreak files to `xlum` (files)

Usage

```
convert_Daybreak2xlum(file, out_file = NULL)
```

Arguments

`file`	character (**required**): file
`out_file`	character (*optional*): output file, if set a file output is created

Value

Depending on the setting. If `out_file == NULL` an xml2::xml_document object is returned, if file is set the function attempts to write an `*.xlum` file‘.

Function version

0.1.0

How to cite

Kreutzer, S., 2022. convert_Daybreak2xlum(): Convert Daybreak TXT and DAT files to XLUM. Function version 0.1.0. In: Kreutzer, S., 2022. xlum: Read, Write, and Convert XLUM Data. R package version 0.1.0.9000-91.

Author(s)

Sebastian Kreutzer, Institute of Geography, Heidelberg University, Heidelberg (Germany)

See Also

convert_rlum2xlum, Luminescence::read_Daybreak2R

Examples

```
## load package example data
## for loading own data use
## file <- file.choose()
file <- system.file("extdata/Daybreak_TestFile.txt", package = "Luminescence")
convert_Daybreak2xlum(file)
```

`convert_psl2xlum` *Convert SUERC PSL-files to XLUM*

Description

Wrapped function to quickly convert PSL files to `xlum` (files) from the portable luminescence system produced by the SUERC

Usage

```
convert_psl2xlum(file, out_file = NULL)
```

Arguments

`file`	character (**required**): file
`out_file`	character (*optional*): output file, if set a file output is created

Value

Depending on the setting. If `out_file == NULL` an xml2::xml_document object is returned, if file is set the function attempts to write an `*.xlum` file‘.

Function version

0.1.0

How to cite

Kreutzer, S., 2022. convert_psl2xlum(): Convert SUERC PSL-files to XLUM. Function version 0.1.0. In: Kreutzer, S., 2022. xlum: Read, Write, and Convert XLUM Data. R package version 0.1.0.9000-91.

Author(s)

Sebastian Kreutzer, Institute of Geography, Heidelberg University, Heidelberg (Germany)

See Also

convert_rlum2xlum, Luminescence::read_PSL2R

Examples

```
## load package example data
## for loading own data use
## file <- file.choose()
file <- system.file("extdata", "DorNie_0016.psl", package = "Luminescence")
convert_psl2xlum(file)
```

`convert_rlum2xlum` *Convert RLum-class objects to the XLUM format*

Description

Converts Luminescence::RLum objects to xlum format

Usage

```
convert_rlum2xlum(rlum, file = NULL)
```

Arguments

`rlum`	Luminescence::RLum.Data and Luminescence::RLum.Analysis or a list of it (**required**): input for the conversion
`file`	character (*optional*): file name for the export, if `NULL` (the default), an xml2::xml_document object is returned

Details

The function tries to make a best possible conversion of the Luminescence::RLum to the `xlum` format. Luminescence::RLum.Results objects are not supported.

Because of the nature the Luminescence::RLum structure, the nodes `<xlum/>`, `<sample/>` are set automatically because the Luminescence::RLum does not distinguish between different samples.

Value

Depending on the setting. If `file == NULL` an xml2::xml_document object is returned, if file is set the function attempts to write an `*.xlum` file‘.

Function version

0.1.0

How to cite

Kreutzer, S., 2022. convert_rlum2xlum(): Convert RLum-class objects to the XLUM format. Function version 0.1.0. In: Kreutzer, S., 2022. xlum: Read, Write, and Convert XLUM Data. R package version 0.1.0.9000-91.

Author(s)

Sebastian Kreutzer, Institute of Geography, Heidelberg University, Heidelberg (Germany)

See Also

Luminescence::RLum.Data, write_xlum

Examples

```
data(ExampleData.RLum.Analysis,
envir = environment(),
package = "Luminescence")
convert_rlum2xlum(IRSAR.RF.Data)
```

---

convert_xsyg2xlum *Convert Freiberg Instruments XSYG files to XLUM*

Description

Wrapped function to quickly convert Freiberg Instruments XSYG-files to `xlum` (files)

Usage

```
convert_xsyg2xlum(file, out_file = NULL)
```

Arguments

`file`	character (**required**): file
`out_file`	character (*optional*): output file, if set a file output is created

Value

Depending on the setting. If `out_file == NULL` an xml2::xml_document object is returned, if file is set the function attempts to write an `*.xlum` file‘.

Function version

0.1.0

How to cite

Kreutzer, S., 2022. convert_xsyg2xlum(): Convert Freiberg Instruments XSYG files to XLUM. Function version 0.1.0. In: Kreutzer, S., 2022. xlum: Read, Write, and Convert XLUM Data. R package version 0.1.0.9000-91.

Author(s)

Sebastian Kreutzer, Institute of Geography, Heidelberg University, Heidelberg (Germany)

See Also

convert_rlum2xlum, Luminescence::read_XSYG2R

Examples

```
## load package example data
## for loading own data use
## file <- file.choose()
file <- system.file("extdata/XSYG_file.xsyg", package = "Luminescence")
convert_xsyg2xlum(file)
```

`read_xlum` *Import XLUM files*

Description

Imports XLUM-files using xml2::read_xml. Comes with a few convenience features, such as the transformation of string lists to numeric vectors where meaningful.

Usage

```
read_xlum(file, verify = TRUE, output = "xlum_list")
```

Arguments

`file`	character (**required**): path to file
`verify`	logical (*with default*): enable/disable format validation
`output`	character (*with default*): output object of the import, supported are `"xml_document"`, `"list"`, `"xlum_list"` (the default)

Details

Supported output options

`"xlum_list"` (default): imports XML-data and coerces them to list. Numeric values for level `<curve>` are transposed into numeric vectors for better handling

`"list"`: imports XML-data and coerces it to a list, no further treatment of data

`"xml_document"`: unprocessed output from xml2::read_xml

Value

The output depends on the setting selected in `output`. It will be either an xml2::xml_document, list, or a list of class `xlum_list`.

Function version

0.1.0

How to cite

Kreutzer, S., 2022. read_xlum(): Import XLUM files. Function version 0.1.0. In: Kreutzer, S., 2022. xlum: Read, Write, and Convert XLUM Data. R package version 0.1.0.9000-91.

Author(s)

Sebastian Kreutzer, Institute of Geography, Heidelberg University, Heidelberg (Germany)

See Also

xml2::read_xml, validate_xlum, write_xlum

Examples

```
file <- system.file("extdata/xlum_example.xlum", package="xlum")
```

`validate_xlum` *Validate xlum format against an XSD reference schema*

Description

A a convenience wrapper around xml2::xml_validate against the reference format description shipped with xlum-package

Usage

```
validate_xlum(file, xsd_version = NULL)
```

Arguments

`file`	xml2::xml_document (**required**): object to test
`xsd_version`	numeric (*optional*): specify format version for the validation, e.g., `1`, `1.1`. The default is `NULL`, which will use the most recent version

Value

Results of the validation logical with attributes

How to cite

Kreutzer, S., 2022. validate_xlum(): Validate xlum format against an XSD reference schema. In: Kreutzer, S., 2022. xlum: Read, Write, and Convert XLUM Data. R package version 0.1.0.9000-91.

Author(s)

Sebastian Kreutzer, Geography & Earth Sciences, Aberystwyth University

Examples

```
file <- system.file("extdata/xlum_prototype.xlum", package = "xlum")
validate_xlum(file)
```

`write_xlum` *Write XLUM-files*

Description

Create XLUM-files using xml2::read_xml

Usage

```
write_xlum(x, file, ...)
```

Arguments

`x`	`xlum_list`, list, xml2::xml_document (**required**) : input object
`file`	character (**required**): valid file path and file name with ending `.xlum` (will be add automatically if needed)
`...`	further arguments to be passed to xml2::write_xml

Value

Creates an XML-file with ending `*.xlum`

Function version

0.1.0

How to cite

Kreutzer, S., 2022. write_xlum(): Write XLUM-files. Function version 0.1.0. In: Kreutzer, S., 2022. xlum: Read, Write, and Convert XLUM Data. R package version 0.1.0.9000-91.

Author(s)

Sebastian Kreutzer, Institute of Geography, Heidelberg University, Heidelberg (Germany)

See Also

xml2::write_xml, read_xlum

Examples

```
file <- system.file("extdata/xlum_prototype.xlum", package="xlum")
out_file <- tempfile()

xlum_data <- read_xlum(file)
write_xlum(xlum_data, out_file)
```

Index