Package 'oxcAAR'

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Type Package

Title Interface to 'OxCal' Radiocarbon Calibration

Version 1.0.0

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Description A set of tools that enables using 'OxCal' from within R. 'Ox-
Cal' (<https://c14.arch.ox.ac.uk/oxcal.html>) is a standard archaeological tool intended to pro-
vide 14C calibration and analysis of archaeological and environmental chronological informa-
tion. 'OxcAAR' allows simple calibration with 'Oxcal' and plotting of the re-
sults as well as the execution of sophisticated ('OxCal') code and the import of the re-
sults of bulk analysis and complex Bayesian sequential calibration.

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LazyData TRUE

Imports stringr, jsonlite

Suggests knitr, testthat

VignetteBuilder knitr

RoxygenNote 6.0.1

NeedsCompilation no

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R topics documented:

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calcurve_plot   *Plots calibrated dates on the calibration curve*

Description

Plots calibrated dates on the calibration curve

Usage

```
calcurve_plot(x, dates_sigma_ranges = NULL, uncal_range = TRUE,
  cal_range = TRUE)
```

Arguments

x   an object of class oxcAARCalibratedDate or oxcAARCalibratedDatesList

dates_sigma_ranges

                 character. The sigma range used for the error bars ("two_sigma", "one_sigma"
                 or "three_sigma")

uncal_range   logical. If TRUE (default), the plot contains error bars for the the uncalibrated
                 age

cal_range   logical. If TRUE (default), the plot contains error bars for the the calibrated age

---

executeOxcalScript *Executes an Oxcal Script*

Description

Takes an Oxcal Script, hands it over to oxcal and receives the output that is read from the output file

Usage

```
executeOxcalScript(oxcal_script)
```

Arguments

oxcal_script   A string containing the Oxcal commands that should be processed.

Value

The path to the js output file

Author(s)

Martin Hinz

---

get_bp *get bp values (ages)*

Description

queries values from date objects

Usage

```
get_bp(x)

## Default S3 method:
get_bp(x)

## S3 method for class 'oxcAARCalibratedDate'
get_bp(x)

## S3 method for class 'oxcAARCalibratedDatesList'
get_bp(x)
```

Arguments

x   an object of class oxcAARCalibratedDate or oxcAARCalibratedDatesList

Value

an integer or a numeric vector

See Also

Other getter functions: `get_cal_curve`, `get_name`, `get_raw_probabilities`, `get_sigma_ranges`,
`get_std`

Examples

```
## Not run:
x <- oxcalCalibrate(c(5000, 4500, 3000), c(20, 50, 60))
get_bp(x)
y <- oxcalCalibrate(5000, 20)[[1]]
get_bp(y)

## End(Not run)
```

---

get_cal_curve   *get calibration curve names*

Description

queries values from date objects

Usage

```
get_cal_curve(x)

## Default S3 method:
get_cal_curve(x)

## S3 method for class 'oxcAARCalibratedDate'
get_cal_curve(x)

## S3 method for class 'oxcAARCalibratedDatesList'
get_cal_curve(x)
```

Arguments

x   an object of class oxcAARCalibratedDate or oxcAARCalibratedDatesList

Value

a string or a character vector

See Also

Other getter functions: get_bp, get_name, get_raw_probabilities, get_sigma_ranges, get_std

Examples

```
## Not run:
x <- oxcalCalibrate(c(5000, 4500, 3000), c(20, 50, 60))
get_cal_curve(x)
y <- oxcalCalibrate(5000, 20)[[1]]
get_cal_curve(y)

## End(Not run)
```

---

get_name *get names (labcodes)*

Description

queries values from date objects

Usage

```
get_name(x)

## Default S3 method:
get_name(x)

## S3 method for class 'oxcAARCalibratedDate'
get_name(x)

## S3 method for class 'oxcAARCalibratedDatesList'
get_name(x)
```

Arguments

x   an object of class oxcAARCalibratedDate or oxcAARCalibratedDatesList

Value

a string or a character vector

See Also

Other getter functions: get_bp, get_cal_curve, get_raw_probabilities, get_sigma_ranges, get_std

Examples

```
## Not run:
x <- oxcalCalibrate(c(5000, 4500, 3000), c(20, 50, 60))
get_name(x)
y <- oxcalCalibrate(5000, 20)[[1]]
get_name(y)

## End(Not run)
```

get_raw_probabilities   *get raw probabilities*

Description

queries values from date objects

Usage

```
get_raw_probabilities(x)

## Default S3 method:
get_raw_probabilities(x)

## S3 method for class 'oxcAARCalibratedDate'
get_raw_probabilities(x)

## S3 method for class 'oxcAARCalibratedDatesList'
get_raw_probabilities(x)
```

Arguments

x   an object of class oxcAARCalibratedDate or oxcAARCalibratedDatesList

Value

a data.frame or a list of data.frames

See Also

Other getter functions: [get_bp](#), [get_cal_curve](#), [get_name](#), [get_sigma_ranges](#), [get_std](#)

Examples

```
## Not run:
x <- oxcalCalibrate(c(5000, 4500, 3000), c(20, 50, 60))
get_raw_probabilities(x)
y <- oxcalCalibrate(5000, 20)[[1]]
get_raw_probabilities(y)

## End(Not run)
```

get_sigma_ranges   *get sigma ranges*

Description

queries values from date objects

Usage

```
get_sigma_ranges(x)

## Default S3 method:
get_sigma_ranges(x)

## S3 method for class 'oxcAARCalibratedDate'
get_sigma_ranges(x)

## S3 method for class 'oxcAARCalibratedDatesList'
get_sigma_ranges(x)
```

Arguments

x   an object of class oxcAARCalibratedDate or oxcAARCalibratedDatesList

Value

a list of three data.frames or a list of those lists

See Also

Other getter functions: get_bp, get_cal_curve, get_name, get_raw_probabilities, get_std

Examples

```
## Not run:
x <- oxcalCalibrate(c(5000, 4500, 3000), c(20, 50, 60))
get_sigma_ranges(x)
y <- oxcalCalibrate(5000, 20)[[1]]
get_sigma_ranges(y)

## End(Not run)
```

---

get_std   *get std values (standard deviations)*

Description

queries values from date objects

Usage

```
get_std(x)

## Default S3 method:
get_std(x)

## S3 method for class 'oxcAARCalibratedDate'
get_std(x)

## S3 method for class 'oxcAARCalibratedDatesList'
get_std(x)
```

Arguments

x   an object of class oxcAARCalibratedDate or oxcAARCalibratedDatesList

Value

an integer or a numeric vector

See Also

Other getter functions: get_bp, get_cal_curve, get_name, get_raw_probabilities, get_sigma_ranges

Examples

```
## Not run:
x <- oxcalCalibrate(c(5000, 4500, 3000), c(20, 50, 60))
get_std(x)
y <- oxcalCalibrate(5000, 20)[[1]]
get_std(y)

## End(Not run)
```

---

get_tidy_oxcalresult   *tidy output*

Description

Transforms oxcAAR output to a tidy data format. See http://vita.had.co.nz/papers/tidy-data.html and https://CRAN.R-project.org/package=broom

Usage

```
get_tidy_oxcalresult(x)

## Default S3 method:
get_tidy_oxcalresult(x)

## S3 method for class 'oxcAARCalibratedDate'
get_tidy_oxcalresult(x)

## S3 method for class 'oxcAARCalibratedDatesList'
get_tidy_oxcalresult(x)
```

Arguments

x   an object of class oxcAARCalibratedDate or oxcAARCalibratedDatesList

Value

a data.frame (with list columns)

Examples

```
## Not run:
x <- oxcalCalibrate(c(5000, 4500, 3000), c(20, 50, 60))
get_tidy_oxcalresult(x)
y <- oxcalCalibrate(5000, 20)[[1]]
get_tidy_oxcalresult(y)

## End(Not run)
```

---

is.oxcAARCalibratedDate

Checks if a variable is of class oxcAARCalibratedDate

Description

Checks if a variable is of class oxcAARCalibratedDate

Usage

```
is.oxcAARCalibratedDate(x)
```

Arguments

x   a variable

Value

true if x is a oxcAARCalibratedDate, false otherwise

---

is.oxcAARCalibratedDatesList

Checks if a variable is of class oxcAARCalibratedDatesList

Description

Checks if a variable is of class oxcAARCalibratedDatesList

Usage

```
is.oxcAARCalibratedDatesList(x)
```

Arguments

x   a variable

Value

true if x is a oxcAARCalibratedDatesList, false otherwise

oxcAARCalibratedDate   *oxcAAR Calibrated Dates Object*

Description

The function `oxcAARCalibratedDate` is used to create an object for a calibrated date.

Usage

```
oxcAARCalibratedDate(name, bp, std, cal_curve, sigma_ranges, raw_probabilities)
```

Arguments

name	a string giving the name of the date (usually the lab number)
bp	a integer giving the BP value for the date
std	a integer giving the standard deviation for the date
cal_curve	a list containing information about the calibration curve (name, resolution, bp, bc, sigma)
sigma_ranges	a list of three elements (one, two, three sigma), each a data frame with start, end and probability giving
raw_probabilities	a data frame of dates and the related probabilities for each date

Value

an object of the class `'oxcAARCalibratedDate'`

oxcAARCalibratedDatesList
                    oxcAAR Calibrated Dates List

Description

A List of oxcAARCalibratedDate

Value

an object of the class 'oxcAARCalibratedDatesList'

---

oxcalCalibrate *Calibrates a 14C date using oxcal*

Description

Calibrates a 14C date using oxcal

Usage

```
oxcalCalibrate(bp, std, names = 1:length(bp))
```

Arguments

bp	A vector containing the bp dates of the measurements
std	A vector containing the standard deviations of the measurements
names	The names of the measurements, usually the Laboratory numbers

Value

An object of class oxcAARCalibratedDatesList

---

oxcalSimulate *Simulates 14C dates using oxcal*

Description

Simulates 14C dates using oxcal

Usage

```
oxcalSimulate(c_date, std, names = 1:length(c_date))
```

Arguments

c_date	A vector containing the calendar dates to be simulated
std	A vector containing the standard deviations for the simulated dates
names	The names of the measurements, usually the Laboratory numbers

Value

An object of class oxcAARCalibratedDatesList

---

oxcalSumSim   *Sum calibration for simulated dates*

Description

Sum calibration for simulated dates

Usage

```
oxcalSumSim(timeframe_begin, timeframe_end, n, stds,
  date_distribution = c("equidist", "uniform"))
```

Arguments

timeframe_begin, timeframe_end

> beginning and end of the time frame for which dates should be simulated

n   the number of dates that should be simulated

stds   either one standard deviation for all dates or a vector of standard deviations with length n

date_distribution

> a character string indicating which method should be used to distribute the dates in the given time frame, can be abbreviated

Details

The dates can be distributed using one of the following methods: 'equidist' distributed the n dates within the time frame with equal distance, 'uniform' random samples n dates from the given time interval with uniform distribution

Value

A list containing the following components:

dates   the dates for the simulated sum calibration

probabilities   the probabilities for the simulated sum calibration

date_distribution

> the distribution method used for the dates

---

oxcal_Sum   *Wraps an Oxcal string into a Oxcal sum function*

Description

Wraps an Oxcal string into a Oxcal sum function

Usage

```
oxcal_Sum(oxcal_string, name = "Sum")
```

Arguments

oxcal_string   The Oxcal script that should be wrapped

name   The name attribute for the resulting sum function

Value

A new oxcal script as string

---

parseFullOxcalOutput   *Parses an Oxcal Output File completely into R*

Description

Takes the output of Oxcal as vector of strings (one string per line) and parse it as list.

Usage

```
parseFullOxcalOutput(output)
```

Arguments

output   The output of Oxcal as vector of strings (one string per line).

Value

A list containing all informations provided by Oxcal as list.

parseOxcalOutput	*Parses an Oxcal Output File into R*

Description

Takes the output of Oxcal as vector of strings (one string per line) and parse it as list.

Usage

```
parseOxcalOutput(result, first = FALSE, only.R_Date = T)
```

Arguments

result	The output of Oxcal as vector of strings (one string per line).
first	Return the first date only
only.R_Date	Return the informations for R_Dates

Value

A list containing all informations provided by Oxcal as list.

quickSetupOxcal	*Quick OxCal setup*

Description

Downloads the latest version of Oxcal and sets the executable path correctly

Usage

```
quickSetupOxcal(os = Sys.info()["sysname"], path = ".")
```

Arguments

os	The operating system of the workstation. Default: automatic determination. Options:

- **Linux**
- Windows
- Darwin

path	The path to the directory where Oxcal is or should be stored. Default: "."

Author(s)

Clemens Schmid

Examples

```
## Not run:
  quickSetupOxcal()

## End(Not run)
```

---

readOxcalOutput   *Reads the content of the Oxcal js output file*

Description

Reads the content of the Oxcal js output file as vector of strings for each line.

Usage

```
readOxcalOutput(output_file)
```

Arguments

output_file   The path to a Oxcal js output file.

Value

The content of the Oxcal js output file as vector of strings for each line.

Author(s)

Martin Hinz

R_Date   *Returns the Oxcal code for the calibration of 14C dates*

Description

R_Date takes names, BP dates and standard deviation for those dates as vectors, and returns a bit of oxcal code that can be used to feed it into oxcal. For details concerning the Oxcal calibration please consult the help page of Oxcal.

Usage

```
R_Date(names, r_dates, stds)
```

Arguments

`names`	a vector of names for the dates
`r_dates`	a vector containing the BP dates that should be calibrated
`stds`	a vector containing the standard deviation that should be calibrated

Value

a string containing the respective Oxcal code

`R_Simulate`	*Returns the Oxcal code for the simulation of 14C dates*

Description

R_Simulate takes names, calendar dates and standard deviation for those dates as vectors, and returns a bit of oxcal code that can be used to feed it into oxcal. For details concerning the Oxcal simulation please consult the help page of Oxcal.

Usage

```
R_Simulate(c_dates, stds, names = 1:length(c_dates))
```

Arguments

`c_dates`	a vector containing the calendar dates that should be simulated
`stds`	a vector containing the standard deviation that should be simulated
`names`	a vector of names for the resulting simulated dates

Value

a string containing the respective Oxcal code

`setOxcalExecutablePath`	
	Setting the Oxcal program path for further use

Description

Stores the path to the oxcal executable it in internally for other functions.

Usage

```
setOxcalExecutablePath(path)
```

Arguments

path   The path to the Oxcal executable

Author(s)

Martin Hinz

Examples

```
## Not run:
connectOxcal('/home/martin/Documents/scripte/OxCal/bin/OxCalLinux')

## End(Not run)
```

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