Package ‘oro.nifti’

May 7, 2015

Version 0.5.2
Date 2015-04-24
Title Rigorous - NIfTI + ANALYZE + AFNI : Input / Output
Description Functions for the input/output and visualization of
medical imaging data that follow either the ANALYZE, NIfTI or AFNI
formats. This package is part of the Rigorous Analytics bundle.
Depends R (>= 2.14.0)
Suggests XML, testthat
Imports bitops, splines, graphics, grDevices, methods, utils, abind
Enhances dcmriS4, fmri, oro.dicom
License BSD_3_clause + file LICENSE
LazyData true
LazyDataCompression gzip
‘xyzt_units.R’ ‘cal_units.R’ ‘compressed.R’ ‘dim_un0.R’
R topics documented:

'funused2.R' 'funused3.R' 'generated.R' 'hist_un0.R'
'hkey_un0.R' 'omax.R' 'omin.R' 'orient.R' 'origin.R'
'patient_id.R' 'scannum.R' 'smax.R' 'smin.R' 'start_field.R'
'unused1.R' 'verified.R' 'views.R' 'vols_added.R' 'vox_units.R'
'zzz.R'

NeedsCompilation no

Author  Brandon Whitcher [aut, cre],
        Volker Schmid [aut],
        Andrew Thornton [aut],
        Karsten Tabelow [ctb],
        Jon Clayden [ctb],
        John Muschelli [ctb]

Maintainer  Brandon Whitcher <bwhitcher@gmail.com>

Repository  CRAN

Date/Publication  2015-05-07 23:02:13

R topics documented:

afni-class ................................................. 5
anlz ....................................................... 7
anlz-class .................................................. 8
anlz-nifti-ops ............................................ 10
as.anlz .................................................... 11
as.nifti .................................................... 12
Audit Trails ................................................. 12
audit.trail-methods ....................................... 15
aux_file-methods .......................................... 16
bitpix-methods ............................................. 18
blend ....................................................... 19
calibrateImage ........................................... 20
cal_max-methods .......................................... 21
cal_min-methods .......................................... 22
cal_units-methods ........................................ 24
coerce-methods ........................................... 25
compressed-methods ....................................... 26
Convert ANALYZE Codes .................................... 27
Convert NIfTI Codes ....................................... 28
convert.scene ............................................. 29
datatype-methods ......................................... 30
data_type-methods ....................................... 31
db_name-methods .......................................... 32
descrip-methods .......................................... 34
dim_-methods ............................................. 35
dim_info-methods ......................................... 36
dim_un0-methods .......................................... 37
dropImageDimension ....................................... 38
R topics documented:

- quaternion2rotation .................................................. 87
- quatern_b-methods .................................................... 88
- quatern_c-methods .................................................... 89
- quatern_d-methods .................................................... 90
- readAFNI ............................................................... 91
- readANALYZE .......................................................... 92
- readNIfTI ............................................................. 94
- regular-methods ....................................................... 95
- reorient ................................................................. 96
- resetSlopeIntercept ................................................... 97
- rmniigz ................................................................. 98
- scannum-methods ...................................................... 98
- scl_inter-methods ..................................................... 99
- scl_slope-methods .................................................... 100
- session_error-methods ............................................... 102
- sform_code-methods .................................................. 103
- sizeof_hdr-methods .................................................. 104
- slice_code-methods .................................................. 105
- slice_duration-methods ............................................... 106
- slice_end-methods .................................................... 107
- slice_start-methods .................................................. 108
- smax-methods .......................................................... 109
- smin-methods .......................................................... 110
- srow_x-methods ....................................................... 111
- srow_y-methods ....................................................... 112
- srow_z-methods ....................................................... 113
- start_field-methods .................................................. 114
- tim.colors ............................................................. 115
- toffset-methods ....................................................... 116
- translateCoordinate .................................................. 117
- unused1-methods ...................................................... 118
- verified-methods ..................................................... 119
- views-methods ........................................................ 120
- vols_added-methods .................................................. 121
- voxdim ................................................................. 122
- vox_offset-methods .................................................. 122
- vox_units-methods .................................................... 124
- writeAFNI-methods ................................................... 125
- writeANALYZE-methods .............................................. 126
- writeNIfTI-methods .................................................. 128
- xyzt2space ............................................................. 130
- xyzt_units-methods ................................................... 132

Index ................................................................. 134
Description

The AFNI class for medical imaging data.

Usage

```r
## S4 method for signature 'afni'
show(object)
```

Arguments

- `object`: An object of class `afni`.

Objects from the Class

Objects can be created by calls of the form `new("afni", data, dim, dimnames, ...)`.

Slots

- `.Data`: Object of class "array" contains the imaging data
- `DATASET_RANK`: Object of class "integer"
- `DATASET_DIMENSIONS`: Object of class "integer"
- `TYPESTRING`: Object of class "character"
- `SCENE_DATA`: Object of class "integer"
- `ORIENT_SPECIFIC`: Object of class "integer"
- `ORIGIN`: Object of class "numeric"
- `DELTA`: Object of class "numeric"
- `TAXIS_NUMS`: Object of class "integer"
- `TAXIS_FLOATS`: Object of class "numeric"
- `TAXIS_OFFSETS`: Object of class "numeric"
- `IDCODE_STRING`: Object of class "character"
- `IDCODE_DATE`: Object of class "character"
- `BYTEORDER_STRING`: Object of class "character"
- `BRICK_STATS`: Object of class "numeric"
- `BRICK_TYPES`: Object of class "integer"
- `BRICK_FLOAT_FACS`: Object of class "numeric"
- `BRICK_LABS`: Object of class "character"
- `BRICK_STAT_AUX`: Object of class "numeric"
STAT_AUX: Object of class "numeric"
HISTORY_NOTE: Object of class "character"
NOTES_COUNT: Object of class "integer"
NOTE_NUMBER: Object of class "character"
TAGALIGN_MATVEC: Object of class "numeric"
VOLREG_MATVEC: Object of class "array"
VOLREG_ROTCOM: Object of class "character"
VOLREG_CENTER_OLD: Object of class "numeric"
VOLREG_CENTER_BASE: Object of class "numeric"
VOLREG_ROTTPARENT_IDCODE: Object of class "character"
VOLREG_ROTTPARENT_NAME: Object of class "character"
VOLREG_GRIDPPARENT_IDCODE: Object of class "character"
VOLREG_GRIDPPARENT_NAME: Object of class "character"
VOLREG_INPUT_IDCODE: Object of class "character"
VOLREG_INPUT_NAME: Object of class "character"
VOLREG_BASE_IDCODE: Object of class "character"
VOLREG_BASE_NAME: Object of class "character"
VOLREG_ROTCOM_NUM: Object of class "integer"
IDCODE_ANAT_PARENT: Object of class "character"
TO3D_ZPAD: Object of class "integer"
IDCODE_WARP_PARENT: Object of class "character"
WARP_TYPE: Object of class "integer"
WARP_DATA: Object of class "numeric"
MARKS_XYZ: Object of class "numeric"
MARKS_LAB: Object of class "character"
MARKS_HELP: Object of class "character"
MARKS_FLAGS: Object of class "integer"
TAGSET_NUM: Object of class "integer"
TAGSET_FLOATS: Object of class "numeric"
TAGSET_LABELS: Object of class "character"
LABEL_1: Object of class "character"
LABEL_2: Object of class "character"
DATASET_NAME: Object of class "character"
DATASET_KEYWORDS: Object of class "character"
BRICK_KEYWORDS: Object of class "character"
**anlz**

**Extends**
- Class "array", from data part.
- Class "matrix", by class “array”, distance 2, with explicit test and coerce.
- Class "structure", by class “array”, distance 2.
- Class "vector", by class “array”, distance 3, with explicit coerce.
- Class "vector", by class “array”, distance 5, with explicit test and coerce.

**Author(s)**
Karsten Tabelow <karsten.tabelow@wias-berlin.de>

**References**
AFNI
http://afni.nimh.nih.gov/pub/dist/src/README.attributes

**See Also**
nifti, anlz

**Examples**
```
showClass("afni")
```

---

**Constructor for Analyze**

**Description**
Constructor for Analyze class objects.

**Usage**
```
anlz(img = array(0, dim = rep(1, 4)), dim, datatype = 2, ...)
```

**Arguments**

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>img</td>
<td>is a multidimensional array of data.</td>
</tr>
<tr>
<td>dim</td>
<td>is the dimension of the data (default = missing).</td>
</tr>
<tr>
<td>datatype</td>
<td>is an integer that denotes the type of data contained in each voxel. See the function convert.datatype.anlz or the ANALYZE documentation for more details.</td>
</tr>
<tr>
<td>...</td>
<td>allows for additional 'slots' to be specified.</td>
</tr>
</tbody>
</table>

**Value**
An object of class anlz.
Author(s)
Brandon Whitcher <bwhitcher@gmail.com>

References
ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf

See Also
anlz, nifti, nifti, convert, datatype, anlz

Examples
aim <- anlz() # default

## S4 method for signature 'anlz'
show(object)

Arguments

object An object of class anlz.

Objects from the Class

Objects can be created by calls of the form new("anlz", data, dim, dimnames, ...) or by calling the anlz function.

Slots

.data: Object of class "array" contains the imaging data
sizeof_hdr: Object of class "numeric" contains the size of the header (= 348)
data_type: Object of class "character"
db_name: Object of class "character"
extents: Object of class "numeric"
session_error: Object of class "numeric"
regular: Object of class "character"
hkey_un0: Object of class "character"
dim_: Object of class "vector" contains the dimensions of the imaging data
vox_units: Object of class "character"
cal_units: Object of class "character"
unused1: Object of class "numeric"
datatype: Object of class "numeric"
bitpix: Object of class "numeric" contains the number of bits per voxel (pixel)
dim_un0: Object of class "numeric"
pixdim: Object of class "vector" contains the real-world dimensions of the imaging data
vox_offset: Object of class "numeric"
funused1: Object of class "numeric"
funused2: Object of class "numeric"
funused3: Object of class "numeric"
cal_max: Object of class "numeric" contains the maximum display intensity
cal_min: Object of class "numeric" contains the minimum display intensity
compressed: Object of class "numeric"
verified: Object of class "numeric"
mlmax: Object of class "numeric"
mlmin: Object of class "numeric"
descrip: Object of class "character"
aux_file: Object of class "character"
orient: Object of class "character"
origin: Object of class "numeric"
generated: Object of class "character"
scannum: Object of class "character"
patient_id: Object of class "character"
exp_date: Object of class "character"
exp_time: Object of class "character"
hist_un0: Object of class "character"
views: Object of class "numeric"
vols_added: Object of class "numeric"
start_field: Object of class "numeric"
field_skip: Object of class "numeric"
omax: Object of class "numeric"
omin: Object of class "numeric"
smax: Object of class "numeric"
smin: Object of class "numeric"
Extends

Class "array", from data part.
Class "matrix", by class "array", distance 2, with explicit test and coerce.
Class "structure", by class "array", distance 2.
Class "vector", by class "array", distance 3, with explicit coerce.
Class "vector", by class "array", distance 5, with explicit test and coerce.

Methods

image signature(x = "anlz"): displays the image(s).
show signature(object = "anlz"): prints out a summary of the imaging data.

Author(s)

Brandon Whitcher <bwhitcher@gmail.com>

References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf

See Also

nifti, niftiExtension

Examples

showClass("anlz")

---

anlz-nifti-ops Operations for Objects in the ANALYZE and NIfTI classes

Description

Operations for Objects in the ANALYZE and NIfTI classes

Usage

```r
## S4 method for signature 'anlz,anlz'
Ops(e1, e2)

## S4 method for signature 'anlz,numeric'
Ops(e1, e2)

## S4 method for signature 'numeric,anlz'
Ops(e1, e2)
```
as.anlz

## S4 method for signature 'nifti,anlz'
Ops(e1, e2)

## S4 method for signature 'anlz,nifti'
Ops(e1, e2)

### Arguments

- **e1**: object
- **e2**: object

### Author(s)

John Muschelli <muschellij2@gmail.com>

### Examples

```r
img01 <- anlz(array(1:64, c(4,4,4,1)), datatype=4)
img02 <- anlz(array(64:1, c(4,4,4,1)), datatype=4)
is.anlz(img01 + img02)
is.anlz(sqrt(2) * img01)
is.anlz(img02 / pi)
```

### Description

Internal function that converts multidimensional arrays to ANALYZE class objects.

### Usage

```r
as.anlz(from, value = NULL, verbose = FALSE)
```

### Arguments

- **from**: is the object to be converted.
- **value**: is the **nifti** class object to use as a template for various ANALYZE header information.
- **verbose**: is a logical variable (default = FALSE) that allows text-based feedback during execution of the function.

### Value

An object of class **anlz**.
Author(s)
Andrew Thornton <zeripath@users.sourceforge.net>, Brandon Whitcher <bwhitcher@gmail.com>

Description
Internal function that converts multidimensional arrays to NIfTI class objects.

Usage
as.nifti(from, value = NULL, verbose = FALSE)

Arguments
from is the object to be converted.
value is the anlz class object to use as a template for various NIfTI header information.
verbose is a logical variable (default = FALSE) that allows text-based feedback during execution of the function.

Value
An object of class nifti.

Author(s)
Andrew Thornton <zeripath@users.sourceforge.net>, Brandon Whitcher <bwhitcher@gmail.com>

Description
Facilitate the creation and modification of audit trails for NIfTI class objects.
Audit Trails

Usage

oro.nifti.info(type)

enableAuditTrail()

getLastCallWithName(functionName)

newAuditTrail()

niftiExtensionToAuditTrail(nim, workingDirectory = NULL, filename = NULL, call = NULL)

niftiAuditTrailSystemNode(type = "system-info", workingDirectory = NULL, filename = NULL, call = NULL)

niftiAuditTrailSystemNodeEvent(trail, type = NULL, call = NULL, workingDirectory = NULL, filename = NULL, comment = NULL)

niftiAuditTrailCreated(history = NULL, call = NULL, workingDirectory = NULL, filename = NULL)

niftiAuditTrailEvent(trail, type = NULL, call = NULL, comment = NULL)

Arguments

type  An identifier to add some meaning to the event.

functionName  The name of a function on the call stack.

nim  is an object of class niftiAuditTrail or can be converted to such.

workingDirectory  The working directory associated with the ‘filename’.

filename  The filename associated with the nifti object.

call  A call, function name in the call-stack or a string.

trail  The XMLAbstractNode representing the audit trail or the niftiAuditTrail object with a trail that will be amended.

comment  Some textual comment

history  An XMLAbstractNode to store historical events for inclusion in the ‘trail’.

Details

The function oro.nifti.info is used to find the ecode or the XML namespace relevant to the audit trail.

The function enableAuditTrail is turned “off” by default to minimize package dependencies. Should one wish to turn “on” the audit trail functionality, then one should set the option NIfTI.audit.trail to TRUE and call the function enableAuditTrail. Setting the option NIfTI.audit.trail to FALSE will disable the audit trail.
The function `newAuditTrail` returns an XMLAbstractNode representing the root node of an audit trail. This is mostly intended as an internal function.

The function `niftiExtensionToAuditTrail` takes an object representing a NIfTI object, casts it as a niftiAuditTrail and checks if there is an extension (a niftiExtensionSection) with `ecode` equal to `oro.nifti.info("ecode")`; i.e. has a extension with data representing a serialized audit trail. The function will then strip the object of this extension parsing the serialized edata into an audit trail and adding a 'read' event to the trail.

The function `niftiAuditTrailToExtension` takes a niftiAuditTrail and returns a niftiExtensionSection with edata containing the serialized form of the audit trail after adding a 'saved' event to the trail.

The function `niftiAuditTrailSystemNodeEvent` adds an element with name equal to `type` to the trail. It uses the `niftiAuditTrailSystemNode` function to create the node.

The function `niftiAuditTrailSystemNode` is an internal function creating an XMLAbstractNode element with name `type` and attributes giving information about the R system and library. The filename and call will also be added as attributes if available.

The function `niftiAuditTrailEvent` adds an element with name `event` to the trail. The arguments `type`, `filename`, and `call` are added as attributes and the `comment` is the text value of the element.

The function `niftiAuditTrailCreated` will create a new audit trail containing a system node element created with the child `history` with the contents `history`. If the last element of the history given is an event with `type="processing"`, then this node will be removed from the history and its `call` attribute will be used as the value of the call attribute on the created node.

The function `getLastCallWithName` will search the call stack for a call of the function `functionName`, returning last call to that function if possible. It will default to the call of the function which called `getLastCallWithName` if there was no such call (and if there was no such call it will return the call of itself).

**Note**

These functions are mostly intended to be used internally in order to document the changes that occur to NIfTI objects due to functions that are audit-trail aware. However, as the precise manner in which these functions are used is not documented anywhere else, we shall proceed to describe which functions are audit-trail aware and how they interact with the audit trail.

`as.nifti` and its S4 alias `as(nim, "nifti")` will always produce niftiAuditTrail objects if the functionality is turned on. The function `niftiAuditTrailCreated` will be used and if an exemplar object is provided (e.g., `as.nifti(array, niftiExemplar)`) then the trail of the exemplar will be used as the history.

`readNIfTI` and `writeNIfTI` also always produce niftiAuditTrail objects if the functionality is turned on. The functions `niftiExtensionToAuditTrail` and `niftiAuditTrailToExtension` are used internally by these functions to facilitate this behaviour.

**Author(s)**

Andrew Thornton <zeripath@users.sourceforge.net> and Brandon Whitcher <bwhitcher@gmail.com>
Examples

## Examples of the use of these functions

```r
### A good example of the use of these functions is shown by this
### wrapper function which takes a function fun(nim, ...) returning
### lists of arrays which are nifti-ized using as(...)
options("niftiAuditTrail"=TRUE)
enableAuditTrail()

wrapper <- function(functionToWrap, nameOfCallingFunction, nim, ...) {
  if (!is(nim, "nifti"))
    nim <- as(nim, "nifti")

  if (is(nim, "niftiAuditTrail")) {
    ## This will force as(....) to set the call which created the
    ## results to the calling function's call rather than
    ## as(result, nifti) as it would otherwise do
    slot(nim, "trail") <- niftiAuditTrailEvent(slot(nim, "trail"), "processing",
                                              nameOfCallingFunction)
  }

  result <- functionToWrap(nim, ...)
  as(result, "nifti") <- nim
  return(result)
}

### An example of how wrapper is used follows:
functionToWrap <- function(ignored, x, y) {
  return(array(1, dim=c(x,y)))
}

### The nifti-ized form
niftiizedForm <- function(nim,...) {
  return(wrapper(functionToWrap, "niftiizedForm", nim, ...))
}

### Not run:
if (isTRUE(getOption("niftiAuditTrail"))) {
  print(slot(as.nifti(functionToWrap(nifti(), 4, 4), nifti()), "trail"))
  print(slot(niftiizedForm(nifti(), 4, 4), "trail"))
}

### End(Not run)
```

---

### Extract or Replace NIfTI Audit Trail

**Description**

Operators that act on the audit trail (XML) in the NIfTI header.
Usage

audit.trail(object)

## S4 method for signature 'nifti'
audit.trail(object)

audit.trail(object) <- value

## S4 replacement method for signature 'nifti'
audit.trail(object) <- value

Arguments

object is of class nifti.
value Value to assign to trail slot

Methods

object = "nifti"  Extract or replace NIfTI audit trail.

Author(s)

Andrew Thornton <zeripath@users.sourceforge.net>

---

aux_file-methods  Extract Image Attribute aux_file

Description

Methods that act on the aux_file field in the NIfTI/ANALYZE header.

Usage

aux_file(object)

## S4 method for signature 'nifti'
aux_file(object)

## S4 method for signature 'anlz'
aux_file(object)

aux_file(object) <- value

## S4 replacement method for signature 'nifti'
aux_file(object) <- value

## S4 replacement method for signature 'anlz'
aux_file(object) <- value

aux.file(object)

## S4 method for signature 'nifti'
aux.file(object)

## S4 method for signature 'anlz'
aux.file(object)

aux.file(object) <- value

## S4 replacement method for signature 'nifti'
aux.file(object) <- value

## S4 replacement method for signature 'anlz'
aux.file(object) <- value

Arguments

object is an object of class nifti or anlz.
value is the value to assign to the aux_file field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muscellij2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/

Examples

## Not run:
urlfile <- file.path(system.file("nifti", package="oro.nifti"),
"mniRL.nii.gz")
download.file(url, urlfile, quiet=TRUE)

## End(Not run)
options("niftiAuditTrail"=FALSE)
Methods that act on the *bitpix* field in the NIfTI/ANALYZE header.

Usage

```r
bitpix(object)
```

## S4 method for signature 'nifti'

```r
bitpix(object)
```

## S4 method for signature 'anlz'

```r
bitpix(object)
```

```r
bitpix(object) <- value
```

## S4 replacement method for signature 'nifti'

```r
bitpix(object) <- value
```

## S4 replacement method for signature 'anlz'

```r
bitpix(object) <- value
```

Arguments

- `object` is an object of class `nifti` or `anlz`.
- `value` is the value to assign to the *bitpix* field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschellij2@gmail.com>, Brandon Whitcher <bwhitcher@gmail.com>
**References**

ANALYZE 7.5  
https://rportal.mayo.edu/bir/ANALYZE75.pdf  
NIFTI-1  
http://nifti.nimh.nih.gov/

---

**blend**  
*Merge Two NIfTI or ANALYZE Volumes*

**Description**

Two volumes of medical imaging data are merged together in the superior-inferior (or $z$) direction. One assumes that there is at least one slice that overlaps between the two volumes.

**Usage**

blendVolumes(x, y, seqX, seqY, method = "linear")

```r
## S4 method for signature 'nifti,nifti'
blend(x, y, seqX, seqY, method = "linear")

## S4 method for signature 'anlz,anlz'
blend(x, y, seqX, seqY, method = "linear")

## S4 method for signature 'anlz,nifti'
blend(x, y, seqX, seqY, method = "linear")

## S4 method for signature 'nifti,anlz'
blend(x, y, seqX, seqY, method = "linear")
```

**Arguments**

- **x,y** are objects of class nifti or anlz.
- **seqX,seqY** are vectors that provide the $z$-coordinate values for the two imaging volumes.
- **method** is the type of weighing to use when combining information where there is an overlap (default = "linear").

**Value**

A single volume that blends the voxel-wise information from x and y.

**Methods**

- **x = "nifti", y = "nifti"** Merge x and y.
- **x = "anlz", y = "anlz"** Merge x on y.
- **x = "nifti", y = "anlz"** Merge x on y.
- **x = "anlz", y = "nifti"** Merge x and y.
**calibrateImage**

Set Minimum/Maximum Values for NIfTI data

**Description**

Rescales image cal_max and cal_min slots to be the max and min, respectively, of an object of class nifti, with na.rm = TRUE. This is so that when images are rendered/written, the values correspond to those in the array (stored in .Data slot) are plotted on correct greyscale and no error is given by writeNIfTI.

**Usage**

```
calibrateImage(img, infok = TRUE)
cal_img(img, infok = TRUE)
```

**Arguments**

- `img` is a nifti object.
- `infok` is a logical value whether or not Inf and -Inf are acceptable (default = TRUE). If FALSE and max or min is infinity, then cal_min or cal_max is set to infinity (negative or positive), respectively.

**Value**

An object of class nifti.

**Author(s)**

John Muschelli <muschellij2@gmail.com>
Description

Methods that act on the cal_max field in the NIfTI/ANALYZE header.

Usage

```r
cal_max(object)

## S4 method for signature 'nifti'
cal_max(object)

## S4 method for signature 'anlz'
cal_max(object)

cal_max(object) <- value

## S4 replacement method for signature 'nifti'
cal_max(object) <- value

## S4 replacement method for signature 'anlz'
cal_max(object) <- value
```

Arguments

- `object` is an object of class nifti or anlz.
- `value` is the value to assign to the cal_max field.
**Details**

See documentation on the ANALYZE and/or NIfTI data standards for more details.

**Author(s)**

John Muschelli <muschellij2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

**References**

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/

**Examples**

```r
## Not run:
urlfile <- file.path(system.file("nifti", package="oro.nifti"),
                    "mniLR.nii.gz")
download.file(url, urlfile, quiet=TRUE)

## End(Not run)
urlfile <- file.path(system.file("nifti", package="oro.nifti"),
                    "mniLR.nii.gz")
mniLR <- readNIfTI(urlfile)
cal.max(mniLR)
```

---

**Description**

Methods that act on the cal_min field in the NIfTI/ANALYZE header.

**Usage**

```r
cal_min(object)

## S4 method for signature 'nifti'
cal_min(object)

## S4 method for signature 'anlz'
cal_min(object)

cal_min(object) <- value
```
cal_min-methods

```r
## S4 replacement method for signature 'nifti'
cal_min(object) <- value

## S4 replacement method for signature 'anlz'
cal_min(object) <- value

cal.min(object)

## S4 method for signature 'nifti'
cal.min(object)

## S4 method for signature 'anlz'
cal.min(object)

cal.min(object) <- value

## S4 replacement method for signature 'nifti'
cal.min(object) <- value

## S4 replacement method for signature 'anlz'
cal.min(object) <- value
```

**Arguments**

- `object` is an object of class `nifti` or `anlz`.
- `value` is the value to assign to the `cal_min` field.

**Details**

See documentation on the ANALYZE and/or NIfTI data standards for more details.

**Author(s)**

John Muschelli <muschellij2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

**References**

- ANALYZE 7.5
  [https://rportal.mayo.edu/bir/ANALYZE75.pdf](https://rportal.mayo.edu/bir/ANALYZE75.pdf)
- NIfTI-1

**Examples**

```r
## Not run:
urlfile <- file.path(system.file("nifti", package="oro.nifti"),
  "mniLR.nii.gz")
download.file(url, urlfile, quiet=TRUE)
```
## cal_units-methods

### Methods that act on the cal_units field in the NIfTI/ANALYZE header.

### Usage

```r
cal_units(object)
```

```r
## S4 method for signature 'anlz'
cal_units(object)
```

```r
cal_units(object) <- value
```

```r
## S4 replacement method for signature 'anlz'
cal_units(object) <- value
```

### Arguments

- `object` is an object of class `nifti` or `anlz`.
- `value` is the value to assign to the `cal_units` field.

### Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

### Author(s)

John Muschelli <muschelli.j2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>
coerce-methods

References

ANALYZE 7.5
https://rpportal.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/

---

coerce-methods  Force an Object to Belong to the ANALYZE or NIfTI Class

Description

Methods for function coerce in Package ‘methods’.

Arguments

object is an object of class array or inherits from array.
Class is the name of the class to which ‘object’ should be coerced; i.e., nifti.
value is the values used to modify ‘object’ (see the discussion below). You should supply an object with class nifti in order to pass NIfTI header information.
from is the object to be converted.
value is the nifti class object to use as a template for various ANALYZE/NIfTI header information.
verbose is a logical variable (default = FALSE) that allows text-based feedback during execution of the function.

Value

An object of class anlz or nifti.

Methods

from = "anlz", to = "nifti"  An object of class anlz is coerced into a NIfTI object.
from = "array", to = "anlz"  An object of class array is coerced into an ANALYZE object.
from = "array", to = "nifti"  An object of class array is coerced into a NIfTI object.
from = "list", to = "anlz"  All objects of class array in the list are coerced into ANALYZE objects. All other objects are left alone. The original list structure is retained.
from = "list", to = "nifti"  All objects of class array in the list are coerced into NIfTI objects. All other objects are left alone. The original list structure is retained.

Author(s)

Andrew Thornton <zeripath@users.sourceforge.net>,
Brandon Whitcher <bwhitcher@gmail.com>

See Also

as
Description

Methods that act on the compressed field in the NIfTI/ANALYZE header.

Usage

```r
compressed(object)
```

```r
## S4 method for signature 'anlz'
compressed(object)
```

```r
compressed(object) <- value
```

```r
## S4 replacement method for signature 'anlz'
compressed(object) <- value
```

Arguments

- `object` is an object of class nifti or anlz.
- `value` is the value to assign to the compressed field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschelli.j2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/
Description

Codes that appear in the ANALYZE header are mapped to meaningful character strings.

Usage

convert.bitpix.anlz(bitpix = NULL)
convert.datatype.anlz(datatype.code = NULL)
convert.orient.anlz(orientation)

Arguments

bitpix is the bit-per-pixel code.
datatype.code defines data type.
orientation defines the orientation.

Details

switch statements are used to map a numeric code to the appropriate string.

Value

A character string.

Author(s)

Brandon Whitcher <bwhitcher@gmail.com>

References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf

See Also

convert.datatype, convert.bitpix, convert.intent, convert.form, convert.units, convert.slice
Examples

```python
## 4 = SIGNED_SHORT
convert.datatype.anlz(4)
## 16 = FLOAT
convert.datatype.anlz(16)
## 2 = "sagittal unflipped"
convert.orient.anlz(2)
## 4 = "coronal flipped"
convert.orient.anlz(4)
```

Description

Codes that appear in the ANALYZE header are mapped to meaningful character strings.

Usage

```python
convert.bitpix(bitpix = NULL)
convert.datatype(datatype.code = NULL)
convert.intent(intent.code = NULL)
convert.form(form.code)
convert.units(units, inverse = FALSE)
convert.slice(slice.code)
```

Arguments

- `bitpix` is the bit-per-pixel code.
- `datatype.code` defines data type.
- `intent.code` is the NIfTI intent code.
- `form.code` is the $(x, y, z)$ coordinate system.
- `units` is the units of `pixdim[1..4].`
- `inverse` is a logical value that denotes the direction of unit conversion.
- `slice.code` is the slice timing order.

Details

switch statements are used to map a numeric code to the appropriate string.
**convert.scene**

**Value**

A character string.

**Author(s)**

Brandon Whitcher <bwhitcher@gmail.com>

**References**

Neuroimaging Informatics Technology Initiative (NIfTI)

http://nifti.nimh.nih.gov/

**Examples**

```# 4 = SIGNED_SHORT
convert.datatype.anlz(4)
# 16 = FLOAT
convert.datatype.anlz(16)
# 2 = "sagittal unflipped"
convert.orient.anlz(2)
# 4 = "coronal flipped"
convert.orient.anlz(4)
```

---

**Description**

Codes that appear in the AFNI header are mapped to meaningful character strings.

**Usage**

```convert.scene(scene.data, typestring)```

**Arguments**

- **scene.data** defines data type.
- **typestring** defines whether func or anat data.

**Details**

`switch` statements are used to map a numeric code to the appropriate string.

**Value**

A character string.
Author(s)
Karsten Tabelow <karsten.tabelow@wias-berlin.de>

References
AFNI
http://afni.nimh.nih.gov/pub/dist/src/README.attributes

See Also
convert.datatype.anlz, convert.orient.anlz

Examples
## 4 = CT for anatomic data
convert.scene(4, "3DIM_HEAD_ANAT")

dataframe-methods Extract Image Attribute datatype

Description
Methods that act on the datatype field in the NIfTI/ANALYZE header.

Usage
dataframe(object)

## S4 method for signature 'nifti'
datatype(object)

## S4 method for signature 'anlz'
datatype(object)

datatype(object) <- value

## S4 replacement method for signature 'nifti'
datatype(object) <- value

## S4 replacement method for signature 'anlz'
datatype(object) <- value

Arguments
object is an object of class nifti or anlz.
value is the value to assign to the datatype field.
## data_type-methods

### Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

### Author(s)

John Muschelli <muschellij2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

### References

ANALYZE 7.5
[https://rportal.mayo.edu/bir/ANALYZE75.pdf](https://rportal.mayo.edu/bir/ANALYZE75.pdf)
NIfTI-1

<table>
<thead>
<tr>
<th>data_type-methods</th>
<th>Extract Image Attribute data_type</th>
</tr>
</thead>
</table>

## Description

Methods that act on the data_type field in the NIfTI/ANALYZE header.

### Usage

```r
data_type(object)

## S4 method for signature 'nifti'
data_type(object)

## S4 method for signature 'anlz'
data_type(object)

data_type(object) <- value

## S4 replacement method for signature 'nifti'
data_type(object) <- value

## S4 replacement method for signature 'anlz'
data_type(object) <- value

data.type(object)

## S4 method for signature 'nifti'
data.type(object)

## S4 method for signature 'anlz'
data.type(object)
```
data.type(object) <- value

## S4 replacement method for signature 'nifti'
data.type(object) <- value

## S4 replacement method for signature 'anlz'
data.type(object) <- value

Arguments

object is an object of class nifti or anlz.
value is the value to assign to the data_type field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschelli.j2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/

---

**Description**

Methods that act on the db_name field in the NIfTI/ANALYZE header.

**Usage**

db_name(object)

## S4 method for signature 'nifti'
db_name(object)

## S4 method for signature 'anlz'
db_name(object)
db_name(object) <- value

## S4 replacement method for signature 'nifti'
db_name(object) <- value

## S4 replacement method for signature 'anlz'
db_name(object) <- value

db.name(object)

## S4 method for signature 'nifti'
db.name(object)

## S4 method for signature 'anlz'
db.name(object)

db.name(object) <- value

## S4 replacement method for signature 'nifti'
db.name(object) <- value

## S4 replacement method for signature 'anlz'
db.name(object) <- value

Arguments

object is an object of class nifti or anlz.
value is the value to assign to the db_name field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschellij2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/
**Description**

Methods that act on the `descrip` field in the NIfTI/ANALYZE header.

**Usage**

```r
descrip(object)
```

```r
## S4 method for signature 'nifti'
descrip(object)
```

```r
## S4 method for signature 'anlz'
descrip(object)
```

```r
descrip(object) <- value
```

```r
## S4 replacement method for signature 'nifti'
descrip(object) <- value
```

```r
## S4 replacement method for signature 'anlz'
descrip(object) <- value
```

**Arguments**

- `object` is an object of class `nifti` or `anlz`.
- `value` is the value to assign to the `descrip` field.

**Details**

See documentation on the ANALYZE and/or NIfTI data standards for more details.

**Author(s)**

John Muschelli <muschelli2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

**References**

- ANALYZE 7.5
  - https://rportal.mayo.edu/bir/ANALYZE75.pdf
- NIfTI-1
Examples

```r
## Not run:
urlfile <- file.path(system.file("nifti", package="oro.nifti"),
                     "mniLR.nii.gz")
download.file(url, urlfile, quiet=TRUE)

## End(Not run)
urlfile <- file.path(system.file("nifti", package="oro.nifti"),
                     "mniLR.nii.gz")
mniLR <- readNIFTI(urlfile)
descrip(mniLR)
## Not run:
descrip(mniLR) <- paste(descrip(mniLR), version$version.string, sep="; ")
descrip(mniLR)
## End(Not run)
```

### dim_methods

#### Dim- Methods

Methods that act on the `dim_` field in the NIfTI/ANALYZE header.

#### Usage

```r
dim_(object)
```

#### Arguments

- `object` is an object of class `nifti` or `anlz`.
- `value` is the value to assign to the `dim_` field.
dim_info-methods

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschellij2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/

dim_info-methods

Description

Methods that act on the dim_info field in the NIfTI/ANALYZE header.

Usage

```r
dim_info(object)
```

```r
## S4 method for signature 'nifti'
dim_info(object)
```

```r
dim_info(object) <- value
```

```r
## S4 replacement method for signature 'nifti'
dim_info(object) <- value
```

Arguments

- `object` is an object of class nifti or anlz.
- `value` is the value to assign to the dim_info field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschellij2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>
**dim_un0-methods**

---

**References**

ANALYZE 7.5  
https://rportal.mayo.edu/bir/ANALYZE75.pdf  
NIfTI-1  
http://nifti.nimh.nih.gov/

---

**dim_un0-methods**  
*Extract Image Attribute* dim_un0

---

**Description**

Methods that act on the dim_un0 field in the NIfTI/ANALYZE header.

**Usage**

```r
dim_un0(object)
```

```r
## S4 method for signature 'anlz'
dim_un0(object)
```

```r
dim_un0(object) <- value
```

```r
## S4 replacement method for signature 'anlz'
dim_un0(object) <- value
```

**Arguments**

- **object**  
  is an object of class nifti or anlz.

- **value**  
  is the value to assign to the dim_un0 field.

**Details**

See documentation on the ANALYZE and/or NIfTI data standards for more details.

**Author(s)**

- John Muschelli <muschellij2@gmail.com>,  
- Brandon Whitcher <bwhitcher@gmail.com>

**References**

ANALYZE 7.5  
https://rportal.mayo.edu/bir/ANALYZE75.pdf  
NIfTI-1  
http://nifti.nimh.nih.gov/
dropImageDimension

**Description**
Drops a dimension of an image that has one-dimension and sets respective values to 0 in pixdim or 1 in dim.

**Usage**

```
dropImageDimension(img, onlylast = TRUE, warn = TRUE)
```

**Arguments**
- **img**: nifti object
- **onlylast**: is a logical variable (default = TRUE). Drop the dimension only if it is the last dimension. For example, if dim is 10x10x10x10 then no dimension is dropped, but if dim is 10x10x10x1 then it will be changed to 10x10x10.
- **warn**: produces a text output if the number of dimensions is under three.

**Value**
Object of class nifti

**Examples**

```r
nim <- nifti(array(rnorm(10^3), dim = rep(10, 3)))
nim2 <- nifti(array(rnorm(10^3), dim = c(10, 10, 1, 1)))
dropImageDimension(nim2)
dropImageDimension(nim2, onlylast = FALSE)
nim3 <- nifti(array(rnorm(10^3), dim = c(10, 10, 10, 1)))
dropImageDimension(nim3)
dropImageDimension(nim3, onlylast = FALSE) # the same as above
nim4 <- nifti(array(rnorm(10^3), dim = c(10, 10, 10, 1, 1)))
dim(nim4[,,1,])
dim(nim4[,,1,],drop=TRUE])
dropImageDimension(nim4)

dim(nim5[,1,])
dropImageDimension(nim5)
dropImageDimension(nim5, onlylast = FALSE)
	nim6 <- nifti(array(rnorm(10^3), dim = c(1, 10, 10, 10, 1)))
dropImageDimension(nim6)
```

## Not run:
```
## 27 scans of Colin Holmes (MNI) brain co-registered and averaged
```
exp_date-methods

## NIfTI two-file format

```r
## NIfTI two-file format
URL <- "http://imaging.mrc-cbu.cam.ac.uk/downloads/Colin/colin_1mm.tgz"
urlfile <- file.path(tempdir(), "colin_1mm.tgz")
download.file(URL, dest=urlfile, quiet=TRUE)
untar(urlfile, exdir=tempdir())
colin <- readNIFTI(file.path(tempdir(), "colin_1mm"))
dim(colin)
dim_(colin)
pixdim(colin)
# this will error
writeNifti(colin, filename = tempfile())
colin <- dropImageDimension(colin)
writeNifti(colin, filename = tempfile())
```

## End(Not run)

---

### Description

Methods that act on the `exp_date` field in the NIfTI/ANALYZE header.

### Usage

```r
exp_date(object)
```

```r
## S4 method for signature 'anlz'
exp_date(object)
```

```r
exp_date(object) <- value
```

```r
## S4 replacement method for signature 'anlz'
exp_date(object) <- value
```

### Arguments

- **object** is an object of class `nifti` or `anlz`.
- **value** is the value to assign to the `exp_date` field.

### Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

### Author(s)

John Muschelli <muschelli.j2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>
exp_time-methods

Description

Methods that act on the exp_time field in the NIfTI/ANALYZE header.

Usage

```r
exp_time(object)
```

## S4 method for signature 'anlz'

```r
exp_time(object)
```

`exp_time(object) <- value`

## S4 replacement method for signature 'anlz'

```r
exp_time(object) <- value
```

Arguments

- `object` is an object of class nifti or anlz.
- `value` is the value to assign to the exp_time field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschellij2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

References

- ANALYZE 7.5
  https://rportal.mayo.edu/bir/ANALYZE75.pdf
- NIfTI-1
  http://nifti.nimh.nih.gov/
Description

Methods that act on the extender field in the NIfTI/ANALYZE header.

Usage

```r
extender(object)
```

```r
## S4 method for signature 'nifti'
extender(object)
```

```r
extender(object) <- value
```

```r
## S4 replacement method for signature 'nifti'
extender(object) <- value
```

Arguments

- `object` is an object of class `nifti` or `anlz`.
- `value` is the value to assign to the extender field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

- John Muschelli <muschellij2@gmail.com>,
- Brandon Whitcher <bwhitcher@gmail.com>

References

- ANALYZE 7.5
  [https://rportal.mayo.edu/bir/ANALYZE75.pdf](https://rportal.mayo.edu/bir/ANALYZE75.pdf)
- NIfTI-1
Description

Methods that act on the extents field in the NIfTI/ANALYZE header.

Usage

```r
extents(object)
```

```
## S4 method for signature 'nifti'
extents(object)
```

```
## S4 method for signature 'anlz'
extents(object)
```

```r
extents(object) <- value
```

```
## S4 replacement method for signature 'nifti'
extents(object) <- value
```

```
## S4 replacement method for signature 'anlz'
extents(object) <- value
```

Arguments

- object is an object of class nifti or anlz.
- value is the value to assign to the extents field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muscellig2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/
Description

Methods that act on the field_skip field in the NIfTI/ANALYZE header.

Usage

```r
field_skip(object)

## S4 method for signature 'anlz'
field_skip(object)

field_skip(object) <- value

## S4 replacement method for signature 'anlz'
field_skip(object) <- value

field.skip(object)

## S4 method for signature 'anlz'
field.skip(object)

field.skip(object) <- value

## S4 replacement method for signature 'anlz'
field.skip(object) <- value
```

Arguments

- object is an object of class nifti or anlz.
- value is the value to assign to the field_skip field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschellij2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>
funused1-methods

Description

Methods that act on the funused1 field in the NIfTI/ANALYZE header.

Usage

```r
funused1(object)

## S4 method for signature 'anlz'
funused1(object)

funused1(object) <- value

## S4 replacement method for signature 'anlz'
funused1(object) <- value
```

Arguments

- **object** is an object of class nifti or anlz.
- **value** is the value to assign to the funused1 field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschelli.j2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

References

AnalYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf

NIfTI-1
http://nifti.nimh.nih.gov/
Description

Methods that act on the funused2 field in the NIfTI/ANALYZE header.

Usage

funused2(object)

## S4 method for signature 'anlz'
funused2(object)

funused2(object) <- value

## S4 replacement method for signature 'anlz'
funused2(object) <- value

Arguments

object is an object of class nifti or anlz.

value is the value to assign to the funused2 field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschellij2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/
Description

Methods that act on the funused3 field in the NIfTI/ANALYZE header.

Usage

funused3(object)

## S4 method for signature 'anlz'
funused3(object)

funused3(object) <- value

## S4 replacement method for signature 'anlz'
funused3(object) <- value

Arguments

object is an object of class nifti or anlz.
value is the value to assign to the funused3 field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschelli.j@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/
Description

Methods that act on the generated field in the NIfTI/ANALYZE header.

Usage

generated(object)

## S4 method for signature 'anlz'
generated(object)

generated(object) <- value

## S4 replacement method for signature 'anlz'
generated(object) <- value

Arguments

object is an object of class nifti or anlz.
value is the value to assign to the generated field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschellij2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/
Description

Methods that act on the glmax field in the NIfTI/ANALYZE header.

Usage

```
glmax(object)
```

```
## S4 method for signature 'nifti'
glmax(object)
```

```
## S4 method for signature 'anlz'
glmax(object)
```

```
glmax(object) <- value
```

```
## S4 replacement method for signature 'nifti'
glmax(object) <- value
```

```
## S4 replacement method for signature 'anlz'
glmax(object) <- value
```

Arguments

- `object` is an object of class nifti or anlz.
- `value` is the value to assign to the glmax field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschelli.j@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/
Description

Methods that act on the glmin field in the NIfTI/ANALYZE header.

Usage

```r
glmin(object)

## S4 method for signature 'nifti'
glmin(object)

## S4 method for signature 'anlz'
glmin(object)

glmin(object) <- value

## S4 replacement method for signature 'nifti'
glmin(object) <- value

## S4 replacement method for signature 'anlz'
glmin(object) <- value
```

Arguments

- `object` is an object of class nifti or anlz.
- `value` is the value to assign to the glmin field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschellij2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

References

- ANALYZE 7.5
  https://rportal mayo.edu/bir/ANALYZE75.pdf
- NIfTI-1
  http://nifti.nimh.nih.gov/
Methods that act on the `hist_un0` field in the NIfTI/ANALYZE header.

Usage

```r
hist_un0(object)
```

```r
## S4 method for signature 'anlz'
hist_un0(object)
```

```r
hist_un0(object) <- value
```

```r
## S4 replacement method for signature 'anlz'
hist_un0(object) <- value
```

Arguments

- `object` is an object of class `nifti` or `anlz`.
- `value` is the value to assign to the `hist_un0` field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschellij2@gmail.com>, Brandon Whitcher <bwhitcher@gmail.com>

References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/
Description

Methods that act on the hkey_un0 field in the NIfTI/ANALYZE header.

Usage

```r
hkey_un0(object)
```

```r
## S4 method for signature 'anlz'
hkey_un0(object)
```

```r
hkey_un0(object) <- value
```

```r
## S4 replacement method for signature 'anlz'
hkey_un0(object) <- value
```

```r
hkey.un0(object)
```

```r
## S4 method for signature 'anlz'
hkey.un0(object)
```

```r
hkey.un0(object) <- value
```

```r
## S4 replacement method for signature 'anlz'
hkey.un0(object) <- value
```

Arguments

- `object` is an object of class nifti or anlz.
- `value` is the value to assign to the hkey_un0 field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

- John Muschelli <muschelliJ2@gmail.com>,
- Brandon Whitcher <bwhitcher@gmail.com>
References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/

---

hotmetal  
Hot Metal Color Table

Description

The hotmetal color table patterned after the one used in Matlab.

Usage

hotmetal(n = 64)

Arguments

n is the number of color levels (default = 64).

Details

Based on the tim.colors function in the fields package. The hotmetal function has been modified to break any dependence on code in the fields package. Spline interpolation (interpSpline) is used when the number of requested colors is not the default.

Value

A vector of character strings giving the colors in hexadecimal format.

See Also

terrain.colors, tim.colors, topo.colors

Examples

hotmetal(10)
image(outer(1:20,1:20,"+"), col=hotmetal(75), main="hotmetal")
Description

Produce “lightbox” layout of images for nifti, anlz and afni objects.

Usage

```r
## S4 method for signature 'nifti'
image(x, z = 1, w = 1, col = gray(0:64/64),
     plane = c("axial", "coronal", "sagittal"), plot.type = c("multiple", "single"), zlim = NULL, xlab = "", ylab = "", axes = FALSE,
     oma = rep(0, 4), mar = rep(0, 4), bg = "black", ...)

## S4 method for signature 'anlz'
image(x, z = 1, w = 1, col = gray(0:64/64),
     plane = c("axial", "coronal", "sagittal"), plot.type = c("multiple", "single"), zlim = NULL, xlab = "", ylab = "", axes = FALSE,
     oma = rep(0, 4), mar = rep(0, 4), bg = "black", ...)

## S4 method for signature 'afni'
image(x, ...)
```

Arguments

- **x** is an object of class nifti or similar.
- **z** is the slice to be displayed (ignored when plot.type = "multiple").
- **w** is the time point to be displayed (4D arrays only).
- **col** is grayscale (by default).
- **plane** is the plane of acquisition to be displayed (choices are ‘axial’, ‘coronal’, ‘sagittal’).
- **plot.type** allows the choice between all slices being displayed, in a matrix (left-to-right, top-to-bottom), or a single slice.
- **zlim** is set to NULL by default and utilizes the internal image range.
- **xlab** is set to “” since all margins are set to zero.
- **ylab** is set to “” since all margins are set to zero.
- **axes** is set to FALSE since all margins are set to zero.
- **oma** is the size of the outer margins in the par function.
- **mar** is the number of lines of margin in the par function.
- **bg** is the background color in the par function.
- **...** other arguments to the image function may be provided here.
Details

Uses the S3 generic function `image`, with medical-image friendly settings, to display `nifti`, `anlz` and `afni` class objects in a “lightbox” layout.

Methods

- `x = "ANY"` Generic function: see `image`.
- `x = "nifti"` Produce images for `x`.
- `x = "anlz"` Produce images for `x`.
- `x = "afni"` Produce images for `x`.

Author(s)

Brandon Whitcher <bwhitcher@gmail.com>

See Also

`orthographic-methods, overlay-methods`

Description

... 

Usage

`integerTranslation(nim, data, verbose = FALSE)`

`invertIntegerTranslation(nim, verbose = FALSE)`

Arguments

- `nim` is an object of class `nifti`.
- `data` is ...
- `verbose` is a logical variable (default = `FALSE`) that allows text-based feedback during execution of the function.

Details

...

Value

...
intent_code-methods

Author(s)
Andrew Thornton <zeripath@users.sourceforge.net>

Description
Methods that act on the intent_code field in the NIfTI/ANALYZE header.

Usage

```r
intent_code(object)
```

```r
## S4 method for signature 'nifti'
intent_code(object)
```

```r
intent_code(object) <- value
```

```r
## S4 replacement method for signature 'nifti'
intent_code(object) <- value
```

```r
intent.code(object)
```

```r
## S4 method for signature 'nifti'
intent.code(object)
```

```r
intent.code(object) <- value
```

```r
## S4 replacement method for signature 'nifti'
intent.code(object) <- value
```

Arguments

- **object** is an object of class nifti or anlz.
- **value** is the value to assign to the intent_code field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)
John Muschelli <muschelliJ2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>
References

ANALYZE 7.5
https://rnportal.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/

Description

Methods that act on the intent_name field in the NIfTI/ANALYZE header.

Usage

```r
intent_name(object)

## S4 method for signature 'nifti'
intent_name(object)

intent_name(object) <- value

## S4 replacement method for signature 'nifti'
intent_name(object) <- value

intent.name(object)

## S4 method for signature 'nifti'
intent.name(object)

intent.name(object) <- value

## S4 replacement method for signature 'nifti'
intent.name(object) <- value
```

Arguments

- `object` is an object of class nifti or anlz.
- `value` is the value to assign to the intent_name field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschelli1@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>
**intent_p1-methods**

**References**

ANALYZE 7.5  
https://rportal.mayo.edu/bir/ANALYZE75.pdf  
NIfTI 1  
http://nifti.nimh.nih.gov/

**intent_p1-methods  
Extract Image Attribute intent_p1**

**Description**

Methods that act on the `intent_p1` field in the NIfTI/ANALYZE header.

**Usage**

```
intent_p1(object)
```

```R
## S4 method for signature 'nifti'
intent_p1(object)

intent_p1(object) <- value

## S4 replacement method for signature 'nifti'
intent_p1(object) <- value

intent.p1(object)

## S4 method for signature 'nifti'
intent.p1(object)

intent.p1(object) <- value

## S4 replacement method for signature 'nifti'
intent.p1(object) <- value
```

**Arguments**

- `object` is an object of class `nifti` or `anlz`.
- `value` is the value to assign to the `intent_p1` field.

**Details**

See documentation on the ANALYZE and/or NIfTI data standards for more details.

**Author(s)**

John Muschelli <muschelli.j2@gmail.com>,  
Brandon Whitcher <bwhitcher@gmail.com>
intent_p2-methods

References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/

| intent_p2-methods | Extract Image Attribute intent_p2 |

Description

Methods that act on the intent_p2 field in the NIfTI/ANALYZE header.

Usage

```r
intent_p2(object)

## S4 method for signature 'nifti'
intent_p2(object)
intent_p2(object) <- value

## S4 replacement method for signature 'nifti'
intent_p2(object) <- value

intent.p2(object)

## S4 method for signature 'nifti'
intent.p2(object)
intent.p2(object) <- value

## S4 replacement method for signature 'nifti'
intent.p2(object) <- value
```

Arguments

- **object**
  - is an object of class `nifti` or `anlz`.
- **value**
  - is the value to assign to the intent_p2 field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschellij2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>
intent_p3-methods

Description

Methods that act on the intent_p3 field in the NIfTI/ANALYZE header.

Usage

```r
intent_p3(object)
```

```r
## S4 method for signature 'nifti'
intent_p3(object)

intent_p3(object) <- value

## S4 replacement method for signature 'nifti'
intent_p3(object) <- value

intent.p3(object)

## S4 method for signature 'nifti'
intent.p3(object)

intent.p3(object) <- value

## S4 replacement method for signature 'nifti'
intent.p3(object) <- value
```

Arguments

- `object` is an object of class `nifti` or `anlz`.
- `value` is the value to assign to the intent_p3 field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschelli.j2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>
is.afni

References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIFTI-1
http://nifti.nimh.nih.gov/

check object

Description

Check whether object is of class afni.

Usage

is.afni(x)

Arguments

x is an object to be checked.

Value

Logical indicating whether object is of class afni.

Author(s)

Karsten Tabelow <karsten.tabelow@wias-berlin.de>

References

AFNI
http://afni.nimh.nih.gov/pub/dist/src/README.attributes

See Also

afni
is.anlz

check object

Description
Check whether object is of class anlz.

Usage
is.anlz(x)

Arguments
x is an object to be checked.

Value
Logical indicating whether object is of class anlz.

Author(s)
Karsten Tabelow <karsten.tabelow@wias-berlin.de>

References
ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf

See Also
anlz

is.nifti

check object

Description
Check whether object is of class nifti.

Usage
is.nifti(x)

Arguments
x is an object to be checked.
Value
Logical indicating whether object is of class `nifti`.

Author(s)
Karsten Tabelow <karsten.tabelow@wias-berlin.de>

References
NIfTI-1
http://nifti.nimh.nih.gov/

See Also
nifti

description
Methods that act on the magic field in the NIfTI/ANALYZE header.

Usage
```r
magic(object)
```
```
## S4 method for signature 'nifti'
magic(object)
```
```
magic(object) <- value
```
```
## S4 replacement method for signature 'nifti'
magic(object) <- value
```

Arguments
- `object` is an object of class `nifti` or `anlz`.
- `value` is the value to assign to the magic field.

Details
See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)
John Muschelli <muschelli.j2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>
REFERENCES

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIFTI-1
http://nifti.nimh.nih.gov/

nifti Constructor for NIfTI

Description
Constructor for NIfTI class objects.

Usage
nifti(img = array(0, dim = rep(1, 4)), dim, datatype = 2, cal.min = NULL,
cal.max = NULL, pixdim = NULL, ...)

Arguments
- img is a multidimensional array of data.
- dim is the dimension of the data (default = missing).
- datatype is an integer that denotes the type of data contained in each voxel. See convert.datatype or the NIfTI documentation for more details.
- cal.min allows user-specified minimum value in the array (visualization purposes only).
- cal.max allows user-specified minimum value in the array (visualization purposes only).
- pixdim allows user-specified pixel dimension vector (length = 8).
- ... allows for additional ‘slots’ to be specified.

Value
An object of class nifti.

Author(s)
Brandon Whitcher <bwhitcher@gmail.com>

References
NIFTI-1
http://nifti.nimh.nih.gov/

See Also
nifti, anlz, convert.datatype
Examples

```r
options("niftiAuditTrail"=FALSE)

nim <- nifti() # default
nim
nim <- nifti(datatype=4) # 2-byte integers
nim
```

---

**nifti-class**

*Class "nifti"*

---

**Description**

The NIfTI class for medical imaging data.

**Usage**

```r
## S4 method for signature 'nifti'
show(object)
```

**Arguments**

object: An object of class nifti.

**Objects from the Class**

Objects can be created by calls of the form `new("nifti", data, dim, dimnames, ...)` or by calling the `nifti` function.

**Slots**

- `.Data`: Object of class "array" contains the imaging data
- `sizeof_hdr`: Object of class "numeric" contains the size of the header (= 348)
- `data_type`: Object of class "character"
- `db_name`: Object of class "character"
- `extents`: Object of class "numeric"
- `session_error`: Object of class "numeric"
- `regular`: Object of class "character"
- `dim_info`: Object of class "numeric" contains MRI slice ordering
- `dim`: Object of class "numeric" contains the dimensions of the imaging data
- `intent_p1`: Object of class "numeric"
- `intent_p2`: Object of class "numeric"
- `intent_p3`: Object of class "numeric"
- `intent_code`: Object of class "numeric"
datatype: Object of class "numeric"
bipix: Object of class "numeric" contains the number of bits per voxel (pixel)
slice_start: Object of class "numeric"
pixdim: Object of class "vector" contains the real-world dimensions of the imaging data
vox_offset: Object of class "numeric" contains the voxel offset (= 352 when no extensions exist)
scl_slope: Object of class "numeric"
scl_inter: Object of class "numeric"
slice_end: Object of class "numeric"
slice_code: Object of class "numeric"
xyzt_units: Object of class "numeric"
cal_max: Object of class "numeric" contains the maximum display intensity
cal_min: Object of class "numeric" contains the minimum display intensity
slice_duration: Object of class "numeric"
tofset: Object of class "numeric"
glm: Object of class "numeric"
glm: Object of class "numeric"
descrip: Object of class "character"
aux_file: Object of class "character"
qform_code: Object of class "numeric"
sform_code: Object of class "numeric"
quatern_b: Object of class "numeric"
quatern_c: Object of class "numeric"
quatern_d: Object of class "numeric"
qoffset_x: Object of class "numeric"
qoffset_y: Object of class "numeric"
qoffset_z: Object of class "numeric"
srow_x: Object of class "vector"
srow_y: Object of class "vector"
srow_z: Object of class "vector"
intent_name: Object of class "character"
magic: Object of class "character"
extender: Object of class "vector"
reoriented: Object of class "logical"

Extends

Class "array", from data part.
Class "matrix", by class "array", distance 2, with explicit test and coerce.
Class "structure", by class "array", distance 2.
Class "vector", by class "array", distance 3, with explicit coerce.
Class "vector", by class "array", distance 5, with explicit test and coerce.
Methods

image signature(x = "nifti"): displays the image(s).
orthographic signature(x = "nifti"): displays the image(s).
overlay signature(x = "nifti", y = "nifti"): displays the image(s).
show signature(object = "nifti"): prints out a summary of the imaging data.

Author(s)

Brandon Whitcher <bwhitcher@gmail.com>,
Andrew Thornton <zeripath@users.sourceforge.net>

References

NIfTI-1
http://nifti.nimh.nih.gov/

See Also

anlz, niftiExtension, niftiAuditTrail

Examples

showClass("nifti")

nifti-operators Operations for NIfTI Objects

Description

Operations for NIfTI Objects

Usage

```r
## S4 method for signature 'nifti,nifti'
Ops(e1, e2)

## S4 method for signature 'nifti,numeric'
Ops(e1, e2)

## S4 method for signature 'numeric,nifti'
Ops(e1, e2)
```

Arguments

- `e1` is an object of class nifti.
- `e2` is an object of class nifti.
Author(s)

John Muschelli <muschellij2@gmail.com>

Examples

```
img01 <- nifti(array(1:64, c(4,4,4,1)), datatype=4)
img02 <- nifti(array(64:1, c(4,4,4,1)), datatype=4)
is.nifti(img01 + img02)
is.nifti(sqrt(2) * img01)
is.nifti(img02 / pi)
```

Description

An extension of the NIfTI class that adds an audit trail in XML format.

Objects from the Class

Objects can be created by calls of the form `new("niftiAuditTrail", data, dim, dimnames, ...)`. 

Methods

```
show signature(object = "niftiAuditTrail"): prints out a summary of the imaging data.
```

Author(s)

Andrew Thornton <zeripath@users.sourceforge.net>

References

NIfTI-1
http://nifti.nimh.nih.gov/

See Also

```
nifti, niftiExtension
```

Examples

```
showClass("niftiAuditTrail")
```
niftiExtension-class  
Class "niftiExtension"

Description

An extension of the NIfTI class that allows “extensions” that conform to the NIfTI data standard.

Objects from the Class

Objects can be created by calls of the form new("niftiExtension", data, dim, dimnames, ...).

Author(s)

Andrew Thornton <zeripath@users.sourceforge.net>

References

NIfTI-1
http://nifti.nimh.nih.gov/

See Also

nifti, niftiAuditTrail

Examples

showClass("niftiExtension")

niftiExtensionSection-class  
Class "niftiExtensionSection"

Description

A niftiExtensionSection contains the fields that conform to the NIfTI standard regarding header extensions. A niftiExtension is composed of one or more of these objects.

Objects from the Class

Objects can be created by calls of the form new("niftiExtensionSection", data, dim, dimnames, ...).

Author(s)

Brandon Whitcher <bwhitcher@gmail.com>,
Andrew Thornton <zeripath@users.sourceforge.net>
References

NIfTI-1
http://nifti.nimh.nih.gov/

See Also

niftiExtension, nifti

Examples

showClass("niftiExtensionSection")

---

nifti_assign-methods  
Methods for Function `[<- in Package 'base'

Description

Methods for function `[<- in Package 'base'

Methods

- `x = "nifti", i = "ANY", j = "ANY", value = "ANY"`  Replaces the data at the provided co-ordinates with the value provided and updates the header.
- `x = "nifti", i = "numeric", j = "numeric", value = "ANY"`  Replaces the data at the provided co-ordinates with the value provided and updates the header.
- `x = "nifti", i = "ANY", j = "missing", value = "ANY"`  Replaces the data row i of the provided nifti object with the value provided and updates the header.
- `x = "nifti", i = "numeric", j = "missing", value = "ANY"`  Replaces the data row i of the provided nifti object with the value provided and updates the header.
- `x = "nifti", i = "missing", j = "missing", value = "array"`  Replaces the data of the provided nifti object with the array provided and updates the header.

---

nsli  
Dimension Accessor Functions

Description

Functions to extract the higher dimensions from ANALYZE/NIfTI data.
Omax-methods

Usage

nsli(x)
NSLI(x)
ntim(x)
NTIM(x)

Arguments

x is a three- or four-dimensional array (e.g., read in from an ANALYZE/NIFTI file).

Details

Simple calls to `dim` to replicate the functionality of `nrow` and `ncol` for higher dimensions of an array that are commonly required when manipulating medical imaging data.

Value

Third (slice) or fourth (time) dimension of the array.

Author(s)

Brandon Whitcher <bwhitcher@gmail.com>

See Also

`readNIfTI, readANALYZE`

Description

Methods that act on the omax field in the NIfTI/ANALYZE header.

Usage

omax(object)

## S4 method for signature 'anlz'
omax(object)

omax(object) <- value

## S4 replacement method for signature 'anlz'
omax(object) <- value
Arguments

object is an object of class nifti or anlz.
value is the value to assign to the omin field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschellij2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/

omin-methods   Extract Image Attribute omin

Description

Methods that act on the omin field in the NIfTI/ANALYZE header.

Usage

omin(object)

## S4 method for signature 'anlz'
omin(object)

omin(object) <- value

## S4 replacement method for signature 'anlz'
omin(object) <- value

Arguments

object is an object of class nifti or anlz.
value is the value to assign to the omin field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.
Author(s)

John Muschelli <muschelli2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/

---

**onfile**  \(\textit{Creates the onefile Specification for NIfTI}\)

**Description**

Changes the magic and vox_offset slots to be consistent with the onefile option in writeNIfTI. As of version 0.4.0, oro.nifti did not support the "ni1" magic type for output.

**Usage**

onfile(img)

**Arguments**

img is a nifti-class object.

**Value**

Object of class nifti.

**Author(s)**

John Muschelli <muschelli2@gmail.com>

**References**

NIfTI-1
http://nifti.nimh.nih.gov/
orient-methods

Description

Methods that act on the orient field in the NIfTI/ANALYZE header.

Usage

orient(object)

## S4 method for signature 'anlz'
orient(object)

orient(object) <- value

## S4 replacement method for signature 'anlz'
orient(object) <- value

Arguments

object is an object of class nifti or anlz.
value is the value to assign to the orient field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschellij2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/
**orientation-methods**

Extract NIfTI 3D Image Orientation

**Description**

Methods that act on the “qform” and “sform” information in the NIfTI header.

**Usage**

`sform(object)`

```r
## S4 method for signature 'nifti'

sform(object)
```

`qform(object)`

```r
## S4 method for signature 'nifti'

cform(object)
```

**Arguments**

- `object` is an object of class `nifti`.

**Methods**

- `object = "nifti"` Extract or replace NIfTI description.

**Author(s)**

Brandon Whitcher <bwhitcher@gmail.com>

**Examples**

```r
## Not run:

urlfile <- file.path(system.file("nifti", package="oro.nifti"),
  "mniLR.nii.gz")
download.file(url, urlfile, quiet=TRUE)

## End(Not run)

urlfile <- file.path(system.file("nifti", package="oro.nifti"),
  "mniLR.nii.gz")
mniLR <- readNIfTI(urlfile)
sform(mniLR)
```
Description

Methods that act on the origin field in the NIfTI/ANALYZE header.

Usage

    origin(object)

    ## S4 method for signature 'anlz'
    origin(object)

    origin(object) <- value

    ## S4 replacement method for signature 'anlz'
    origin(object) <- value

Arguments

    object is an object of class nifti or anlz.
    value is the value to assign to the origin field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschellij2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

References

    ANALYZE 7.5
    https://rportal.mayo.edu/bir/ANALYZE75.pdf
    NIfTI-1
    http://nifti.nimh.nih.gov/
Description

Produce orthographic display for nifti, anlz and afni objects.

Usage

orthographic.nifti(x, y = NULL, xyz = NULL, w = 1, col = gray(0:64/64),
  col.y = hotmetal(), zlim = NULL, zlim.y = NULL, crosshairs = TRUE,
  col.crosshairs = "red", xlab = "", ylab = "", axes = FALSE,
  oma = rep(0, 4), mar = rep(0, 4), bg = "black", text = NULL,
  text.color = "white", text.cex = 2, ...)

orthographic(x, ...)

## S4 method for signature 'nifti'
orthographic(x, y = NULL, xyz = NULL, w = 1,
  col = gray(0:64/64), col.y = hotmetal(), zlim = NULL, zlim.y = NULL,
  crosshairs = TRUE, col.crosshairs = "red", xlab = "", ylab = "",
  axes = FALSE, oma = rep(0, 4), mar = rep(0, 4), bg = "black",
  text = NULL, text.color = "white", text.cex = 2, ...)

## S4 method for signature 'anlz'
orthographic(x, y = NULL, xyz = NULL, w = 1,
  col = gray(0:64/64), col.y = hotmetal(), zlim = NULL, zlim.y = NULL,
  crosshairs = TRUE, col.crosshairs = "red", xlab = "", ylab = "",
  axes = FALSE, oma = rep(0, 4), mar = rep(0, 4), bg = "black",
  text = NULL, text.color = "white", text.cex = 2, ...)

## S4 method for signature 'array'
orthographic(x, ...)

## S4 method for signature 'afni'
orthographic(x, ...)

Arguments

x is an object of class nifti or similar.
y is an object of class nifti or similar for the overlay.
xyz is the coordinate for the center of the crosshairs.
w is the time point to be displayed (4D arrays only).
col is grayscale (by default).
col.y is hotmetal (by default).
zlim is the minimum and maximum ‘z’ values passed into `image`.
zlim.y is the minimum and maximum ‘z’ values passed into `image` for the overlay.
crosshairs is a logical value for the presence of crosshairs in all three orthogonal planes (default = TRUE).
col.crosshairs is the color of the crosshairs (default = red).
xlab is set to "" since all margins are set to zero.
ylab is set to "" since all margins are set to zero.
axes is set to FALSE since all margins are set to zero.
oma is the size of the outer margins in the `par` function.
mar is the number of lines of margin in the `par` function.
bg is the background color in the `par` function.
text allows the user to specify text to appear in the fourth (unused) pane.
text.color is the color of the user-specified text (default = “white”.
text.cex is the size of the user-specified text (default = 2).
... other arguments to the `image` function may be provided here.

Methods

x = "afni"  Produce orthographic display for x.
x = "anlz"  Produce orthographic display for x.
x = "array" Produce orthographic display for x.
x = "nifti"  Produce orthographic display for x.

Author(s)

Brandon Whitcher <bwhitcher@gmail.com>

See Also

`image-methods, overlay-methods`

Description

Methods for function `overlay`
Usage

```r
overlay.nifti(x, y, z = 1, w = 1, col.x = gray(0:64/64),
col.y = hotmetal(), zlim.x = NULL, zlim.y = NULL, plane = c("axial",
"coronal", "sagittal"), plot.type = c("multiple", "single"), xlab = "",
ylab = "", axes = FALSE, oma = rep(0, 4), mar = rep(0, 4),
bg = "black", ...)
overlay(x, y, ...)
```

```r
## S4 method for signature 'nifti,nifti'
overlay(x, y, z = 1, w = 1, col.x = gray(0:64/64),
col.y = hotmetal(), zlim.x = NULL, zlim.y = NULL, plane = c("axial",
"coronal", "sagittal"), plot.type = c("multiple", "single"), xlab = "",
ylab = "", axes = FALSE, oma = rep(0, 4), mar = rep(0, 4),
bg = "black", ...)
## S4 method for signature 'anlz,anlz'
overlay(x, y, z = 1, w = 1, col.x = gray(0:64/64),
col.y = hotmetal(), zlim.x = NULL, zlim.y = NULL, plane = c("axial",
"coronal", "sagittal"), plot.type = c("multiple", "single"), xlab = "",
ylab = "", axes = FALSE, oma = rep(0, 4), mar = rep(0, 4),
bg = "black", ...)
## S4 method for signature 'anlz,nifti'
overlay(x, y, z = 1, w = 1, col.x = gray(0:64/64),
col.y = hotmetal(), zlim.x = NULL, zlim.y = NULL, plane = c("axial",
"coronal", "sagittal"), plot.type = c("multiple", "single"), xlab = "",
ylab = "", axes = FALSE, oma = rep(0, 4), mar = rep(0, 4),
bg = "black", ...)
## S4 method for signature 'nifti,anlz'
overlay(x, y, z = 1, w = 1, col.x = gray(0:64/64),
col.y = hotmetal(), zlim.x = NULL, zlim.y = NULL, plane = c("axial",
"coronal", "sagittal"), plot.type = c("multiple", "single"), xlab = "",
ylab = "", axes = FALSE, oma = rep(0, 4), mar = rep(0, 4),
bg = "black", ...)
## S4 method for signature 'array,array'
overlay(x, y, ...)
## S4 method for signature 'array,nifti'
overlay(x, y, ...)
## S4 method for signature 'nifti,array'
overlay(x, y, ...)
## S4 method for signature 'array,anlz'
overlay(x, y, ...)
```
## S4 method for signature 'anlz,array'
overlay(x, y, ...)

## S4 method for signature 'afni,afni'
overlay(x, y, ...)

## S4 method for signature 'afni,array'
overlay(x, y, ...)

### Arguments

- **x, y** is an object of class nifti or similar.
- **z** is the slice to be displayed (ignored when plot.type = "multiple").
- **w** is the time point to be displayed (4D arrays only).
- **col.x** is grayscale (by default).
- **col.y** is hotmetal (by default).
- **zlim.x, zlim.y** are set to NULL (by default) and taken from the header information.
- **plane** is the plane of acquisition to be displayed (choices are ‘axial’, ‘coronal’, ‘sagittal’).
- **plot.type** allows the choice between all slices being displayed, in a matrix (left-to-right, top-to-bottom), or a single slice.
- **xlab** is set to "" since all margins are set to zero.
- **ylab** is set to "" since all margins are set to zero.
- **axes** is set to FALSE since all margins are set to zero.
- **oma** is the size of the outer margins in the par function.
- **mar** is the number of lines of margin in the par function.
- **bg** is the background color in the par function.
- **...** other arguments to the image function may be provided here.

### Details

The `image` command is used multiple times to simultaneously visualize one of the three orthogonal planes in two multidimensional arrays, one on top of the other, for medical imaging data.

### Methods

- **x = "nifti", y = "nifti"** Produce overlay of y on x.
- **x = "anlz", y = "anlz"** Produce overlay of y on x.
- **x = "afni", y = "afni"** Produce overlay of y on x.

### Author(s)

Brandon Whitcher <bwhitcher@gmail.com>
See Also

image-methods, overlay-methods

---

patient_id-methods Extract Image Attribute patient_id

Description

Methods that act on the patient_id field in the NIfTI/ANALYZE header.

Usage

patient_id(object)

## S4 method for signature 'anlz'
patient_id(object)

patient_id(object) <- value

## S4 replacement method for signature 'anlz'
patient_id(object) <- value

patient.id(object)

## S4 method for signature 'anlz'
patient.id(object)

patient.id(object) <- value

## S4 replacement method for signature 'anlz'
patient.id(object) <- value

Arguments

object is an object of class nifti or anlz.

value is the value to assign to the patient_id field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschellij2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>
performPermutation

References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/

---

**performPermutation**  
*Transform array with orthogonal permutation matrix*

**Description**

Given an orthogonal permutation matrix $T$, an array of dimensions and a one-dimensional representation of data. It will return a transformed array with the transformed dimensions.

**Usage**

performPermutation(T, real.dimensions, data, verbose = FALSE)

**Arguments**

- $T$ is an orthogonal matrix.
- real.dimensions is a one-dimensional array, representing the length of dimensions in data.
- data is a one-dimensional representation of the data to be transformed.
- verbose is a logical variable (default = FALSE) that allows text-based feedback during execution of the function.

**Details**

This function is mainly used by the `reorient` function to transform nifti data into neuroradiological convention.

**Author(s)**

Andrew Thornton <zeripath@users.sourceforge.net>

**See Also**

reorient, inverseReorient

---
Description

Methods that act on the pixdim field in the NIfTI/ ANALYZE header.

Usage

pixdim(object)

## S4 method for signature 'nifti'
pixdim(object)

## S4 method for signature 'anlz'
pixdim(object)

pixdim(object) <- value

## S4 replacement method for signature 'nifti'
pixdim(object) <- value

## S4 replacement method for signature 'anlz'
pixdim(object) <- value

Arguments

object is an object of class nifti or anlz.
value is the value to assign to the pixdim field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschelli.j2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/
Examples

```r
## Not run:
urlfile <- file.path(system.file("nifti", package="oro.nifti"), "mniLR.nii.gz")
download.file(url, urlfile, quiet=TRUE)

## End(Not run)
urlfile <- file.path(system.file("nifti", package="oro.nifti"), "mniLR.nii.gz")
mniLR <- readNIFTI(urlfile)
pixdim(mniLR)
```

---

qform_code-methods Extract Image Attribute qform_code

### Description

Methods that act on the qform_code field in the NIfTI/ANALYZE header.

### Usage

```r
qform_code(object)

## S4 method for signature 'nifti'
qform_code(object)
qform_code(object) <- value

## S4 replacement method for signature 'nifti'
qform_code(object) <- value

qform_code(object)

## S4 method for signature 'nifti'
qform_code(object)
qform_code(object) <- value

## S4 replacement method for signature 'nifti'
qform_code(object) <- value
```

### Arguments

- **object** is an object of class nifti or anlz.
- **value** is the value to assign to the qform_code field.
qoffset_x-methods

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschelli2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

References

ANALYZE 7.5
https://rportals.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/

qoffset_x-methods  Extract Image Attribute qoffset_x

Description

Methods that act on the qoffset_x field in the NIfTI/ANALYZE header.

Usage

qoffset_x(object)

## S4 method for signature 'nifti'
qoffset_x(object)

qoffset_x(object) <- value

## S4 replacement method for signature 'nifti'
qoffset_x(object) <- value

qoffset.x(object)

## S4 method for signature 'nifti'
qoffset.x(object)

qoffset.x(object) <- value

## S4 replacement method for signature 'nifti'
qoffset.x(object) <- value

Arguments

object is an object of class nifti or anlz.
value is the value to assign to the qoffset_x field.
Methods that act on the qoffset_y field in the NIfTI/ANALYZE header.

Usage

```r
qoffset_y(object)
```

### S4 method for signature 'nifti'

```r
qoffset_y(object)
qoffset_y(object) <- value
```

### S4 replacement method for signature 'nifti'

```r
qoffset.y(object)
```

### S4 method for signature 'nifti'

```r
qoffset.y(object)
qoffset.y(object) <- value
```

### S4 replacement method for signature 'nifti'

```r
qoffset.y(object)
```

Arguments

- `object` is an object of class `nifti` or `anlz`.
- `value` is the value to assign to the `qoffset_y` field.
Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschelli.j2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/

Description

Methods that act on the qoffset_z field in the NIfTI/ANALYZE header.

Usage

qoffset_z(object)

## S4 method for signature 'nifti'
quots
qoffset_z(object)

qoffset_z(object) <- value
def

## S4 method for signature 'nifti'
quots
qoffset_z(object) <- value

qoffset.z(object)

## S4 method for signature 'nifti'
quots
qoffset.z(object)

qoffset.z(object) <- value

## S4 replacement method for signature 'nifti'
quots
qoffset.z(object) <- value

Arguments

object is an object of class nifti or anlz.
value is the value to assign to the qoffset_z field.
quaternion2rotation

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschelliJ2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/

quaternion2rotation   Convert Quaternion into a Rotation Matrix

Description

The affine/rotation matrix \( R \) is calculated from the quaternion parameters.

Usage

quaternion2rotation(b, c, d, tol = 1e-07)
quaternion2mat44(nim, tol = 1e-07)

Arguments

b       is the quaternion \( b \) parameter.
c       is the quaternion \( c \) parameter.
d       is the quaternion \( d \) parameter.
tol    is a very small value used to judge if a number is essentially zero.
nim    is an object of class nifti.

Details

The quaternion representation is chosen for its compactness in representing rotations. The orientation of the \((x, y, z)\) axes relative to the \((i, j, k)\) axes in 3D space is specified using a unit quaternion \([a, b, c, d]\), where \(a^2 + b^2 + c^2 + d^2 = 1\). The \((b, c, d)\) values are all that is needed, since we require that \(a = \left[1 - (b^2 + c^2 + d^2)\right]^{1/2}\) be non-negative. The \((b, c, d)\) values are stored in the \([\text{quatern}_b, \text{quatern}_c, \text{quatern}_d]\) fields.

Value

The (proper) 3×3 rotation matrix or 4×4 affine matrix.
Author(s)

Brandon Whitcher <bwhitcher@gmail.com>

References

NIFTI-1
http://nifti.nimh.nih.gov/

Examples

```r
## This R matrix is represented by quaternion [a,b,c,d] = [0,1,0,0]
## (which encodes a 180 degree rotation about the x-axis).
(R <- quaternion2rotation(1, 0, 0))
```

Description

Methods that act on the `quatern_b` field in the NIfTI/ANALYZE header.

Usage

```r
quatern_b(object)
```

```r
## S4 method for signature 'nifti'
quatern_b(object)
```

```r
quatern_b(object) <- value
```

```r
## S4 replacement method for signature 'nifti'
quatern_b(object) <- value
```

```r
quatern.b(object)
```

```r
## S4 method for signature 'nifti'
quatern.b(object)
```

```r
quatern.b(object) <- value
```

```r
## S4 replacement method for signature 'nifti'
quatern.b(object) <- value
```

Arguments

- object is an object of class nifti or anlz.
- value is the value to assign to the quatern_b field.
Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschellij2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/

Description

Methods that act on the quaternion_c field in the NIfTI/ANALYZE header.

Usage

quaternion_c(object)

## S4 method for signature 'nifti'
quaternion_c(object)
quaternion_c(object) <- value

## S4 replacement method for signature 'nifti'
quaternion_c(object) <- value

quaternion.c(object)

## S4 method for signature 'nifti'
quaternion.c(object)
quaternion.c(object) <- value

## S4 replacement method for signature 'nifti'
quaternion.c(object) <- value

Arguments

object          is an object of class nifti or anlz.
value           is the value to assign to the quaternion_c field.
Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschellij2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/

```
quatern_d-methods
Extract Image Attribute quatern_d
```

Description

Methods that act on the quatern_d field in the NIfTI/ANALYZE header.

Usage

```r
quatern_d(object)
```

```r
## S4 method for signature 'nifti'
quatern_d(object)
```

```r
quatern_d(object) <- value
```

```r
## S4 replacement method for signature 'nifti'
quatern_d(object) <- value
```

```r
quatern.d(object)
```

```r
## S4 method for signature 'nifti'
quatern.d(object)
```

```r
quatern.d(object) <- value
```

```r
## S4 replacement method for signature 'nifti'
quatern.d(object) <- value
```

Arguments

- **object** is an object of class nifti or anlz.
- **value** is the value to assign to the quatern_d field.
Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschellij2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/

Description

These functions read in the header information and multidimensional array from a binary file in
AFNI format into a `afni`-class object.

Usage

`readAFNI(fname, vol = NULL, verbose = FALSE, warn = -1, call = NULL)`

Arguments

- `fname` is the file name of the AFNI file.
- `vol` vector of brick numbers to be read from file.
- `verbose` is a logical variable (default = FALSE) that allows text-based feedback during
  execution of the function.
- `warn` is a number to regulate the display of warnings (default = -1). See
  options for more details.
- `call` keeps track of the current function call for use in the AFNI extension.

Details

The `readAFNI` function utilizes internal methods `readBin` and `readLines` to efficiently extract
information from the header and binary file(s). Compression is allowed on the BRIK file using gzip.
Current acceptable data types include

- `list("INT16")` DT SIGNED SHORT (16 bits per voxel)
- `list("FLOAT32")` DT FLOAT (32 bits per voxel)
- `list("COMPLEX128")` DT COMPLEX (128 bits per voxel)
Value

object of class `afni`

Author(s)

Karsten Tabelow <karsten.tabelow@wias-berlin.de>

References

AFNI
http://afni.nimh.nih.gov/pub/dist/src/README.attributes

See Also

`readANALYZE`, `readNIfTI`

Examples

```r
## Not run:
## Taken from the AFNI Matlab Library
## http://afni.nimh.nih.gov/pub/dist/data/afni_matlab_data.tgz
afni.path <- system.file("afni", package="oro.nifti")
orig <- readAFNI(file.path(afni.path, "ARzs_CW_avvr.DEI+orig"))
image(orig, zlim=c(0.5,256), oma=rep(2,4))
orthographic(orig, zlim=c(0.5,256), oma=rep(2,4))
## Taken from the AFNI installation
TT <- readAFNI(file.path(afni.path, "TT_N27_EZ_LR+t1rc"))
image(TT, zlim=c(0.5,256), oma=rep(2,4))
orthographic(TT, zlim=c(0.5,256), oma=rep(2,4))
## End(Not run)
```

---

Description

These functions read in the header information and multi-dimensional array from a binary file in Analyze 7.5 format.

Usage

```r
readANALYZE(fname, SPM = FALSE, verbose = FALSE, warn = -1)
```
readANALYZE

Arguments

fname
Pathname of the Analyze pair of files .img and .hdr without the suffix.

SPM
is a logical variable (default = FALSE) that forces the voxel data values to be rescaled using the funused1 ANALYZE header field. This is an undocumented convention of ANALYZE files processed using the Statistical Parametric Mapping (SPM) software.

verbose
is a logical variable (default = FALSE) that allows text-based feedback during execution of the function.

warn
is a number to regulate the display of warnings (default = -1). See options for more details.

Details

The internal functions readBin and rawToChar are utilized in order to efficiently extract information from a binary file. The types of data are limited to 1- and 2-byte integers, 4-byte floats and 8-byte doubles.

Value

An object of class anlz is produced.

Author(s)

Brandon Whitcher <bwhitcher@gmail.com>,
Volker Schmid <volkerschmid@users.sourceforge.net>

References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf

See Also

readNIfTI

Examples

```r
## avg152T1
anlz.path <- system.file("anlz", package="oro.nifti")
mni152 <- readANALYZE(file.path(anlz.path, "avg152T1"))
image(mni152, oma=rep(2,4))
orthographic(mni152, oma=rep(2,4))
```
Description

These functions read in the header information and multidimensional array from a binary file in NifTI-1 format into a nifti-class object.

Usage

readNIfTI(fname, verbose = FALSE, warn = -1, reorient = TRUE,
          call = NULL)

Arguments

fname is the file name of the NIfTI file(s).
verbose is a logical variable (default = FALSE) that allows text-based feedback during execution of the function.
warn is a number to regulate the display of warnings (default = -1). See options for more details.
reorient is a logical variable (default = TRUE) that enforces Qform/Sform transformations.
call keeps track of the current function call for use in the NIfTI extension.

Details

The readNIfTI function utilizes internal methods readBin and readChar to efficiently extract information from the binary file(s).

Current acceptable data types include

list("UINT8")  BINARY (1 bit per voxel)
list("INT16")  SIGNED SHORT (16 bits per voxel)
list("INT32")  SIGNED INT (32 bits per voxel)
list("FLOAT32")  FLOAT (32 bits per voxel)
list("DOUBLE64")  DOUBLE (64 bits per voxel)
list("UINT16")  UNSIGNED SHORT (16 bits per voxel)
list("UINT32")  UNSIGNED INT (32 bits per voxel)

Value

An object of class nifti.

Author(s)

Brandon Whitcher <bwhitcher@gmail.com>,
Volker Schmid <volkerschmid@users.sourceforge.net>,
Andrew Thornton <zeripath@users.sourceforge.net>
regular-methods

References

NIfTI-1
http://nifti.nimh.nih.gov/

See Also

readAFNI, readANALYZE

Examples

```r
## Not run:
urlfile <- file.path(system.file("nifti", package="oro.nifti"),
                     "filtered_func_data")
download.file(url, urlfile, quiet=TRUE)

## End(Not run)
## The NIfTI file provided here contains the first 18 volumes (10%) of the original data set
urlfile <- file.path(system.file("nifti", package="oro.nifti"),
                     "filtered_func_data")
(ffd <- readNIfTI(urlfile))
image(ffd, oma=rep(2,4))
orthographic(ffd, oma=rep(2,4))
## Not run:
## 27 scans of Colin Holmes (MNI) brain co-registered and averaged NIfTI two-file format
URL <- "http://imaging.mrc-cbu.cam.ac.uk/downloads/Colin/colin_1mm.tgz"
urlfile <- file.path(tempdir(), "colin_1mm.tgz")
download.file(URL, dest=urlfile, quiet=TRUE)
untar(urlfile, exdir=tempdir())
colin <- readNIfTI(file.path(tempdir(), "colin_1mm"))
image(colin, oma=rep(2,4))
orthographic(colin, oma=rep(2,4))
## End(Not run)
```

regular-methods Extract Image Attribute regular

Description

Methods that act on the regular field in the NIfTI/ANALYZE header.

Usage

```r
regular(object)
```

## S4 method for signature 'nifti'
Arguments

object is an object of class nifti or anlz.
value is the value to assign to the regular field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschelli.j2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/

Description

Transforms in the NIfTI header are parsed and normalized versions of these transforms are applied.

Usage

reorient(nim, data, verbose = FALSE, invert = FALSE, tol = 1e-07)

inverseReorient(nim, verbose = FALSE)
Arguments

nim is an object of class nifti.
data is an array associated with nim.
verbose is a logical variable (default = FALSE) that allows text-based feedback during execution of the function.
invert stores the inverse transform.
tol is a very small value used to judge if a number is essentially zero.

Details

This function utilizes the performPermutation function internally.

Author(s)

Andrew Thornton <zeripath@users.sourceforge.net>, Brandon Whitcher <bwhitcher@gmail.com>

See Also

performPermutation

resetSlopeIntercept  Change Intercept to 0 and Slope to 1 in NIfTI Object

Description

Forces image scl_slope to 1 and scl_inter to be 0 of slots of class nifti. This is so that when images are rendered/written, the values correspond to those in the array (stored in the .Data slot) and are not scaled.

Usage

resetSlopeIntercept(img)

zero_trans(img)

Arguments

img is a nifti object (or character of filename). If an anlz object is passed, the unaltered anlz object is returned.

Value

An object of the same type passed.

Author(s)

John Muschelli <muschelli2@gmail.com>
scannum-methods

---

**rmniigz**  
*Remove File Extensions Around the NIfTI/ANALYZE Formats*

### Description

Simple function(s) that remove file extensions commonly found when using NIfTI-1 or ANALYZE format files.

### Usage

- `rmniigz(x)`
- `rmnii(x)`
- `rmgz(x)`
- `rmhdrgz(x)`
- `rmhdr(x)`
- `rmimggz(x)`
- `rmimg(x)`

### Arguments

- `x` is the file name.

### Value

The file name without offending suffix.

### Author(s)

Brandon Whitcher <bwhitcher@gmail.com>

---

**scannum-methods**  
*Extract Image Attribute scannum*

### Description

Methods that act on the scannum field in the NIfTI/ANALYZE header.
Usage

scannum(object)

## S4 method for signature 'anlz'
scannum(object)

scannum(object) <- value

## S4 replacement method for signature 'anlz'
scannum(object) <- value

Arguments

object is an object of class nifti or anlz.
value is the value to assign to the scannum field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschelli.j2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/

---

Description

Methods that act on the scl_inter field in the NIfTI/ANALYZE header.

Usage

scl_inter(object)

## S4 method for signature 'nifti'
scl_inter(object)

scl_inter(object) <- value
## scl_slope-methods

### Description

Methods that act on the scl_slope field in the NIfTI/ANALYZE header.

### Arguments

- **object**: An object of class `nifti` or `anlz`.
- **value**: The value to assign to the `scl_inter` field.

### Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

### Author(s)

John Muschelli <muschelli.j@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

### References

- **ANALYZE 7.5**
  - [https://rportal.mayo.edu/bir/ANALYZE75.pdf](https://rportal.mayo.edu/bir/ANALYZE75.pdf)
- **NIfTI-1**

---

```r
## S4 replacement method for signature 'nifti'
scl_inter(object) <- value
scl.inter(object)

## S4 method for signature 'nifti'
scl_inter(object)
scl.inter(object) <- value

## S4 replacement method for signature 'nifti'
scl_inter(object) <- value
```
Usage

scl_slope(object)

## S4 method for signature 'nifti'
scl_slope(object)

scl_slope(object) <- value

## S4 replacement method for signature 'nifti'
scl_slope(object) <- value

scl_slope(object)

## S4 method for signature 'nifti'
scl_slope(object)

scl_slope(object) <- value

## S4 replacement method for signature 'nifti'
scl_slope(object) <- value

Arguments

object is an object of class nifti or anlz.

value is the value to assign to the scl_slope field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschellij2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/
Description

Methods that act on the `session_error` field in the NIfTI/ANALYZE header.

Usage

```r
session_error(object)
```

```r
## S4 method for signature 'nifti'
session_error(object)
```

```r
## S4 method for signature 'anlz'
session_error(object)
```

```r
session_error(object) <- value
```

```r
## S4 replacement method for signature 'nifti'
session_error(object) <- value
```

```r
## S4 replacement method for signature 'anlz'
session_error(object) <- value
```

Arguments

- `object` is an object of class `nifti` or `anlz`.
- `value` is the value to assign to the `session_error` field.
Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschelli.j2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/

Description

Methods that act on the sform_code field in the NIfTI/ANALYZE header.

Usage

sform_code(object)

## S4 method for signature 'nifti'
sform_code(object)

sform_code(object) <- value

## S4 replacement method for signature 'nifti'
sform_code(object) <- value

sform_code(object)

## S4 method for signature 'nifti'
sform_code(object)

sform_code(object) <- value

## S4 replacement method for signature 'nifti'
sform_code(object) <- value

Arguments

object is an object of class nifti or anlz.
value is the value to assign to the sform_code field.
Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschellij2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/

Description

Methods that act on the sizeof_hdr field in the NIfTI/ANALYZE header.

Usage

sizeof_hdr(object)

## S4 method for signature 'nifti'
sizeof_hdr(object)

## S4 method for signature 'anlz'
sizeof_hdr(object)

sizeof_hdr(object)

## S4 method for signature 'nifti'
sizeof_hdr(object)

## S4 method for signature 'anlz'
sizeof_hdr(object)

Arguments

object is an object of class nifti or anlz.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.
slice_code-methods

Author(s)

John Muschelli <muschellij2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/

Description

Methods that act on the slice_code field in the NIfTI/ANALYZE header.

Usage

slice_code(object)

## S4 method for signature 'nifti'
slice_code(object)

slice_code(object) <- value

## S4 replacement method for signature 'nifti'
slice_code(object) <- value

slice.code(object)

## S4 method for signature 'anlz'
slice.code(object)

slice.code(object) <- value

## S4 replacement method for signature 'anlz'
slice.code(object) <- value

Arguments

object is an object of class nifti or anlz.
value is the value to assign to the slice_code field.
slice_duration-methods

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschellij2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/

slice_duration-methods

Extract Image Attribute slice_duration

Description

Methods that act on the slice_duration field in the NIfTI/ANALYZE header.

Usage

slice_duration(object)

## S4 method for signature 'nifti'
slice_duration(object)

slice_duration(object) <- value

## S4 replacement method for signature 'nifti'
slice_duration(object) <- value

slice.duration(object)

## S4 method for signature 'nifti'
slice.duration(object)

slice.duration(object) <- value

## S4 replacement method for signature 'nifti'
slice.duration(object) <- value
slice_end-methods

Arguments

- object: is an object of class nifti or anlz.
- value: is the value to assign to the slice_duration field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschellij2@gmail.com>, Brandon Whitcher <bwhitcher@gmail.com>

References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/

slice_end-methods  Extract Image Attribute slice_end

Description

Methods that act on the slice_end field in the NIfTI/ANALYZE header.

Usage

slice_end(object)

## S4 method for signature 'nifti'
slice_end(object)

slice_end(object) <- value

## S4 replacement method for signature 'nifti'
slice_end(object) <- value

slice.end(object)

## S4 method for signature 'nifti'
slice.end(object)

slice.end(object) <- value

## S4 replacement method for signature 'nifti'
slice.end(object) <- value
slice_start-methods

Arguments

object is an object of class nifti or anlz.
value is the value to assign to the slice_end field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschelli.j2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/

slice_start-methods Extract Image Attribute slice_start

Description

Methods that act on the slice_start field in the NIfTI/ANALYZE header.

Usage

slice_start(object)

## S4 method for signature 'nifti'
slice_start(object)

slice_start(object) <- value

## S4 replacement method for signature 'nifti'
slice_start(object) <- value

slice.start(object)

## S4 method for signature 'nifti'
slice.start(object)

slice.start(object) <- value

## S4 replacement method for signature 'nifti'
slice.start(object) <- value
smax-methods

Arguments

object is an object of class nifti or anlz.
value is the value to assign to the slice_start field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschellij2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/

---

smax-methods Extract Image Attribute smax

Description

Methods that act on the smax field in the NIfTI/ANALYZE header.

Usage

smax(object)

## S4 method for signature 'anlz'
smax(object)

smax(object) <- value

## S4 replacement method for signature 'anlz'
smax(object) <- value

Arguments

object is an object of class nifti or anlz.
value is the value to assign to the smax field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.
smin-methods

Author(s)

John Muschelli <muschellij2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/

---

smin-methods  Extract Image Attribute smin

Description

Methods that act on the smin field in the NIfTI/ANALYZE header.

Usage

smin(object)

## S4 method for signature 'anlz'
smin(object)

smin(object) <- value

## S4 replacement method for signature 'anlz'
smin(object) <- value

Arguments

object is an object of class nifti or anlz.
value is the value to assign to the smin field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschellij2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>
srow_x-methods

References
ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/

**srow_x-methods**

*Extract Image Attribute srow_x*

**Description**
Methods that act on the srow_x field in the NIfTI/ANALYZE header.

**Usage**
srow_x(object)

## S4 method for signature 'nifti'
srow_x(object)

srow_x(object) <- value

## S4 replacement method for signature 'nifti'
srow_x(object) <- value

srow.x(object)

## S4 method for signature 'nifti'
srow.x(object)

srow.x(object) <- value

## S4 replacement method for signature 'nifti'
srow.x(object) <- value

**Arguments**

object is an object of class nifti or anlz.

value is the value to assign to the srow_x field.

**Details**
See documentation on the ANALYZE and/or NIfTI data standards for more details.

**Author(s)**
John Muschelli <muschellij2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>
srow_y-methods

Description

Methods that act on the srow_y field in the NIfTI/ANALYZE header.

Usage

srow_y(object)

## S4 method for signature 'nifti'
srow_y(object)
srow_y(object) <- value

## S4 replacement method for signature 'nifti'
srow_y(object) <- value

srow.y(object)

## S4 method for signature 'nifti'
srow.y(object)
srow.y(object) <- value

## S4 replacement method for signature 'nifti'
srow.y(object) <- value

Arguments

object is an object of class nifti or anlz.
value is the value to assign to the srow_y field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muscellij2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>
**Description**

Methods that act on the `srow_z` field in the NIfTI/ANALYZE header.

**Usage**

```r
srow_z(object)
```

```
## S4 method for signature 'nifti'
srow_z(object)

srow_z(object) <- value
```

```
## S4 replacement method for signature 'nifti'
srow_z(object) <- value
```

```
## S4 method for signature 'anlz'
srow_z(object)

srow_z(object) <- value
```

```
## S4 replacement method for signature 'nifti'
srow_z(object) <- value
```

**Arguments**

- `object` is an object of class `nifti` or `anlz`.
- `value` is the value to assign to the `srow_z` field.

**Details**

See documentation on the ANALYZE and/or NIfTI data standards for more details.

**Author(s)**

John Muschelli <muschelli2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>
References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf

NIfTI-1
http://nifti.nimh.nih.gov/

Description

Methods that act on the start_field field in the NIfTI/ANALYZE header.

Usage

start_field(object)

## S4 method for signature 'anlz'
start_field(object)

start_field(object) <- value

## S4 replacement method for signature 'anlz'
start_field(object) <- value

Arguments

object is an object of class nifti or anlz.
value is the value to assign to the start_field field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschelli.j@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf

NIfTI-1
http://nifti.nimh.nih.gov/
Description

A pleasing rainbow style color table patterned after that used in Matlab.

Usage

tim.colors(n = 64)

Arguments

n is the number of color levels (default = 64).

Details

Based on the tim.colors function in the fields package. The tim.colors function here has been modified to break any dependence on code in the fields package. Spline interpolation (interpSpline) is used when the number of requested colors is not the default.

Value

A vector of character strings giving the colors in hexadecimal format.

Author(s)

Tim Hoar (GSP-NCAR); modified by Brandon Whitcher

See Also

hotmetal, topo.colors, terrain.colors

Examples

tim.colors(10)
image(outer(1:20, 1:20, "+"), col=tim.colors(75), main="tim.colors")
Methods that act on the `toffset` field in the NIfTI/ANALYZE header.

### Usage

```r

toffset(object)

## S4 method for signature 'nifti'
toffset(object)

toffset(object) <- value

## S4 replacement method for signature 'nifti'
toffset(object) <- value
```

### Arguments

- `object` is an object of class `nifti` or `anlz`.
- `value` is the value to assign to the `toffset` field.

### Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

### Author(s)

John Muschelli <muschellij2@gmail.com>, Brandon Whitcher <bwhitcher@gmail.com>

### References

- ANALYZE 7.5
  - [https://rportal.mayo.edu/bir/ANALYZE75.pdf](https://rportal.mayo.edu/bir/ANALYZE75.pdf)
- NIfTI-1
translateCoordinate  Translate Voxel Coordinates

Description
Translates a voxel index into the continuous coordinate space defined by the NIfTI qform and sform information.

Usage
translateCoordinate(i, nim, verbose = FALSE)

Arguments
- i: An index vector in nim.
- nim: An object of class nifti.
- verbose: Provide detailed output to the user.

Details
This function takes as input a nifti object and an index vector in the voxel space of the object and translates that voxel index into the continuous coordinate space defined by the object’s qform and sform.

Please note:
1. By default the index i varies most rapidly, etc.
2. The ANALYZE 7.5 coordinate system is
   \[ +x = \text{Left} \]
   \[ +y = \text{Anterior} \]
   \[ +z = \text{Superior} \]
   (A left-handed co-ordinate system).
3. The three methods below give the locations of the voxel centres in the x,y,z system. In many cases programs will want to display the data on other grids. In which case the program will be required to convert the desired (x,y,z) values into voxel values using the inverse transformation.
4. Method 2 uses a factor qfac which is either -1 or 1. qfac is stored in pixdim[0]. If pixdim[0] != 1 or -1, which should not occur, we assume 1.
5. The units of the xyzt are set in xyzt_units field.

Value
A nifti-class object with translated coordinates.
Author(s)

Andrew Thornton <zeripath@users.sourceforge.net>

Examples

```r
ffd <- readNIfTI(file.path(system.file("nifti", package="oro.nifti"),
                       "filtered_func_data"))
xyz <- c(1,1,1)
translateCoordinate(xyz, ffd, verbose=TRUE)
xyz <- trunc(dim(ffd)[1:3]/2)
translateCoordinate(xyz, ffd, verbose=TRUE)
```

Description

Methods that act on the unused1 field in the NIfTI/ANALYZE header.

Usage

```r
unused1(object)
```

```r
## S4 method for signature 'anlz'
unused1(object)
unused1(object) <- value
```

Arguments

- `object` is an object of class nifti or anlz.
- `value` is the value to assign to the unused1 field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschellij2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>
Description

Methods that act on the `verified` field in the NIfTI/ANALYZE header.

Usage

```r
verified(object)
```

```r
## S4 method for signature 'anlz'
verified(object)
```

```r
verified(object) <- value
```

```r
## S4 replacement method for signature 'anlz'
verified(object) <- value
```

Arguments

- `object` is an object of class `nifti` or `anlz`.
- `value` is the value to assign to the `verified` field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

- John Muschelli `<muschelli2@gmail.com>`
- Brandon Whitcher `<bwhitcher@gmail.com>`

References

- ANALYZE 7.5
  [https://rportal.mayo.edu/bir/ANALYZE75.pdf](https://rportal.mayo.edu/bir/ANALYZE75.pdf)
- NIfTI-1
Description

Methods that act on the views field in the NIfTI/ANALYZE header.

Usage

views(object)

## S4 method for signature 'anlz'
views(object)

views(object) <- value

## S4 replacement method for signature 'anlz'
views(object) <- value

Arguments

object is an object of class nifti or anlz.
value is the value to assign to the views field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschellij2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/
Description

Methods that act on the `vols_added` field in the NIfTI/ANALYZE header.

Usage

```r
vols_added(object)
## S4 method for signature 'anlz'
vols_added(object)

vols_added(object) <- value
## S4 replacement method for signature 'anlz'
vols_added(object) <- value

vols_added(object)
## S4 method for signature 'anlz'
vols.added(object)

vols.added(object) <- value
## S4 replacement method for signature 'anlz'
vols.added(object) <- value
```

Arguments

- `object` is an object of class `nifti` or `anlz`.
- `value` is the value to assign to the `vols_added` field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli `<muschellij2@gmail.com>`,
Brandon Whitcher `<bwhitcher@gmail.com>`
References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/

---

### voxdim

<table>
<thead>
<tr>
<th>Usage</th>
<th>Description</th>
<th>Arguments</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>voxdim(img)</td>
<td>Grabs the pixdim and takes the correct elements</td>
<td>img: nifti object</td>
<td>Vector of length 3</td>
</tr>
</tbody>
</table>

---

### vox_offset-methods

Methods that act on the vox_offset field in the NIfTI/ANALYZE header.

<table>
<thead>
<tr>
<th>Usage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>vox_offset(object)</td>
<td>## S4 method for signature 'nifti'</td>
</tr>
<tr>
<td></td>
<td><code>vox_offset(object)</code></td>
</tr>
<tr>
<td></td>
<td>## S4 method for signature 'anlz'</td>
</tr>
<tr>
<td></td>
<td><code>vox_offset(object)</code></td>
</tr>
<tr>
<td></td>
<td><code>vox_offset(object) &lt;- value</code></td>
</tr>
<tr>
<td></td>
<td>## S4 replacement method for signature 'nifti'</td>
</tr>
</tbody>
</table>
vox_offset(object) <- value

## S4 replacement method for signature 'anlz'
vox_offset(object) <- value
vox.offset(object)

## S4 method for signature 'nifti'
vox.offset(object)

## S4 method for signature 'anlz'
vox.offset(object)
vox.offset(object) <- value

## S4 replacement method for signature 'nifti'
vox.offset(object) <- value

## S4 replacement method for signature 'anlz'
vox.offset(object) <- value

**Arguments**

object is an object of class nifti or anlz.

value is the value to assign to the vox_offset field.

**Details**

See documentation on the ANALYZE and/or NIfTI data standards for more details.

**Author(s)**

John Muschelli <muschellij2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>

**References**

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIfTI-1
http://nifti.nimh.nih.gov/
Description

Methods that act on the `vox_units` field in the NIfTI/ANALYZE header.

Usage

```r
vox_units(object)

## S4 method for signature 'anlz'
vox_units(object)

vox_units(object) <- value

## S4 replacement method for signature 'anlz'
vox_units(object) <- value

vox_units(object)

## S4 method for signature 'anlz'
vox_units(object)

vox_units(object) <- value

## S4 replacement method for signature 'anlz'
vox_units(object) <- value
```

Arguments

- `object` is an object of class `nifti` or `anlz`.
- `value` is the value to assign to the `vox_units` field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschellij2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>
Description

This function saves a afni-class object to HEAD/BRIK pair in AFNI format.

Usage

writeAFNI(nim, ...)  

## S4 method for signature 'afni'
writeAFNI(nim, fname, verbose = FALSE, warn = -1)

Arguments

nim is an object of class afni.

... Additional variables defined by the method.

fname is the path and file name to save the AFNI file (.HEAD/BRIK) without the suffix.

verbose is a logical variable (default = FALSE) that allows text-based feedback during execution of the function.

warn is a number to regulate the display of warnings (default = -1). See options for more details.

Details

The writeAFNI function utilizes the internal writeBin and writeLines command to write information to header-binary file pair.

Current acceptable data types include

INT16" DT SIGNED SHORT (16 bits per voxel)

FLOAT32" DT FLOAT (32 bits per voxel)

"COMPLEX128" DT COMPLEX (128 bits per voxel)

Value

Nothing.
Methods

nim = "afni"  Write AFNI volume to disk.
nim = "ANY"  Not implemented.

Author(s)

Karsten Tabelow <karsten.tabelow@wias-berlin.de>

References

AFNI
http://afni.nimh.nih.gov/pub/dist/src/README.attributes

See Also

writeANALYZE, writeNIfTI

Examples

## Taken from the AFNI Matlab Library
## http://afni.nimh.nih.gov/pub/dist/data/afni_matlab_data.tgz
afni.path <- system.file("afni", package="oro.nifti")
orig <- readAFNI(file.path(afni.path, "ARzs_CW_avvr.DEL+orig"))
writeAFNI(orig, "test-afni-image", verbose=TRUE)

data <- readAFNI("test-afni-image", verbose=TRUE)
image(orig, zlim=c(0.5,256), oma=rep(2,4), bg="white")
image(data, zlim=c(0.5,256), oma=rep(2,4), bg="white")
abs.err <- abs(data - orig)
image(as(abs.err, "nifti"), zlim=range(0,1), oma=rep(2,4),
     bg="white")

writeANALYZE-methods  writeANALYZE

Description

This function saves an Analyze-class object to a single binary file in Analyze format.

Usage

## S4 method for signature 'anlz'
writeANALYZE(anlz, filename, gzipped = TRUE,
              verbose = FALSE, warn = -1)
Arguments

- **aim**: is an object of class `anlz`.
- **filename**: is the path and file name to save the Analyze file pair (.hdr,.img) **without** the suffixes.
- **gzipped**: is a character string that enables exportation of compressed (.gz) files (default = TRUE).
- **verbose**: is a logical variable (default = FALSE) that allows text-based feedback during execution of the function.
- **warn**: is a number to regulate the display of warnings (default = -1). See `options` for more details.

Details

The `writeANALYZE` function utilizes the internal `writeBin` and `writeChar` command to write information to a binary file.

Value

Nothing.

Methods

- **object = "anlz"**: Write ANALYZE volume to disk.

Author(s)

Brandon Whitcher <bwhitcher@gmail.com>

References

Analyze 7.5

https://rportal.mayo.edu/bir/ANALYZE75.pdf

See Also

`writeAFNI`, `writeNIfTI`

Examples

```r
norm <- dnorm(seq(-5, 5, length=32), sd=2)
norm <- (norm-min(norm)) / max(norm-min(norm))
img <- outer(outer(norm, norm), norm)
img <- round(255*img)
img[17:32,] <- 255 - img[17:32,]
img.anlz <- anlz(img) # create Analyze object

writeANALYZE(img.anlz, "test-anlz-image-uint8", verbose=TRUE)
## These files should be viewable in, for example, FSLview
## Make sure you adjust the min/max values for proper visualization
```
data <- readANALYZE("test-anlz-image-uint8", verbose=TRUE)
image(img.anlz, oma=rep(2, 4), bg="white")
image(data, oma=rep(2, 4), bg="white")
abs.err <- abs(data - img.anlz)
image(as(abs.err, "anlz"), zlim=range(img.anlz), oma=rep(2, 4), bg="white")

## Not run:
## Loop through all possible data types
datatypes <- list(code=c(2, 4, 8, 16, 64),
                   name=c("uint8", "int16", "int32", "float", "double"))
equal <- vector("list")
for (i in 1:length(datatypes$code)) {
  fname <- paste("test-anlz-image-", datatypes$name[i], sep="")
  rm(img.anlz)
  img.anlz <- anlz(img, datatype=datatypes$code[i])
  writeANALYZE(img.anlz, fname)
  equal[[i]] <- all(readANALYZE(fname) == img)
}
names(equal) <- datatypes$name
unlist(equal)

## End(Not run)

writeNIfTI-methods

Description

This function saves a NIfTI-class object to a single binary file in NIfTI format.

Usage

## S4 method for signature 'nifti'
writeNIfTI(nim, filename, onefile = TRUE, gzipped = TRUE,
           verbose = FALSE, warn = -1)

## S4 method for signature 'anlz'
writeNIfTI(nim, filename, onefile = TRUE, gzipped = TRUE,
           verbose = FALSE, warn = -1)

## S4 method for signature 'array'
writeNIfTI(nim, filename, onefile = TRUE, gzipped = TRUE,
           verbose = FALSE, warn = -1)

Arguments

nim is an object of class nifti or anlz.
filename is the path and file name to save the NIfTI file (.nii) without the suffix.
onefile is a logical value that allows the scanning of single-file (.nii) or dual-file format (.hdr and .img) NIfTI files (default = TRUE).
gzipped is a character string that enables exportation of compressed (.gz) files (default = TRUE).
verbose is a logical variable (default = FALSE) that allows text-based feedback during execution of the function.
warn is a number to regulate the display of warnings (default = -1). See options for more details.

Details

The writeNIfTI function utilizes the internal writeBin and writeChar command to write information to a binary file.

Current acceptable data types include

list("UINT8") DT BINARY (1 bit per voxel)
list("INT16") DT SIGNED SHORT (16 bits per voxel)
list("INT32") DT SIGNED INT (32 bits per voxel)
list("FLOAT32") DT FLOAT (32 bits per voxel)
list("DOUBLE64") DT DOUBLE (64 bits per voxel)
list("UINT16") DT UNSIGNED SHORT (16 bits per voxel)

Value

Nothing.

Methods

object = "anlz" Convert ANALYZE object to class nifti and write the NIfTI volume to disk.
object = "array" Convert array to class nifti and write the NIfTI volume to disk.
object = "nifti" Write NIfTI volume to disk.

Author(s)

Brandon Whitcher <bwhitcher@gmail.com>,
Volker Schmid <volkerschmid@users.sourceforge.net>

References

NIfTI-1
http://nifti.nimh.nih.gov/

See Also

writeAFNI, writeANALYZE
Examples

```r
norm <- dnorm(seq(-5, 5, length=32), sd=2)
norm <- (norm-min(norm)) / max(norm-min(norm))
img <- outer(norm, norm, norm)
img <- round(255 * img)
img[17:32,] <- 255 - img[17:32,]
img.nifti <- nifti(img) # create NIfTI object

writeNIfTI(img.nifti, "test-nifti-image-uint8", verbose=TRUE)
## These files should be viewable in, for example, FSLview
## Make sure you adjust the min/max values for proper visualization
data <- readNIfTI("test-nifti-image-uint8", verbose=TRUE)
image(img.nifti, oma=rep(2,4), bg="white")
image(data, oma=rep(2,4), bg="white")
abs.err <- abs(data - img.nifti)
image(as(abs.err, "nifti"), zlim=range(img.nifti), oma=rep(2,4),
      bg="white")
```

## Not run:
## Loop through all possible data types

datatypes <- list(code=c(2, 4, 8, 16, 64),
                 name=c("uint8", "int16", "int32", "float", "double"))

equal <- vector("list")
for (i in 1:length(datatypes$code)) {
  fname <- paste("test-nifti-image-", datatypes$name[i], sep="")
  rm(img.nifti)
  img.nifti <- nifti(img, datatype=datatypes$code[i])
  writeNIfTI(img.nifti, fname, verbose=TRUE)
  equal[[i]] <- all(readNIfTI(fname) == img)
}
names(equal) <- datatypes$name
unlist(equal)
```

## End(Not run)

### Bitwise Conversion Subroutines

**Description**

Units of spatial and temporal dimensions, and MRI-specific spatial and temporal information.

**Usage**

```r
xyz2space(xyzt)
```

```r
xyz2time(xyzt)
```

```r
space.time2xyzt(ss, tt)
```
xyz2space

dim2freq(di)
dim2phase(di)
dim2slice(di)

Arguments

xyzt represents the units of pixdim[1..4] in the NIfTI header.
ss is the character string of spatial units. Valid strings are: “Unknown”, “meter”, “mm” and “micron”.
tt is the character string of temporal units. Valid strings are: “sec”, “msec”, “usec”, “Hz”, “ppm” and “rads”.
di represents MRI slice ordering in the NIfTI header.

Details

The functions xyz2space and xyz2time can be used to mask off the undesired bits from the xyzt_units fields, leaving “pure” space and time codes.

The functions dim2freq, dim2phase, and dim2slice can be used to extract values from the dim_info byte.

Value

For diminfo: the frequency, phase and slice dimensions encode which spatial dimension (1, 2, or 3) corresponds to which acquisition dimension for MRI data. For xyzt_units: the codes are used to indicate the units of pixdim. Dimensions 1, 2, 3 are for x,y,z; dimension 4 is for time (t).

Author(s)

B. Whitcher <bwhitcher@gmail.com>

References

Neuroimaging Informatics Technology Initiative (NIfTI)
http://nifti.nimh.nih.gov/

See Also

convert.units, convert.slice
Description

Methods that act on the `xyzt_units` field in the NIfTI/ANALYZE header.

Usage

```r
xyzt_units(object)
```

```r
## S4 method for signature 'nifti'
xyzt_units(object)

xyzt_units(object) <- value
```

```r
## S4 replacement method for signature 'nifti'
xyzt_units(object) <- value

xyzt_units(object)
```

```r
## S4 method for signature 'nifti'
xyzt_units(object)

xyzt_units(object) <- value
```

```r
## S4 replacement method for signature 'nifti'
xyzt_units(object) <- value
```

Arguments

- `object` is an object of class `nifti` or `anlz`.
- `value` is the value to assign to the `xyzt_units` field.

Details

See documentation on the ANALYZE and/or NIfTI data standards for more details.

Author(s)

John Muschelli <muschellij2@gmail.com>,
Brandon Whitcher <bwhitcher@gmail.com>
References

ANALYZE 7.5
https://rportal.mayo.edu/bir/ANALYZE75.pdf
NIFTI-1
http://nifti.nimh.nih.gov/
Index

*Topic Misc
  rmniigz, 98
*Topic aplot
  hotmetal, 52
tim.colors, 115
*Topic classes
  afni-class, 5
  anlz-class, 8
  nifti-class, 64
  niftiAuditTrail-class, 67
  niftiExtension-class, 68
  niftiExtensionSection-class, 68
*Topic file
  readAFNI, 91
  readANALYZE, 92
  readNIFTI, 94
  writeAFNI-methods, 125
  writeANALYZE-methods, 126
  writeNIFTI-methods, 128
*Topic methods
  audit.trail-methods, 15
  blend, 19
  coerce-methods, 25
  image-methods, 53
  nifti_assign-methods, 69
  orientation-methods, 74
  orthographic-methods, 76
  overlay-methods, 77
  readAFNI, 91
  writeAFNI-methods, 125
  writeANALYZE-methods, 126
  writeNIFTI-methods, 128
*Topic misc
  convert.scene, 29
  nsli, 69
  xytz2space, 130
  [<-nifti,ANY,missing,ANY-method (nifti_assign-methods), 69
[<-nifti,ANY,ANY,ANY-method (nifti_assign-methods), 69
[<-nifti,ANY,missing,nifti-method (nifti_assign-methods), 69
[<-nifti,missing,missing,array-method (nifti_assign-methods), 69
[<-nifti,numerical,missing,ANY-method (nifti_assign-methods), 69
[<-nifti,numerical,numerical,ANY-method (nifti_assign-methods), 69
[<-methods (nifti_assign-methods), 69
  afni, 60, 91
  afni-class, 5
  anlz, 7, 8, 61, 63, 66
  anlz-class, 8
  anlz-nifti-ops, 10
  array, 7, 10, 65
  as, 25
  as, array, anlz-method (coerce-methods),
    25
  as, array, nifti-method (coerce-methods),
    25
  as, anlz, 11
  as, nifti, 12
  as<-array, anlz-method (coerce-methods), 25
  as<-array, nifti-method (coerce-methods), 25
  Audit Trails, 12
  audit.trail (audit.trail-methods), 15
  audit.trail, nifti-method (audit.trail-methods), 15
  audit.trail-methods, 15
  audit.trail<- (audit.trail-methods), 15
  audit.trail<-nifti-method (audit.trail-methods), 15
  aux.file (aux_file-methods), 16
  aux.file, anlz-method (aux_file-methods), 16

134
INDEX

cal_units-methods, 24
convert.form, 27
convert.form(Convert NIfTI Codes), 28
convert.intent, 27
convert.intent( Convert NIfTI Codes), 28
calibrateImage, 20
convert.units, 27, 131
coerce, anlz,nifti-method (coerce-methods), 25
data.type (data_type-methods), 31
data.type, anlz-method (data_type-methods), 31
data.type,nifti-method (data_type-methods), 31
cal_units<-(cal_units-methods), 24
data_type<-(data_type-methods), 31
cal_units<-.anlz-method (cal_units-methods), 24
data_type<-.anlz-method (data_type-methods), 31
cal_units<-, anlz-method (cal_units-methods), 24
data_type<-.nifti-method (data_type-methods), 31
cal_units-, anlz-method (cal_units-methods), 24
data_type<-.nifti-method (data_type-methods), 31
cal_units<nifti-method (cal_units-methods), 24
data_type<-.array,nifti-method (data_type-methods), 31
cal_units<-.nifti-method (cal_units-methods), 24
data_type<-.array-method (data_type-methods), 31
cal_units<-.array-method (cal_units-methods), 24
data_type<-.array-method (data_type-methods), 31
cal_units<-.nifti-method (cal_units-methods), 24
data_type<-.nifti-method (data_type-methods), 31
cal_units<-.array-method (cal_units-methods), 24
data_type<-.array-method (data_type-methods), 31
cal_units<-.nifti-method (cal_units-methods), 24
data_type<-.nifti-method (data_type-methods), 31
cal_units<-.nifti-method (cal_units-methods), 24
data_type<-.nifti-method (data_type-methods), 31
calibrateImage, 20
convert.units, 27, 131
compressed (compressed-methods), 26
data_type<-(data_type-methods), 31
compressed,anlz-method (compressed-methods), 26
data_type<-(compressed-methods), 31
compressed-anlz-method (compressed-methods), 26
data_type<-(compressed-methods), 31
compressed-methods, 26
data_type<-(compressed-methods), 31
compressed-methods, (compressed-methods), 26
data_type<-(compressed-methods), 31
compressed-methods, (compressed-methods), 26
data_type<-(compressed-methods), 31
Convert ANALYZE Codes, 27
data_type<-(data_type-methods), 31
Convert NIFTI Codes, 28
compressed<-(compressed-methods), 26
data_type<-(compressed-methods), 31
data_type<-.anlz-method (data_type-methods), 31
data_type<-.nifti-method (data_type-methods), 31
data_type<-(data_type-methods), 31
data_type<-(data_type-methods), 31
compressed<-(compressed-methods), 26
data_type<-(data_type-methods), 31
compressed<-(compressed-methods), 26
data_type<-(data_type-methods), 31
compressed<-(compressed-methods), 26
Convert ANALYZE Codes, 27
data_type<-(data_type-methods), 31
convert.bitpix, 27
data_type<-(data_type-methods), 31
convert.bitpix( Convert NIFTI Codes), 28
data_type<-(data_type-methods), 31
convert.bitpix.anlz (Convert ANALYZE Codes), 27
data_type<-(data_type-methods), 31
convert.datatype, 27, 63
data_type<-(data_type-methods), 31
convert.datatype (Convert NIfTI Codes), 28
data_type<-(data_type-methods), 31
convert.datatype.anlz, 8, 30
data_type<-(data_type-methods), 31
convert.datatype.anlz (Convert ANALYZE Codes), 27
convert.datatype, 27, 63
convert.datatype (Convert NIfTI Codes), 28
INDEX

db.name (db_name-methods), 32
db.name, anlz-method (db_name-methods), 32
db.name, nifti-method (db_name-methods), 32
db.name<- (db_name-methods), 32
db.name<- (db_name-methods), 32
db.name<- (db_name-methods), 32
db.name<- (db_name-methods), 32
db.name<- (db_name-methods), 32
db.name<- (db_name-methods), 32
descrip (descrip-methods), 34
descrip, anlz-method (descrip-methods), 34
descrip, nifti-method (descrip-methods), 34
descrip-methods, 34
descrip-methods, (descrip-methods), 34
descrip<- (descrip-methods), 34
descrip<- (descrip-methods), 34
descrip<- (descrip-methods), 34
dim2freq (xyzt2space), 130
dim2phase (xyzt2space), 130
dim2slice (xyzt2space), 130
dim_ (dim_-methods), 35
dim_, anlz-method (dim_-methods), 35
dim_, nifti-method (dim_-methods), 35
dim_-methods, 35
dim_-methods, (dim_-methods), 35
dim_- (dim_-methods), 35
dim_- (dim_-methods), 35
dim_- (dim_-methods), 35
dim_- (dim_-methods), 35
dim_info (dim_info-methods), 36
dim_info, nifti-method (dim_info-methods), 36
dim_info-methods, 36
dim_info-methods, (dim_info-methods), 36
dim_info<- (dim_info-methods), 36
dim_info<- (dim_info-methods), 36
dim_un0 (dim_un0-methods), 37
dim_un0, anlz-method (dim_un0-methods), 37
dim_un0-methods, 37
dim_un0-methods, (dim_un0-methods), 37
dim_un0<- (dim_un0-methods), 37
dim_un0<- (dim_un0-methods), 37
drop_img_dim (dropImageDimension), 38
dropImageDimension, 38
enableAuditTrail (Audit Trails), 12
exp.date (exp_date-methods), 39
exp.date, anlz-method (exp_date-methods), 39
exp.date, anlz-method (exp_date-methods), 39
exp.date-methods, (exp_date-methods), 39
exp.date-methods, (exp_date-methods), 39
exp.date<- (exp_date-methods), 39
exp.date<- (exp_date-methods), 39
exp.time (exp_time-methods), 40
exp.time, anlz-method (exp_time-methods), 40
exp.time-methods, 40
exp.time-methods, (exp_time-methods), 40
exp.time<- (exp_time-methods), 40
exp.time<- (exp_time-methods), 40
extender (extender-methods), 41
extender, nifti-method (extender-methods), 41
extender-methods, 41
extender-methods, (extender-methods), 41
extender<- (extender-methods), 41
extender<- (extender-methods), 41
extents (extents-methods), 42
extents, anlz-method (extents-methods), 42
extents, nifti-method (extents-methods), 42
extents-methods, 42
extents-methods, (extents-methods), 42
extents<- (extents-methods), 42
hkey_un0<-, nifti-method
   (hkey_un0-methods), 51
hotmetal, 52, 115
image, 54
image, afni-method (image-methods), 53
image, anlz-method (image-methods), 53
image, ANY-method (image-methods), 53
image, nifti-method (image-methods), 53
image-methods, 53
image.nifti (image-methods), 53
integerTranslation, 54
intent_code (intent_code-methods), 55
intent_code, nifti-method
   (intent_code-methods), 55
intent_code< (intent_code-methods), 55
intent_code<- (intent_code-methods), 55
intent_name (intent_name-methods), 56
intent_name, nifti-method
   (intent_name-methods), 56
intent_name-methods, 56
intent_name< (intent_name-methods), 56
intent_name<- (intent_name-methods), 56
intent_p1 (intent_p1-methods), 57
intent_p1, nifti-method
   (intent_p1-methods), 57
intent_p1<- (intent_p1-methods), 57
intent_p1< (intent_p1-methods), 57
intent_p2 (intent_p2-methods), 58
intent_p2, nifti-method
   (intent_p2-methods), 58
intent_p2<- (intent_p2-methods), 58
intent_p2< (intent_p2-methods), 58
intent_p3 (intent_p3-methods), 59
intent_p3, nifti-method
   (intent_p3-methods), 59
intent_p3< (intent_p3-methods), 59
intent_p3<- (intent_p3-methods), 59
inverseReorient, 81
inverseReorient (reorient), 96
invertIntegerTranslation
   (integerTranslation), 54
is.afni, 60
is.anlz, 61
is.nifti, 61
magic (magic-methods), 62
magic, nifti-method (magic-methods), 62
magic-methods, 62
magic-methods, (magic-methods), 62
magic<-(magic-methods), 62
magic<-,nifti-method (magic-methods), 62
matrix, 7, 10, 65

newAuditTrail (Audit Trails), 12
nifti, 7, 8, 10, 61–63, 63, 67–69, 94
nifti-class, 64
nifti-operators, 66
nifti_assign-methods, 69
niftiAuditTrail, 66, 68
niftiAuditTrail-class, 67
niftiAuditTrailCreated (Audit Trails), 12
niftiAuditTrailEvent (Audit Trails), 12
niftiAuditTrailSystemNode (Audit Trails), 12
niftiAuditTrailSystemNodeEvent (Audit Trails), 12
niftiAuditTrailToExtension (Audit Trails), 12
niftiExtension, 10, 66, 67, 69
niftiExtension-class, 68
niftiExtensionSection-class, 68
niftiExtensionToAuditTrail (Audit Trails), 12
NSLI (nsli), 69
nsli, 69
NTIM (nsli), 69
ntim (nsli), 69

omax (omax-methods), 70
omax, anlz-method (omax-methods), 70
omax-methods, 70
omax-methods, (omax-methods), 70
omax<-(omax-methods), 70
omax<-, anlz-method (omax-methods), 70
omin (omin-methods), 71
omin, anlz-method (omin-methods), 71
omin-methods, 71
omin-methods, (omin-methods), 71
omin<-(omin-methods), 71
omin<-, anlz-method (omin-methods), 71
onefile, 72
Ops, anlz, anlz-method (anlz-nifti-ops), 10
Ops, anlz, nifti-method (anlz-nifti-ops), 10
Ops, anlz, numeric-method (anlz-nifti-ops), 10
Ops, nifti, anlz-method (anlz-nifti-ops), 10
Ops, nifti, nifti-method (nifti-operators), 66
Ops, nifti, numeric-method (nifti-operators), 66
Ops, numeric, anlz-method (anlz-nifti-ops), 10
Ops, numeric, nifti-method (nifti-operators), 66

options, 125, 127, 129
orient (orient-methods), 73
orient, anlz-method (orient-methods), 73
orient-methods, 73
orient-methods, (orient-methods), 73
orient<-(orient-methods), 73
orient<-, anlz-method (orient-methods), 73
orientation-methods, 74
origin (origin-methods), 75
origin, anlz-method (origin-methods), 75
origin-methods, 75
origin-methods, (origin-methods), 75
origin<-(origin-methods), 75
origin<-, anlz-method (origin-methods), 75
oro.nifti.info (Audit Trails), 12
orthographic (orthographic-methods), 76
orthographic, anfi-method (orthographic-methods), 76
orthographic, anlz-method (orthographic-methods), 76
orthographic, array-method (orthographic-methods), 76
orthographic, nifti-method (orthographic-methods), 76
orthographic-methods, 76
orthographic-methods, (orthographic-methods), 76
overlay (overlay-methods), 77
overlay, anfi, anfi-method (overlay-methods), 77
overlay, anfi, array-method (overlay-methods), 77
overlay, anlz, anlz-method (overlay-methods), 77
overlay, anlz, array-method
(overlay-methods), 77
overlay, anlz, nifti-method
(overlay-methods), 77
overlay, array, anlz-method
(overlay-methods), 77
overlay, array, array-method
(overlay-methods), 77
overlay, array, nifti-method
(overlay-methods), 77
overlay, nifti, anlz-method
(overlay-methods), 77
overlay, nifti, array-method
(overlay-methods), 77
overlay, nifti, nifti-method
(overlay-methods), 77
overlay-methods, 77
overlay.nifti (overlay-methods), 77
patient.id (patient_id-methods), 80
patient.id, anlz-method
(patient_id-methods), 80
patient.id, nifti-method
(patient_id-methods), 80
patient.id<- (patient_id-methods), 80
patient.id<-, anlz-method
(patient_id-methods), 80
patient.id-methods, 80
patient.id-methods,
(patient_id-methods), 80
patient.id<- (patient_id-methods), 80
patient.id<-, anlz-method
(patient_id-methods), 80
performPermutation, 81, 97
pixdim (pixdim-methods), 82
pixdim, anlz-method (pixdim-methods), 82
pixdim, nifti-method (pixdim-methods), 82
pixdim-methods, 82
pixdim<- (pixdim-methods), 82
pixdim<-, anlz-method (pixdim-methods), 82
pixdim<-, nifti-method (pixdim-methods), 82
qform (orientation-methods), 74
qform, nifti-method
(orientation-methods), 74
qform-methods (orientation-methods), 74
qform.code (qform_code-methods), 83
qform.code, nifti-method
(qform_code-methods), 83
qform.code<- (qform_code-methods), 83
qform.code<-, nifti-method
(qform_code-methods), 83
qform_code (qform_code-methods), 83
qform_code, nifti-method
(qform_code-methods), 83
qform_code-methods, 83
qform_code<- (qform_code-methods), 83
qform_code<-, nifti-method
(qform_code-methods), 83
qoffset.x (qoffset_x-methods), 84
qoffset.x, nifti-method
(qoffset_x-methods), 84
qoffset.x<- (qoffset_x-methods), 84
qoffset.x<-, nifti-method
(qoffset_x-methods), 84
qoffset.y (qoffset_y-methods), 85
qoffset.y, nifti-method
(qoffset_y-methods), 85
qoffset.y<- (qoffset_y-methods), 85
qoffset.y<-, nifti-method
(qoffset_y-methods), 85
qoffset.z (qoffset_z-methods), 86
qoffset.z, nifti-method
(qoffset_z-methods), 86
qoffset.z<- (qoffset_z-methods), 86
qoffset.z<-, nifti-method
(qoffset_z-methods), 86
qoffset_x (qoffset_x-methods), 84
qoffset_x, nifti-method
(qoffset_x-methods), 84
qoffset_x-methods, 84
qoffset_x-methods, (qoffset_x-methods), 84
qoffset_x<- (qoffset_x-methods), 84
qoffset_x<-, nifti-method
(qoffset_x-methods), 84
qoffset_y (qoffset_y-methods), 85
qoffset_y, nifti-method
(qoffset_y-methods), 85
qoffset_y-methods, 85
qoffset_y-methods, (qoffset_y-methods), 85
qoffset_y<- (qoffset_y-methods), 85
qoffset_y<-niifti-method
(qoffset_y-methods), 85
qoffset_z (qoffset_z-methods), 86
qoffset_z,niifti-method
(qoffset_z-methods), 86
qoffset_z-methods, 86
qoffset_z-methods, (qoffset_z-methods), 86
qoffset_z<- (qoffset_z-methods), 86
qoffset_z<-niifti-method
(qoffset_z-methods), 86
qoffset_z<- (qoffset_z-methods), 86
qoffset_z<-niifti-method
(qoffset_z-methods), 86
qoffset_z<- (qoffset_z-methods), 86
qoffset_z<-niifti-method
(qoffset_z-methods), 86
qoffset_z<- (qoffset_z-methods), 86
qoffset_z<-niifti-method
(qoffset_z-methods), 86
qoffset_z<- (qoffset_z-methods), 86
qoffset_z<-niifti-method
(qoffset_z-methods), 86
quatern_b (quatern_b-methods), 88
quatern_b,niifti-method
(quatern_b-methods), 88
quatern_b<- (quatern_b-methods), 88
quatern_b<-niifti-method
(quatern_b-methods), 88
quatern_c (quatern_c-methods), 89
quatern_c,niifti-method
(quatern_c-methods), 89
quatern_c<- (quatern_c-methods), 89
quatern_c<-niifti-method
(quatern_c-methods), 89
quatern_d (quatern_d-methods), 90
quatern_d,niifti-method
(quatern_d-methods), 90
quatern_d-methods, 90
quatern_d-methods, (quatern_d-methods), 90
quatern_d<- (quatern_d-methods), 90
quatern_d<-niifti-method
(quatern_d-methods), 90
quaternion2mat44 (quaternion2rotation), 87
quaternion2rotation, 87
readAFNI, 91, 95
readANALYZE, 70, 92, 92, 95
readNIfTI, 70, 92, 93, 94
regular (regular-methods), 95
regular, anlz-method (regular-methods), 95
regular,niifti-method (regular-methods), 95
regular-methods, 95
regular-methods, (regular-methods), 95
regular<- (regular-methods), 95
regular<- anlz-method
(regular-methods), 95
regular<-niifti-method
(regular-methods), 95
reorient, 81, 96
resetSlopeIntercept, 97
rmgz (rmniigz), 98
rmhdr (rmniigz), 98
rmhdrgz (rmniigz), 98
rmimg (rmniigz), 98
rmimggz (rmniigz), 98
rmnii (rmniigz), 98
rmniigz, 98
scannum (scannum-methods), 98
scannum, anlz-method (scannum-methods), 98
scannum-methods, 98
scannum-methods, (scannum-methods), 98
scannum<- (scannum-methods), 98
scannum<- anlz-method
(scannum-methods), 98
scl_inter (scl_inter-methods), 99
scl_inter, nifti-method (scl_inter-methods), 99
scl_inter< (scl_inter-methods), 99
scl_inter<-, nifti-method (scl_inter-methods), 99
scl_slope (scl_slope-methods), 100
scl_slope, nifti-method (scl_slope-methods), 100
scl_slope< (scl_slope-methods), 100
scl_slope<-, nifti-method (scl_slope-methods), 100
scl_inter (scl_inter-methods), 99
scl_inter, nifti-method (scl_inter-methods), 99
scl_inter< (scl_inter-methods), 99
scl_inter<-, nifti-method (scl_inter-methods), 99
scl_slope (scl_slope-methods), 100
scl_slope, nifti-method (scl_slope-methods), 100
scl_slope methods, 100
scl_slope-methods, (scl_slope-methods), 100
scl_slope< (scl_slope-methods), 100
scl_slope<-, nifti-method (scl_slope-methods), 100
session_error (session_error-methods), 102
session_error, nifti-method (session_error-methods), 102
session_error< (session_error-methods), 102
session_error<-, nifti-method (session_error-methods), 102
session_error (session_error-methods), 102
session_error, nifti-method (session_error-methods), 102
session_error< (session_error-methods), 102
session_error<-, nifti-method (session_error-methods), 102
session_error (session_error-methods), 102
session_error, nifti-method (session_error-methods), 102
session_error< (session_error-methods), 102
session_error<-, nifti-method (session_error-methods), 102
slice_code (slice_code-methods), 105
slice_code, nifti-method (slice_code-methods), 105
slice_code< (slice_code-methods), 105
slice.code<-, nifti-method
  (slice_code-methods), 105
slice.duration
  (slice_duration-methods), 106
slice.duration, nifti-method
  (slice_duration-methods), 106
slice.duration<- (slice_duration-methods), 106
slice.duration<-, nifti-method
  (slice_duration-methods), 106
slice.end (slice_end-methods), 107
slice.end, nifti-method
  (slice_end-methods), 107
slice.end< (slice_end-methods), 107
slice.end<-, nifti-method
  (slice_end-methods), 107
slice.start (slice_start-methods), 108
slice.start, nifti-method
  (slice_start-methods), 108
slice.start<- (slice_start-methods), 108
slice.start<-, nifti-method
  (slice_start-methods), 108
slice_code (slice_code-methods), 105
slice.code, nifti-method
  (slice_code-methods), 105
slice_code-methods, 105
slice.code<- (slice_code-methods), 105
slice.code<-, nifti-method
  (slice_code-methods), 105
slice.duration
  (slice_duration-methods), 106
slice.duration, nifti-method
  (slice_duration-methods), 106
slice.duration-methods, 106
slice.duration<- (slice_duration-methods), 106
slice.duration<-, nifti-method
  (slice_duration-methods), 106
slice.end (slice_end-methods), 107
slice.end, nifti-method
  (slice_end-methods), 107
slice.end-methods, 107
slice.end-methods, (slice_end-methods), 107
slice_end< (slice_end-methods), 107
slice_end<-, nifti-method
  (slice_end-methods), 107
slice_start (slice_start-methods), 108
slice_start, nifti-method
  (slice_start-methods), 108
slice_start<- (slice_start-methods), 108
slice_start<-, nifti-method
  (slice_start-methods), 108
smax (smax-methods), 109
smax, nifti-method (smax-methods), 109
smax-methods, 109
smax-methods, (smax-methods), 109
smax< (smax-methods), 109
smax<-, nifti-method (smax-methods), 109
smin (smin-methods), 110
smin, nifti-method (smin-methods), 110
smin-methods, 110
smin-methods, (smin-methods), 110
smin<- (smin-methods), 110
smin<-, nifti-method (smin-methods), 110
space.time2xyz (xyz2space), 130
srow.x (srow_x-methods), 111
srow.x, nifti-method (srow_x-methods), 111
srow.x< (srow_x-methods), 111
srow.x<-, nifti-method (srow_x-methods), 111
srow.x<-, nifti-method (srow_x-methods), 111
srow.y (srow_y-methods), 112
srow.y, nifti-method (srow_y-methods), 112
srow.y< (srow_y-methods), 112
srow.y<-, nifti-method (srow_y-methods), 112
srow.z (srow_z-methods), 113
srow.z, nifti-method (srow_z-methods), 113
srow.z< (srow_z-methods), 113
srow.z<-, nifti-method (srow_z-methods), 113
srow.x (srow_x-methods), 111
srow.x, nifti-method (srow_x-methods), 111
srow.x-methods, 111
srow.x-methods, (srow_x-methods), 111
INDEX

srow_x< (srow_x-methods), 111
srow_x<, nifti-method (srow_x-methods),
111
srow_x (srow_x-methods), 111
srow_x, nifti-method (srow_x-methods),
111
srow_x-methods, 112
srow_y< (srow_y-methods), 112
srow_y, nifti-method (srow_y-methods),
112
srow_y-methods, 112
srow_y-methods, (srow_y-methods), 112
srow_y<, nifti-method (srow_y-methods),
112
srow_y (srow_y-methods), 113
srow_y, nifti-method (srow_y-methods),
113
srow_y-methods, 113
srow_y-methods, (srow_y-methods), 113
srow_y<, nifti-method (srow_y-methods),
113
start_field (start_field-methods), 114
start_field, anlz-method
(start_field-methods), 114
start_field-methods, 114
start_field-methods,
(start_field-methods), 114
start_field< (start_field-methods), 114
start_field<, anlz-method
(start_field-methods), 114
structure, 7, 10, 65
terrain.colors, 52, 115
tim.colors, 52, 115
toffset (toffset-methods), 116
toffset, nifti-method (toffset-methods),
116
toffset-methods, 116
toffset-methods, (toffset-methods), 116
toffset<, nifti-method
(toffset-methods), 116
topo.colors, 52, 115
translateCoordinate, 117
unused1 (unused1-methods), 118
unused1, anlz-method (unused1-methods),
118
unused1-methods, 118
unused1-methods, (unused1-methods), 118
unused1< (unused1-methods), 118
unused1<, anlz-method
(unused1-methods), 118
vector, 7, 10, 65
verified (verified-methods), 119
verified, anlz-method
(verified-methods), 119
verified-methods, 119
verified-methods, (verified-methods),
119
verified< (verified-methods), 119
verified<, anlz-method
(verified-methods), 119
views (views-methods), 120
views, anlz-method (views-methods), 120
views-methods, 120
views-methods, (views-methods), 120
views< (views-methods), 120
views<, anlz-method (views-methods), 120
vols_added (vols_added-methods), 121
vols_added, anlz-method
(vols_added-methods), 121
vols_added, nifti-method
(vols_added-methods), 121
vols_added< (vols_added-methods), 121
vols_added<, anlz-method
(vols_added-methods), 121
vols_added (vols_added-methods), 121
vols_added, anlz-method
(vols_added-methods), 121
vols_added-methods, 121
vols_added-methods,
(vols_added-methods), 121
vols_added< (vols_added-methods), 121
vols_added<, anlz-method
(vols_added-methods), 121
vox.offset (vox_offset-methods), 122
vox.offset, anlz-method
(vox_offset-methods), 122
vox.offset, nifti-method
(vox_offset-methods), 122
vox.offset< (vox_offset-methods), 122
vox.offset<, anlz-method
(vox_offset-methods), 122
vox.offset<, nifti-method
(vox_offset-methods), 122
vox.units (vox_units-methods), 124
vox.units, anlz-method
(vox_units-methods), 124
Vox Units, Nifti-Method
(vox_units-methods), 124
Vox Units <= (vox_units-methods), 124
Vox Units <-, anlz-method
(vox_units-methods), 124
Vox Offset (vox_offset-methods), 122
Vox Offset, anlz-method
(vox_offset-methods), 122
Vox Offset, nifti-method
(vox_offset-methods), 122
Vox offset-methods, 122
Vox offset-methods,
 (vox_offset-methods), 122
Vox Offset- (vox_offset-methods), 122
Vox Offset<-, anlz-method
 (vox_offset-methods), 122
Vox Offset<-, nifti-method
 (vox_offset-methods), 122
Vox Units (vox_units-methods), 124
Vox Units, anlz-method
 (vox_units-methods), 124
Vox Units-methods, 124
Vox Units-methods, (vox_units-methods), 124
Vox Units< (vox_units-methods), 124
Vox Units<-, anlz-method
 (vox_units-methods), 124
VoxDim, 122

WriteAFNI, /27, /29
WriteAFNI (writeAFNI-methods), 125
WriteAFNI, anfi-method
 (writeAFNI-methods), 125
WriteAFNI, ANY-method
 (writeAFNI-methods), 125
WriteAFNI-methods, 125
WriteANALYZE, /26, /29
WriteANALYZE (writeANALYZE-methods), 126
WriteANALYZE, anlz-method
 (writeANALYZE-methods), 126
WriteANALYZE-methods, 126
WriteNIfTI, /72, /26, /27
WriteNIfTI (writeNIfTI-methods), 128
WriteNIfTI, anlz-method
 (writeNIfTI-methods), 128
WriteNIfTI, array-method
 (writeNIfTI-methods), 128
WriteNIfTI, nifti-method
 (writeNIfTI-methods), 128

WriteNIfTI-methods, 128
Xyzt Units (xzyt_units-methods), 132
Xyzt Units, Nifti-Method
 (xzyt_units-methods), 132
Xyzt Units< (xzyt_units-methods), 132
Xyzt Units<-, nifti-method
 (xzyt_units-methods), 132
Xyzt2space, 130
Xyzt2time (xzyt2space), 130
Xyzt Units (xzyt_units-methods), 132
Xyzt Units, nifti-method
 (xzyt_units-methods), 132
Xyzt Units-methods, 132
Xyzt Units-methods,
 (xzyt_units-methods), 132
Xyzt Units< (xzyt_units-methods), 132
Xyzt Units<-, nifti-method
 (xzyt_units-methods), 132
Zero_trans (resetSlopeIntercept), 97