

Package: proccalibrad (via r-universe)

September 17, 2024

Type Package

Title Extraction of Bands from MODIS Calibrated Radiances MOD02 NRT

Version 0.14

Author Rishabh Gupta <rishabh.uk@gmail.com>, Nicholas J. Matzke

Maintainer Rishabh Gupta <rishabh.uk@gmail.com>

Description Package for processing downloaded MODIS Calibrated radiances Product HDF files. Specifically, MOD02 calibrated radiance product files, and the associated MOD03 geolocation files (for MODIS-TERRA). The package will be most effective if the user installs MRTSwath (MODIS Reprojection Tool for swath products; <https://lpdaac.usgs.gov/tools/modis_reprojection_tool_swath>, and adds the directory with the MRTSwath executable to the default R PATH by editing ~/.Rprofile.

SystemRequirements MRTSwath

Imports utils

License GPL (>= 2)

LazyData TRUE

RoxygenNote 5.0.1

NeedsCompilation no

Date/Publication 2016-07-31 08:54:00

Repository <https://prishabh.r-universe.dev>

RemoteUrl <https://github.com/cran/proccalibrad>

RemoteRef HEAD

RemoteSha 1c4690305a90e6e62b476dbb41d10532a0e43d56

Contents

| | |
|---|---|
| adf | 2 |
| check_for_matching_geolocation_files_mod02nrt | 3 |

| | |
|--|---|
| extract_fn_from_path | 4 |
| run_swath2grid_mod02nrt | 5 |
| slashslash | 7 |
| write_MRTSwath_param_file_mod02nrt | 7 |

| | |
|--------------|-----------|
| Index | 10 |
|--------------|-----------|

| | |
|-----|---|
| adf | <i>Convert to data.frame, without factors</i> |
|-----|---|

Description

Shortcut for: `as.data.frame(x, row.names=NULL, stringsAsFactors=FALSE)`

Usage

```
adf(x)
```

Arguments

x matrix or other object transformable to data.frame

Details

This function is useful for dealing with errors due to automatic conversion of some columns to factors. Another solution may be to prepend `options(stringsAsFactors = FALSE)` at the start of one's script, to turn off all default `stringsAsFactors` silliness.

Value

data.frame

Examples

```
x = matrix(c(1,2,3,4,5,6), nrow=3, ncol=2)
adf(x)
```

```
check_for_matching_geolocation_files_mod02nrt
```

Checks that every MODIS calibrated radiance project HDF has a matching MOD03 file

Description

Each MOD02 calibrated radiance product file requires a corresponding MOD03 geolocation file to be successfully processed with the MRTSwath tool.

Usage

```
check_for_matching_geolocation_files_mod02nrt(moddir = getwd(),
  modtxt = "MOD02", geolotxt = "MOD03", return_geoloc = FALSE,
  return_product = FALSE)
```

Arguments

| | |
|----------------|---|
| moddir | the string describing the directory containing the MOD02 and MOD03 files; both must be in the same directory. Default: getwd(), which gives the present working directory. |
| modtxt | the text string indicating which HDF files are the MODIS calibrated radiance product (or hypothetically, other product). Default: MOD02 (MODIS calibrated radiance product) |
| geolotxt | the text string indicating which HDF files are the MODIS geolocation files (or hypothetically, another set of files). Default: MOD03 |
| return_geoloc | if TRUE, return the list of unmatched geolocation files (e.g. MOD03) |
| return_product | if TRUE, return the list of unmatched product files (e.g. MOD02) |

Details

MRTSwath is the MRT (MODIS Reprojection Tool) for the MODIS

E.g. this calibrated radiance file:

```
MOD021KM.A2016209.0515.005.NRT.hdf
```

...goes with this corresponding geolocation file:

```
MOD03.A2016209.0515.005.NRT.hdf
```

...which is a large file (~30 MB) containing detailed information on the position, tilt, etc. of the MODIS satellite. MRTSwath tool needs one of each, however.

Value

data.frame of matching files; or a list of non-matching files, if return_geoloc or return_product are TRUE.

Author(s)

Rishabh Gupta <rishabh.uk@gmail.com>

Examples

```
# Check your working directory
moddir = getwd()

# Here are some example MODIS files in mod02nrt/extdata/
# Code excluded from CRAN check because it depends on modiscdata
## Not run:
library(devtools)
library(modiscdata)
moddir = system.file("extdata/2002raw/", package="modiscdata")

# You need to have some e.g. MOD files in it (from the MODIS-TERRA platform)
list.files(path=moddir, pattern="MOD")
list.files(path=moddir, pattern="MOD")

# Check for matches (for MODIS-TERRA platform)
check_for_matching_geolocation_files_mod02nrt(moddir=moddir, modtxt="MOD02", geolotxt="MOD03",
  return_geoloc=FALSE, return_product=FALSE)

## End(Not run)
```

extract_fn_from_path *Get the filename from a path*

Description

The filename is split on slashes, and the last item is taken; this should be just the filename.

Usage

```
extract_fn_from_path(fn_with_path)
```

Arguments

fn_with_path The filename, with partial or full path

Value

fn The extracted filename

Examples

```
fn_with_path = "/Library/Frameworks/R.framework/Versions/2.15/Resources/library/
MOD021KM.A2016209.0515.005.NRT.hdf"
extract_fn_from_path(fn_with_path)
```

```
run_swath2grid_mod02nrt
```

Run MRTSwath swath2grid tool

Description

MRTSwath is the "MODIS Reprojection Tool for swath products". See: https://lpdaac.usgs.gov/tools/modis_reprojection_tool_swath).

Usage

```
run_swath2grid_mod02nrt(mrtpath = "swath2grid", prmfnc = "tmpMRTparams.prm",
  tifmdir, modfn, geoloc_fn, ul_lon, ul_lat, lr_lon, lr_lat)
```

Arguments

| | |
|-----------|--|
| mrtpath | This is the path to the MRTSwath executable swath2grid. If your ~/.Rprofile file has the location of swath2grid in the PATH, then you can just use mrtpath="swath2grid". Otherwise, the user must provide the full path to swath2grid. |
| prmfnc | The name of the parameter/control file which will be the input to MRTSwath's swath2grid function. |
| tifmdir | The directory to save the output TIF files in |
| modfn | The filename of the MODIS data |
| geoloc_fn | The filename of the corresponding geolocation file (annoyingly, this is a much larger file than the data file!) |
| ul_lon | Upper left (ul) longitude (x-coordinate) for subsetting |
| ul_lat | Upper left (ul) latitude (y-coordinate) for subsetting |
| lr_lon | Lower right (lr) longitude (x-coordinate) for subsetting |
| lr_lat | Lower right (lr) latitude (y-coordinate) for subsetting |

Details

If you want this function to use MRTSwath tool successfully, you should add the directory with the MRTSwath executable to the default R PATH by editing ~/.Rprofile.

Value

cmdstr The string giving the system command that ran swath2grid

See Also

[write_MRTSwath_param_file_mod02nrt](#)

http://landweb.nascom.nasa.gov/cgi-bin/QA_WWW/newPage.cgi?fileName=hdf_filename@cite NASA2001

Examples

```
#####
# Run MRTSwath tool "swath2grid"
#####

# Source MODIS files (both data and geolocation)
# Code excluded from CRAN check because it depends on modiscdata
## Not run:
library(devtools)
library(modiscdata)
moddir = system.file("extdata/2002raw/", package="modiscdata")

# Get the matching data/geolocation file pairs
fns_df = check_for_matching_geolocation_files(moddir, modtxt="MOD02", geolctxt="MOD03")
fns_df

# Resulting TIF files go in this directory
tifsdir = getwd()

# Box to subset
ul_lat = 13
ul_lon = -87
lr_lat = 8
lr_lon = -82

for (i in 1:nrow(fns_df))
{

prmf = write_MRTSwath_param_file_mod02nrt(prmf="tmpMRTparams.prm", tifsdir=tifsdir,
  modfn=fns_df$mod02_fns[i], geoloc_fn=fns_df$mod03_fns[i], ul_lon=ul_lon, ul_lat=ul_lat,
  lr_lon=lr_lon, lr_lat=lr_lat)
print(scan(file=prmf, what="character", sep="\n"))

run_swath2grid_mod02nrt(mrtpath="swath2grid", prmf="tmpMRTparams.prm", tifsdir=tifsdir,
  modfn=fns_df$mod302_fns[i], geoloc_fn=fns_df$mod03_fns[i], ul_lon=ul_lon, ul_lat=ul_lat,
  lr_lon=lr_lon, lr_lat=lr_lat)

}

list.files(tifsdir, pattern=".tif", full.names=TRUE)

## End(Not run)
```

| | |
|------------|--|
| slashslash | <i>Remove double slash (slash a slash)</i> |
|------------|--|

Description

Shortcut for: `gsub(pattern="//", replacement="/", x=tmpstr)`

Usage

```
slashslash(tmpstr)
```

Arguments

`tmpstr` a path that you want to remove double slashes from

Details

This function is useful for removing double slashes that can appear in full pathnames due to inconsistencies in trailing slashes in working directories etc.

Value

`outstr` a string of the fixed path

Examples

```
tmpstr = "/Library/Frameworks/R.framework/Versions/2.15/Resources/library/  
MOD03.A2016209.0515.005.NRT.hdf"
```

```
outstr = slashslash(tmpstr)  
outstr
```

| | |
|---|--|
| <code>write_MRTSwath_param_file_mod02nrt</code> | <i>Write a parameter control file for MRTSwath</i> |
|---|--|

Description

MRTSwath is the "MODIS Reprojection Tool for swath products". See: https://lpdaac.usgs.gov/tools/modis_reprojection_tool_swath).

Usage

```
write_MRTSwath_param_file_mod02nrt(prmfn = "tmpMRTparams.prm", tifdir, modfn,  
  geoloc_fn, ul_lon, ul_lat, lr_lon, lr_lat)
```

Arguments

| | |
|-----------------------|---|
| prmf _n | The name of the parameter/control file which will be the input to MRTSwath's swath2grid function. |
| tifsd _{ir} | The directory to save the output TIF files in |
| modf _n | The filename of the MODIS data |
| geoloc_ _{fn} | The filename of the corresponding geolocation file (annoyingly, this is a much larger file than the data file!) |
| ul_ _{lon} | Upper left (ul) longitude (x-coordinate) for subsetting |
| ul_ _{lat} | Upper left (ul) latitude (y-coordinate) for subsetting |
| lr_ _{lon} | Lower right (lr) longitude (x-coordinate) for subsetting |
| lr_ _{lat} | Lower right (lr) latitude (y-coordinate) for subsetting |

Details

If you want this function to use MRTSwath tool successfully, you should add the directory with the MRTSwath executable to the default R PATH by editing ~/.Rprofile.

This function hard-codes these options into the parameter file:

- * all the bands are extracted
- * the output file is a GeoTIFF
- * the output projection is Geographic (plain unprojected Latitude/Longitude)
- * the resampling is Nearest Neighbor (NN), which of course is the only one which makes sense when the pixels encode bytes that encode bits that encode discrete classification results, 0/1 error flags, etc.

MRTSwath can do many other projections and output formats; users can modify this function to run those options.

Value

prmf_n The name of the temporary parameter file

Author(s)

Rishabh Gupta <rishabh.uk@gmail.com>

See Also

[run_swath2grid_mod02nrt](#)

http://landweb.nascom.nasa.gov/cgi-bin/QA_WWW/newPage.cgi?fileName=hdf_filename@cite NASA2001

Examples

```
# Source MODIS files (both data and geolocation)
# Code excluded from CRAN check because it depends on modiscdata
## Not run:
library(devtools)
library(modiscdata)
moddir = system.file("extdata/2002raw/", package="modiscdata")

# Get the matching data/geolocation file pairs
fns_df = check_for_matching_geolocation_files_mod02nrt(moddir, modtxt="MOD02", geolotxt="MOD03")
fns_df

# Resulting TIF files go in this directory
tifsdir = getwd()

# Box to subset
ul_lat = 13
ul_lon = -87
lr_lat = 8
lr_lon = -82

for (i in 1:nrow(fns_df))
{

  prmfnc = write_MRTSwath_param_file_mod02nrt(prmfnc="tmpMRTparams.prm", tifsdir=tifsdir,
  modfn=fns_df$mod02_fns[i], geoloc_fn=fns_df$mod03_fns[i], ul_lon=ul_lon, ul_lat=ul_lat,
  lr_lon=lr_lon, lr_lat=lr_lat)
  print(scan(file=prmfnc, what="character", sep="\n"))

}

## End(Not run)
```

Index

adf, [2](#)

check_for_matching_geolocation_files_mod02nrt, [3](#)

extract_fn_from_path, [4](#)

run_swath2grid_mod02nrt, [5](#), [8](#)

slasheslash, [7](#)

write_MRTSwath_param_file_mod02nrt, [6](#), [7](#)