

Package ‘hillshader’

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Title Create Hillshade Relief Maps Using Ray-Tracing

Version 0.1.2

Description A set of tools to create georeferenced hillshade relief raster maps using ray-tracing and other advanced hill-shading techniques. It includes a wrapper function to create a georeferenced, ray-traced hillshade map from a digital elevation model, and other functions that can be used in a rayshader pipeline.

License GPL (>= 3)

Encoding UTF-8

LazyData true

RoxygenNote 7.1.1

Imports methods, raster, rayshader, scales

Depends R (>= 2.10)

Collate 'add_shadow_2d.R' 'matrix_to_raster.R' 'write_raster.R' 'utils.R' 'hillshader.R' 'maungawhau.R' 'maungawhau_hr.R'

NeedsCompilation no

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add_shadow_2d *Add shadow*

Description

Multiplies a texture array or shadow map by a shadow map.

Usage

```
add_shadow_2d(hillshade, shadowmap, max_darken = 0.7, rescale_original = FALSE)
```

Arguments

hillshade	A 2D matrix of shadow intensities.
shadowmap	A matrix that indicates the intensity of the shadow at that point. 0 is full darkness, 1 is full light.
max_darken	Default '0.7'. The lower limit for how much the image will be darkened. 0 is completely black, 1 means the shadow map will have no effect.
rescale_original	Ignored.

Value

A shaded map.

Author(s)

Slight modification from Tyler's code in rayshader::add_shadow

Examples

```
library(rayshader)

# Create elevation matrix
el_mat <- raster_to_matrix(maungawhau)

el_mat %>%
  # Create hillshade layer using
  # ray-tracing
  ray_shade() %>%
  # Add ambient shading
  add_shadow_2d(
    ambient_shade(
      heightmap = el_mat
    )
  )
```

hillshader	<i>Hillshader</i>
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Description

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Usage

```
hillshader(elevation, shader = "ray_shade", filename = NULL, ...)
```

Arguments

elevation	Raster, a digital elevation model.
shader	Character. List of rayshader shader(s) to sequentially apply. Defaults to ray_shade.
filename	Character. If set, the result is written as a raster file. Defaults to NULL.
...	Additional parameters to be passed to the either shader functions or to raster::writeRaster.

Value

Either a RasterLayer of light intensities (hillshade), or writes the result to disk if filename is set.

Author(s)

Pierre Roudier

Examples

```
# Simple example
library(raster)

hs <- hillshader(maungawhau)
plot(hs)
```

matrix_to_raster	<i>Matrix to Raster</i>
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Description

Turns a matrix into a Raster

Usage

```
matrix_to_raster(matrix, raster, crs = NULL)
```

Arguments

matrix	The input matrix, typically the output of a rayshader operation
raster	The original raster from which matrix is derived. Can be an Extent object.
crs	If an Extent object is passed to the raster option, the corresponding coordinate reference system information.

Value

a RasterLayer

Author(s)

Pierre Roudier

maungawhau

Elevation Raster for Maungawhau in Tāmaki Mākaaurau/Auckland

Description

Elevation data as a raster for Maungawhau, a volcano located in Tāmaki Mākaaurau/Auckland.

Usage

maungawhau

Format

A RasterLayer with 87 rows, 61 columns, and 1 band with the elevation data at a 10-m resolution. The data is projected in New Zealand Map Grid (NZMG, EPSG:27200).

Source

Elevation data from datasets::volcano, georeferencing adapted from <https://waterdata.usgs.gov/blog/inlmiscmaps/>

maungawhau_hr	<i>LiDAR Elevation Raster for Maungawhau in Tāmaki Mākaurau/Auckland</i>
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Description

Elevation data as a raster for Maungawhau, a volcano located in Tāmaki Mākaurau/Auckland.

Usage

```
maungawhau_hr
```

Format

A RasterLayer with 860 rows, 600 columns, and 1 band with the elevation data at a 1 m resolution. The data is projected in New Zealand Map Grid (NZMG, EPSG:27200).

Source

Elevation data from LINZ Data Service: <https://data.linz.govt.nz/layer/53405-auckland-lidar-1m-dem-2013/>

write_raster	<i>Write hillshade to a file</i>
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Description

Write an array from a hillshade procedure to a geospatial raster file.

Usage

```
write_raster(hillshade, elevation, filename, format, ...)
```

Arguments

hillshade	A 2D matrix of shadow intensities.
elevation	Original elevation raster.
filename	Character. Output filename.
format	Character. Output file type. Passed to raster::writeRaster.
...	Additional arguments passed to raster::writeRaster.

Value

This function is used for the side-effect of writing values to a file.

Author(s)

Pierre Roudier

Examples

```
library(rayshader)

out_fn <- paste0(tempfile(), ".tif")

# Create elevation matrix
el_mat <- maungawhau %>%
  raster_to_matrix()

el_mat %>%
# Create hillshade layer using
# ray-tracing
ray_shade() %>%
# Add ambient shading
add_shadow_2d(
  ambient_shade(
    heightmap = el_mat
  )
) %>%
write_raster(
  elevation = maungawhau,
  filename = out_fn
)
```

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