

Package ‘regional’

March 14, 2022

Title Intra- and Inter-Regional Similarity

Version 0.3.3

Description Calculates intra-regional and inter-regional similarities based on user-provided spatial vector objects (regions) and spatial raster objects (cells with values). Implemented metrics include inhomogeneity, isolation (Haralick and Shapiro (1985) <[doi:10.1016/S0734-189X\(85\)90153-7](https://doi.org/10.1016/S0734-189X(85)90153-7)>, Jasiewicz et al. (2018) <[doi:10.1016/j.cageo.2018.06.003](https://doi.org/10.1016/j.cageo.2018.06.003)>), and distinction (Nowosad (2021) <[doi:10.1080/13658816.2021.1893324](https://doi.org/10.1080/13658816.2021.1893324)>).

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Encoding UTF-8

RoxygenNote 7.1.2

Imports philentropy (>= 0.6.0), terra

BugReports <https://github.com/Nowosad/regional/issues>

Suggests supercells, sf, testthat (>= 3.0.0), covr

Config/testthat/edition 3

NeedsCompilation no

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reg_distinction	<i>Distinction</i>
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Description

Distinction is an average distance between the focus region and all of the other regions. This value is between 0 and 1, where large value indicates that the values in the region stands out from the other regions.

Usage

```
reg_distinction(
  region,
  raster,
  dist_fun = "euclidean",
  sample_size = 1,
  unit = "log2"
)
```

Arguments

region	An object of class <code>sf</code> with a POLYGON or MULTIPOLYGON geometry type
raster	An object of class <code>SpatRaster</code> (terra)
dist_fun	Distance measure used. This function uses the <code>philentropy::distance</code> function in the background. Run <code>philentropy::getDistMethods()</code> to find possible distance measures.
sample_size	Proportion of the cells inside of each region to be used in calculations. Value between 0 and 1. It is also possible to specify an integer larger than 1, in which case the specified number of cells of each region will be used in calculations.
unit	a character string specifying the logarithm unit that should be used to compute distances that depend on log computations.

Value

A vector with the distinction values

Examples

```
## Not run:
library(terra)
if (requireNamespace("sf", quietly = TRUE)) {
  library(sf)
  volcano = rast(system.file("raster/volcano.tif", package = "regional"))
  vr = read_sf(system.file("regions/volcano_regions.gpkg", package = "regional"))
  vr$dis = reg_distinction(vr, volcano, sample_size = 0.5)

  mean(vr$dis)
```

```

    plot(volcano)
    plot(vect(vr), add = TRUE)
    plot(volcano)
    plot(vr["dis"], add = TRUE)
  }

## End(Not run)

```

reg_inhomogeneity *Inhomogeneity*

Description

Inhomogeneity measures a degree of mutual dissimilarity between values of all cells in a region. This value is between 0 and 1, where small value indicates that values of all cells in the region represent consistent patterns so the cluster is pattern-homogeneous.

Usage

```

reg_inhomogeneity(
  region,
  raster,
  dist_fun = "euclidean",
  sample_size = 1,
  unit = "log2"
)

```

Arguments

region	An object of class <code>sf</code> with a POLYGON or MULTIPOLYGON geometry type
raster	An object of class <code>SpatRaster</code> (terra)
dist_fun	Distance measure used. This function uses the <code>philentropy::distance</code> function in the background. Run <code>philentropy::getDistMethods()</code> to find possible distance measures.
sample_size	Proportion of the cells inside of each region to be used in calculations. Value between 0 and 1. It is also possible to specify an integer larger than 1, in which case the specified number of cells of each region will be used in calculations.
unit	a character string specifying the logarithm unit that should be used to compute distances that depend on log computations.

Value

A vector with the inhomogeneity values

Examples

```
## Not run:
library(terra)
if (requireNamespace("sf", quietly = TRUE)) {
  library(sf)
  volcano = rast(system.file("raster/volcano.tif", package = "regional"))
  vr = read_sf(system.file("regions/volcano_regions.gpkg", package = "regional"))
  vr$inh = reg_inhomogeneity(vr, volcano, sample_size = 1)

  mean(vr$inh)

  plot(volcano)
  plot(vect(vr), add = TRUE)
  plot(volcano)
  plot(vr["inh"], add = TRUE)
}

## End(Not run)
```

 reg_isolation

Isolation

Description

Isolation is an average distance between the focus region and all of its neighbors. This value is between 0 and 1, where large value indicates that values of the region stands out from its surroundings.

Usage

```
reg_isolation(
  region,
  raster,
  dist_fun = "euclidean",
  sample_size = 1,
  unit = "log2"
)
```

Arguments

region	An object of class sf with a POLYGON or MULTIPOLYGON geometry type
raster	An object of class SpatRaster (terra)
dist_fun	Distance measure used. This function uses the <code>philentropy::distance</code> function in the background. Run <code>philentropy::getDistMethods()</code> to find possible distance measures.
sample_size	Proportion of the cells inside of each region to be used in calculations. Value between 0 and 1. It is also possible to specify an integer larger than 1, in which case the specified number of cells of each region will be used in calculations.

unit a character string specifying the logarithm unit that should be used to compute distances that depend on log computations.

Value

A vector with the isolation values

Examples

```
## Not run:
library(terra)
if (requireNamespace("sf", quietly = TRUE)) {
  library(sf)
  volcano = rast(system.file("raster/volcano.tif", package = "regional"))
  vr = read_sf(system.file("regions/volcano_regions.gpkg", package = "regional"))
  vr$iso = reg_isolation(vr, volcano, sample_size = 1)

  mean(volcano$iso)

  plot(volcano)
  plot(vect(vr), add = TRUE)
  plot(volcano)
  plot(vr["iso"], add = TRUE)
}

## End(Not run)
```

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