

Package: planisphere (via r-universe)

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Title Map Projections

Version 0.1.0

Description Applies cartographic projections to spatial data frames containing geographic coordinates. Projection methods are based on the 'D3.js' ecosystem <[doi:10.1109/TVCG.2011.185](https://doi.org/10.1109/TVCG.2011.185)> and use spherical geometry rather than ellipsoidal geodesic models.

License GPL (>= 3)

URL <https://riatelab.github.io/planisphere/>

BugReports <https://github.com/riatelab/planisphere/issues/>

Encoding UTF-8

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display	<i>Display a projected planisphere</i>
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Description

Render a complete planisphere from a projected object created with `project()`. The display includes the projected sphere outline, graticule, and geographic features.

Usage

```
display(x, title = NULL, extent = NULL)
```

Arguments

<code>x</code>	A list returned by <code>project()</code> , containing three <code>sf</code> objects: <ul style="list-style-type: none"> • <code>basemap</code>: projected geographic features • <code>sphere</code>: outline of the projected globe • <code>graticule</code>: projected latitude/longitude grid
<code>title</code>	Character string. Optional title to add to the plot. Default is <code>NULL</code> .
<code>extent</code>	object. A spatial extent used to clip or define the mapping area (<code>'sf'</code> , <code>'sfc'</code> , or <code>'bbox'</code>).

Details

The visualization follows the D3.js spherical projection model used in the package. The rendering order is: 1. Sphere background 2. Graticule 3. Projected landmass (`basemap`) 4. Sphere outline

All geometries are expected to be already projected in spherical coordinates. This function is intended for fast visualization and exploration of D3-based projections.

Value

a base R plot.

Examples

```
library(sf)
world <- st_read(
  system.file("gpkg/land.gpkg", package = "planisphere"),
  quiet = TRUE
)

result <- planisphere::project(
  x = world,
  proj = "Eckert1",
  additional_layers = TRUE
)
planisphere::display(result)
```

gallery

Display a gallery of map projections

Description

Creates a gallery of projected world maps using the projections available in **planisphere**. By default, a random sample of projections is selected from the projection registry and displayed in a multi-panel layout.

Usage

```
gallery(
  projections = NULL,
  sample = 12,
  ncol = 4,
  title = TRUE,
  verbose = TRUE
)
```

Arguments

projections	Character vector of projection names. If 'NULL', projections are selected from 'registry'.
sample	Integer. Number of projections to display when 'projections = NULL'. Ignored if 'projections' is provided. Set to 'NULL' to display all available projections.
ncol	Integer. Number of columns in the gallery layout.
title	Logical. Should projection names be displayed as titles?
verbose	Logical. Display progress messages while rendering projections.

Details

The function uses the bundled world land dataset and applies each selected projection through [project()]. Maps are displayed using [display()] in a base R graphics layout.

Value

Draws a gallery of projected maps in the current graphics device and returns 'NULL' invisibly.

Examples

```
# Display a random sample of 12 projections
gallery(verbose = FALSE)

# Display selected projections
gallery(
  projections = c(
    "Mercator",
    "Robinson",
    "Orthographic",
    "EqualEarth"
  ),
  ncol = 2,
  verbose = FALSE
)
```

new_v8_context

New V8 context

Description

Create a new V8 JavaScript context preloaded with the D3.js geospatial stack.

Usage

```
new_v8_context(
  libs = c("https://cdn.jsdelivr.net/npm/d3@7", "https://cdn.jsdelivr.net/npm/d3-geo@3",
    "https://cdn.jsdelivr.net/npm/d3-geo-polygon@2",
    "https://cdn.jsdelivr.net/npm/d3-geo-projection@4"),
  verbose = TRUE
)
```

Arguments

libs	Character vector of JavaScript library URLs to load. By default, libraries are loaded from the jsDelivr CDN. Users may replace these with local files, pinned versions, or alternative CDNs.
verbose	Logical. If TRUE, prints loading status for each library.

Details

This function initializes a fresh V8 JavaScript runtime and automatically loads the latest versions of the required D3.js libraries from the jsDelivr CDN.

The following JavaScript libraries are loaded by default:

- d3 (core library): <https://cdn.jsdelivr.net/npm/d3> - d3-geo (spherical geometry and geographic projections): <https://cdn.jsdelivr.net/npm/d3-geo> - d3-geo-projection (extended cartographic projections): <https://cdn.jsdelivr.net/npm/d3-geo-projection> - d3-geo-polygon (spherical polygon clipping): <https://cdn.jsdelivr.net/npm/d3-geo-polygon>

These libraries are fetched dynamically at runtime from the jsDelivr CDN, ensuring that the most recent compatible versions are used unless explicitly overridden via the ‘libs’ argument.

All projections computed in this environment rely on D3.js spherical geometry, where the Earth is modeled as a sphere rather than an ellipsoid. This allows fast and consistent computation of map projections and geometric transformations.

Value

A V8 JavaScript context with the D3.js geospatial stack loaded and ready for cartographic computations.

Examples

```
ct <- planisphere::new_v8_context()
# Then:
library(sf)
world <- st_read(
  system.file("gpkg/land.gpkg", package = "planisphere"),
  quiet = TRUE
)
out <- planisphere::project(x = world, proj = "InterruptedBoggs", ct = ct)
```

planisphere

Package description

Description

A wrapper around D3.js for cartographic projections to design and visualize world maps (planispheres). Projections are computed using D3.js spherical geometry rather than ellipsoidal geodesic models.

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See Also

Useful links:

- <https://riatelab.github.io/planisphere/>
- Report bugs at <https://github.com/riatelab/planisphere/issues>

project

Project geographic data using a D3.js projection

Description

Projects spatial data using D3.js geographic projections executed in a V8 JavaScript context. The projection is performed in spherical coordinates, following D3.js design principles, where the Earth is modeled as a sphere rather than an ellipsoid.

Usage

```
project(
  x,
  proj = "geoAzimuthalEqualArea",
  rotate = NULL,
  reflectX = NULL,
  reflectY = NULL,
  scale = 500,
  center = NULL,
  parallel = NULL,
  parallels = NULL,
  clipExtent = NULL,
  clip = TRUE,
  graticule = c(10, 10),
  additional_layers = FALSE,
  verbose = FALSE,
  ct = .planisphere$ct,
  ...
)
```

Arguments

x	An sf spatial dataframe to project.
proj	A D3 projection name or constructor (e.g. "geoInterruptedHomolosine").
rotate	Rotation parameters passed to the projection.
reflectX	Logical; whether to reflect the projection on the X axis.
reflectY	Logical; whether to reflect the projection on the Y axis.
scale	Projection scale factor (D3 spherical scale, not planar CRS units).
center	Optional projection center.

parallel	Optional standard parallel of the projection
parallels	Optional standard parallels of the projection
clipExtent	Projection's viewport clip extent to the specified bounds in pixels
clip	If TRUE, clips the projected geometries to the projected sphere.
graticule	Numeric vector of longitude/latitude step size for graticule generation.
additional_layers	Logical. If TRUE, adds graticule and sphere layers. In this case, the function returns a list. If FALSE (default), it returns a spatial data frame.
verbose	Logical. Display messages
ct	A custom V8 JavaScript context if needed. See <code>new_v8_context()</code> .
...	Additional parameters passed to the projection builder.

Details

D3 geographic projections are based on spherical geometry. All transformations assume a perfect sphere, which differs from traditional GIS pipelines that often rely on ellipsoidal datums (e.g., WGS84). As a result, this function is primarily intended for visualization and cartographic rendering rather than high-precision geodetic computation.

Value

If `additionalLayers = FALSE`, a single `sf` object corresponding to the projected basemap.

If `additionalLayers = TRUE`, a list of `sf` objects:

- `basemap`: projected input geometries
- `sphere`: outline of the projected globe
- `graticule`: projected graticule lines

Examples

```
library(sf)
world <- st_read(
  system.file("gpkg/land.gpkg", package = "planisphere"),
  quiet = TRUE
)

result <- planisphere::project(x = world, proj = "InterruptedBoggs")
```

`registry`*List available map projections*

Description

Returns the list of available map projections registered in **planisphere**. Projections are organized into thematic families to facilitate exploration and selection.

By default, all projections are returned as a single sorted character vector. Alternatively, a specific family of projections can be requested.

Usage

```
registry(type = NULL)
```

Arguments

`type` Character. Optional projection family. Must be one of: "cylindrical", "conic", "azimuthal", "perspective", "pseudocylindrical", "interrupted", "polyhedral", "quincuncial", "regional", "pseudoazimuthal", "miscellaneous".

Value

A sorted unique character vector of projection names. If 'type' is provided, only projections belonging to the selected family are returned.

Examples

```
# List all available projections

# List cylindrical projections
registry(type = "cylindrical")

# Explore regional projections
registry("regional")

# Visualize polyhedral projections
gallery(projections = registry("polyhedral"), verbose = FALSE)
```

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