

Package ‘ggautomap’

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Type Package

Title Create Maps from a Column of Place Names

Version 0.4.0

Description Mapping tools that convert place names to coordinates on the fly. These 'ggplot2' extensions make maps from a data frame where one of the columns contains place names, without having to directly work with the underlying geospatial data and tools. The corresponding map data must be registered with 'cartographer' either by the user or by another package.

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<https://cidm-ph.github.io/ggautomap/>

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Author Carl Suster [aut, cre, cph] (ORCID:
<<https://orcid.org/0000-0001-7021-9380>>),
Western Sydney Local Health District, NSW Health [cph] (2023-2025)

Maintainer Carl Suster <carl.suster@sydney.edu.au>

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ggautomap-package *Create Maps From a Column of Place Names*

Description

Mapping geometries based on {ggplot2} for turning a spreadsheet into maps. This package provides ggplot geoms that make maps from a data frame where one of the columns contains place names. The map data must be registered with {cartographer}.

Author(s)

Maintainer: Carl Suster <carl.suster@sydney.edu.au> ([ORCID](#)) [copyright holder]

Other contributors:

- Western Sydney Local Health District, NSW Health (2023-2025) [copyright holder]

See Also

Useful links:

- <https://github.com/cidm-ph/ggautomap>
- <https://cidm-ph.github.io/ggautomap/>
- Report bugs at <https://github.com/cidm-ph/ggautomap/issues>

coord_automap	<i>Specify an inset configuration for the whole plot</i>
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Description

This allows a default inset configuration to be provided to avoid having to repeat it for each layer. Any layer that is inset-aware can use this as the default configuration if none is specifically provided to that layer. This coord also expands the axis limits to include the inset area.

Usage

```
coord_automap(feature_type = NA, inset = NULL, ...)
```

Arguments

feature_type	Type of map feature. See feature_types() for a list of registered types. If NA, the type is guessed based on the values in feature_names.
inset	Inset configuration; see configure_inset() .
...	Arguments passed to coord_sf_inset()

Value

A ggplot coordinate

Examples

```
library(ggplot2)
library(cartographer)

ggplot(nc_type_example_2, aes(location = county)) +
  geom_choropleth(aes(colour = type), size = 0.5) +
  geom_sf_label_inset(aes(label = county), stat = "automap_coords", size = 3) +
  coord_automap(feature_type = "sf.nc")
```

crs_eqc	<i>Coordinate reference system for spatial computations</i>
---------	---

Description

crs_eqc() gives a CRS that can be used for e.g. computing centroids or distances. It is an equidistant cylindrical system that by does not distort latitudes near latitude. The CRS is in units of kilometres by default.

Usage

```
crs_eqc(latitude = 0, units = "km")
```

Arguments

latitude	The latitude of true scale (the proj parameter lat_ts). This is the latitude where the scale is not distorted by the projection.
units	Base length unit (e.g. "km" or "mi"). See ggmapinset::configure_inset() for supported values.

Value

CRS object from sf.

Examples

```
# Sydney, Australia has a latitude of 33.87 S so this CRS will be suitable
# for computations close to there:
crs_eqc(latitude = -33.87)
```

geom_boundaries

Map feature boundaries

Description

Retrieves the full map data from {cartographer} and plots the boundaries. As well as the chosen feature boundaries, the outline of the map is drawn separately if one has been registered with the map data, with the possibility to override its aesthetics.

Usage

```
geom_boundaries(
  mapping = aes(),
  data = NULL,
  stat = "sf_inset",
  position = "identity",
  ...,
  feature_type = NULL,
  inset = waiver(),
  map_base = "normal",
  map_inset = "auto",
  na.rm = FALSE,
  outline.aes = list(colour = "#666666"),
  show.legend = NA,
  inherit.aes = FALSE
)
```

Arguments

mapping, stat, position, na.rm, show.legend, inherit.aes, ...	See <code>ggplot2::geom_sf()</code> .
data	Ignored (this geometry always uses the registered geographic data).
feature_type	Type of map feature. See <code>feature_types()</code> for a list of registered types. If NA, the type is guessed based on the values in <code>feature_names</code> .
inset	Inset configuration; see <code>configure_inset()</code> . If <code>waiver()</code> , the default, this is inherited from the coord (see <code>coord_sf_inset()</code>).
map_base	Controls the layer with the base map. Possible values are "normal" to create a layer as though the inset were not specified, "clip" to create a layer with the inset viewport cut out, and "none" to prevent the insertion of a layer for the base map.
map_inset	Controls the layer with the inset map. Possible values are "auto" to choose the behaviour based on whether <code>inset</code> is specified, "normal" to create a layer with the viewport cut out and transformed, and "none" to prevent the insertion of a layer for the viewport map.
outline.aes	A list to override the aesthetics for the outline of the map. This has no effect if the map wasn't registered with a separate outline.

Value

A ggplot layer.

Examples

```
library(ggplot2)
library(nswgeo)

ggplot() +
  geom_boundaries(
    feature_type = "nswgeo.lhd",
    outline.aes = list(colour = "red", linewidth = 0.6)
  )
```

geom_centroids	<i>Geographic centroid of locations</i>
----------------	---

Description

Assigns each point a longitude and latitude corresponding to the geographic centre of its administrative area. This means that all points in the same area will overlap. The default position uses `position_circle_repel()` to repel the points outwards with an amount controllable with its `scale` parameter.

Usage

```
geom_centroids(
  mapping = aes(),
  data = NULL,
  stat = "automap_coords",
  position = "circle_repel_sf",
  ...,
  fun.geometry = NULL,
  feature_type = NA,
  inset = waiver(),
  map_base = "clip",
  map_inset = "auto",
  na.rm = TRUE,
  show.legend = "point",
  inherit.aes = TRUE
)
```

Arguments

mapping, data, stat, position, na.rm, show.legend, inherit.aes,
fun.geometry, ...

See [ggplot2::stat_sf_coordinates\(\)](#).

- feature_type** Type of map feature. See [feature_types\(\)](#) for a list of registered types. If NA, the type is guessed based on the values in feature_names.
- inset** Inset configuration; see [configure_inset\(\)](#). If [waiver\(\)](#), the default, this is inherited from the coord (see [coord_sf_inset\(\)](#)).
- map_base** Controls the layer with the base map. Possible values are "normal" to create a layer as though the inset were not specified, "clip" to create a layer with the inset viewport cut out, and "none" to prevent the insertion of a layer for the base map.
- map_inset** Controls the layer with the inset map. Possible values are "auto" to choose the behaviour based on whether inset is specified, "normal" to create a layer with the viewport cut out and transformed, and "none" to prevent the insertion of a layer for the viewport map.

Value

A ggplot layer.

Aesthetics

The location aesthetic is required. `geom_centroids()` understands the same aesthetics as [ggplot2::geom_point\(\)](#).

Examples

```
library(ggplot2)

cartographer::nc_type_example_2 |>
```

```
head(n = 100) |>
ggplot(aes(location = county)) +
geom_boundaries(feature_type = "sf.nc") +
geom_centroids(
  aes(colour = type),
  position = position_circle_repel_sf(scale = 6),
  size = 0.5
) +
coord_automap(feature_type = "sf.nc")
```

geom_choropleth	<i>Associate regions with counts</i>
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Description

Counts the number of occurrences of each location, then by default maps the count to the fill aesthetic. If your data has only one row per location and some other field that you'd like to map to aesthetics, use `geom_sf()` or `geom_sf_inset()` with `stat = "automap"` instead.

Usage

```
geom_choropleth(
  mapping = aes(),
  data = NULL,
  stat = "choropleth",
  position = "identity",
  ...,
  feature_type = NA,
  inset = waiver(),
  map_base = "normal",
  map_inset = "auto",
  na.rm = TRUE,
  show.legend = NA,
  inherit.aes = TRUE
)
```

```
stat_choropleth(
  mapping = NULL,
  data = NULL,
  geom = "sf",
  position = "identity",
  ...,
  feature_type = NA,
  na.rm = TRUE,
  show.legend = NA,
  inherit.aes = TRUE
)
```

Arguments

mapping, data, stat, geom, position, na.rm, show.legend, inherit.aes, ...	See <code>ggplot2::geom_sf()</code> .
feature_type	Type of map feature. See <code>feature_types()</code> for a list of registered types. If NA, the type is guessed based on the values in <code>feature_names</code> .
inset	Inset configuration; see <code>configure_inset()</code> . If <code>waiver()</code> , the default, this is inherited from the coord (see <code>coord_sf_inset()</code>).
map_base	Controls the layer with the base map. Possible values are "normal" to create a layer as though the inset were not specified, "clip" to create a layer with the inset viewport cut out, and "none" to prevent the insertion of a layer for the base map.
map_inset	Controls the layer with the inset map. Possible values are "auto" to choose the behaviour based on whether <code>inset</code> is specified, "normal" to create a layer with the viewport cut out and transformed, and "none" to prevent the insertion of a layer for the viewport map.

Details

Note that choropleths have a tendency to be misleading by emphasising geographically larger areas.

Value

A ggplot layer.

Computed variables

count rows matching the region
geometry sf geometry column
 ... limits as computed by `ggplot2::stat_sf()`

Aesthetics

`stat_choropleth()` understands the following aesthetics. Required aesthetics are displayed in bold and defaults are displayed for optional aesthetics:

- location
- **fill** → `ggplot2::after_stat(count)`
- **group** → inferred

Learn more about setting these aesthetics in `vignette("ggplot2-specs")`.

Examples

```
library(ggplot2)

cartographer::nc_type_example_2 |>
  ggplot(aes(location = county)) +
  geom_choropleth() +
  geom_boundaries(feature_type = "sf.nc") +
  scale_fill_steps(low = "#e6f9ff", high = "#00394d") +
  coord_automap(feature_type = "sf.nc")
```

 geom_geosscatter

Place points randomly or in a grid within locations

Description

Each row of data is drawn as a single point inside the geographic area. This has similar strengths to a standard scatter plot, but has the potential to be misleading by implying that there is significance to the exact placement of the points.

Usage

```
geom_geosscatter(
  mapping = aes(),
  data = NULL,
  stat = "geosscatter",
  position = "identity",
  ...,
  feature_type = NA,
  sample_type = "random",
  seed = 12345,
  inset = waiver(),
  map_base = "clip",
  map_inset = "auto",
  na.rm = TRUE,
  show.legend = "point",
  inherit.aes = TRUE
)
```

```
stat_geosscatter(
  mapping = NULL,
  data = NULL,
  geom = "sf_inset",
  position = "identity",
  ...,
  feature_type = NA,
  sample_type = "random",
  seed = 12345,
```

```

  show.legend = NA,
  inherit.aes = TRUE
)

```

Arguments

mapping, data, stat, geom, position, na.rm, show.legend, inherit.aes, ...
 See [ggplot2::geom_sf\(\)](#).

feature_type Type of map feature. See [feature_types\(\)](#) for a list of registered types. If NA, the type is guessed based on the values in `feature_names`.

sample_type sampling type (see the `type` argument of [sf::st_sample\(\)](#)). "random" will place points randomly inside the boundaries, whereas "regular" and "hexagonal" will evenly space points, leaving a small margin close to the boundaries.

seed random seed, used when `sample_type` is "random". When NA, the global seed, if any, is used instead of a fixed seed.

inset Inset configuration; see [configure_inset\(\)](#). If [waiver\(\)](#), the default, this is inherited from the `coord` (see [coord_sf_inset\(\)](#)).

map_base Controls the layer with the base map. Possible values are "normal" to create a layer as though the inset were not specified, "clip" to create a layer with the inset viewport cut out, and "none" to prevent the insertion of a layer for the base map.

map_inset Controls the layer with the inset map. Possible values are "auto" to choose the behaviour based on whether `inset` is specified, "normal" to create a layer with the viewport cut out and transformed, and "none" to prevent the insertion of a layer for the viewport map.

Value

A ggplot layer.

Aesthetics

The `location` aesthetic is required. `geom_geosscatter()` understands the same aesthetics as [ggplot2::geom_point\(\)](#).

Computed variables

x longitude
y latitude

Examples

```

library(ggplot2)

cartographer::nc_type_example_2 |>
  ggplot(aes(location = county)) +
  geom_boundaries(feature_type = "sf.nc") +
  geom_geosscatter(aes(colour = type), size = 0.5, seed = 123) +
  coord_automap(feature_type = "sf.nc")

```

position_circle_repel *Pack overlapping points into a circle*

Description

This position looks for any points with identical x and y positions and packs them in a circle around the original point. The `_sf` version applies the position adjustment in projected coordinates.

Usage

```
position_circle_repel(scale = 1/4)
position_circle_repel_sf(scale = 10)
```

Arguments

`scale` Scale of packing around the central point. This is in data units, so for the `_sf` variant it will depend on the units specified by the coordinate reference system.

Details

Note that extreme choices of scale may cause errors.

The scale parameter can instead be specified as an aesthetic for geoms that support it (`geom_centroids()`). This allows different locations to have different scales, which is especially useful when combined with map insets.

Value

A ggplot position object.

Examples

```
library(ggplot2)
library(dplyr, warn.conflicts = FALSE)

points <- data.frame(
  x = c(rep(1, 10), 2, 2, 3),
  y = c(rep(1, 10), 2, 2, 3)
)
ggplot(points, aes(x, y)) +
  geom_point(size = 3, colour = "red") +
  geom_point(position = position_circle_repel(0.05), size = 3, alpha = 0.5) +
  coord_equal()

cartographer::nc_type_example_2 |>
  filter(!county %in% c("HENDERSON", "GASTON", "LINCOLN")) |>
  ggplot(aes(location = county)) +
  geom_boundaries(feature_type = "sf.nc") +
  geom_centroids(
```

```

    aes(colour = type),
    position = position_circle_repel_sf(scale = 4),
    size = 0.2
  ) +
  coord_automap(feature_type = "sf.nc")

```

stat_automap

Attach spatial data with 'cartographer'

Description

Use 'cartographer' to attach a spatial column to the data based on place names in another column. The result can then be used by `ggplot2::geom_sf()` or `ggmapinset::geom_sf_inset()`.

Usage

```

stat_automap(
  mapping = NULL,
  data = NULL,
  geom = "sf",
  position = "identity",
  ...,
  feature_type = NA,
  na.rm = TRUE,
  show.legend = NA,
  inherit.aes = TRUE
)

```

Arguments

mapping, data, geom, position, na.rm, show.legend, inherit.aes, ...

See `ggplot2::geom_sf()`.

feature_type Type of map feature. See `feature_types()` for a list of registered types. If NA, the type is guessed based on the values in feature_names.

Value

A ggplot layer

Computed variables

geometry sf geometry column

... limits as computed by `ggplot2::stat_sf()`

Aesthetics

stat_automap() understands the following aesthetics. Required aesthetics are displayed in bold and defaults are displayed for optional aesthetics:

- location
- **group** → inferred

Learn more about setting these aesthetics in vignette("ggplot2-specs").

Examples

```
library(ggplot2)

events <- data.frame(
  county = c("Mecklenburg", "Carteret", "Moore", "Caldwell"),
  proportion_A = c(0.1, 0.8, 0.0, 0.6)
)

ggplot(events, aes(location = county)) +
  geom_sf(aes(fill = proportion_A), stat = "automap")

ggplot(events, aes(location = county)) +
  stat_automap(aes(fill = proportion_A)) +
  coord_automap(feature_type = "sf.nc")
```

stat_automap_coords *Attach coordinates with 'cartographer'*

Description

Use 'cartographer' to attach a spatial column to the data based on place names in another column. The spatial data is then reduced to coordinates in the same way as [stat_sf_coordinates\(\)](#).

Usage

```
stat_automap_coords(
  mapping = NULL,
  data = NULL,
  geom = "sf_inset",
  position = "identity",
  ...,
  feature_type = NA,
  na.rm = TRUE,
  inset = waiver(),
  fun.geometry = NULL,
  show.legend = NA,
  inherit.aes = TRUE
)
```

Arguments

mapping, data, geom, position, na.rm, show.legend, inherit.aes, fun.geometry, ...
 See [ggplot2::stat_sf_coordinates\(\)](#).

feature_type Type of map feature. See [feature_types\(\)](#) for a list of registered types. If NA, the type is guessed based on the values in feature_names.

inset Inset configuration; see [configure_inset\(\)](#). If [waiver\(\)](#), the default, this is inherited from the coord (see [coord_sf_inset\(\)](#)).

Value

A plot layer

Computed variables

geometry sf geometry column representing the points

x X dimension of the simple feature

y Y dimension of the simple feature

x_inset X dimension of the simple feature after inset transformation

y_inset Y dimension of the simple feature after inset transformation

inside_inset logical indicating points inside the inset viewport

inset_scale 1 for points outside the inset, otherwise the configured inset scale parameter

Aesthetics

stat_automap_coords() understands the following aesthetics. Required aesthetics are displayed in bold and defaults are displayed for optional aesthetics:

- location
- **group** → inferred
- **x** → after_stat(x)
- **y** → after_stat(y)

Learn more about setting these aesthetics in [vignette\("ggplot2-specs"\)](#).

See Also

[ggmapinset::stat_sf_coordinates_inset\(\)](#)

Examples

```
library(ggplot2)

events <- data.frame(
  county = c("Mecklenburg", "Carteret", "Moore", "Caldwell"),
  proportion_A = c(0.1, 0.8, 0.0, 0.6)
```

```
)  
  
ggplot(events, aes(location = county)) +  
  geom_sf(aes(fill = proportion_A), stat = "automap") +  
  geom_label(aes(label = county), stat = "automap_coords") +  
  coord_automap(feature_type = "sf.nc")
```

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