Package 'geodetector'

August 26, 2024

Title Stratified Heterogeneity Measure, Dominant Driving Force
Detection, Interaction Relationship Investigation

Version 1.0-5

Description Spatial stratified heterogeneity (SSH), referring to the within strata are more similar than the between strata, a model with global parameters would be confounded if input data is SSH. Note that the ``spatial" here can be either geospatial or the space in mathematical meaning. Geographical detector is a novel tool to investigate SSH: (1) measure and find SSH of a variable Y; (2) test the power of determinant X of a dependent variable Y according to the consistency between their spatial distributions; and (3) investigate the interaction between two explanatory variables X1 and X2 to a dependent variable Y (Wang et al 2014 <doi:10.1080/13658810802443457>, Wang, Zhang, and Fu 2016 <doi:10.1016/j.ecolind.2016.02.0

License GPL (>= 2.0)

Encoding UTF-8

RoxygenNote 7.3.1

Depends R (>= 2.10)

LazyData true

Suggests knitr, rmarkdown

VignetteBuilder knitr

NeedsCompilation no

Author Chengdong Xu [aut, cre],
Jinfeng Wang [aut],
Yue Hou [ctb],
Qian Yin [ctb]

Maintainer Chengdong Xu <xucd@Lreis.ac.cn>

Repository CRAN

Date/Publication 2024-08-26 15:50:10 UTC

Contents

CollectData   *CollectData*

Description

Including data for neural-tube birth defects (NTD) Y and suspected and environmental factor data, "elevation", "soil type", and "watershed".

Usage

```
data("CollectData")
```

Format

A data frame with 185 observations on the following 4 variables.

---

ecological_detector   *ecological detector*

Description

This function identifies the impact differences between two factors X1 ~ X2.

Usage

```
ecological_detector(y_column, x_column_nn, tabledata)
```

Arguments

y_column	The index or field name of explained variable column in input dataset.
x_column_nn	The index or field name of explanatory variable(s)in input dataset.
tabledata	The dataset (dataframe) contains fields of explained variable and explanatory variables.

Value

Results of ecological detector is the significance test of impact difference between two explanatory variables.

Examples

```
data(CollectData)
ecological_detector("incidence",c("soiltype","watershed"),CollectData)
ecological_detector("incidence",c("soiltype","watershed","elevation"),CollectData)
```

---

factor_detector   *factor detector*

Description

The factor detector q-statistic measures the spatial stratified heterogeneity of a variable Y, or the determinant power of a covariate X of Y.

Usage

```
factor_detector(y_column, x_column_nn, tabledata)
```

Arguments

y_column	The index or field name of explained variable in input dataset.
x_column_nn	The index or the field name(s) of explanatory variable(s) in input dataset.
tabledata	The dataset (dataframe) contains fields of explained variable and explanatory variables.

Value

Results of factor detector include q statistic and the corresponding p value.

Examples

```
data(CollectData)
factor_detector("incidence","soiltype",CollectData)
factor_detector(1,2,CollectData)
factor_detector (1,c(2,3,4),CollectData)
factor_detector ("incidence",c("soiltype","watershed"),CollectData)
```

---

interaction_detector   *interaction detector*

Description

This function reveals whether the risk factors X1 and X2 (and more X) have an interactive influence on a disease Y.

Usage

```
interaction_detector(y_column, x_column_nn, tabledata)
```

Arguments

y_column	The index or field name of explained variable in input dataset.
x_column_nn	The index or field name of explanatory variable(s) in input dataset.
tabledata	The dataset (dataframe) contains fields of explained variable and explanatory variables.

Value

Results of interaction detector include the interactive q satistic.

Examples

```
data(CollectData)
interaction_detector("incidence",c("soiltype","watershed"),CollectData)
interaction_detector("incidence",c("soiltype","watershed","elevation"),CollectData)
```

---

risk_detector   *risk detector*

Description

This function calculates the average values in each stratum of explanatory variable (X), and presents if there exists difference between two strata.

Usage

```
risk_detector(y_column, x_column_nn, tabledata)
```

Arguments

y_column	The index or field name of explained variable in input dataset.
x_column_nn	The index or field name of explanatory variable(s) in input dataset.
tabledata	The dataset (dataframe) contains fields of explained variable and explanatory variables.

Value

Results of risk detector include the means of explained variable in each stratum derived from an explanatory variable and the t-test for difference between two strata.

Examples

```
data(CollectData)
risk_detector("incidence","soiltype",CollectData)
risk_detector(1,2,CollectData)
risk_detector(1,c(2,3,4),CollectData)
risk_detector("incidence",c("soiltype","watershed","elevation"),CollectData)
```

Index