

# Package: geodetector (via r-universe)

August 27, 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](https://doi.org/10.1080/13658810802443457)>, Wang, Zhang, and Fu 2016 <[doi:10.1016/j.ecolind.2016.02.052](https://doi.org/10.1016/j.ecolind.2016.02.052)>).

**License** GPL (>= 2.0)

**Encoding** UTF-8

**RoxygenNote** 7.3.1

**Depends** R (>= 2.10)

**LazyData** true

**Suggests** knitr, rmarkdown

**VignetteBuilder** knitr

**NeedsCompilation** no

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CollectData	<i>CollectData</i>
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### 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.

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ecological_detector	<i>ecological_detector</i>
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### 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)
```

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factor_detector	<i>factor detector</i>
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**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)
```

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interaction\_detector    *interaction detector*

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### 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 statistic.

### Examples

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

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risk\_detector    *risk detector*

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### 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)
```

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