

# Package: SpatialRoMLE (via r-universe)

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**Type** Package

**Title** Robust Maximum Likelihood Estimation for Spatial Error Model

**Version** 0.1.0

**Author** Vural Yildirim [aut,cre], Yeliz Mert Kantar [aut,ths]

**Maintainer** Vural Yildirim <vurall\_yildirim@hotmail.com>

**Description** This package provides robust maximum likelihood estimation for spatial error model.

**License** GPL-3

**Encoding** UTF-8

**LazyData** true

**RoxygenNote** 7.1.0

**Depends** R (>= 2.10)

**Repository** <https://wyilldirim.r-universe.dev>

**RemoteUrl** <https://github.com/wyilldirim/spatialromle>

**RemoteRef** HEAD

**RemoteSha** 5d0560027dd69fa56369f24e373dbddb6ec835b0

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IPS_coefs	<i>Initial coefficients of individual pension system data</i>
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**Description**

Initial coefficients of individual pension system data were obtained by MLE.

**Usage**

IPS\_coefs

**Format**

A list with 10 values, which are:

**(Intercept)** intercept

**Labor\_Rate** labor rate

**Unemployment\_Rate** unemployment rate

**Sex\_Ratio** sex ratio

**Urbanization\_Rate** urbanization rate

**Deposit\_Rate** deposit rate

**Illiteracy\_Rate** illiteracy rate

**HDI** human development index

**lambda** spatial autocorrelation parameter

**s2** variance

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IPS_data	<i>The individual pension system data of Turkey</i>
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**Description**

This is individual pension system data of Turkey for analysing spatial error model.

**Usage**

IPS\_data

**Format**

A list with 10 variables, which are:

**ID** provinces ID  
**Province** provinces names  
**RPIPS** participant rate of individual pension system  
**Labor\_Rate** labor rate  
**Unemployment\_Rate** unemployment rate  
**Sex\_Ratio** sex ratio  
**Urbanization\_Rate** urbanization rate  
**Deposit\_Rate** deposit rate  
**Illiteracy\_Rate** illiteracy rate  
**HDI** human development index

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RoMLE.error

*Robust Maximum Likelihood Estimation for Spatial Error Model*

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**Description**

This package provides robust maximum likelihood estimation for spatial error model.

**Usage**

```
RoMLE.error(  
  initial.beta,  
  initial.s2,  
  initial.lambda,  
  W,  
  y,  
  x,  
  phi.function,  
  converge.v,  
  iter,  
  print.values  
)
```

**Arguments**

<code>initial.beta</code>	initial value of coefficients
<code>initial.s2</code>	initial value of varaince
<code>initial.lambda</code>	initial value of autocorrelation parameters
<code>W</code>	a symmetric weight matrix
<code>y</code>	dependent variable

x	independent variables
phi.function	a robust m-estimator function, should be set as 1 for Cauchy, 2 for Welsch, 3 for Insha and 4 for Logistic
converge.v	converge value for fisher scoring algorithm, can be set as 1e-04
iter	iteration number for fisher scoring algorithm, set by users (e.g. 100)
print.values	printing estimated values for each step until converge, should be set TRUE or FALSE

### Value

coefficients, lambda, s2, Phi

### References

Yildirim, V. and Kantar, Y.M. (2020). Robust estimation of spatial error model. in Journal of Statistical Computation and Simulation <https://doi.org/10.1080/00949655.2020.1740223>

Yildirim, V., Mert Kantar, Y. (2019). Spatial Statistical Analysis of Participants in The Individual Pension System of Turkey. Eskisehir Teknik Universitesi Bilim Ve Teknoloji Dergisi B - Teorik Bilimler, 7(2), 184-194 <https://doi.org/10.20290/estubtdb.518706>

### Examples

```
#spdep library can be used to create a weight matrix from listw
#require(spdep)
#W <- as(listw, "CsparseMatrix")

#example 1
data(TRQWM)
data(unemployment_data)
data(unemployment_coefs)

y <- unemployment_data$unemployment
x <- unemployment_data$urbanization

#initial values was taken from MLE
initial.beta <- unemployment_coefs[1:2,2]
initial.lambda <- unemployment_coefs[3,2]
initial.s2 <- unemployment_coefs[4,2]

RoMLE.error(initial.beta, initial.s2, initial.lambda, W=TRQWM, y, x,
             phi.function=3, converge.v=0.0001, iter=100, print.values=TRUE)

#example 2
data(TRQWM)
data(IPS_data)
data(IPS_coefs)
y <- IPS_data[,3]
x <- IPS_data[,4:10]

#initial values was taken from MLE
```

```
initial.beta <- IPS_coefs[1:8,2]
initial.lambda <- IPS_coefs[9,2]
initial.s2 <- IPS_coefs[10,2]
RoMLE.error(initial.beta, initial.s2, initial.lambda, W=TRQWM, y, x,
             phi.function=3, converge.v=0.0001, iter=100, print.values=TRUE)
```

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SpatialRoMLE

*Spatial Robust MLE Package*

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### Description

Robust Maximum Likelihood Estimation for Spatial Error Model.

### Author(s)

Vural Yildirim <vurall\_yildirim@hotmail.com>

Yeliz Mert Kantar

### References

Yildirim, V. and Kantar, Y.M. (2020). Robust estimation of spatial error model. in *Journal of Statistical Computation and Simulation*. <https://doi.org/10.1080/00949655.2020.1740223>

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TRQWM

*Queen weight matrix of Turkey*

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### Description

This is queen continugity weight matrix of Turkey.

### Usage

TRQWM

### Format

A symmetric matrix with 81x81 values,

**V** provinces ID

unemployment\_coefs     *Initial coefficients of unemployment data*

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**Description**

Initial coefficients of unemployment data were obtained by MLE.

**Usage**

unemployment\_coefs

**Format**

A list with 4 values, which are:

**(Intercept)** intercept

**Unemployment\_Rate** unemployment rate

**lambda** spatial autocorrelation parameter

**s2** variance

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unemployment\_data     *Unemployment data of Turkey*

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**Description**

This is unemployment data of Turkey for analysing spatial error model.

**Usage**

unemployment\_data

**Format**

A list with 4 variables, which are:

**ID** provinces ID

**province** provinces names

**unemployment** unemployment rate

**urbanization** urbanization rate

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