R documentation

of 'lmcr.Rd'

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`lmcr` *Fit a linear model of coregionalisation to a gstat object.*

Description

Given a gstat model object with two variables and a gstat variogram with two variograms and a cross co variogram, this function will fit a lmcr, using the method of Lark and Papritz (2003).

Usage

```
lmcr(g, v, covar, guessa, modtyp, cpar,...)

lmcr(g, v, covar, guessa, modtyp, cpar,
wgt=1, icvp=1, lock=0, istop = 50,
plot.wss.change = TRUE)
```

Arguments

`g`	A gstat object with no model parameters and two variables.
`v`	A gstat cross variogram with with the same two variables and the cross variogram
`covar`	The nugget of each covariogram. In the order, auto.1,cross,auto.2. Must be three in length
`guessa`	Initial guesses of the distance of the variogram model. If modtyp is <6 only one number is required, else two variables must be specified.
`modtyp`	An integer between 1 and 8 indicating which type of model is to be used. See details for more information.
`cpar`	Cooling paparameter for the simulating annealing process. See Lark's 2003 paper for more details.

`wgt` The weighted sum of squares method to use. Defualt is set to 1. Equal wieghting. See details below for more information.

`icvp` Should covariance matrix be positive definitive. 1 indicates yes. defualt is 1.

`lock` If the distance parameter should be fitted. 0 = fit range, 1 = accept guessa for distance. Default = 0.

`istop` The length of each markov chain. See Lark's 2003 paper for more details. Defualt is 50.

`plot.wss.change`
Wether a plot of each iterative weighted sum of squares should be given. Default is TRUE

Details

This function is an adaptation of fortran code, based on Lark and Papritz (2003). The orginal fortran code has been modified to fit a LMCR to a gstat cross-covariogram object (Please see the example for further details).

The function can use 10 different semi-variogram models;

1 An isotropic linear model.

2 An istopric circular model.

3 An istropic spherical model.

4 An istropic exponential model.

5 An iso.pen

6 An istropic double model.

7 A double exponential model.

8 A stable model.

9 A double stable model.

10 bro

The optimisation of the model is based on a weighted sums of squares approach and can accomidate four different weighting methods (TODO: complete the wss weighting methods);

1 Equal weighting

2 wdevs=wdevs*rnp

3 wdevs=wdevs*(rnp/(prgam^2.0))

4 wdevs=wdevs*(rnp/(h^2.0))

Value

`WSSGuessedParameter`
The intial WSS of the input parameters.

`initialTemperature`
The initial Cooling parameter used.

`coolingParameter`

`numberTrialMarkovChain`

`numberMarkovChainReturningNoChange`

`weightingOption`
: The weighting option set for the WSS.

`other.wss`
: The WSS of each fitted model from the annealing process.

`other.pacc`
: The amount of change from previous model.

`solutionAfter`
: The amount of models fitted.

`structure`

`distance`
: The distance of the final LMCR.

`ir`

`ic`

`c`
: The LMCR fitted nugget and psill (auto1,cross,auto2)

`finalWSS`
: The WSS of the returned LMCR

`variogram`
: A gstat cross-covariogram object of the initial input

`gstat`
: A gstat formatted LMCR of the final model.

`variableAIC`

`effectiveRange1stStructure`
: The practical range of the LMCR

`effectiveRange2ndStructure`
: Depending on the model specified The 2nd practical range of the LMCR.

Note

The function is not the most stabile, and care should be taken to insure the order of the parameters are provided in the correct manor.

Author(s)

JS LESSELS

References

Lark, RM and Papritz, A (2003) Fitting a linear model of coregionalization for soil properties using simulated annealing, **Geoderma**,115, 245-260.

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