Package ‘isotonic.pen’

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Type Package
Title Penalized Isotonic Regression in one and two dimensions
Version 1.0
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Description Given a response y and a one- or two-
dimensional predictor, the isotonic regression estimator is calculated with the usual orderings.
License GPL-2 | GPL-3
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isotonic.pen-package  Penalized Isotonic Regression in one and two dimensions

Description

Given a response y and a one- or two-dimensional predictor, the isotonic regression estimator is calculated with the usual orderings. The user can specify a penalty to tame spiking, or a default value can be used.

Details
iso_pen

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References

iso_pen

Penalized Isotonic Regression in one and two dimensions

Description
Given a response vector y and a predictor matrix xmat with (one or two) columns, the isotonic regression estimator is returned, with the usual (complete or partial) ordering.

Usage
iso_pen(y, xmat, wt = 1, pen = TRUE, default = TRUE, lambda = 0, nsim = 0, alpha = 0.05)

Arguments
y
The response vector of length n
xmat
Either a one-dimensional predictor vector or an n by 2 matrix of two-dimensional predictor values.
wt
Optional weights – a positive vector of length n.
pen
If pen=FALSE, no penalty is applied to tame spiking. Default is pen=TRUE.
default
If default=FALSE, the user must specify a penalty value.
lambda
Optional penalty. If pen=0, an unpenalized isotonic regression is performed. If not supplied a default penalty is used.
nsim
The number of simulations used in the computation of approximate point-wise confidence intervals. The default is nsim=0, and no confidence intervals are returned.
alpha
The confidence level of the confidence intervals. Default is alpha=.05 (i.e., 95 percent confidence intervals)
Details

The least-squares isotonic regression is computed using the coneA function of the R package cone-proj.

Value

- **fit**: The fitted values; i.e., the estimated expected response
- **sighat**: The estimated model standard deviation
- **upper**: The upper points of the point-wise confidence intervals, returned if nsim>0
- **lower**: The lower points of the point-wise confidence intervals, returned if nsim>0

Author(s)

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References


Examples

```r
### plot the estimated expected lung volume of children given age and height
data(fev)
x1=fev[,1]  ## age
x2=fev[,3]  ## height
y=fev[,2]
ans=iso_pen(y,cbind(x1,x2))
persp(ans$xg1,ans$xgR,ans$xgmat,th=-40,tick="detailed",xlab="age",ylab="height",zlab="FEV")
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