R documentation

of 'SVR-ES.Rd'

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SVR-ES *Support Vector Regression with Evolutionary Strategy*

Description

svres is a hybrid algorithm which combines support vector regression and evolutionary strategy (uncorrelated mutation with *p* step sizes) to build predictive models.

Usage

```
svres(X.train, Y.train, X.test, PercentValid=20, Generations=30,
              InitialGamma=0.001, ErrorFunc=MSE, Step=FALSE,
              Trace=TRUE)
```

Arguments

X.train	Data matrix (numeric) containing the input values (predictors) used to train the model.
Y.train	Response vector (numeric) used to train the model.
X.test	Data matrix (numeric) containing the input values (predictors) used to test the model.
PercentValid	Percentage of the data reserved for validation. Default is 20%.
Generations	Number of generations considered to train the model. Default is 30 generations.
InitialGamma	Initial gamma hyperparameter. Default is 0.001
ErrorFunc	Error function to be minimized. The default is the function MSE from package qualV but the function could be customized.
Step	Option whether to use the stepwise regression to prescreening the input variables.
Trace	If TRUE, information is printed during the running of svres. Default is TRUE.

Details

To achieve better results, the use of a pre-processing technique (e.g. standardization of variables) is important.

If there are multiple minima, try different values of `InitialGamma`.

Value

`hypparameter`	Hyper-parameter of the best trained model.
`forecast`	A vector of predicted values generated by the best trained model.
`svmf`	An object of class "svm" containing the fitted model.
`ffTrain`	Error value of the training based on `ErrorFunc`.
`ffValid`	Error value of the validation based on `ErrorFunc`.

Author(s)

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References

Cherkassky, V. and Ma, Y., 2004. Practical selection of SVM parameters and noise estimation for SVM regression. Neural Netw. 17, 113-126.

Eiben, A.E. and Smith, J.E., 2003. Introduction to Evolutionary Computing. Natural Computing Series, Springer, Berlin.

Examples

```
## necessary libraries
library(qualV)
library(e1071)
library(FNN)

 ## generating sets
 x1 <- rnorm(1000)
 x2 <- x1^2
 y  <- x1+x2

 x.fit <- cbind(x1,x2)[1:700,]
 x.test <- cbind(x1,x2)[701:1000,]
 y.fit <- y[1:700]
 y.test <- y[701:1000]

 ## running SVR-ES
 resul <- svres(x.fit, y.fit, x.test)

 ## points are the target and lines are the forecasting
 plot(y.test[1:100])
 lines(resul$forecast[1:100])
```

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